

# Digitalization of “Large-scale Maps of Kyoto City (*Kyoto-shi meisai-zu*)”

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## Abstract

This paper discusses “Large-scale Maps of Kyoto City (*Kyoto-shi meisai-zu*)” and their digitalization project. The Maps consist of 291 of them, produced between 1927 and 1951. The scale of these maps is 1:1200, and the size of map is about 38 cm by 54 cm. Made for fire insurance purposes, these maps contain various kinds of building-related information necessary to prevent fire. For example, the information includes not only buildings’ lot numbers, but also the number of stories and usage of each building. These various kinds of information related to buildings was color-coded and continued to be added to the maps by hand. Such rich information of “Large-scale Maps of Kyoto City” can contribute greatly to the development of historical research of Kyoto-city. For this reason, the Historical GIS Research Group of Global COE Program “Digital Humanities Center for Japanese arts and Culture” of Ritsumeikan University has been conducting a digitalization project of these maps. The digitalization will help to reconstruct the urban landscape of Kyoto between the 1920s and the 1950s, and to analyze the description on the maps. The database of maps is constructed by using ArcGIS™. The following steps are taken to digitalize these maps. First, the maps are traced, put into the computer, overlaid on and adjusted to match Kyoto City’s Digital Maps for city planning in GIS. Called geometric correction, this procedure has the maps acquire positional information, which makes it possible to compare the landscape then and now using GIS. Second, we clip blank spaces on the rectified maps using GIS. Then, we join 286 clipped maps to display them as an integrated one. What we can understand by this procedure is that the maps feature the city after its merger with neighboring

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towns in 1918. Third, we make polygon data about each building through digitizing its vertexes on GIS. In addition to this, for each polygon data, we make a database of materials such as the number of stories, and usage. Furthermore, rectified image data is converted to the KML format, which makes it possible to display maps onto Google Earth™. As a result, “Large-scale Maps of Kyoto City” can be easily compared with present Kyoto-city, which reveals dramatic changes in the city’s landscape. For example, Kyo-machiya, Kyoto’s traditional wooden houses, changed to Western-style buildings, and major streets such as Oike, Horikawa, and Gojo became much wider. In this way, “Large-scale Maps of Kyoto City” are digitalized, which helps reconstruct the landscape of modern Kyoto-City and reveal historical changes.

**Keywords: “Large-scale Maps of Kyoto City”, GIS, digitalization, landscape reconstruction, modern Kyoto**

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# 京都大比例尺地圖

## (京都市明細圖 *Kyoto-shi meisai-zu*) 數位化

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### 摘要

本文探討京都大比例尺地圖(京都市明細圖 *Kyoto-shi meisai-zu*)及其數位化專案的進行過程。這些地圖涵蓋了 1927 年至 1951 年間繪製的 291 份地圖，比例尺為 1:1200，大小約為 38x54 公分。這些地圖的繪製目的是消防安全之用，因此包含了建物相關的各種防火必要資訊，例如各建物之地號、樓層數與使用目的。用色彩編碼對建物相關各類資料加以區分，並陸續以人工方式新增到地圖中。日本立命館大學「日本藝術與文化數位人文中心」乃日本文部科學省設置之全球卓越計畫(COE Program)研究中心，基於京都市明細圖所載之豐富資訊對研究京都市的歷史發展有極大貢獻，其所屬之歷史地理資訊系統(HGIS)研究群，特別針對此批地圖執行數位化計畫，期能藉此重建 1920 至 1950 年代京都的都市景觀，並對地圖所呈現之資料進行分析。此計畫運用 ArcGIS™ 軟體建置地圖資料庫，並透過以下方式進行數位化。首先，這些大比例尺的歷史地圖可以利用 GIS 地理資訊系統軟體，將其轉繪成數位檔案，然後與京都的都市計畫數位地圖相疊合，並加以調整，讓兩者相互對應。這些地圖經幾何校正，取得定位資訊，便能用以比對古今地景。接著，將 286 張已校正的地圖，裁切掉空白區域，組合成為一整份地圖，藉此我們可以理解此份地圖所呈現 1918 年時京都市及其鄰近市鎮完整市容。將建物各個端點數位化後，每棟建物便能建立一個多邊形(polygon)資料，連結其所屬之物質特性資料庫，例如樓層數與用途等。我們也將校正後的影像資料轉換為 KML 格式，地圖便能在 Google Earth™ 上顯示，方便我們將京都市明細圖與現代的京都市容作比較，看出京都市景觀所產生的巨大變化，例如，京都傳統木造建築京町屋已被西式洋房取代，御池通、堀川通與五条通等主要道路也拓寬了。顯見京都市明細圖的數位化對重建現代京都市的歷史景觀與觀察歷史變化有極大助益。

**關鍵字：**京都大比例尺地圖、GIS、數位化、景觀重建、現代京都

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