Creating Multi-Unit Complex GIS Address Points and Building Polygons for the City of Garden Grove

By Phyllis Nakagawa, Masters of Science in Geographic Information Science (MSGISci) Department of Geography, CSULB 2014

Geospatial Techniques

DEPARTMENT OF GEOGRAPHY
CALIFORNIA STATE UNIVERSITY, LONG BEACH

GARDEN GROVE

Introduction

This applied project represents the work I have undertaken with the City of Garden Grove. I have had an invaluable opportunity to work for the City of Garden Grove as a volunteer GIS practitioner. As part of this position I have been tasked with digitizing multi-unit complexes; creating an address point layer of units and structures, and a building polygon layer. The IT manager and GIS Analyst have both been very helpful and patient while working with me on this great challenge and journey!

The City of Garden Grove is located in Orange County, California, with an estimated population of 175,000 in 2013, and is eighteen square miles in size (Figure 1).

Figure 1. Garden Grove, Orange County, California.

Data Sources: Esri Topo basemap, City of Garden Grove provided the boundary, CSULB provided the L.A./Orange county boundaries. Map by Phyllis Nakagawa 8/6/14

Data and Data Sources

All project data are stored in folders and a geodatabase in Esri ArcMap and ArcCatalog using ArcGIS 10.1 (Table 1).

Table 1. List of data and data sources used.

Dataset	Source
City of Garden Grove boundary shapefile, vector data	Obtained from the City of Garden Grove, 2013
Orange County landbase parcels shapefile, vector data	Obtained from the City of Garden Grove, 2014
High resolution aerial raster data	Obtained from the City of Garden Grove, 2012
Excel spreadsheet with 48,175 addresses	Obtained from the City of Garden Grove, 2013
Map book with complexes, units, and floors, CD format	Obtained from the City of Garden Grove, 2014
TIGER/line shapefile of Orange County, California, All Lines 2013, vector data	Obtained from the U.S. Census website, 2014
Los Angeles and Orange County Boundaries, vector data	Obtained from CSULB Department of Geography lab, 2014
Esri topographic basemap, vector data	Available from Esri ArcMap, ArcGIS 10.1

Methodology

Aerial photography provided by the City, plus a map book with multi-unit apartments, condos, schools, mobile homes, and shopping complex unit information serve as the base datasets upon which the address layer is being built. By digitizing both an address point layer and a building polygon layer, new spatial and attribute data will be created.

Attributes that are being created for this project include: address, zip code, unit number or type of structure, floor of the unit, complex name, map book page number, and XY coordinates will be digitized and created. Different colored points represent the different floors -- black for the ground or first floor, red for the second floor, etc.

Results

Figures 2 and 3 provide examples of a digitized complex and the associated map book page.
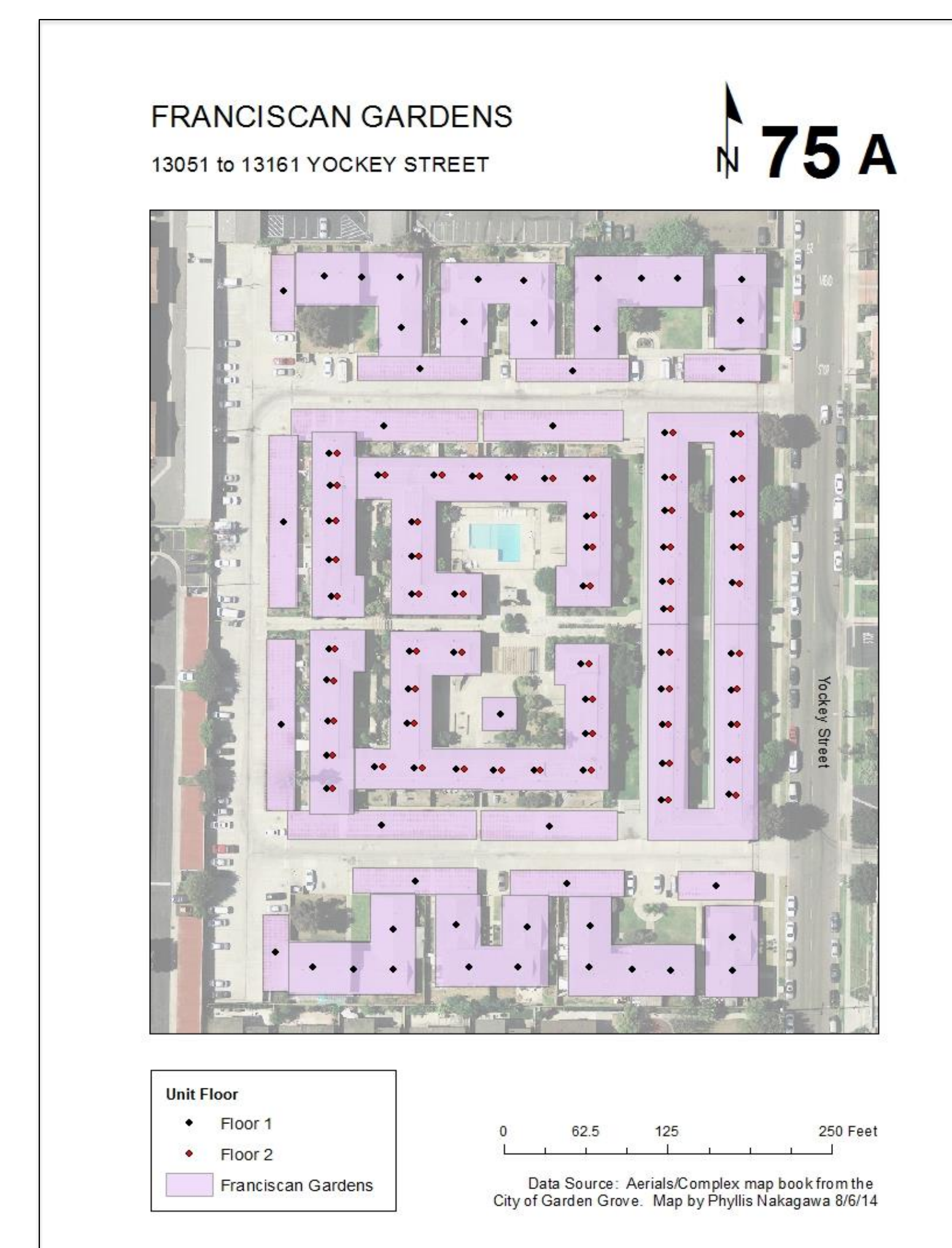
FRANCISCAN GARDENS
13051 to 13161 YOCKEY STREET
N 75 A

Unit Floor
● Floor 1
● Floor 2
▨ Franciscan Gardens

0   62.5   125   250 Feet

Data Source: Aerials/Complex map book from the City of Garden Grove. Map by Phyllis Nakagawa 8/6/14

Figure 2. Digitized multi-unit complex address points for units and other structures, and building polygons.

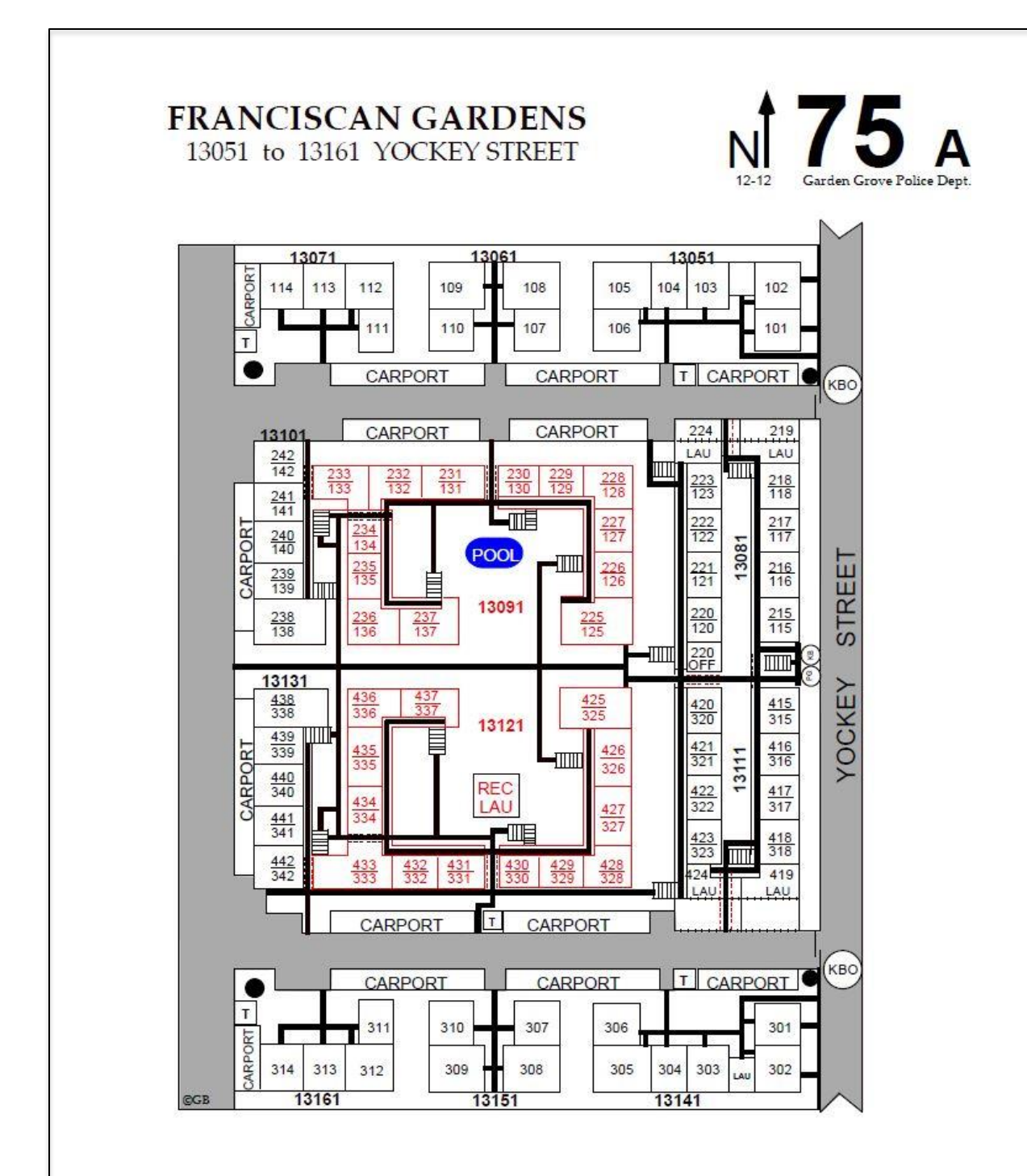FRANCISCAN GARDENS
13051 to 13161 YOCKEY STREET
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Figure 3. The corresponding page of the city-provided map book of multi-unit complexes.

Discussion

Initially the units were to be digitized as polygons, but if they were not aligned vertically on multiple floors, the polygons could not be identifiable. Therefore points representing each unit or structure were the answer. This requires utilizing different colored points for different floors. Relevant attribute information below is available for each address point.

Table 2. New point layer attribute table.

Table 3. New polygon layer attribute table.

Conclusion

The process developed for this project will enable the City of Garden Grove's GIS department to have both a dynamic address point layer and a building polygon layer of multi-unit complexes. Each unit or structure will have its own address point, crucial to a city's planning, permitting, taxing, and utility departments.

Acknowledgements