

Which Libraries Are Open?: How to Quickly Map Library Reopening Statuses and Service Updates Using CARTO

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Abstract

This article outlines how libraries can quickly map library information such as location and service updates using the free version of CARTO, an online mapping platform that provides both free and subscription-based accounts. Institutions with multiple library locations and different COVID-19 site reopening statuses can quickly map which library locations are open, partially opened, or closed and indicate what services are currently available. Mapping this data requires minimal technical expertise and time. The map itself can be helpful for patrons, librarians, and staff.

Keywords: mapping platform; CARTO; library services during COVID-19; information visualization

Introduction

For library systems with multiple locations, consolidating and communicating information about the resumption of on-site services during the COVID-19 pandemic is challenging. One way in which library systems with limited staff and technical resources can consolidate, update, and communicate this information is to create a map of library locations and reopening statuses using a free online mapping application such as CARTO. This article outlines the process for creating such a map, using the example of one made by the author for the City University of New York (CUNY) Libraries, a federation of 31 libraries located across New York City's five boroughs (www.cuny.edu/libraries/college-libraries).

The CUNY Libraries map (tinyurl.com/CUNYlibrariesMap) was created during the spring of

2021 when a handful of CUNY Libraries began to offer study spaces on-site. Current CUNY students, faculty, and staff are normally able to visit and use most CUNY library locations; however, throughout the pandemic on-site access policies had new and changing restrictions. Communicating and consolidating these restrictions were important for reference librarians who answer queries about which libraries are open and to what extent on-site services are being offered.

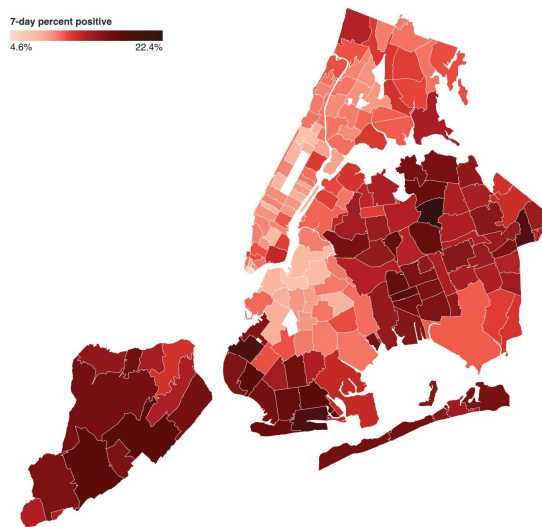
The CUNY Libraries map uses color coded dots to indicate the level of on-site services available at each library location (see Figure 1 below for a screen capture of the map). Information about on-site library services across a multi-site library system has a uniquely spatial element to it particularly as it relates to COVID-19. In order to limit exposure to and transmission of COVID-19 and its variants via public transportation systems, CUNY patrons would ideally visit and use the closest CUNY campus library, a recommendation made by the CUNY Libraries COVID-19 Task Force (Dreyer et al., 2020, p. 2).

Figure 1: The CARTO Map of CUNY Library Locations and On-Site Service Information



The spatial dimensions of COVID have been captured in numerous types of maps. Most notably, the spread of COVID or COVID positivity rates have been captured by a plethora of maps such as the New York City Department of Health and Mental Hygiene's seven-day percent positive map in Figure 2 below (www1.nyc.gov/site/doh/covid/covid-19-data.page#maps,

Figure 2: The New York City Department of Health and Mental Hygiene's Seven-Day Percent Positive Map



Note: Map from <https://www1.nyc.gov/site/doh/covid/covid-19-data.page#maps>, January 26, 2022.

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Maps of vaccination sites and testing centers such as the Vaccine Finder map created by the New York City government (vaccinefinder.nyc.gov/locations) are also available. For libraries, OCLC created a resource sharing map of library locations accepting returns of physical materials and providing physical lending (libraries.oclc.org). The OCLC map is no longer available but it was widely used and was created in May 2020. By June 2020, over 1,400 libraries contributed data to the map (OCLC, personal communication, June 3, 2020).

The proliferation of maps during the pandemic underscores how effective visualizing data – particularly spatial data – can be for multiple audiences. Maps can be considered an early form of information visualization, making geographical data easier to explore and understand (Chen, 2017, p. 5). As Chen (2017) explains, graphical displays of data use our dominant sense of vision to make data more intuitive, presenting data to audiences in a more powerful and tangible way (p. 6). As Chen (2017, p. 7) plainly states it: “Information visualization is easier for the brain to process than other forms of data, such as reports or spreadsheets.” For our users, a list or a spreadsheet of library locations and reopening statuses might be less user-friendly than a map which, in a single visual, can potentially display all the data contained in a spreadsheet.

The remaining part of this article outlines the steps for mapping library locations and

on-site services using the free version of CARTO (<https://carto.com/>). CARTO is a cloud-based location data platform that was founded in 2012. It boasts its easy-to-use platform as a way to make spatial analysis more accessible to different industries (<https://carto.com/about-us/>).

Indeed, CARTO is straightforward to use as outlined in the following steps. However, it has not been widely reviewed in the library literature. In a recent article on web-based mapping platforms for libraries, Mallon (2019) reviews Mapbox, Google MyMaps, and HealthMap, but not CARTO. Mapbox (www.mapbox.com) offers a free version of its software where users can upload a GeoJSON, JSON, or CSV file. For a user who is new to mapping platforms, Mapbox's free interface is confusing and does not provide as many features as the free version of CARTO. For example, Mapbox does not connect with Google Sheets and it is unclear whether users can add pop-up windows containing data for each point on the map. Google MyMaps (google.com/maps/about/mymaps) is another free option, but it lacks some of the customizations that CARTO offers such as color-coded pop-up windows based on the on-site reopening status of each library. For librarians who are looking for additional free mapping features, CARTO is currently a good option. This article fills the gap in the library literature on easy-to-use mapping platforms by detailing how libraries can take advantage of the free version of CARTO.

Steps for Creating a Map of Library Locations and Services

The following steps outline how to create and maintain a map of locations and reopening data.

1. **Determine what information is needed.** Before delving into creating the map, first consider what information you want to display on your map. Take into account who will be using the map. Will it be for both internal and external users? What information will they need? For example, internal users could include reference librarians who answer queries about library locations and whether they are open and what services they are offering. Perhaps internal users would like to know which libraries are offering in-person reference services and reach out to them for details on how those libraries are staffing their service. Both internal and external users might want to know what services are available to university-wide patrons such as study rooms and guest wifi. Are patrons asking the same questions about library services? If so, consider adding this information to the map. However, keep in mind the

information patrons need might change after you publish your map.

2. **Consider your workflow for updating the map.** Before creating the map, it's also helpful to consider your workflow for updating the map. As the reopening statuses of your libraries change, who will be updating this information? You can create a Google Form and designate one representative per library location who will be responsible for updating the data on the form for their library. When you create a Google Form, the information collected by the form will be stored in an automatically generated Google Sheet. Alternately, if the information will be updated by one or two people, you can update the information on a shared Google Sheet. Google Sheets connects to CARTO, but CARTO also accepts other file types such as Excel spreadsheets and CSV files.
3. **Create a Google Form or Google Sheet.** Create a free Google Drive account if you do not already have one. Create a new Google Form or a Google Sheet depending on how you plan to update your map (mentioned above in step two). Add questions to your form or columns for the data you need such as:
 - a. library name
 - b. library site reopening status
 - c. on-site services offered and for whom (e.g., all current campus affiliates only? university-wide users? external researchers?)
 - d. additional notes

Whether you are using a Google Form or Google Sheet, you will need to add two columns to your Sheet: one for the latitude and one for the longitude of a specific library location. Further details on latitude and longitude will be provided below.

4. **Gather library information.** Start with a few library locations and have the representatives from each library complete your Google Form or enter their data into your Google Sheet. Add the other locations once you see how these initial libraries display on your map.
5. **Find the latitude and longitude for each library location.** You will need to obtain the latitude and longitude for each library location. To do this, simply search for

Figure 3: Screenshot of the Latitude and Longitude Coordinates for the John Jay College of Criminal Justice Library on Google Maps



Figure 4: Spreadsheet Columns for the Longitude and Latitude of the John Jay College Library

N	D
Latitude	Longitude
40.77085368	-73.9887514

your library on Google Maps and then right click on your library. A pop-up window will appear as displayed in Figure 3 below. Click on the coordinates to copy them. In your spreadsheet, add these coordinates for each library location as pictured in Figure 4 below.

6. **Create a free CARTO account and connect your spreadsheet.** Visit [Carto.com](https://carto.com) and create a free account. Once you have created an account, click on **New Map** then click on **New Dataset**. You should see an option to connect to Google Drive. Look for and select your spreadsheet from **Google Drive**. You will be given options for how often you would like CARTO to sync with your Google spreadsheet and update your map with the data you have added or edited in your spreadsheet. Initially, you may want to select updates every hour as you might make frequent changes when you first create your map.
7. **Make adjustments.** The default map with the coordinates for the John Jay College Library is displayed in Figure 5.

Figure 5: The Default Map Created Using CARTO Indicating the Location of the John Jay College Library

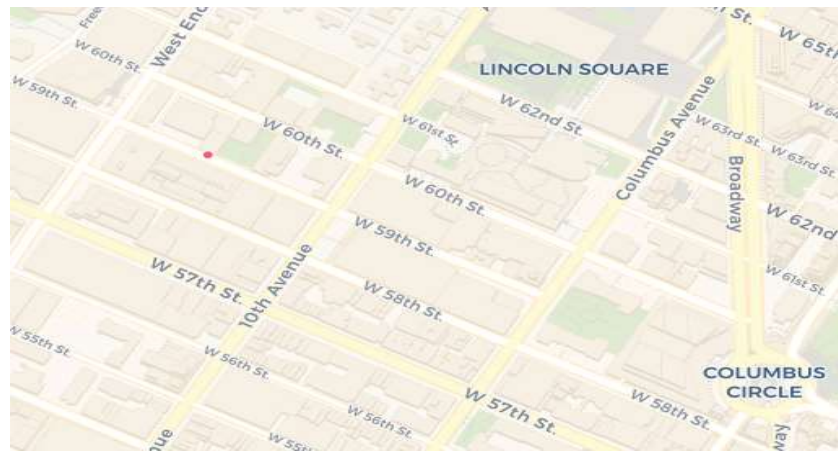
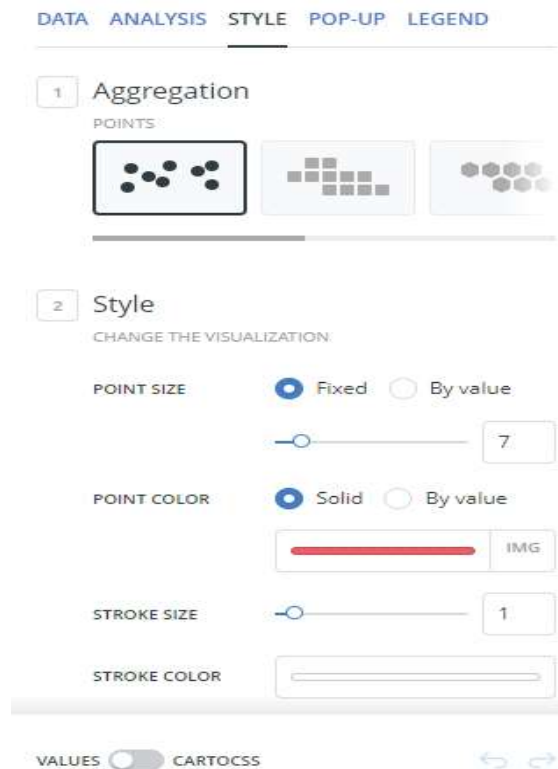


Figure 6: Example of the Customizations Available in CARTO



Changes can be made to the color scheme of the map, and the size and color of the library location dots. Users can also add a legend and pop-up information windows for each library location. Figure 6 is a screen capture of some of the customizations available in CARTO. Map creators will want to spend time exploring and applying these options to their maps.

8. **Publish the map.** Click on the publish link to make your map public. CARTO will provide a link to the map and an embed code that will allow you to display the map on your website.

9. **Update the map.** If you have opted to allow libraries to update their own data either by completing a Google Form or a spreadsheet, then the map will automatically be updated with the new information provided. You can set the frequency for updates to the map to hourly, daily, weekly, monthly, or never. Otherwise, you will have to check for any updates to library information or send gentle reminders to representatives at the other library locations for any map updates.

Challenges

While it is fairly straightforward and seemingly easy to map library locations and service updates on a CARTO map, there are challenges to creating and maintaining one. Keeping the map updated during the rapidly changing situation with COVID-19 is one unique challenge to maintaining such a map. Finding the right workflow for maintaining the map is also a process. This workflow might change over the course of the pandemic with shifting staffing levels, priorities, and information needs at libraries. Another challenge is standardizing the language for various services and facilities which may be unique to one or several libraries. Each library location might have their own preferences for the terminology used on the map for their site. Lastly, limited technical coding skills can limit the possibilities for displaying and customizing the map. Perhaps with advanced coding skills and access to the subscription version of CARTO, filters for guest wifi access and other services could be added to the map. It is unclear at this time if map usage analytics are provided by CARTO. Nevertheless, the benefits of having a visual representation rather than a lengthy and ever changing text-based list of library closures and reopening statuses can be beneficial

Conclusion

For library systems with multiple locations, keeping patrons and library staff informed about COVID-19 on-site service changes and statuses has been challenging. Creating a map of library locations indicating the on-site service levels for each library location using the free version of Carto can be helpful. Creating such a map can be straightforward and accomplished with very minimal technical skills. However, maintaining and updating such a map can be challenging with limited staff. Having a map in place can be useful even beyond the pandemic to communicate any unforeseen or planned library closures across systems with multiple library locations.

References

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