

Welcome to the Geocoding Workshop

Drew MacQueen & Chris Gist

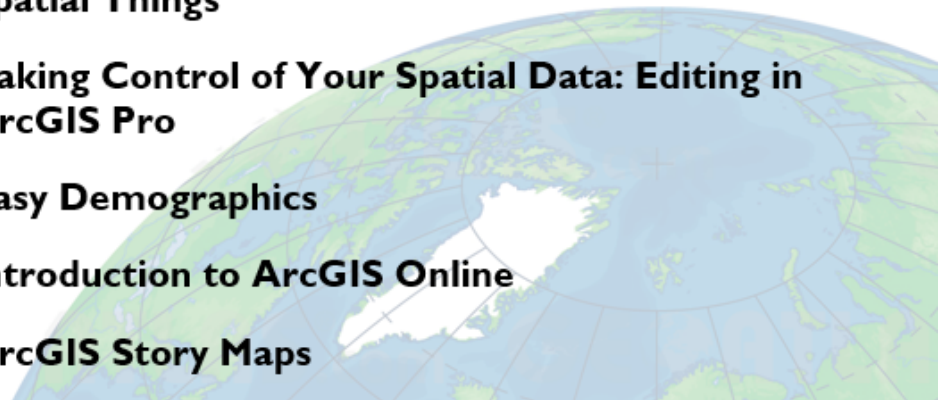
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Fall 2023

Virtual GIS Workshops

Wednesdays – Sept. 6th to Oct. 25th 2PM – 3PM

September 6th	Making Your First Map with ArcGIS Pro
September 13th	Putting Old maps and Aerial Photos on Your Map: Georeferencing in ArcGIS Pro
September 20th	Getting Your Data on a Map
September 27th	Points on Your Map: Street Addresses and More Spatial Things
October 4th	Taking Control of Your Spatial Data: Editing in ArcGIS Pro
October 11th	Easy Demographics
October 18th	Introduction to ArcGIS Online
October 25th	ArcGIS Story Maps



What is Geocoding?

Transforming a description into a location.

Descriptions can be...

- Address

- City

- County

- State

- Zip Code

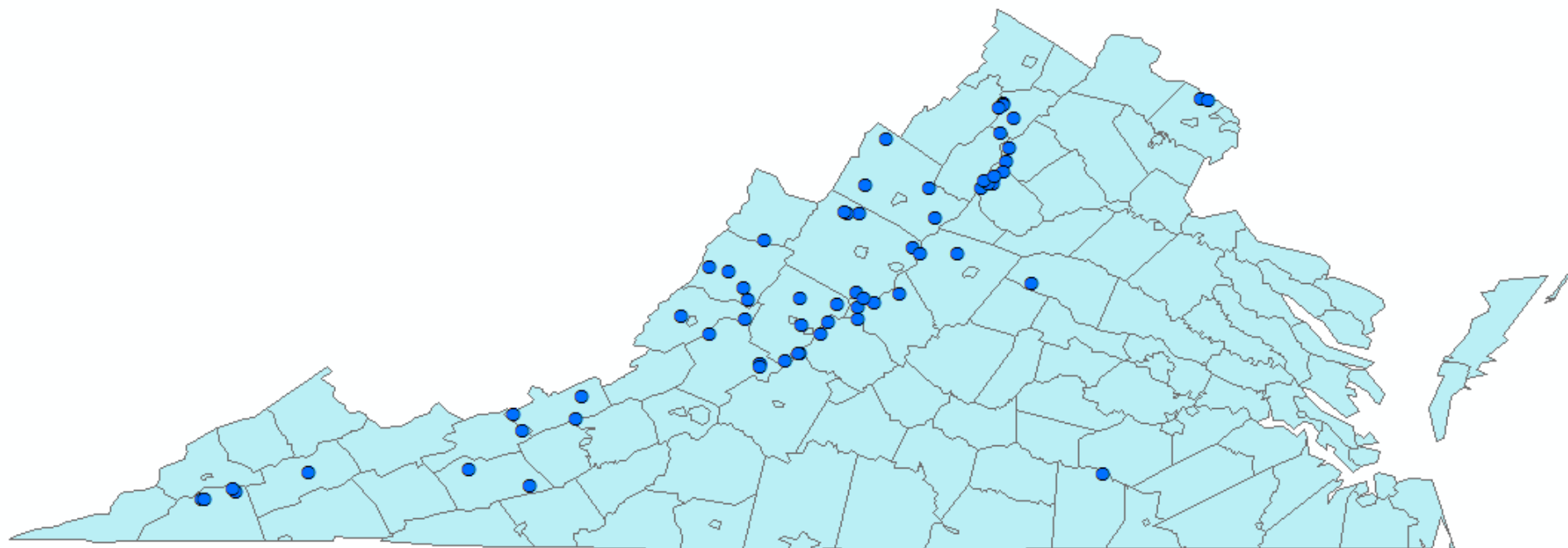
- Census Tract

- Place Name

- .

- .

XY Data



Attributes of swimminHoles\$

	LAT	LON	AREA	FULL_NAME	AREA_NAME	
▶	37.56572	-79.48064	ARNO	ARNOLD VALLEY POOL	<Null>	D
	37.7516	-79.3921	BENS	BEN SALEM WAYSIDE	<Null>	D
	37.87111	-79.20536	BIGM	BIG MARYS CREEK SLIDE	<Null>	D
	38.4954	-78.4241	BIGR	BIG ROCK FALLS	<Null>	M
	37.24964	-80.60908	BLAC	BLACKSBURG HOLE	<Null>	D
	38.06481	-79.88817	BLOW	BLOWING SPRINGS	<Null>	M
	38.9458	-78.3034	ELIA(BLUZ)	BLUE HOLE	ELIZABETH FURNACE AREA	D
	38.75619	-78.93769	BLUB	BLUE HOLE - BERGTON	<Null>	D
	38.50583	-79.04892	BLUR	BLUE HOLE - RAWLEY SPRINGS	<Null>	D
	38.21331	-79.59131	BULL	BULLPASTURE GORGE	<Null>	M
	38.94296	-78.3077	ELIA(BUZZ)	BUZZARD ROCK HOLE	ELIZABETH FURNACE AREA	D
	38.1405	-78.5565	CAMP	CAMP ALBEMARLE	<Null>	D
	37.87456	-79.00281	CAMB	CAMPBELL CREEK	<Null>	n
	37.3673	-80.5763	CASC	CASCADE FALLS	<Null>	D
	36.95817	-82.05653	CEDF	CEDAR CREEK FALLS	<Null>	D
	38.5398	-78.365	OLDR(CEDA)	CEDAR RUN FALLS	OLD RAG AREA	T
	37.95289	-79.70336	COWP(COW1	COWPASTURE 1	COWPASTURE RIVER AREA	D
	36.98073	-81.18665	DARK	DARK HORSE HOLLOW	<Null>	D
	36.8187	-82.6324	DEVI(DEVB)	DEVILS BATHTUB	DEVILS BATHTUB AREA	D
	38.9765	-77.2381	DIFA(DIFF)	DIFFICULT RUN	DIFFICULT RUN AREA	D
	38.92589	-78.32947	ELIA(ELIZ)	ELIZABETH FURNACE	ELIZABETH FURNACE AREA	n
	37.18836	-80.90036	FALL	FALLS OF DISMAL	<Null>	D
	36.88639	-80.85897	FOST	FOSTER FALLS	<Null>	D
	38.86822	-78.24933	OVEA(GOON)	GOONEY CREEK	OVERALL AREA	D
	37.8983	-79.4064	GOSH	GOSHEN PASS	<Null>	D
	38.51406	-78.36244	OLDR(GRAV)	GRAVES MOUNTAIN LODGE	OLD RAG AREA	D
	36.8584	-82.4486	LITT(HANG)	HANGING ROCK DEC AREA	LITTLE STONY FALLS AREA	D

Street Addresses – No Lat/Long

DISTRICTADDRESS	CITY	STATE	ZIP	SALU
12515 Warwick Boulevard, Suite 100	Newport News	VA	23606	Abbo
6367 Rolling Mill Place, Suite 102	Springfield	VA	22152	Albo
7246 Granby Street	Norfolk	VA	23505	Alexa
35 N. Royal Avenue	Front Royal	VA	22630	Athey
2309 Finch Court	Charlottesville	VA	22911	Bell
2620 Eston Drive	Staunton	VA	24401	Bell
523 Leesville Road	Lynchburg	VA	24502	Byron
221 S. Main Street, Suite 200, P.O. Box 1100 C	Independence	VA	24333	Carri
40 British Woods Drive, Suite 101	Roanoke	VA	24019	Cleav
10451 Dow-Gil Road	Ashland	VA	23005	Cox
131 Old Brickhouse Lane	Colonial Heights	VA	23834	Cox
455 Short Street, Suite 204	South Boston	VA	24592	Edmu
City Hall, 301 King Street, Box 65	Alexandria	VA	22314	Englin
2255 Langhorne Road, Suite 4	Lynchburg	VA	24501	Garre
3302 Oaklawn Boulevard	Hopewell	VA	23860	Ingra
25 Early Drive	Portsmouth	VA	23701	Jame
709 Court Street	Portsmouth	VA	23704	Joan
164 E. Valley Street	Abingdon	VA	24210	John
1852 Mill Landing Road	Virginia Beach	VA	23457	Knigh

Address Elements

- Street Address
- City
- State
- Zip
- Country

Place Names

Address Locators

- The Geocoding Brain
- Built in a particular style
- Contains the data / properties / rules
- Sorts through all possibilities and assigns scores
- Presents the results for human interaction

Today: Esri World Geocoding Service

Reference Data

US Census “TIGER” Database

Created for census work

Topologically

Integrated

Geographic

Encoding and

Referencing

US Census TIGER data

Geographic elements that can be used for address matching

- Lines

streets, railroads, rivers

- Areas

zip codes, census blocks, tracts, counties, etc.

- Points

landmarks such as churches, schools, and other cultural features

Sources and Hierarchy



← Match Found



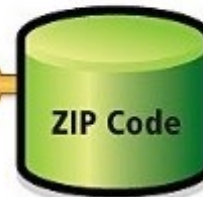
← Match Found



← Match Found



← Match Found



← Match Found



Data Appended Address Record

Name: Joe Smith

Address: 123 Main St.

City: Anytown

State: CA

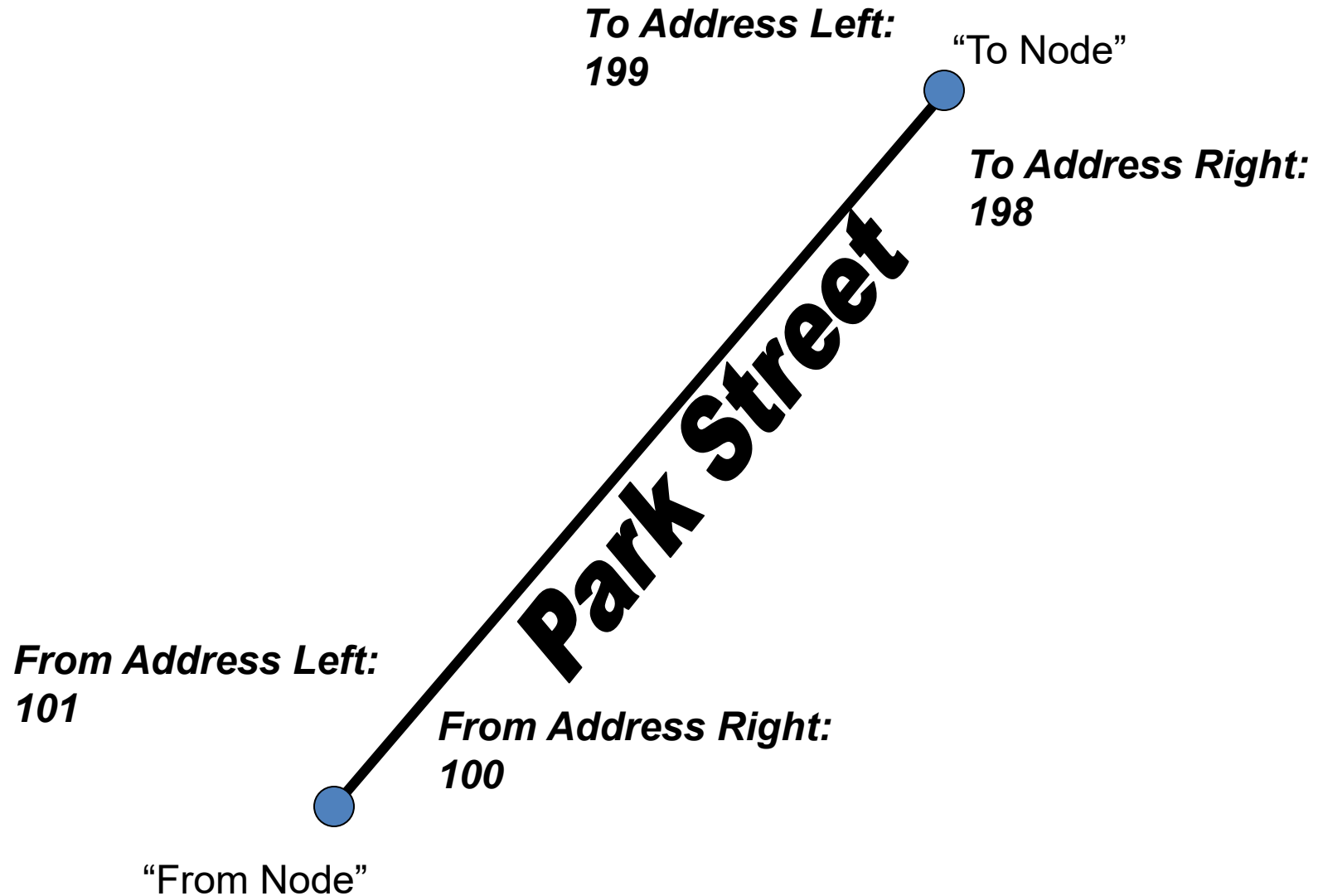
ZIP Code: 99999-9999

Latitude: 32.87090

Longitude: -117.23261

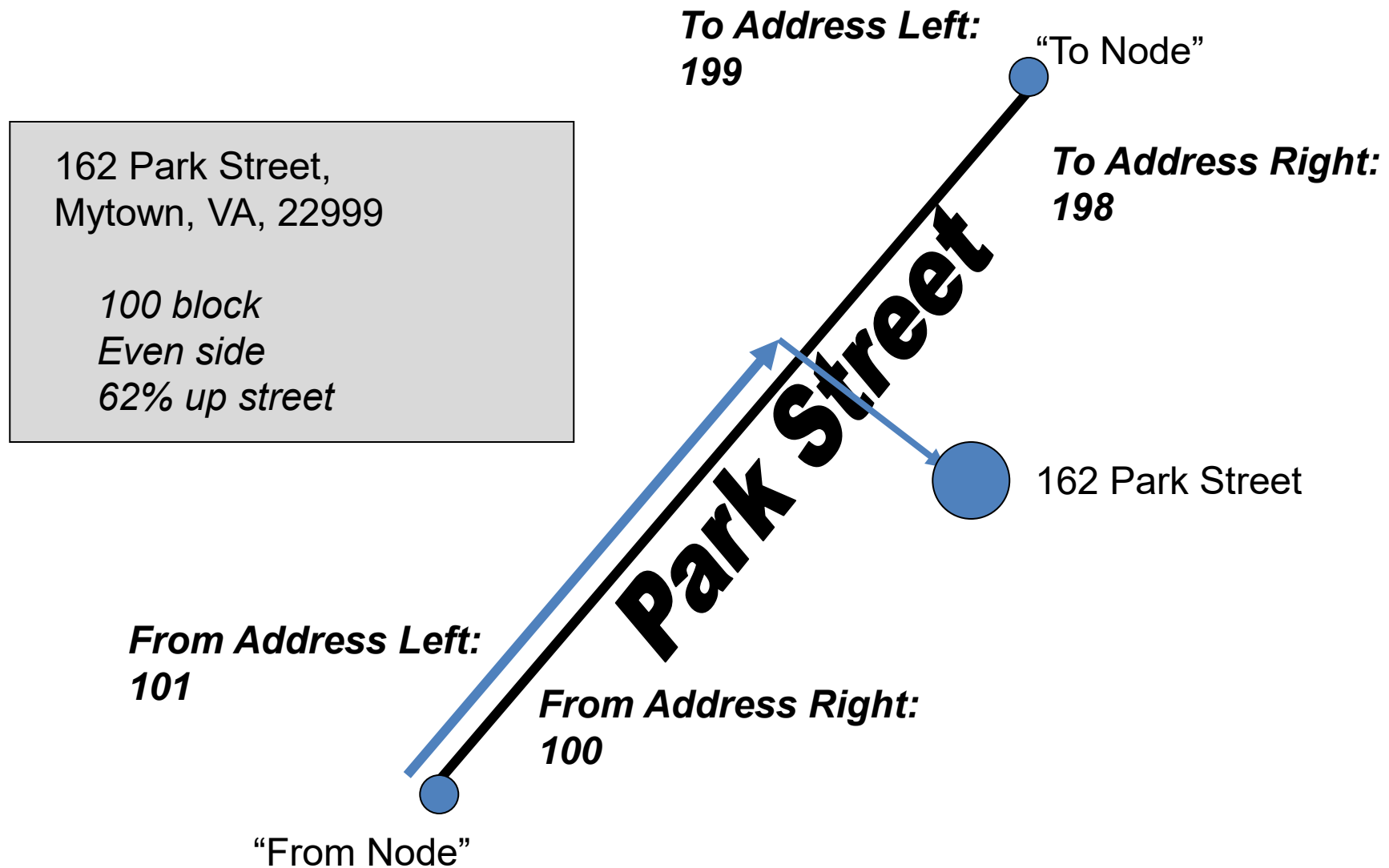
Street Address Matching

162 Park Street, Mytown, VA



Address Matching

Park Street, Mytown, VA



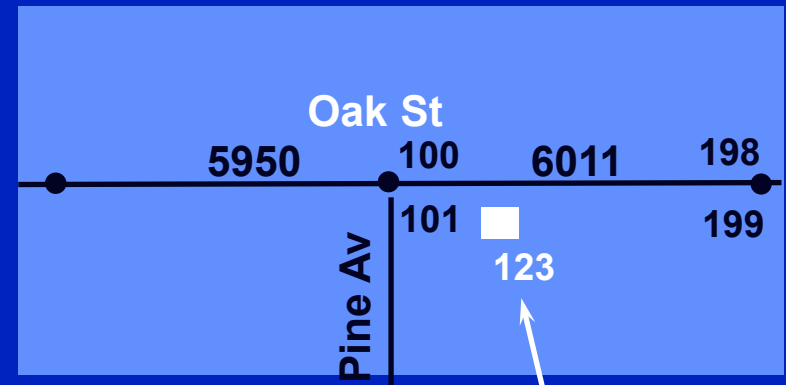
Street Address Matching

List of input locations

Address Locator/Reference Data

Map Location

StoreID	Address	Class
1437	123 Oak St	A
402	333 Pine Av	A
855	18 Bay Dr	B



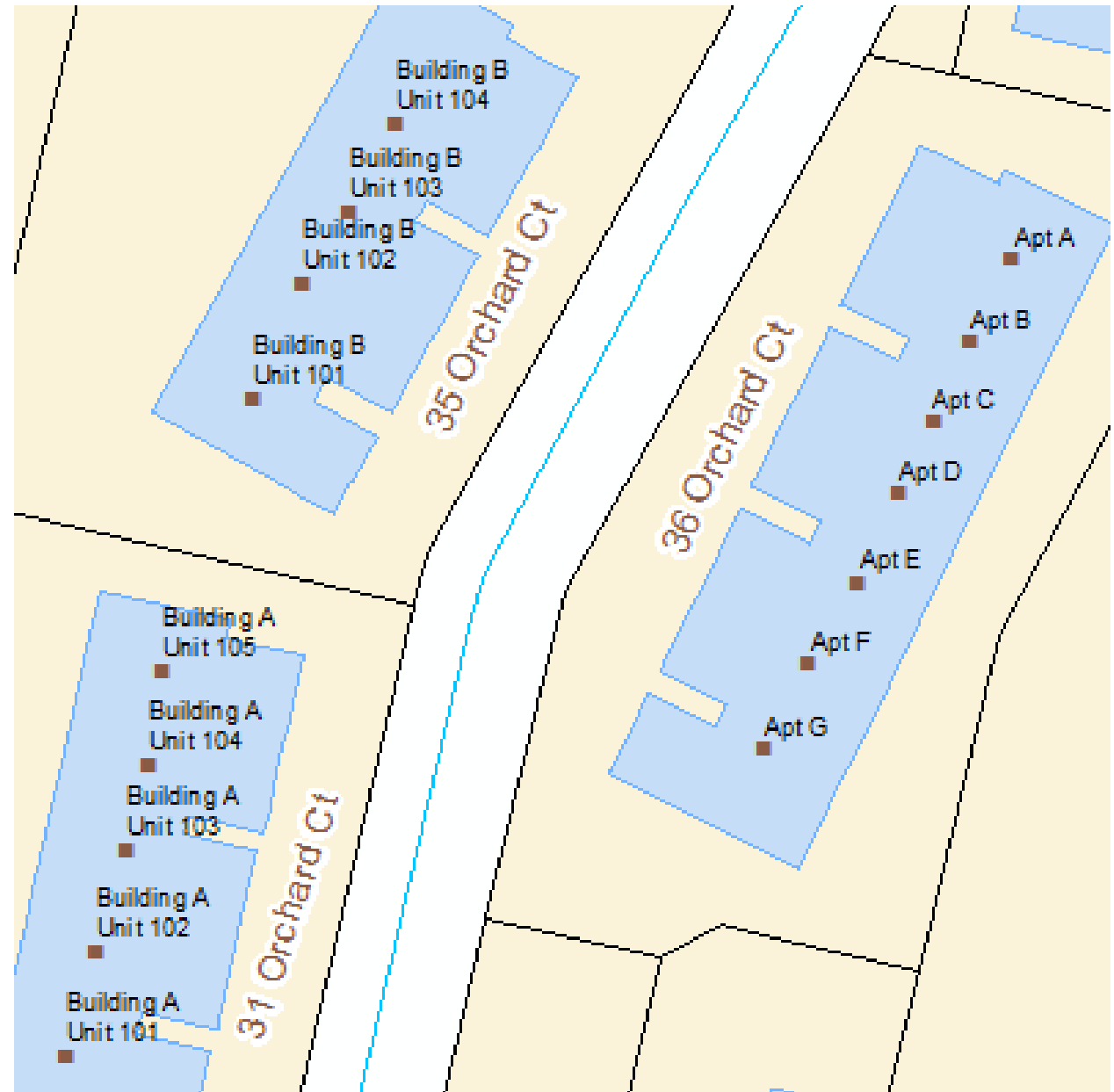
Attributes of Streets

From	To	Street	Type	Side	Parity	Street_
2	98	Oak	St	R	E	5950
1	99	Oak	St	L	O	5950
100	198	Oak	St	R	E	6011
101	199	Oak	St	L	O	6011

Point Address Matching



Point Address Matching



Non Address Geocoding

Geocoding can also work on:

- Census Geographies
- Zip Codes
- Place Names
- States
- Countries

Composite Geocoding



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City: Anytown

State: CA

ZIP Code: 99999-9999

Latitude: 32.87090

Longitude: -117.23261

Address Issues

Alternate Names – Alternate Name Table

Fifth Avenue, Fifth Ave., 5th AV

West Main, Route 51, Veterans Highway

Data Entry Errors

Fidth Avenue

Place Names – Place Name Alias Table

UVa, JPJ Arena, Downtown Mall

Post Office Boxes

P.O. Box 125

Address Issues

Alternate Names – via an Alternate Names Table

Fifth Avenue, Fifth Ave., 5th AV

West Main, Arlington Highway, US Route 66

