

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



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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 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.

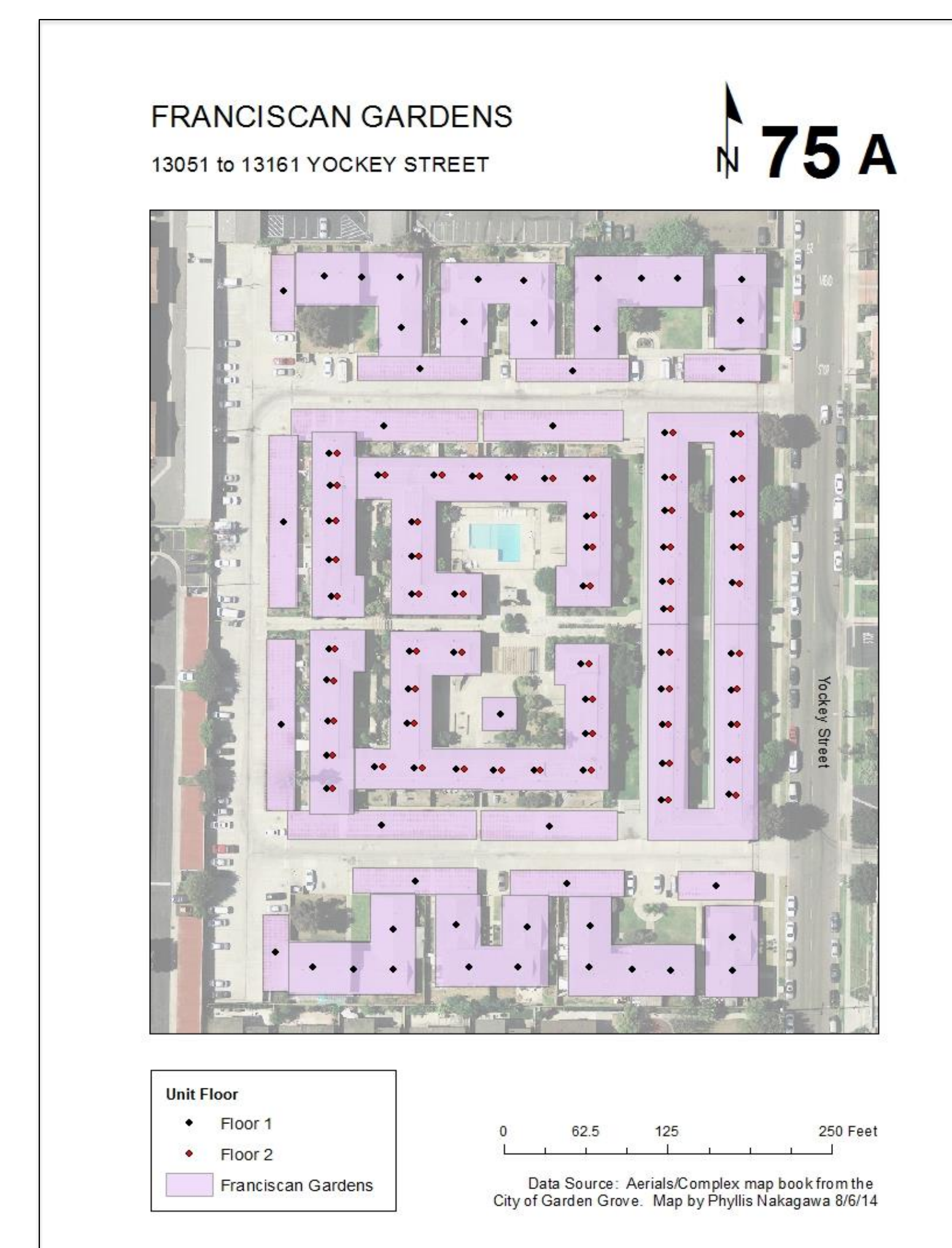


Figure 2. Digitized multi-unit complex address points for units and other structures, and building polygons.

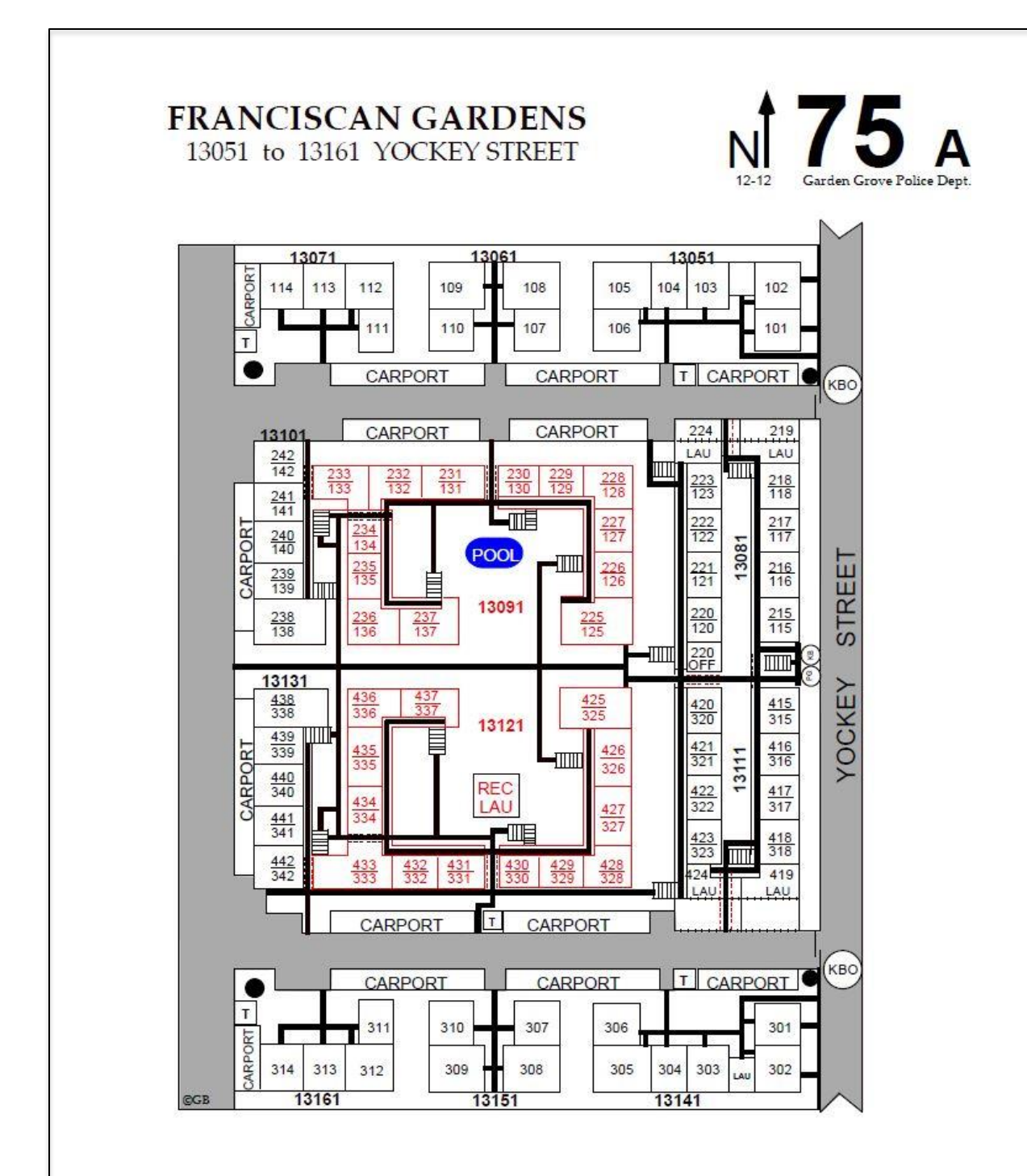


Figure 3. The corresponding page of the city-provided map book of multi-unit complexes.

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.

ID	Shape	APR	Address	City	ZipCode	UnitNo_OrType	Unit_Floor	Complex	Mapbook	X_Coord	Y_Coord
19	Point	097-231-06	13091 Yockey St	Garden Grove	92644	Carport		1 Franciscan Gardens	75A	603679.86405	2229214.2887
20	Point	097-231-06	13091 Yockey St	Garden Grove	92644	Carport		1 Franciscan Gardens	75A	6036798.05071	2229214.2887
21	Point	097-231-06	13161 Yockey St	Garden Grove	92644	130		1 Franciscan Gardens	75A	603679.29987	2229216.6462
22	Point	097-231-06	13161 Yockey St	Garden Grove	92644	130		1 Franciscan Gardens	75A	6036537.52284	2229199.42789
23	Point	097-231-06	13161 Yockey St	Garden Grove	92644	239		2 Franciscan Gardens	75A	6036843.97949	2229199.42789
24	Point	097-231-06	13161 Yockey St	Garden Grove	92644	140		1 Franciscan Gardens	75A	6036537.87919	2229140.33037
25	Point	097-231-06	13161 Yockey St	Garden Grove	92644	240		2 Franciscan Gardens	75A	6036842.71327	2229140.33037

Table 3. New polygon layer attribute table.

ID	Shape	APR	Address	City	ZipCode	Type	BlgNo	Floors	Complex	Mapbook	Y_Coord	X_Coord
6	Polygon	097-231-06	13091 Yockey St	Garden Grove	92644	Carport		1	Franciscan Gardens	75A	2229207.69603	6036722.29294
7	Polygon	097-231-06	13091 Yockey St	Garden Grove	92644	Carport		1	Franciscan Gardens	75A	2229209.36984	6036660.75143
8	Polygon	097-231-06	13091 Yockey St	Garden Grove	92644	Units		2	Franciscan Gardens	75A	2229138.26236	6036660.20275
9	Polygon	097-231-06	13091 Yockey St	Garden Grove	92644	Carport		1	Franciscan Gardens	75A	2229215.52602	6036798.80436
10	Polygon	097-231-06	13091 Yockey St	Garden Grove	92644	Carport		1	Franciscan Gardens	75A	2229214.64664	6036798.80436

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

Appreciation to the City of Garden Grove, IT Manager Anand Rao and GIS analyst Jennifer Wang, for giving me this great opportunity to explore and to learn. Classmate and City of Huntington Beach GIS Manager Daniel Richards for sharing his invaluable knowledge and experience, and his coworker, GIS analyst Leslie Edwards for sharing her addressing experiences Classmates Rogelio Flores and Daniel Salto for the great digitizing tips! Michael Shensky for your time and knowledge.

Submitted in partial fulfillment of the requirements of the Masters of Science in Geographic Information Science (MSGISci), August 16, 2014. For additional information please contact Phyllis Nakagawa, naominaks@gmail.com.