APPENDIX B. HISTORIC MATERIALS ANALYSIS

To achieve my research goal of recreating Milwaukee's historic housing submarkets, a variety of data sources were needed to develop the 2D mapping and 3D models. Because these historic materials originated from a variety of sources, each needed to be analyzed independently and then overlaid or pooled with similar resources for comparison. Secondary-source historical research and narrative provided the framework for understanding the characteristics of Milwaukee's housing from 1910-1970. However, to conduct a detailed analysis, primary-source documents, maps, and photos were needed to build a more complete portrait of the city's neighborhoods. The individual analysis of each of these sources revealed nuances in the housing submarkets; and, when analyzed collectively, the various historical narratives and datasets provided context for one another enabling cross referencing and verification.

The collective analysis of the various data sources presented a series of challenges. While some of the sources were readily identified and clarifying context information was available, others had previously been identified as authentic with no additional information provided. As a result, multiple methods of historic materials analysis were undertaken to place these primary sources in the appropriate context.

1. Map Inferencing

Historical research about Milwaukee benefits from an ample supply of maps drawn since the city's founding in the 1830s and 1840s. Additionally, 90 years of Milwaukee County aerial photography is available beginning countywide in 1937 that a) accurately represents a plan view of the city in as-built condition, and b) provides a valuable overlay for comparison with the maps collection.

While these maps create the foundation for the 2D mapping and 3D modeling in my dissertation research, challenges existed during the digitization process. Because some maps were drawn to scale

with highly accurate land survey methods while others were drawn in a schematic way, inferences needed to be made during the digitization process. To ensure accuracy, the Sanborn Maps for Milwaukee (1910) and Milwaukee County aerial photography (1937-1970) were used as foundational references to confirm land features, water features, block structure, and building attributes. Data from other map sources were then overlaid onto the digitized Sanborn Maps and aerial photography to build feature class databases. At times, conflicting information was identified between the multiple map sources. To clarify these conflicts, multiple information sources – including primary- and secondary-source written narrative and historic photographs – were utilized as cross references in conjunction with the maps to appropriately digitize the data. When these conflicts were assessed, a good faith effort was made to make the most judicious decision that was reasonably accurate given information sources.

An illustrative example of this process is the analysis of Milwaukee's slum wards during the 1910s. Primary-source written narrative from Thompson (1910) and Hegemann (1916) identify and describe the wards with additional information provided by McCarthy (2006). The Sanborn Maps (1910), C.N. Caspar Company ward map (1912), Milwaukee Bureau of Public Land Commissioners' zoning map (1920), and Milwaukee County aerial photography (1937) provide the map references for digitization of the city's land features, water features, block structure, and building attributes. The Women's Club of Wisconsin racial map (1918) and the U.S. Department of Commerce Decennial Census (1920) provide demographic data about the neighborhoods. These sources were utilized in conjunction to build an as-accurate portrait as possible.

These digitization and analysis processes revealed ambiguities across the data sources in examining the city's slum wards. At various points, the conflicting data indicators were examined and attempts were made to rectify the incongruities.

- The Sanborn Maps and Milwaukee County aerial photography accurately depict the city with reasonable land survey precision. However, hand drawn Sanborns differ in accuracy with the aerial photography, specifically with respect to street centerlines and block layout. Corrections were made only when a serious discrepancy was identified. In contrast, the aerial photography served an important purpose in clarifying omissions in the Sanborns. The Sanborns are incomplete in certain areas for unplatted lands in the city, as well as areas that were never surveyed.
- The Milwaukee Bureau of Public Land Commissioners – the precursor to the City's contemporary Department of City Development – published a variety of maps beginning in the 1920s. The maps typically adopted a more schematic approach to the city's block structure. When compared to the Sanborns and aerial photography, some discrepancies exist.
- The racial map from the Women's Club of Wisconsin has a largely unknown provenance. The Milwaukee Public Library has confirmed basic details about the map as authentic. However, the survey methodology used to build the map has never been identified. As a result, while the map is a primary source document, it should be interpreted with critical thought and some skepticism.

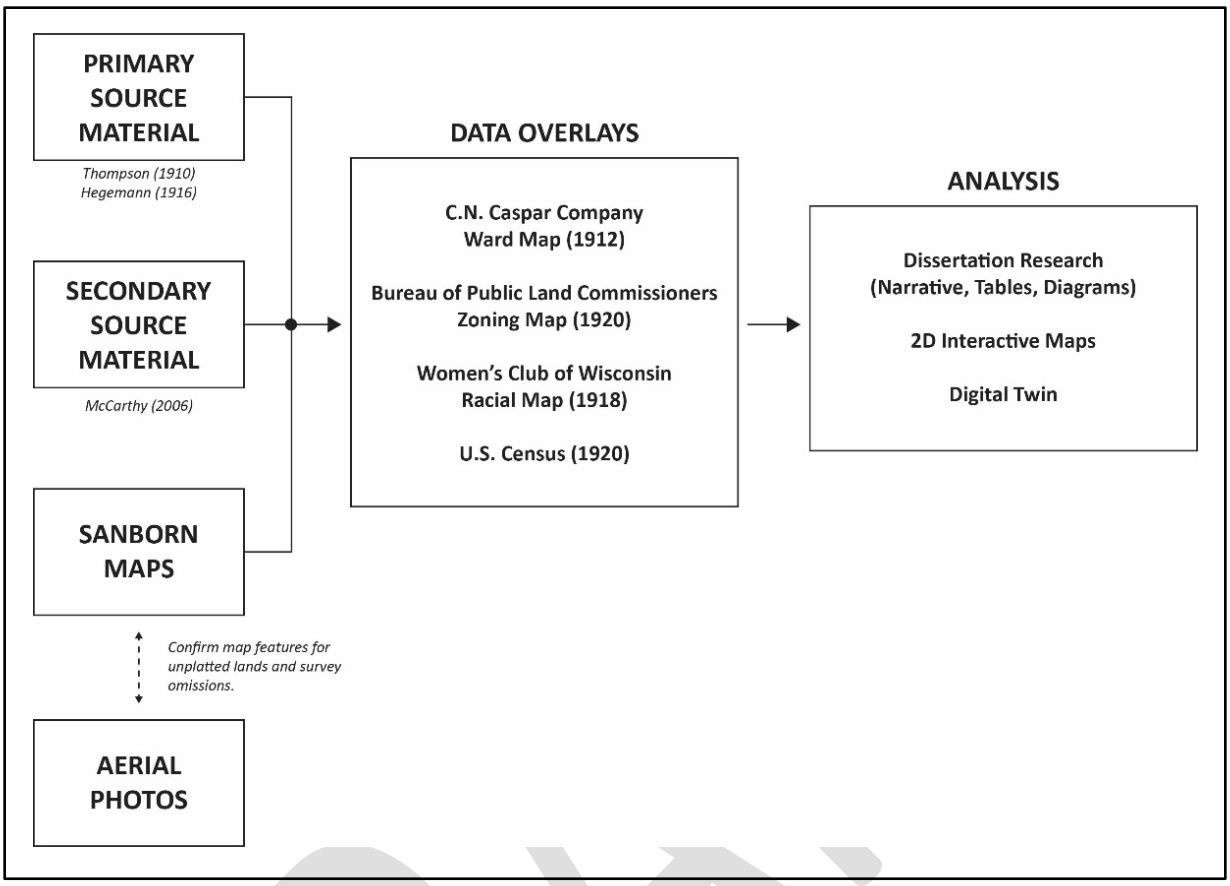


Figure B.1: Example of Map Inferencing – Milwaukee Slum Wards, 1910s-1920s

2. Geolocating Photos

Historic aerial photography and first-person photographs proved to be some of the most valuable primary source materials for my dissertation research. These data sources accurately captured moments in time that depicted the realities of conditions in Milwaukee with no pretense or bias. To use these photos correctly in my research, the location (i.e., street address, perspective) of each photo needed to be identified and placed on a map. This process is known as geolocation. To achieve this, multiple data sources needed to be used to identify features in each photo, identify those same features on historic aerial photography, and then successfully place the photo at an exact location in the city.

In my research, the geolocation of photos became an increasingly important component of the analysis of primary source materials. Historic maps, oral histories, government documents, newspaper clippings,

and other primary source materials provide the written narrative of Milwaukee's housing. While this narrative is valuable, it lacks the critical element of visual analysis. Photographs provided the first-person account of life in Milwaukee's neighborhoods. To analyze and understand this perspective, the historic photos were geolocated and analyzed in conjunction with other available resources.

2.a. Kaszub Fishing Colony Spatial Analysis, 1840s-1940s

The Kaszub Fishing Colony on Jones' Island represented a unique opportunity to conduct a comprehensive historic materials analysis because of the volume of materials available about the community. The analysis was a beta test for the broader effort my research undertook to analyze multiple neighborhoods. The type and number of historic photos available provided longitudinal perspective about the community from approximately the 1840s to the 1940s. This perspective was central to the understanding of the spatial structure of the community and how its physical architecture related to its demographic profile and economic activity.

Initially, each first-person photo was examined to identify general features and common factors that were easily verifiable with other information sources. With the aid of historic maps and aerial photography, the structure of Milwaukee (i.e., streets, blocks, topography, landmarks) was well understood. With that base of information, first-person photos that clearly depicted certain scenes in a confirmed location could be easily verified. These photos typically provided a broader perspective that created a visual context for the community.

For photos that captured a more detailed scene, additional analysis steps were necessary to accurately verify the information. In a detailed first-person photo, the foreground and background were analyzed to identify distinctive features. These features typically included landmark structures, unique topography, and/or distinctive design characteristics of neighborhood structures. With these features

identified, historic aerial photography was consulted to cross reference the photo's features with those present from the aerial perspective. With these common points identified, the image location was then triangulated.

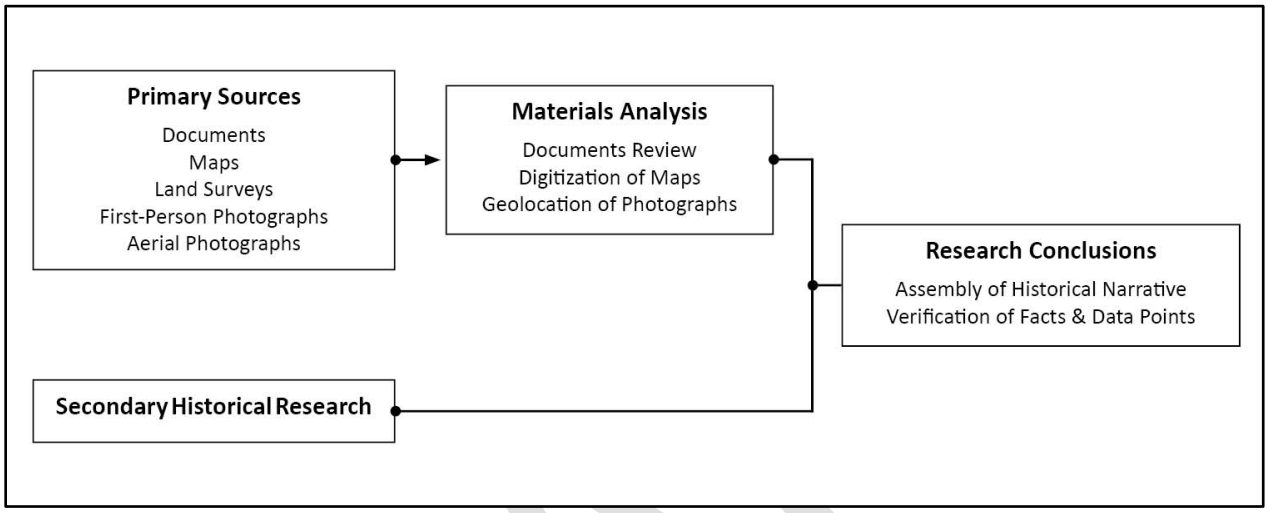


Figure B.2: Analysis Workflow for Geolocating Photos

MILWAUKEE COUNTY AERIAL PHOTOGRAPHY, 1937
PORT OF MILWAUKEE

The development of Milwaukee's harbor from its original state as a sandbar peninsula and fishing community to a fully industrialized port reveals a striking evolution over a short period of time. In less than 20 years from 1920 to the late 1930s, Milwaukee's harbor was transformed by a series of large-scale engineering projects to create a deepwater, Great Lakes port. Once only a little over 35 acres as the Kaszub Fishing Colony, the port rapidly grew to almost 210 acres – space that would eventually accommodate multiple marine freight terminals.

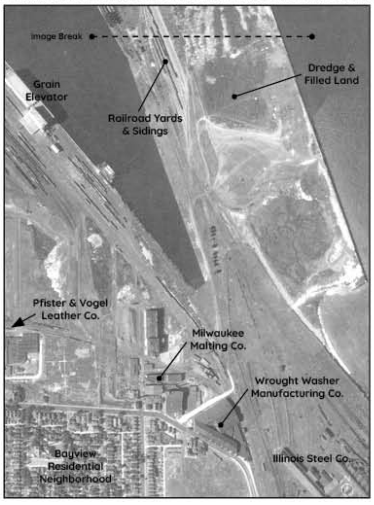
Over multiple decades, dredging and filling operations created the conditions suitable for deepwater freight vessels to dock at Milwaukee's port within the breakwater of Milwaukee Bay and within the Milwaukee Municipal Mooring Basin at Kinnickinnic Bay. The expanded port included engineered dockwall construction, railroad sidings and yards, large cranes, fuel tanks, shipping terminals, and a small network of gravel and paved roads. The City coordinated this work with the construction of a new sewerage treatment facility on the northern end of the port.

NORTHERN FOCUS - INDUSTRIAL USERS

Dock wall construction and the ongoing dredging and filling operations expanded the width of the port to create a contiguous, level area: to the west was the Milwaukee Municipal Mooring Basin, and to the east was dock wall that would become freight terminals. To support this expansion, multiple railroad yards and sidings were built to carry freight cargo to the various terminals. Additionally, a road network and fuel tanks supported daily operations.

The City's sewerage treatment facility anchored the northern end of the port. Far larger than the facilities that occupied the space previously, the new treatment facility was designed and built to accommodate Milwaukee's growing population. Remnants of the original garbage crematory and Coast Guard Life Saving Station stood to the west.

The remaining members of the Kaszub Fishing Colony occupied a small inlet on the western side of the port. Still able to launch boats into Kinnickinnic Bay, the fishermen continued their daily work by sailing up the Kinnickinnic River, through the harbor inlet and breakwater, and out into Lake Michigan.



SOUTHERN FOCUS - INDUSTRIAL USERS

By the late 1930s, the southern area of the port was still under construction. Dredging and filling operations were ongoing with the eastern side requiring additional work. Multiple railroad lines emanating from Bayview pushed northward into the port.

On the southern edge, the industrial operations of multiple companies employed a significant number of Bayview residents. Presumably, these companies would be direct beneficiaries of an expanded port with improved rail and marine access for cargo freight. The companies included the Pfister & Vogel Leather Co., Milwaukee Malting Co., Wrought Washer Manufacturing Co., and the Illinois Steel Co.

Figure B.3: Geolocation of Notable Features at the Port of Milwaukee on Milwaukee County Historic Aerial Photography, 1937

2.b. U.S. Resettlement Administration Milwaukee Photo Survey Analysis, 1936

The historic materials analysis for the design study of the U.S. Resettlement Administration photo survey (1936) required a multi-disciplinary approach to utilize a variety of data sources to develop a complete portrait of neighborhood conditions in the late 1930s. The ability to conduct this analysis represents a historically unique moment because sufficient primary sources existed to build accurate re-creations of housing patterns and draw conclusions from the models. To achieve this level of detailed analysis, multiple methods were utilized to analyze each photograph in the Library of Congress collection.

The primary sources referenced in the analysis included historic photographs, maps, and aerial photography. The evidence was further supported by details provided by historic narrative from secondary sources, oral histories, and neighborhood geographies identified in primary and secondary sources. The analysis included the geolocation of the housing photos, the plan analysis of maps and aerial photography, the analysis of the housing photos for significant features, and the schematic modeling of neighborhood conditions.

Geolocation of Housing Photos

The analysis included only those photos identified by a street address that could be placed on historic maps and aerial photography with confidence. The address indices on the Sanborn Maps (1910) and the address conversion files at the Milwaukee Public Library were used to compare and confirm addresses from 1910 and 1936. With a confirmed address, the location of the photo was then placed on a map.

Plan Analysis of Maps & Aerial Photography

The Sanborn Maps (1910) provided important details about spatial attributes in the neighborhoods. Because the maps were developed with survey-level accuracy, the digitized spatial data can be analyzed with a high degree of detail. The digitized data included block

structure and dimensions, parcel structure and dimensions, and structure attributes (including building orientation, floor plate area, height, land use, and building materials). The 1937 aerial photography provides a comparison to track changes in neighborhood conditions and confirm attributes from the housing photos.

Features Analysis of Housing Photos

The housing photos are rich primary source materials that give important clues to how structures and dwelling units were utilized and adapted by residents. Because the majority of the housing photos are located in Milwaukee's original inner core neighborhoods, multi-decadal changes can be tracked in the built environment. Additionally, demographic attributes of residents are relevant because certain groups utilized housing in distinctive ways.

Schematic Modeling of Neighborhood Conditions

Utilizing the digitized spatial data from the Sanborn Maps (1910) and 1937 aerial photography, schematic models of the neighborhoods were built in ArcGIS CityEngine to visualize the built environment. These 3D models provide valuable insights into the texture of neighborhood density and the massing of buildings.

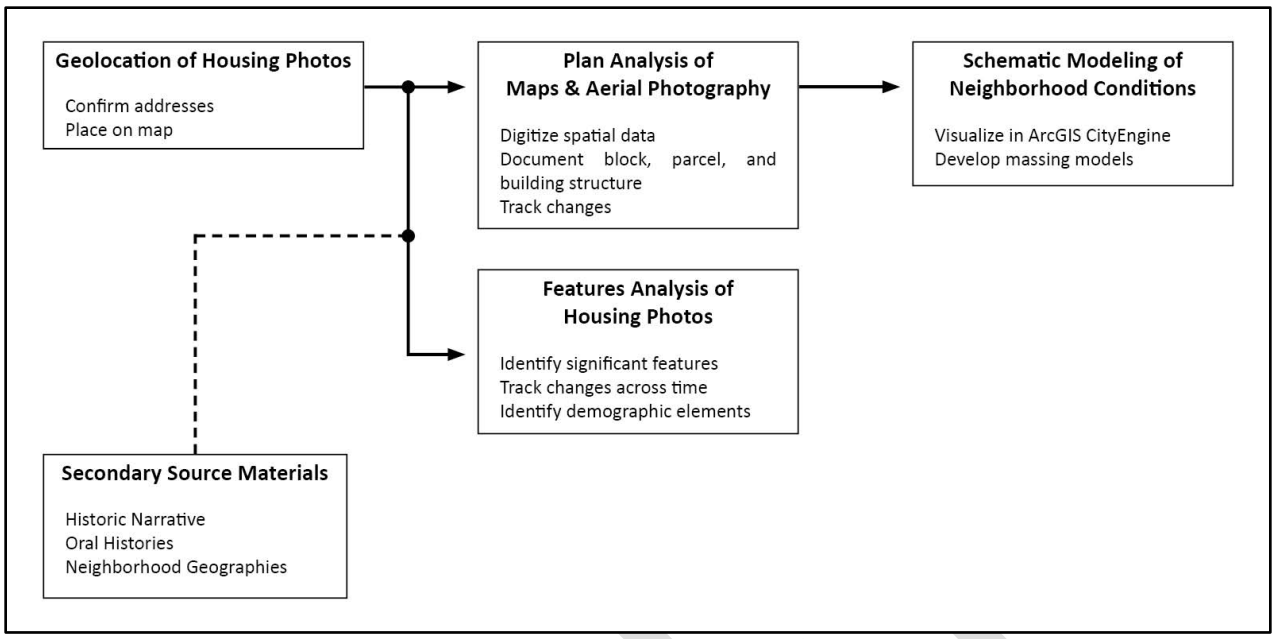


Figure B.4: Analysis Workflow for Design Study Utilizing Multiple Primary Sources