

## White Paper

*Visualizing Downtown Cleveland*  
Faculty Research Development Grant  
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### Project Team:

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*Visualizing Downtown Cleveland* was an exploratory data visualization project funded by a Faculty Research Development grant from the Office of Research at Cleveland State University in 2020-2022. *Visualizing Downtown Cleveland* began with the following research question: Could a visualization of historical city directory data reveal meaningful patterns of change in building uses in downtown Cleveland? We wondered whether these patterns would align with existing knowledge about the trajectory of downtown change in Cleveland. Such a visualization might yield insights useful not only to urban historians but also others in urban planning, finance, real estate, placemaking, and marketing. If the visualization proved insightful, it might also become a model that is easily replicable in other cities, yielding broader scholarly insights on one hand and applications on the other.

To answer our basic research question, we worked with graduate students to develop a spreadsheet of all addresses listed in the Cleveland City Directory's "criss-cross directory," which lists all addresses by street name followed by street number. Criss-cross directories appear in all directories after 1930. We relied primarily on directory years that were available at CSU and elected to survey in five-year increments. Based on availability, we identified years ending in a 2 or 7, with one exception. The years are 1937, 1942, 1947, 1953, 1957, 1962, 1967, 1972, and 1997. Directories were not available to fill the long interval between 1972 and 1997. We also collected the information for 2019 using firsthand observation. We surveyed a 26-block stretch of Euclid Avenue, downtown's preeminent commercial corridor, from Public Square to the Innerbelt Freeway. Our focus was primarily on the pedestrian experience, so we were only interested in charting what was located in storefronts, lobbies, mezzanines, arcades, and concourses—not offices or other building uses on upper floors reached only by elevators.

City directories categorized many businesses by type. They used abbreviations such as clo for clothing, confr for confectioner, and so on. Over the course of the century, some types disappeared while others appeared. Some types remained the same but were expressed using different abbreviations. The term confectioner disappeared, but a candy store in later years clearly corresponded with a confectioner in earlier years. Accordingly, we developed a standardized typology that included Retail; Service; Food Services and Drinking Places; Finance, Insurance and Real Estate; Professional; Institutional; Manufacturing; Clubs and Organizations; Government; Building Detail; Vacant; and Other. To tailor the typology, we used a longer list of subcategories. To the greatest extent possible, we sought to reduce the number of specific business types. One example will suffice: Other Clothing and Accessories included several more-specific listings such as furriers, milliners, etc. The point of broader categorization was to reveal rather than obscure broader patterns.

The Center's developer Erin Bell created a website to provide access to – and contextual information about – the collected data. Before publication online, data was reviewed, normalized, and geocoded. The user interface provides several methods for interactive data visualization. The map provides for basic spatial analysis by year, with color coding to represent the primary categories for each business. The stacked bar chart also employs color coding, providing visual representation of changes to the quantity and distribution of categories over time. Users may also select a particular category to assess changes according to narrower criteria. Finally, the full data set is made accessible in a browsable card-based interface, which can be filtered/searched by keyword, year, and category. The data may also be downloaded in full as a CSV file.

The visualization proved moderately useful in showing both expected and unexpected patterns of building uses. It was only moderately useful because of limitations in our methodological choices and in the specificity afforded by the way we devised the visualizations.

First, our methodology proved a limiting factor in a few important ways. One was our decision to draw upon only the top-level typology of uses (e.g., Service). As a result, the visualization failed to show interesting concentrations of certain types of service businesses that could be readily observed in the spreadsheet. A prime example was the substantial number of airline ticket offices, travel agencies, and other travel-related service businesses that concentrated in and near the Hanna Building at 1422 Euclid Avenue in the 1960s. This pattern was clear in the spreadsheet but is only vaguely evident in the visualization, which readily showed a notable emergence of service businesses between 1957 and 1962 in the vicinity of Euclid and East 14<sup>th</sup> Street (especially when zoomed in a couple of levels from the default zoom level), but not the fact that these related to travel except once one clicks on the clusters and then on each individual map pin.

A second limitation was that the visualization did not plot the precise location of every building use. The use of pin clusters that, when one zooms in, open in spirals could only approximate the precise locations. A cluster on the south side of the street might prove to have some businesses on the north side of the street once one clicked on each pin in the spiral at closer range. Of course, manual manipulation of the coordinates for specific addresses could help make the visualization look more precise to the end user, but it does not negate the fact of the shortcoming

itself and suggests that without further work, such a visualization is not completely straightforward to generate. We did adjust the cluster settings, thereby minimizing some of the liabilities of clustering. In addition, we added color gradients to clusters, which greatly improved the ability to toggle through each year in the visualization and see meaningful changes in business concentrations and types.

A third limitation was that historical building uses were not always possible to determine with certainty. In part, the uncertainty reflected the presence of older kinds of products that are no longer used and are therefore obscure to modern observers. The research team turned to qualitative research to clarify uncertain business types, including examining articles and advertisements in the Plain Dealer Historical database. Even so, we discovered many edge cases, anomalies, or businesses that seemed equally suited to two types, or at least two sub-categories. Depending on the degree of uncertainty, addresses might be coded with a type and sub-category (e.g., Retail | Jewelry) or simply left as Unknown or Other. The presence of so many “Unknown or Other” locations helped guard against many mistakes and, in cases of duplicated listings in a directory (a common issue) overstating the presence of a type of use.

Despite the limitations, the visualization is a useful tool. On the broadest level, the chart visualization shows an unexpected resilience of Euclid Avenue business through at least 1967 and a surprisingly modest decline in the number of categorized businesses between 1967 and 1972. I had thought we might see a more significant drop between 1957 and 1967 based on anecdotal commentaries in that time, but this assumption is a reminder that number of businesses and volume of business are not the same.

In other ways, the visualization squares with some assumptions based on my previous research on downtown. In writing about the unsuccessful effort to build a downtown subway in the 1950s, I argued that the stated purpose of the subway changed over the course of the decade. When voters approved the project (pending a feasibility study) in 1953, promoters of the subway generally emphasized that it was needed to keep downtown strong and solve the problem of worsening traffic congestion. Two years after the county commissioners rejected the implementation of the subway plan in 1957, subway backers tried to revive the push to get the commissioners to reconsider. By that time, their argument for the subway was that it would be needed to reverse downtown’s decline. The visualization adds another dimension to the known drop in downtown traffic and downtown retail sales, showing a drop in retail from 264 categorized businesses in 1953 to 249 in 1957, 199 in 1962, and then a slight rise to 205 in 1967 (possibly showing the limited beneficial effect of downtown urban renewal, merchant association promotional efforts, and store modernization campaigns). The uptick in office development brought by the construction of several new office buildings in the late 1950s to late 1960s stabilized downtown even as it changed in terms of building uses. Between 1953 and 1967, an increase in professional and finance, insurance, and real estate sectors largely offset the drop in retail. The number of these businesses rose from 46 to 72. The visualization also corresponds as expected with the decline of downtown between 1972 and 1997 as a result of suburbanization, regional population decline, and the departure of many headquarters offices. The overall number of downtown Euclid Avenue’s *categorized* businesses (excluding the “Other” category) plummeted in that 25-year period from 380 to 255 (–33%). The further drop over the 22 years between 1997 and 2019 also shows up in the visualization: from 255 to 169 businesses (–34%).

The Euclid Corridor (Healthline) construction of the mid-2000s hastened the departure of most remaining retailers, a fact reflected in the visualization, which shows a drop from 89 to 39 retailers. The visualization also captures the expected rise in the number of food and drink businesses. These never deviated from the range of 36 to 53 (6.25% to 9.71% of all businesses) between 1937 and 1972, but they rose to 66 (accounting for nearly 28%) by 2019. Without annual data points, it is impossible to make firmer connections. Lacking any data points between 1972 and 1997 and between 1997 and 2019 also makes the visualization appear to dramatize the flight of businesses after 1972. While the trajectory was generally downward, the loss was actually a slower and steadier process that spanned over a half-century after 1967.

The map is good for showing generally where businesses were concentrated along the avenue but is hard to compare across years. If one zooms in on the map in one year and toggles to another year, the default zoom level prevents easy comparison. Still, it was possible, with some counting of the numerals in the pin clusters, to test one other assumption springing from previous research. That assumption was that in the 15 years after 1955, when the Cleveland Transit System opened the new rapid transit (now the RTA Red Line) and slashed express bus service on Euclid Avenue, the number of businesses in the Playhouse Square area might have declined, and if not, the number would have more likely dropped from 1967 to 1972 with the closing of five Playhouse Square theaters. However, the visualization suggests that businesses grew in this area between 1957 and 1962 despite reduced public transit access, fell between 1962 and 1967 before the theaters closed, and rose again between 1967 and 1972.

Still, the visualization only goes so far. Counting the clusters of pins obscures the number of pins that represent vacant spaces. The category “Other” fails to differentiate businesses that did not fall into a named type and subcategory from those that performed an unknown function. It also does not distinguish listings that received the category “Other” because they were a building detail such as a lobby, additional entrance, storeroom, or office. A more granular look is necessary, but it was not possible in our visualization prototype.

The bottom line is that the visualization might become more effective through further refinement of the dataset. Its limitations, again, are not solely or even primarily technological ones. Methodological decisions proved problematic in ways that were not clear until we saw their results. Removing vacancies and all ancillary spaces such as lobbies, entrances, storerooms, and offices might have produced a dataset that was more attuned to analyzing actual businesses. Even so, our wish for a robust visualization tool is at loggerheads with another imperative: the need to create a replicable model that is sustainable and resistant to the problems that often come with more complexity.

Nevertheless, the collection, digitization, and consolidation of otherwise dispersed and inaccessible city directory data (albeit limited by geography) provides an ongoing opportunity for further iteration and analysis – by our team and others.

City directories have a criss-cross directory in the back after 1929. This permits one to look at a section of a street and see what was located at specific addresses. The directories differentiate clearly between street-facing addresses and interior addresses (e.g., inside office buildings or arcades). Most listings also indicate the type of occupant, and these were the basis for our more expansive and encompassing categories.

Maynard  
H. Murch  
& Co.

Members  
Cleveland  
Stock  
Exchange

Investment  
Securities

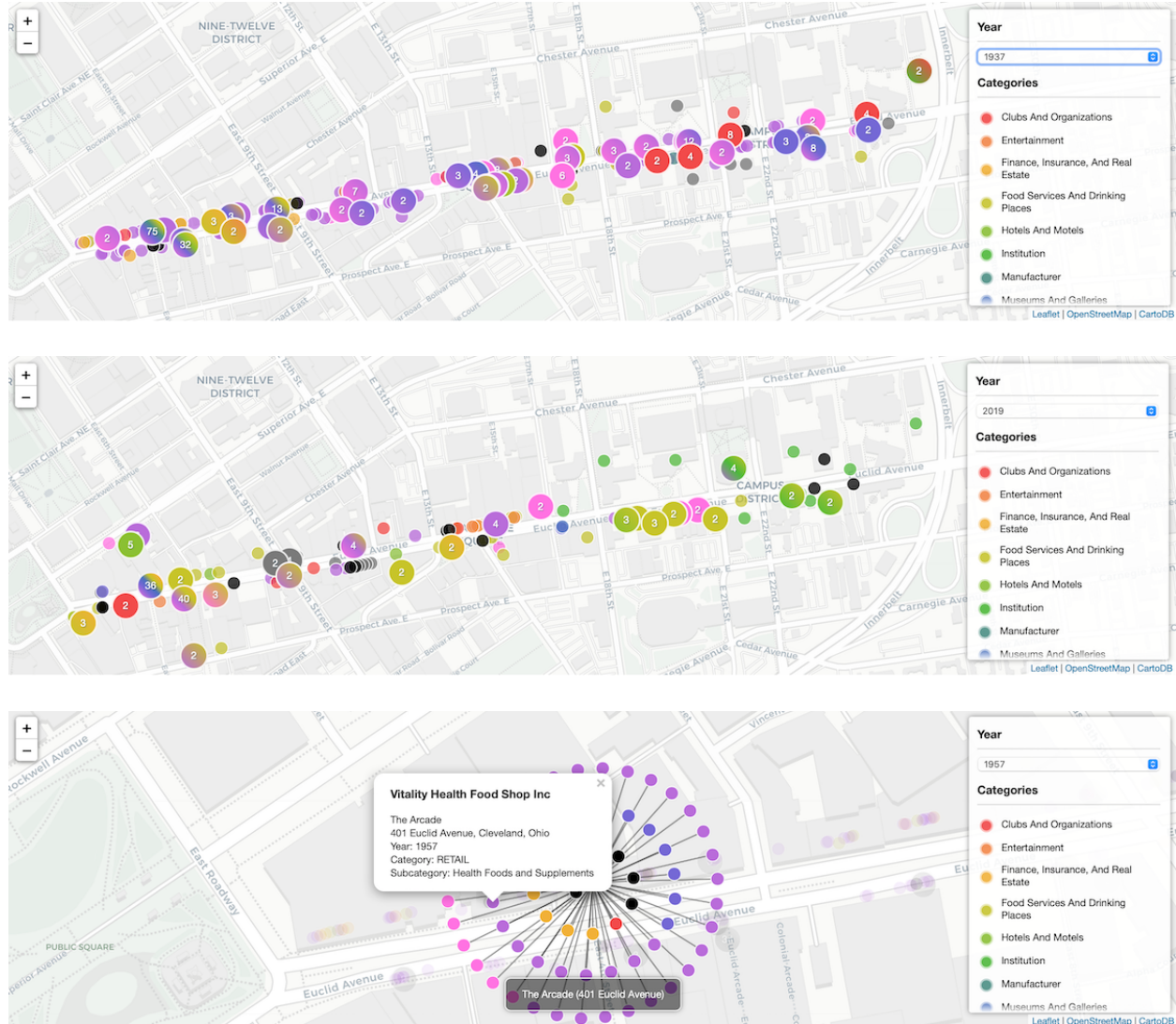
Union  
Commerce  
Bldg.  
Cleveland

**CLEVELAND  
BRICK  
&  
CLAY  
Co.**

# PAVING BRICK SEWER

**Factory & Office**  
**7511**  
**Jeffries Ave**  
**Michigan**  
**9120-912**

## Appendix 2. Examples of map showing business types/concentrations in two years

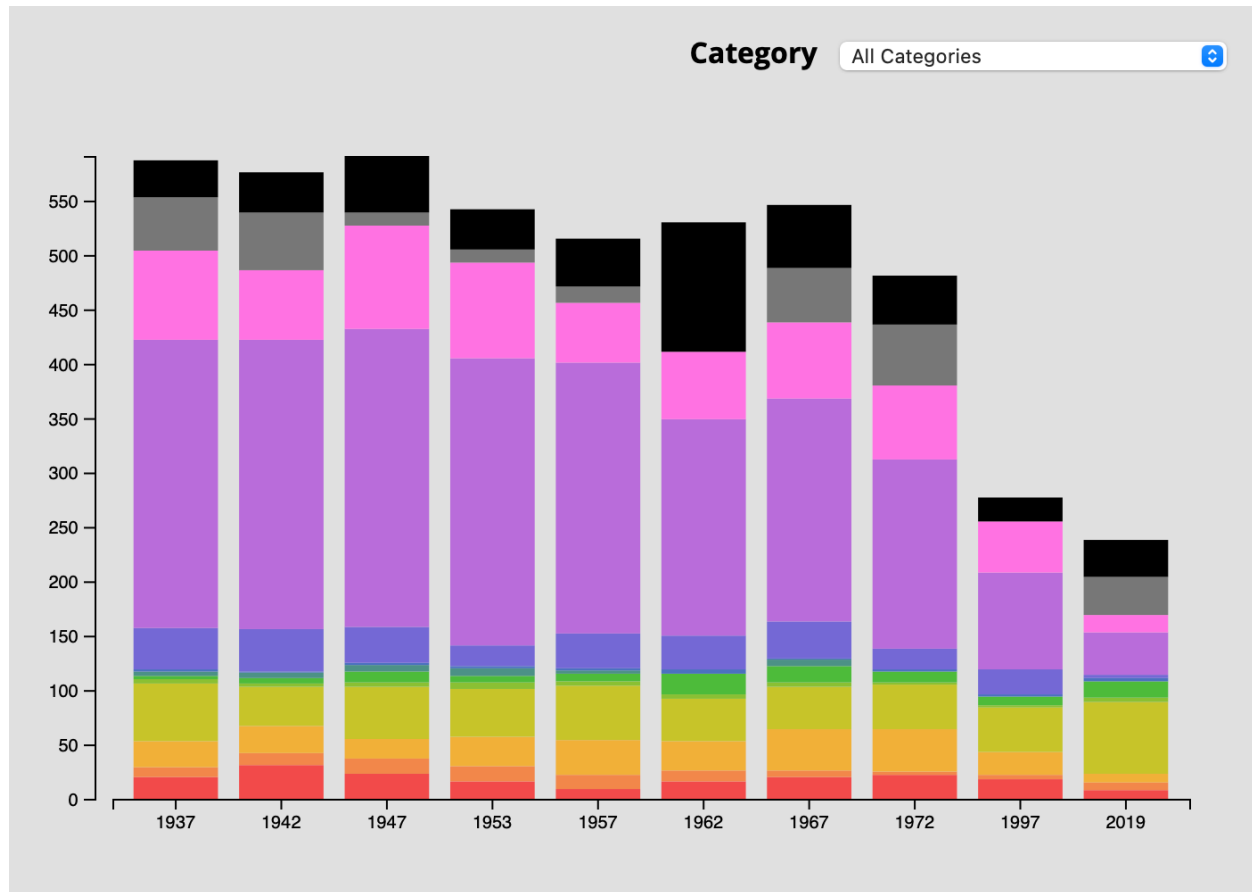


Pins and clusters are color-coded to correspond with categories. Color gradients reflect the variety of categories represented by certain clusters. One may explore 10 different years and may click on any category in the legend to view just that category. Zoom level is preserved as one toggles between years, aiding comparison.

The top two examples above suggest the transformation of the downtown section of Euclid Avenue from tradition retail stores to food/drink establishments between 1937 and 2019. More precise or short-term changes are revealed when one examines the map in 5-year increments, sometimes only when one zooms closer to examine a smaller area such as Euclid/E. 9<sup>th</sup> or Playhouse Square.

The third (bottom) example above shows the pins that comprise a large cluster at The Arcade at 401 Euclid Avenue in 1957. Colors show proportions of categories, and clicking reveals specific data about each building occupant. As noted in the narrative, the project examined the pedestrian experience, which necessitated focusing on street-level and primary interior concourses that one might readily access (i.e., one level above or below street level).

### Appendix 3. Bar chart of changes in Euclid Avenue businesses, 1937-2019



Each color corresponds to a category (e.g., purple = Retail and lime green = Food Services and Drinking Places). Hovering over a colored segment of each stack reveals the category, percent of total, and absolute number. The dropdown menu enables easier recognition of changes in each of 13 categories.