

# OpenSidewalks Editing

## OpenSidewalks Motivation

Pedestrian pathways are critical infrastructure in urban environments that help people engage in their professional, community, and daily lives. To promote equitable urban growth, transit-oriented development, and resilient communities, we must give strategic, pedestrian-centric consideration to our sidewalks and pedestrian pathways, which are the dynamic connective tissue of our physical environments. Individuals experience the built environment in innumerable ways depending upon many factors, including their mobility. Therefore, their optimal path through the built environment is not necessarily the shortest or most direct route (despite the inherent Google Maps bias). Rather, their travel experience is influenced by *static* physical features, e.g., the availability of curb ramps and auditory signaling at crosswalks, as well as transient conditions (like precipitation). Municipalities, first responders and transit agencies require this kind of data for multiple purposes in their operation (not covered here), but automated routing applications can also make great use of this kind of data. For example, provided with such information, individuals prone to slipping on wet terrain could circumvent cobblestone sidewalk surfaces on rainy days, and individuals who require curb ramps can selectively identify routes that can accommodate their needs.

The OpenSidewalks focuses on the use of multiple new data tools, new sources and sensors to collect important infrastructure information in an open, shared, scalable and maintainable manner. As such, OpenSidewalks is promoting the use of OpenStreetMap as the repository for collection of such information in a standardized manner. OpenStreetMap is based around a community of mappers (whether individuals or agencies) working together. OpenSidewalks is promoting the creation and acceptance of standards specific to the collection of pedestrian-centered information.

The data can be used in multiple contexts and use cases, to improve non-motorized transit forecasting, enhance personal-preference-based pedestrian routing models, and overall enhancing the utility of both transportation/city planning tools and personal use navigation tools.

In this guide, we present a suggested workflow for municipal efforts to perform a deep pedestrian infrastructure collection for a specified area. The effort will typically require a three phase approach. The first phase focuses on creating the fundamental pedestrian transportation layer: namely, this includes individual line entities for every sidewalk edge, all sidewalks that connect in physical space are connected data entities, and a full specification of road crossings, also linked to the sidewalk entities by sidewalk links. The second phase focuses on the addition of attributes of the paths and crossings that could impact traversal of those spaces (for example, elevation, surface types, and non-visual cues that assist traversal without use of vision). The third phase is focused on particular applications, such as transit and transportation, or utilities, and would be dependent on the interests of the group performing the collection.

The guide is organized in the following way: We introduce the proposed workflow. Then for each step in the workflow we specify: (1) what are the OpenSidewalks recommended tags (2) whether these tags have already been in use, community accepted, or still under examination (3) methods of collection. The appendices at the end of the guide give full specification to the collection methods mentioned in the proposed workflow.

## ***Proposed Collection Workflow***

First, your group must identify the bounds of the area of interest. For the purposes of this guide, we will use the ½ mile walkshed/bikeshed of a light rail station in the Puget Sound area.

The proposed collection proceeds in three phases as discussed above:

- 1. Phase I: Fundamental pedestrian transportation layer- focus on paths and how they connect**
  - a. Footways
    - i. Sidewalks
    - ii. Crossings (best crossing locations)
  - b. Footway links (paths that go through curb ramps)
  - c. Curb lowered/raised
  - d. Outdoor stairs/ Escalators
  - e. Outdoor Ramps/ Wheelchair ramps
  - f. Publically accessible buildings with elevators (interior or exterior)
  - g. Ensuring all the components are connected appropriately to represent a connected transportation graph layer
- 2. Phase II: primary pedestrian path features- necessary information for all needs travelers**
  - a. Footpath surface information
    - i. Elevation information
    - ii. Cross-slope (cross grade)
    - iii. Surface type
    - iv. Large surface interruptions
    - v. Sidewalk width
    - vi. Shoring
      1. Tree lined
      2. Grass lined
      3. High curbed
      4. Presence of a curb
      5. Other separators
  - b. Pedestrian corners
    - i. Pedestrian Signalization
      1. Crossing type
      2. Are there signals letting pedestrians know it's time to cross
      3. Signals indicating to traffic that pedestrians are crossing
      4. Are there Accessible Pedestrian Signals
    - ii. Sidewalk bulbs
    - iii. Pedestrian islands
    - iv. Lit corners
- 3. Phase III: application specific path features- needed by all, but pertaining to particular use cases like entering a building or use of public transit**

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- a. Transit stops
  - i. Node location
  - ii. Footway link to the rest of pedestrian transportation network
    - 1. Forces specifying the actual path to getting to the transportation stop, including going underground, etc
  - iii. Amenities and descriptors of the stop (much more detailed information below)
- b. Entrances to public buildings and amenities

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Here we describe the OSM-specific tagging for each pedestrian-centric feature and methods of collection for each step in the workflow.

**Preparation work:** Given the dependency on OSM, every mapper or agency should obtain their own OSM user login so that their mapping contributions can be traced back to the origin. Details on how this is done are found in **Appendix 1: Creating an OSM account**

**Note:** Phase I can be done remotely, but a lot of time can be saved on Phase II and the data would be more complete if you perform Phase I in person along with imagery collection.

## 1. Phase I: Fundamental pedestrian transportation layer- focus on paths and how they connect

### a. Footways

#### i. Sidewalks

OpenSidewalk standard in OSM convention	In use	Approved	Mechanisms for mapping
creating separate line geometries and tagging them as <code>highway=footway</code> <code>footway=sidewalk</code> Optional: <code>description="4th Ave NE, N. sidewalk"</code>	YES	YES	(1) Editing by hand by drawing sidewalks into <a href="https://id.opensidewalks.com">id.opensidewalks.com</a> (2) import GPS traces and imagery collected via Mapillary (or similar app) and redraw lines by hand (see <b>Appendix 2: Using Mapillary to collect GPS traces and import to sidewalks id editor</b> ) (3) Use OpenSidewalks tasking manager with entire digital import set up provided by OpenSidewalks team (for municipalities with decent sidewalk data sets)

#### ii. Crossings (best crossing locations)

OpenSidewalk standard in OSM convention	In use	Approved	Mechanisms for mapping
creating separate line geometries and tagging them as <code>highway=footway</code> <code>footway=crossing</code> creating separate node geometry intersecting the crossing line and road and tagging as: <code>highway=crossing</code>	YES	YES	(1) Editing by hand by drawing sidewalks into <a href="https://id.opensidewalks.com">id.opensidewalks.com</a> (2) import GPS traces and imagery collected via Mapillary (or similar app) and redraw lines by hand (see <b>Appendix 2: Using Mapillary to collect GPS traces and import to sidewalks id editor</b> ) (3) Use OpenSidewalks tasking manager with entire digital import set up provided by OpenSidewalks team (for

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			municipalities with decent sidewalk data sets)
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## b. Footway links (paths that go through curb ramps)

OpenSidewalk standard in OSM convention	In use	Approved	Mechanisms for mapping
<p>creating separate line geometries and tagging them as</p> <p>highway=footway footway=sidewalk</p> <p>*we are proposing a different tag for these links as "sidewalk_link" but this is in proposal state right now</p>	YES	YES	<p>(1) Editing by hand by drawing sidewalks into <a href="https://id.opensidewalks.com">id.opensidewalks.com</a></p> <p>(2) import GPS traces and imagery collected via Mapillary (or similar app) and redraw lines by hand (<b>see Appendix 2: Using Mapillary to collect GPS traces and import to sidewalks id editor</b>)</p> <p>(3) Use OpenSidewalks tasking manager with entire digital import set up provided by OpenSidewalks team (for municipalities with decent sidewalk data sets)</p>

## c. Curb lowered/raised

OpenSidewalk standard in OSM convention	In use	Approved	Mechanisms for mapping
<p>creating separate node geometry right at the interface between the sidewalk link and the crossing and tagging them as</p> <p>kerb=* (lowered/raised) (lowered is used when there is a curb ramp. Raised otherwise). recommended: tactile_paving=* (yes/no)</p>	YES	YES	<p>(1) Editing by hand by drawing sidewalks into <a href="https://id.opensidewalks.com">id.opensidewalks.com</a></p> <p>(2) import GPS traces and imagery collected via Mapillary (or similar app) and redraw lines by hand (<b>see Appendix 2: Using Mapillary to collect GPS traces and import to sidewalks id editor</b>)</p> <p>(3) Use GoOpenSidewalks app.</p>

## d. Outdoor stairs/ Escalators

OpenSidewalk standard in OSM convention	In use	Approved	Mechanisms for mapping
<p>creating separate line geometry to indicate the location of the escalator</p> <p>highway=steps Conveying = * (yes/forward/backward/reversible) recommended: incline=up, incline=down or the more precise incline=[-]&lt;number&gt;% can be used for conveyors that aren't horizontal. width=* tactile_paving=* (yes/no)</p>	YES	YES	<p>(1) Editing by hand by drawing sidewalks into <a href="https://id.opensidewalks.com">id.opensidewalks.com</a></p> <p>(2) import GPS traces and imagery collected via Mapillary (or similar app) and redraw lines by hand (<b>see Appendix 2: Using Mapillary to collect GPS traces and import to sidewalks id editor</b>)</p>

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- e. Outdoor Ramps/ Wheelchair ramps
- f. Publically accessible buildings with elevators (interior or exterior)
- g. Ensuring all the components are connected appropriately to represent a connected transportation graph layer

## 2. Phase II: primary pedestrian path features- necessary information for all needs travelers

**NOTE: our OpenSidewalksGO app can collect the majority of these (we call these quests). OpenSidewalks can also customize the application for your team to enable collection of only those attributes you wish to prioritize.**

- a. Footpath surface information
  - i. Elevation information
  - ii. Cross-slope (cross grade)
  - iii. Surface type
  - iv. Large surface interruptions
  - v. Sidewalk width

If possible to have mappers carry a measuring implement, that's great.

Rather than asking mappers to carry these, with the OpenSidewalksGO app, we ask:

Pick the picture that best matches the width of this sidewalk. (Narrow, Medium, Wide)



- vi. Shoring
  - 1. Tree lined
  - 2. Grass lined
  - 3. High curbed
  - 4. Presence of a curb
  - 5. Other separators
- b. Pedestrian corners & crossings
  - i. Pedestrian Signalization
    - 1. Crossing type

Pick the picture that best matches the markings of this crosswalk.



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2. Are there signals letting pedestrians know it's time to cross

Sample questions for mappers:

Is there a traffic light at this crosswalk to signal pedestrians?

- (a) Yes
- (b) No

3. Signals indicating to traffic that pedestrians are crossing

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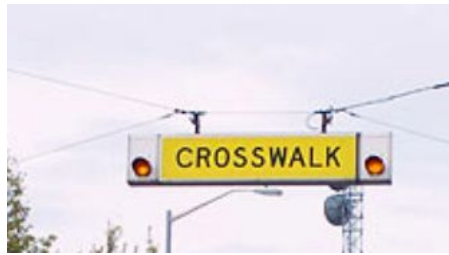
Use the pictures to select the signs and symbols that are **missing** from this crosswalk.

Or

Use the pictures to select the signs and symbols that are at this crosswalk.



Yellow pedestrian sign



Hanging yellow sign



Stoplight



Stopsign

## 4. Are there Accessible Pedestrian Signals

- ii. Sidewalk bulbs
- iii. Pedestrian islands
- iv. Lit corners

Does this **corner** have lighting for pedestrians who are waiting or walking on the sidewalk?  
Examples of lighting are (include images)

## 3. Phase III: application specific path features- needed by all, but pertaining to particular use cases like entering a building or use of public transit

- a. Transit stops
  - i. Node location
  - ii. Footway link to the rest of pedestrian transportation network
    - 1. Forces specifying the actual path to getting to the



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- transportation stop, including going underground, etc
  - iii. Amenities and descriptors of the stop (much more detailed information below)
- b. Entrances to public buildings and amenities

## Appendix I: Creating an OSM account

This page is directly lifted from the page on the same topic in LearnOSM.org

### Getting started on OpenStreetMap.org

*In this section we will learn step by step how to navigate the OpenStreetMap website, view maps, and sign up for a user account. After you have your own username and password, you will be able to contribute your first points to the map.*

### Visit the OpenStreetMap Website

- *Before you begin, be sure your computer is connected to the internet. (If you are reading this online, then you must be connected!)*
- *Open your web browser. Common browsers are Firefox, Chrome, Opera, or Internet Explorer. If it is already open then you can create a new tab.*
- *In the address bar at the top of the window, enter the following and press Enter: [www.openstreetmap.org](http://www.openstreetmap.org)*
- *When the page has finished loading, you should see something like this:*

### Navigate the Map

- *The main thing you should see is the map. Move the map by clicking on it with your left mouse button, holding the button down, and dragging your mouse around (see figure below).*
- *If you have a mouse with a scroll-wheel, zoom in and out on the map by turning the wheel. If you don't have a scroll-wheel, use the + and – buttons on the upper right corner of the map. (see figure below)*
- *To search for a place, left-click in the box labelled “Search” on the left side of the page (see figure above). Type in the name of your town or village and press Enter. A window should appear to the left of the map with the results of your search. Click on the location that looks like the one you want. The map will automatically move to the location you chose.*

### View Different Map Styles

*OpenStreetMap contains geographic data from all over the world. Although it is a single database, the data can be interpreted and styled in different ways. To see this in action, let's look at various map “styles” available on the OSM website.*

- *Click on the Layers button on the right side of the map window.*
- *Click on the different style options for the map. Notice how the map changes with each one. The transport map, for example, emphasizes transportation routes on the map while the cycle map emphasizes cycling routes. All of the data to make this possible is contained in the OSM database.*

### Create an OpenStreetMap Account

- *Now that you have seen what the main website looks like, you can register for a username and password and make your first additions to the map.*
- *On the OpenStreetMap website, click “sign up” in the top right corner of the page.*
- *You should see a new page that looks like this:*
- *There are five boxes on this page that you need to fill in to register an account with OSM.*
- *Enter your email address in the first two boxes. You should enter the same email address in both boxes. Later, you will need to open your email to confirm your account with OpenStreetMap.*
- *In the third box, enter the username that you would like to have. You will not be able to choose a username that someone else has chosen before, so it should be creative. If you try to enter something simple, like your first name, it*

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is likely that someone has already claimed that name.

- Enter a new password in the fourth and fifth boxes. You should enter the same password in both boxes. It does not

## Appendix 1 (cont'd):

need to be the same as the password for your email.

- You may want to write down your OSM username and password. You will need it to log in later.
- After you have completed all the boxes, click “Sign Up” at the bottom of the page.
- If there are any problems, an error message may pop up. Check to make sure that your email is the same in the first two boxes, and your password is the same in the bottom two boxes. If the third box is highlighted red, it means that someone else has already chosen your username, and you should try a different name.
- Open a separate window or tab in your internet browser, and navigate to your email. Common email sites are [mail.yahoo.com](mailto:mail.yahoo.com) and [www.gmail.com](http://www.gmail.com).
- Enter your email address and your email password to open your email. Note that this is not the same as your OpenStreetMap username and password.
- If everything was successful with your registration, you should see an email from OpenStreetMap in your inbox. Open the email. It should look like the image below. Click on the link that is identified below:
- A new tab or window will open. If everything went well, you should have an OSM account!
- On the OpenStreetMap page, click “log in” in the top right corner. Enter your OpenStreetMap username and password and press Enter. You should now be logged in. You should see your username in the upper right corner of the page.

## Adding Your First Points

- Now that you are logged in with your username on the OpenStreetMap website, you can use the iD editor to add your first point to the map.
- Move the map to a place that you know very well, such as your town or neighborhood. A good idea is to ensure your home (or your neighbour’s home) and workplace are drawn and given the correct address.
- Zoom in to a place where you would like to add a point to the map (perhaps a restaurant or grocery store near you isn’t yet mapped).
- Just above the map on the left, there is a tab named “Edit” with a small triangle besides it. Click the small triangle. You should see a menu drop down.
- Click “Edit with iD (in-browser editor)”.
- The online editor, named iD, should open. It will look something like this.
- You can add a point to the map by clicking on the button named “Point” at the top the window. Then click on the map where you would like to add a new point.
- Select from the menu on the left what type of location it is that you are adding to the map. You can then fill in the appropriate form with the location’s name and other information.
- To save your changes, click the “Save” button at the top. Since this is your first edit, you may prefer to play around with the editor. Don’t save your changes unless you are sure they are correct.
- If you do click Save, you will be asked to provide a description of your changes. Then you can click “Save” once more, and your additions will be saved to the OSM database!

The iD editor is a fantastic way to easily edit OpenStreetMap.

## Summary

Congratulations! If all went well you now have an OpenStreetMap username and password, you know how to navigate the OSM website, and you have your first understanding of how to add points to the map.

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## ***Appendix 2: Using Mapillary to collect GPS traces and imagery and import into iD.opensidewalks.com***

Note: For any mobile phone collection, it is **highly recommended** that you use an external GPS and connect it to the phone via BlueTooth. We like to use the [Dual XGPS150A Bluetooth GPS Receiver](#) (available from [AMAZON](#) and other vendors).

Mapillary is a collaborative street-level imagery platform for extracting map data at scale using computer vision. Images from any device are combined into a visualization of the world to generate data for improving maps, developing cities, and progressing the automotive industry. Mapillary's tools enable anyone to collect, share, and use street-level images.

### **Step 1: link your OpenStreetMap account to a new Mapillary account**

We're assuming you've already followed Appendix I and created an OSM account. Now you'll need to link your OSM account to a new Mapillary account. Go to [Mapillary.com](#). Click on "Create Account" and use the "Sign in with OpenStreetMap" button. You will be asked to authorize access to your OSM account. Please "Grant Access". Your account should now be linked.

### **Step 2: Capture Photos of an area of interest**

To get started you need the Mapillary app on your [iPhone](#) or [Android](#). Get the app and sign into the account you just created in step 1. **Please be sure that your phone is connected to the external GPS tracker, if you're using one, and check to make sure that you are in good satellite range.** In the Mapillary app, go to the camera screen, select walking or riding mode, tap the green "Start" button and start moving. Keep the camera straight in horizontal orientation (either in your hand or use a mount) and the app will automatically capture photos for you. The app will store location information and save photos in sequences.



When done taking photos or if you want to create a new sequence press the red "Stop" button. Try to capture between 10-150 in one sequence. All photos and location information will be stored on your phone until you choose to upload them to Mapillary or OpenSidewalks.

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**The OpenSidewalks recommendation** is to start and end a sequence for 2 or 3 sidewalks at a time, starting and ending sequences in the MIDDLE of blocks rather than at intersections. We recommend that you walk along one side of the street, but image the sidewalk infrastructure on the other side of the street. It makes sense to point the camera a little down, to be able to capture in the frame the types of curb ramps you passed, the surface type of the sidewalk, as well as any severe sidewalk quality issues that were met along the way. Also, while mapping the app uses storage on your phone to store the images. You have to make sure that you have enough space on your phone to capture a large amount of imagery data. Otherwise, you'll set up to go mapping and discover you can only capture a few images.

## Step 3: Upload photos

When you've photo mapped your area it's time to upload your photos. By default the app only allows uploads when you are on wifi. To upload, navigate to the upload screen, review your photos and if needed, delete the ones with bad quality. Once you upload your photos they will be deleted from your phone, made public and connected to others with the same location data. Faces and licence plates will be blurred. NOTE: the upload step does take some time and it is best if you are not putting the app in the background while you're uploading images. For this reason, we often do all of our mapping in one chunk, albeit we save it into many small sequences, and perform the upload from a nearby coffeeshop where we can get decent Wifi, or just leave the uploading until we get to a stable wifi connection.

VALIDATION: Make sure that your photos actually uploaded. You can find your photos on your profile page or by exploring the map. To find the photos on the map go to the area where you have been capturing and press on the green trail. You can also see photos that other community members have captured. In the web application, you can also go to the tab "Uploads" to see your own uploads.

## Step 4: Importing your GPS trace and imagery in Id.OpenSidewalks.com

Here we assume you'll be working on a desktop or laptop to do the sidewalk editing and importing. Log into OpenStreetMap and then open the mapillary app on your computer by going to <https://www.mapillary.com/app/>

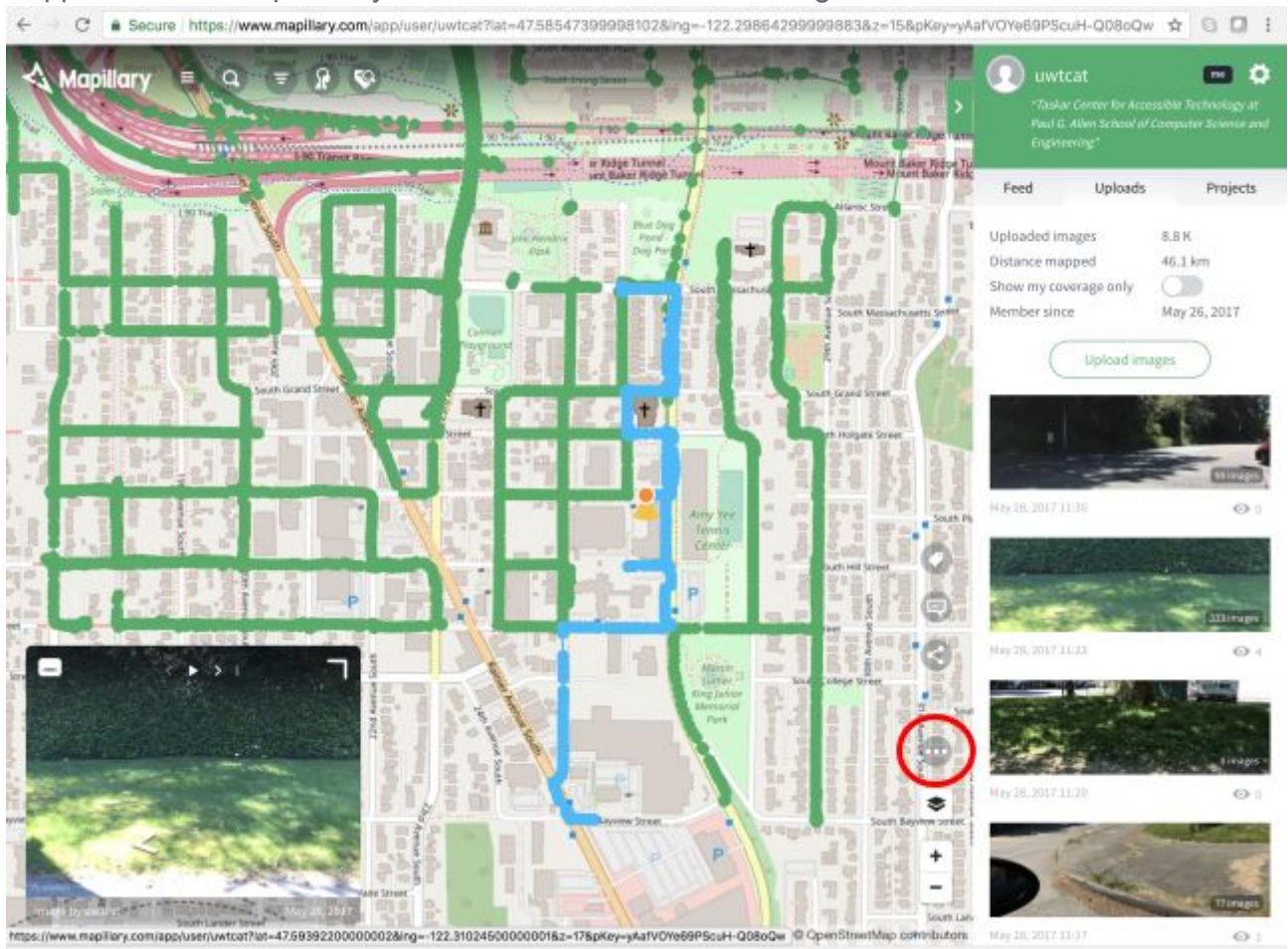
You should either be already logged into mapillary (because they detected that you were logged into OSM). Otherwise log into Mapillary with your OSM login (you should see your login name at the upper right hand corner of the mapillary web app:





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Click on your login name (in our case, uwtcats). A pullout drawer should show with three tabs: Feed, Uploads, Projects. Click on "Uploads". You should see all your recent uploads. Click on one you would like to import into OpenSidewalks. The map should snap to the area you mapped and the sequence you collected will be shown in bright blue:



The image shown on the bottom left corner should be the first image in your sequence. Click on the "Image Options" button which is the round button showing three dots (...) right above the map style button on the right hand side of the map (see red circle in the image above).

In the menu that popped up, click on "advanced options", and then "Download Data". Save the file locally on your computer where you will be able to easily find it.

(if you clicked on download and a large text file showed up in your browser, just use the FILE menu in your browser to save the page as. The dialog should recognize that this is a JSON file. Save it to your computer under an identifiable name. Here we used "JudkinsSequence.JSON").

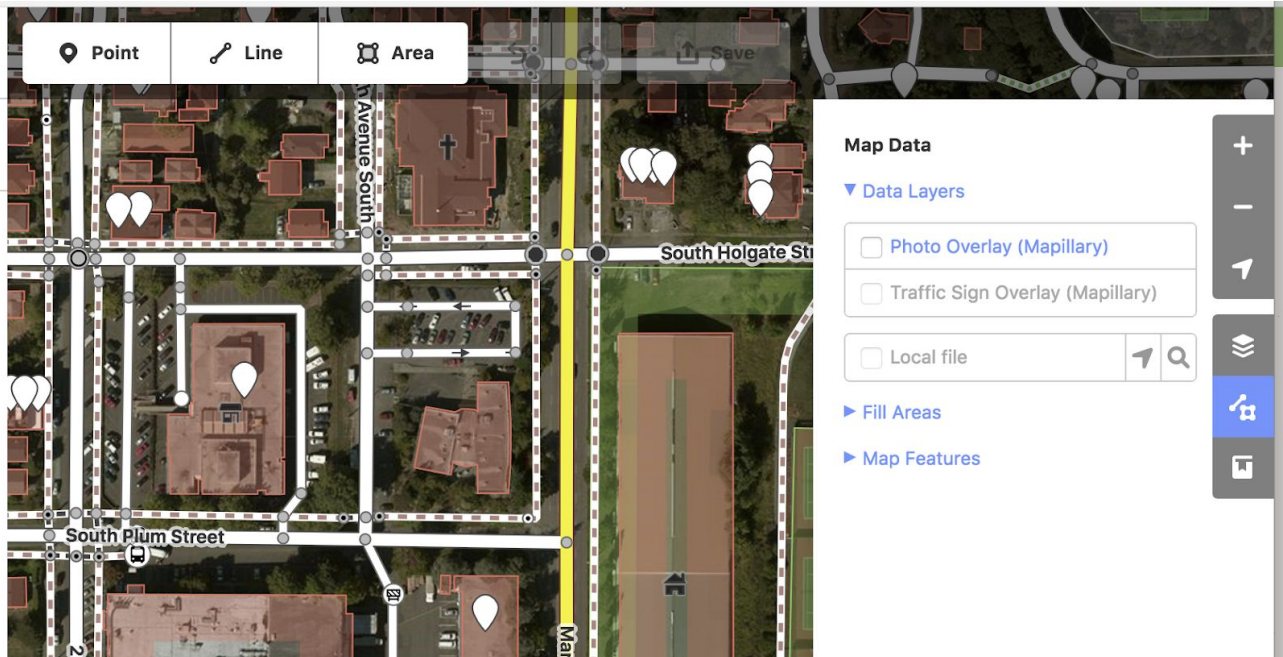
## Step 5: import into Id.OpenSidewalks.com

The next step is to import your sequence into the OpenSidewalks editor.

Remember you still need to be logged into your OSM account (OpenSidewalks will import all the sidewalks and credit your contributions to the OSM user account that is linked with you).

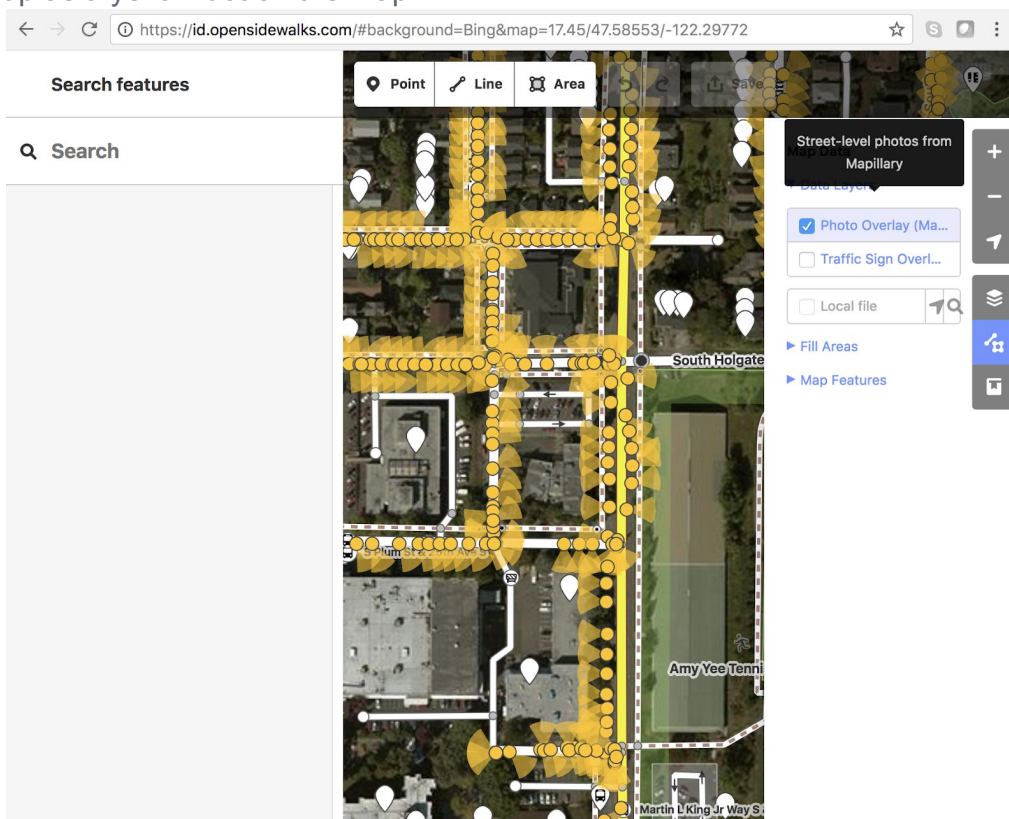
You will see a very generic world map when you just open ID.OpenSidewalks.com. Zoom into your urban area of interest.

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Click on the “map data” button in the right hand column (shown in blue highlight in the image above). First, check the box under Data Layers “Photo Overlay (Mapillary).” This takes a little while (20 seconds or so), so be patient if nothing changes on the map right away. Also in that box, click on the arrow to the right of “local file” and upload the file you just downloaded from Mapillary.

Your map should now look something like the image below where each of your images shows up as a yellow dot on the map



You are now ready to map OpenSidewalk sidewalks and crossings in the [id.OpenSidewalks.com](https://id.opensidewalks.com) editor!