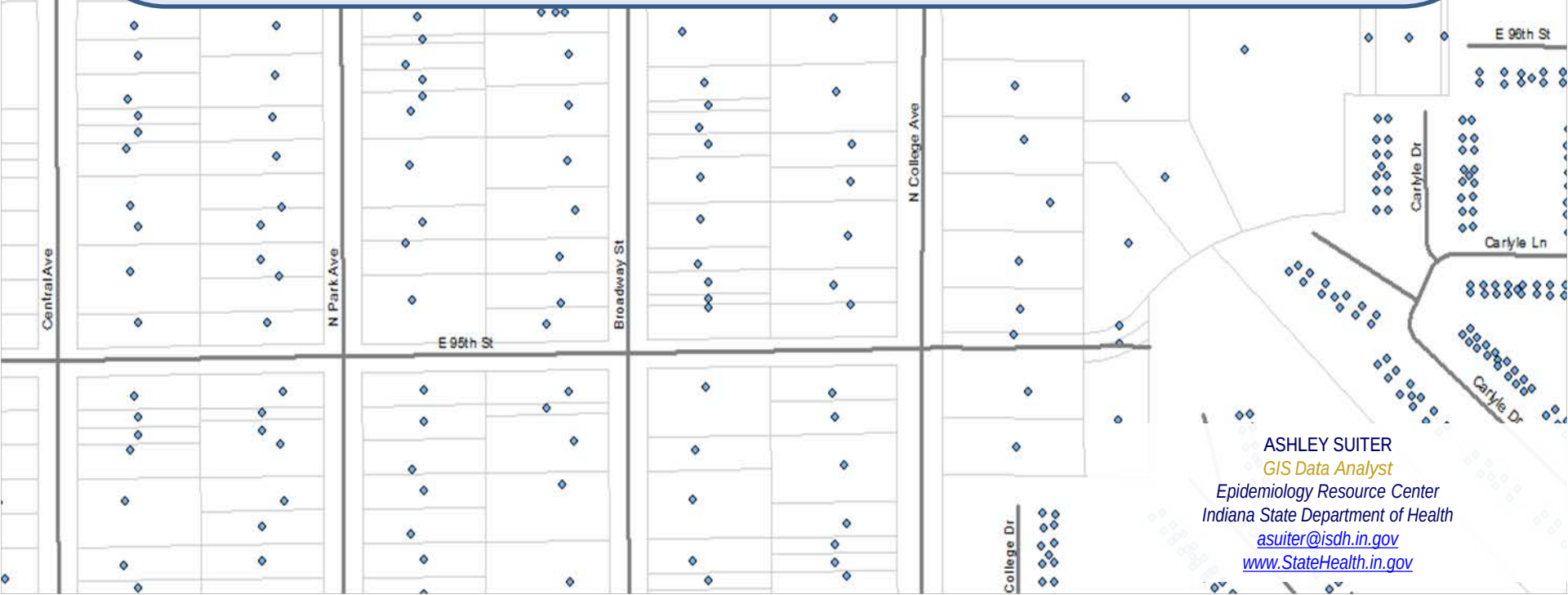
ARCGIS DESKTOP DEMO

(GEOCODING, SERVICE AREAS, TABULAR & SPATIAL JOINS)

Indiana State GIS Day Conference: September 22, 2015



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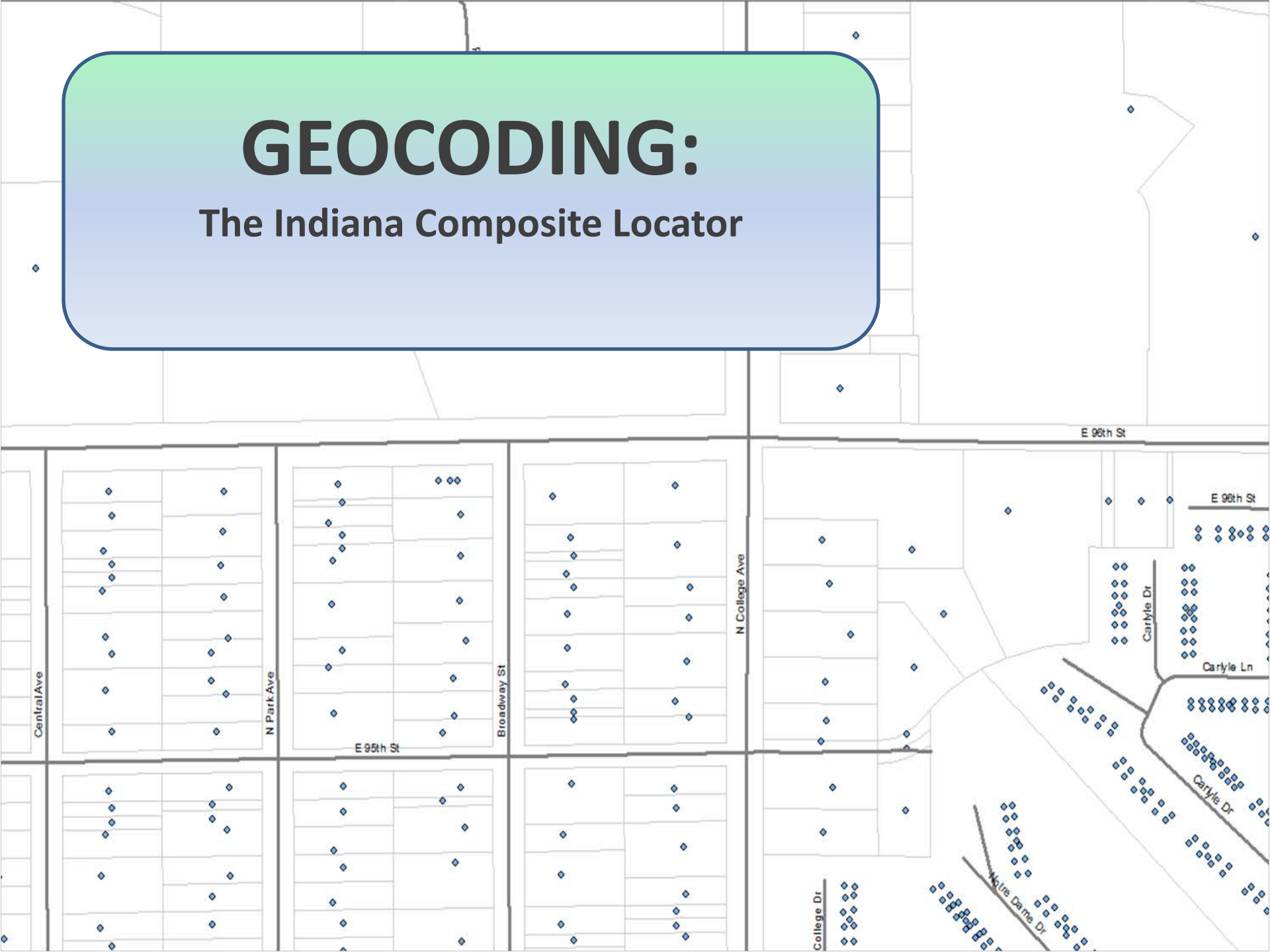
GEOCODING:

The Indiana Composite Locator



What is Geocoding?

Dataset With addresses

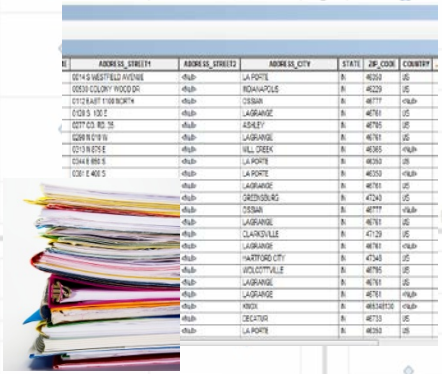
+

Address Locator

=

Point Feature Class

Geocoding is the process of transforming a description —such as a pair of coordinates, an address, or a name of a place—to a location on the earth's surface. (ESRI)

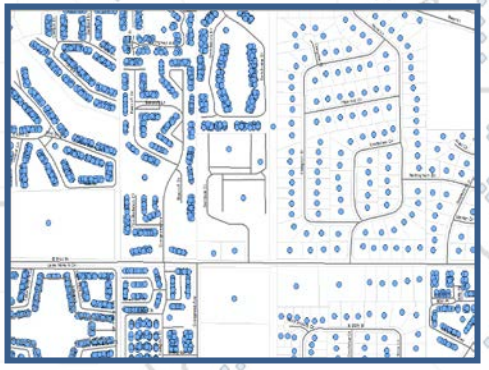


Input Addresses

+

Find Locations

=



Create Points

Address Matching Process

Add the address table to the map

Choose the Address Locator

Set the geocoding parameters

Match the Addresses

Adjust geocoding parameters

NOTE

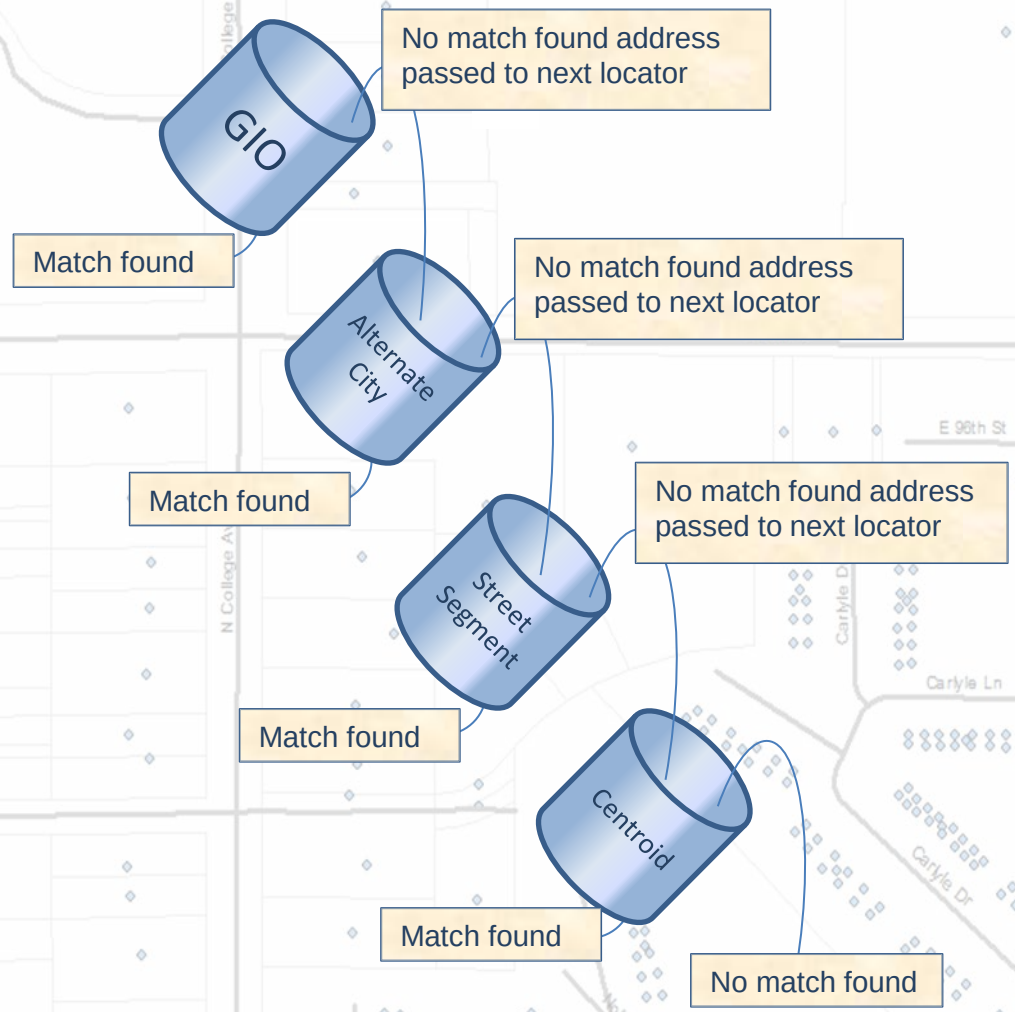
Geocoding can be done from ArcCatalog or ArcMap.

GeoCoder <Type an address...>

State GIO Composite Locator

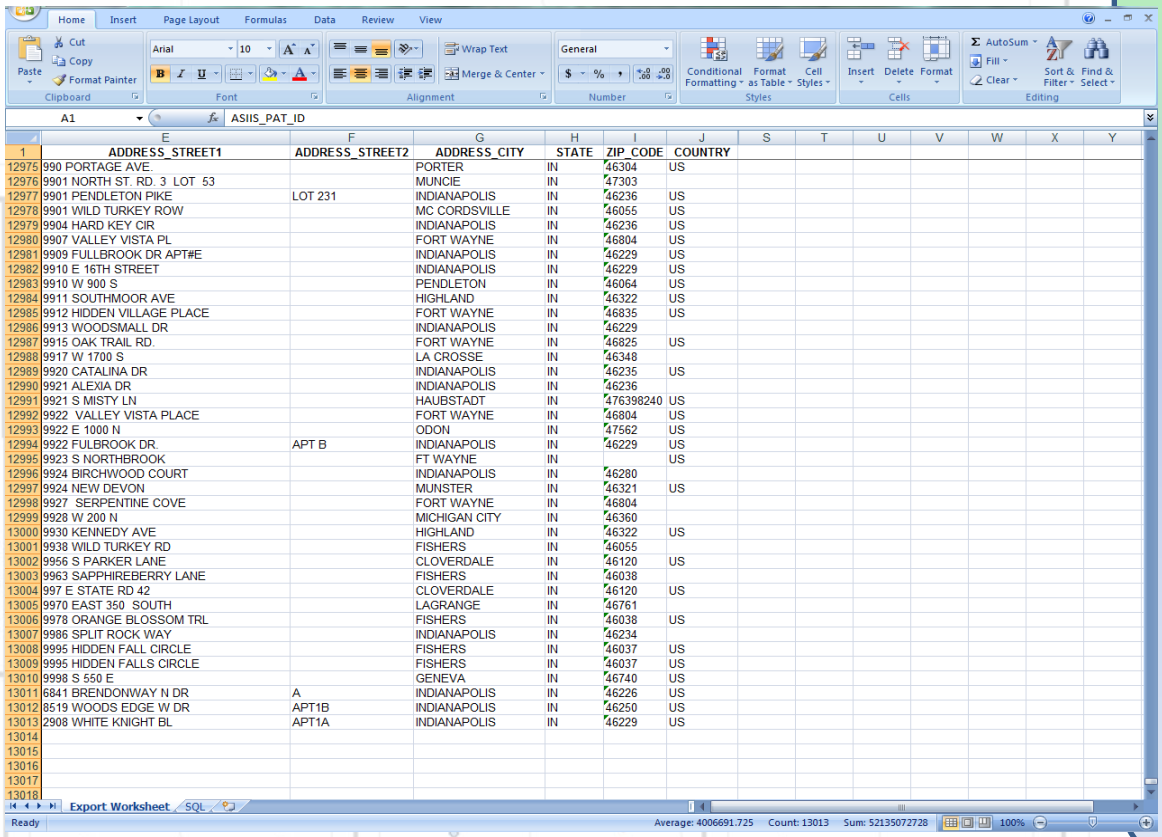
https://gis.in.gov/arcgis/rest/services

- Contains multiple locators
- Allows for more address matching types.
- Order is important…the locators are searched from the top down.
- Once an address is matched searching stops for that address.



Geocoding Example

Adding Address Data



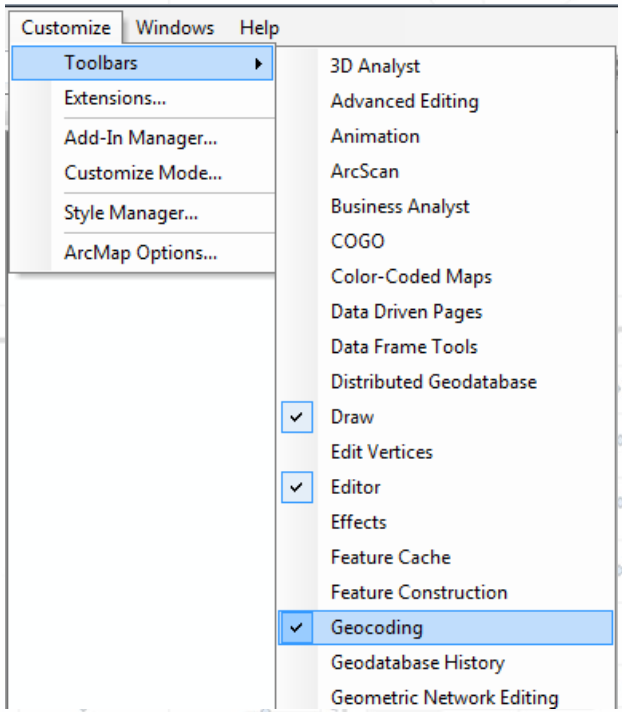
	ADDRESS_STREET1	ADDRESS_STREET2	ADDRESS_CITY	STATE	ZIP_CODE	COUNTRY
12975	990 PORTAGE AVE.		PORTER	IN	46304	US
12976	9901 NORTH ST. RD. 3 LOT 53		MUNCIE	IN	47303	
12977	9901 PENDLETON PIKE	LOT 231	INDIANAPOLIS	IN	46236	US
12978	9901 WILD TURKEY ROW		MC CORDSVILLE	IN	46055	US
12979	9904 HARD KEY CIR		INDIANAPOLIS	IN	46236	US
12980	9907 VALLEY VISTA PL		FORT WAYNE	IN	46804	US
12981	9909 FULLBROOK DR APT#E		INDIANAPOLIS	IN	46229	US
12982	9910 E 16TH STREET		INDIANAPOLIS	IN	46229	US
12983	9910 W 900 S		PENDLETON	IN	46064	US
12984	9911 SOUTHMOOR AVE		HIGHLAND	IN	46322	US
12985	9912 HIDDEN VILLAGE PLACE		FORT WAYNE	IN	46835	US
12986	9913 WOODSMALL DR		INDIANAPOLIS	IN	46229	
12987	9915 OAK TRAIL RD.		FORT WAYNE	IN	46825	US
12988	9917 W 1700 S		LA CROSSE	IN	46348	
12989	9920 CATALINA DR		INDIANAPOLIS	IN	46235	US
12990	9921 ALEXIA DR		INDIANAPOLIS	IN	46236	
12991	9921 S MISTY LN		HAUBSTADT	IN	476398240	US
12992	9922 VALLEY VISTA PLACE		FORT WAYNE	IN	46804	US
12993	9922 E 1000 N		ODON	IN	47562	US
12994	9922 FULBROOK DR.	APT B	INDIANAPOLIS	IN	46229	US
12995	9923 S NORTHBROOK		FT WAYNE	IN		US
12996	9924 BIRCHWOOD COURT		INDIANAPOLIS	IN	46280	
12997	9924 NEW DEVON		MUNSTER	IN	46321	US
12998	9927 SERPENTINE COVE		FORT WAYNE	IN	46804	
12999	9928 W 200 N		MICHIGAN CITY	IN	46360	
13000	9930 KENNEDY AVE		HIGHLAND	IN	46322	US
13001	9938 WILD TURKEY RD		FISHERS	IN	46055	
13002	9956 S PARKER LANE		CLOVERDALE	IN	46120	US
13003	9963 SAPPHIREBERRY LANE		FISHERS	IN	46038	
13004	997 E STATE RD 42		CLOVERDALE	IN	46120	US
13005	9970 EAST 350 SOUTH		LAGRANGE	IN	46761	
13006	9978 ORANGE BLOSSOM TRL		FISHERS	IN	46038	US
13007	9986 SPLIT ROCK WAY		INDIANAPOLIS	IN	46234	
13008	9995 HIDDEN FALL CIRCLE		FISHERS	IN	46037	US
13009	9995 HIDDEN FALLS CIRCLE		FISHERS	IN	46037	US
13010	9998 S 550 E		GENEVA	IN	46740	US
13011	6841 BRENDONWAY N DR	A	INDIANAPOLIS	IN	46226	US
13012	8519 WOODS EDGE W DR	APT1B	INDIANAPOLIS	IN	46250	US
13013	2908 WHITE KNIGHT BL	APT1A	INDIANAPOLIS	IN	46229	US

Addresses may be stored in any common table format:

.xls, .xlsx,
.dbf,
.txt, .csv,
.mdb,
Oracle table

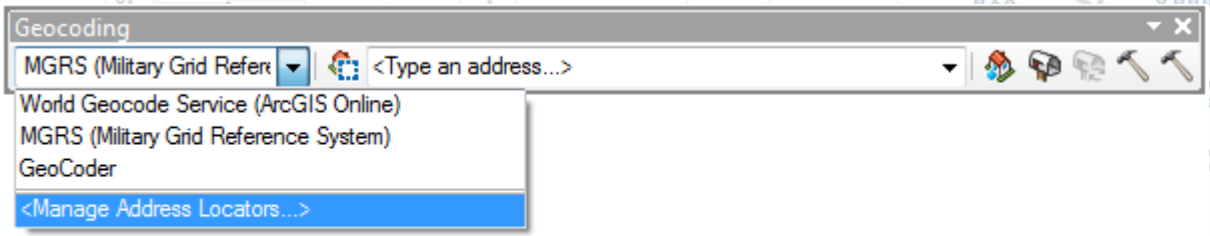
Geocoding Example

Adding the Geocoding Toolbar



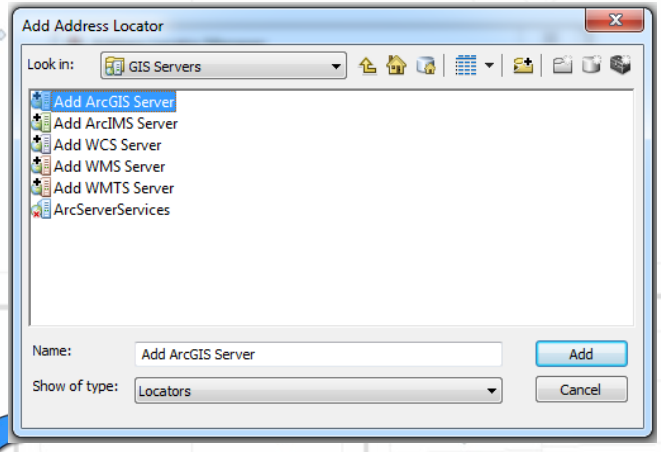
Customize → Toolbars → Geocoding

- Manage address locators
- Search and view single address
- Inspect addresses
- Geocode address table
- Rematch addresses



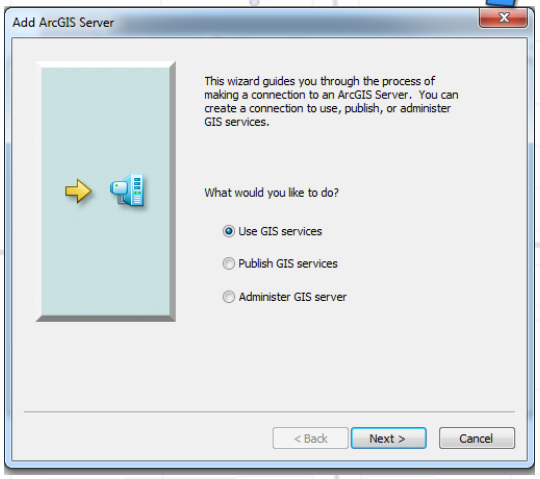
Geocoding Example

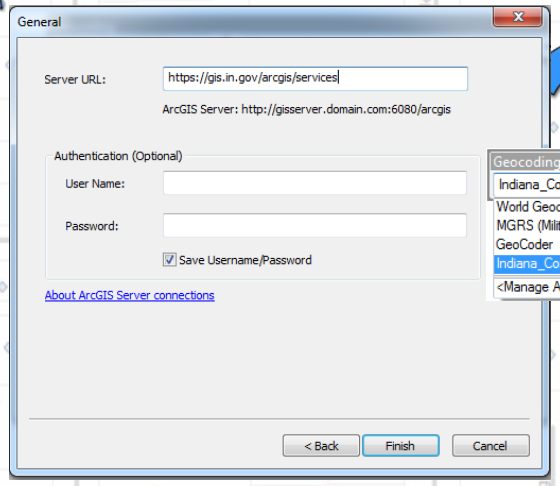
Adding the State Composite Locator

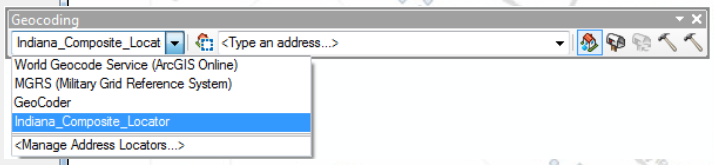


From the Geocoding Toolbar:

- Choose Manage address locators
- Navigate to GIS Servers
- Add State ArcGIS Server
- URL: https://gis.in.gov/arcgis/services
- Locate Indiana_Composite_Locator

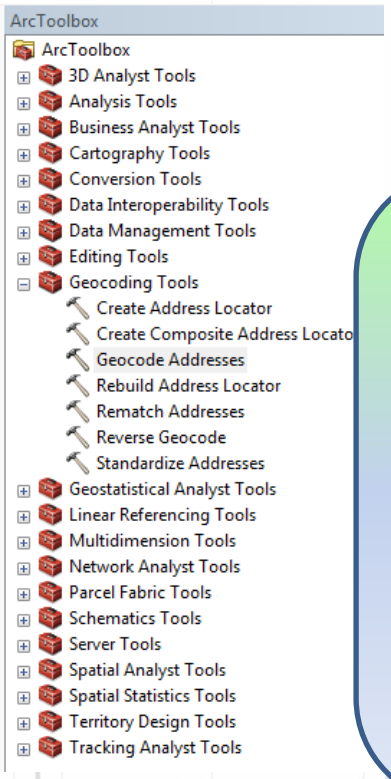


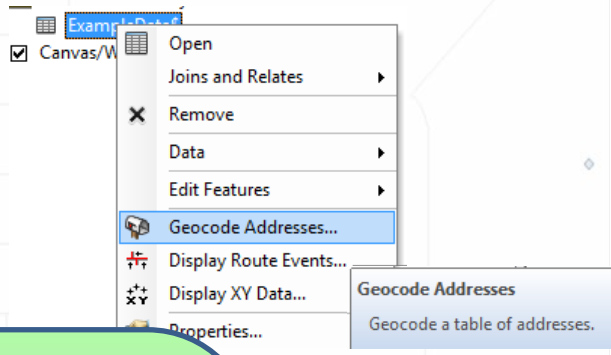




Geocoding Example

Start Geocoding!





Many ways to get started

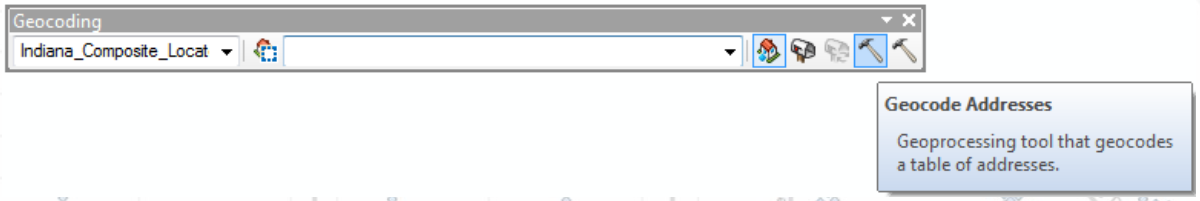
1. Right-click on address table in Table of Contents

OR

2. Select Geocode tool from Geocoding Toolbar

OR

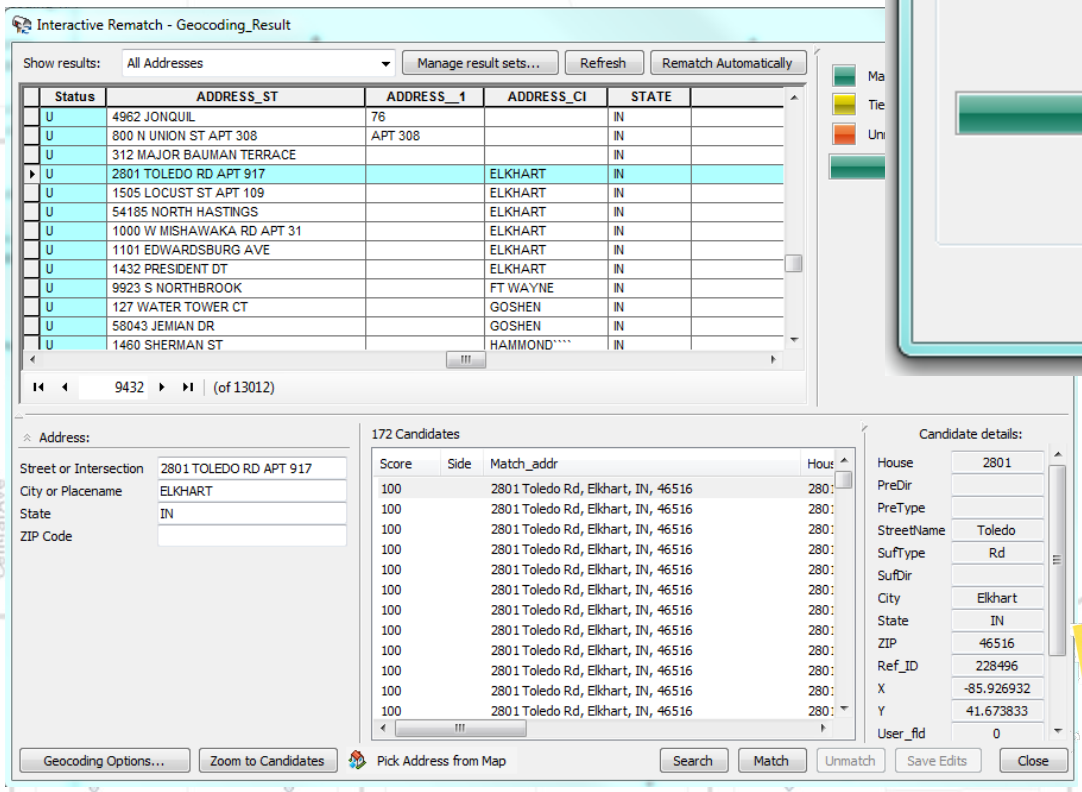
3. Choose Geocoding Tools > Geocode Addresses from ArcToolbox

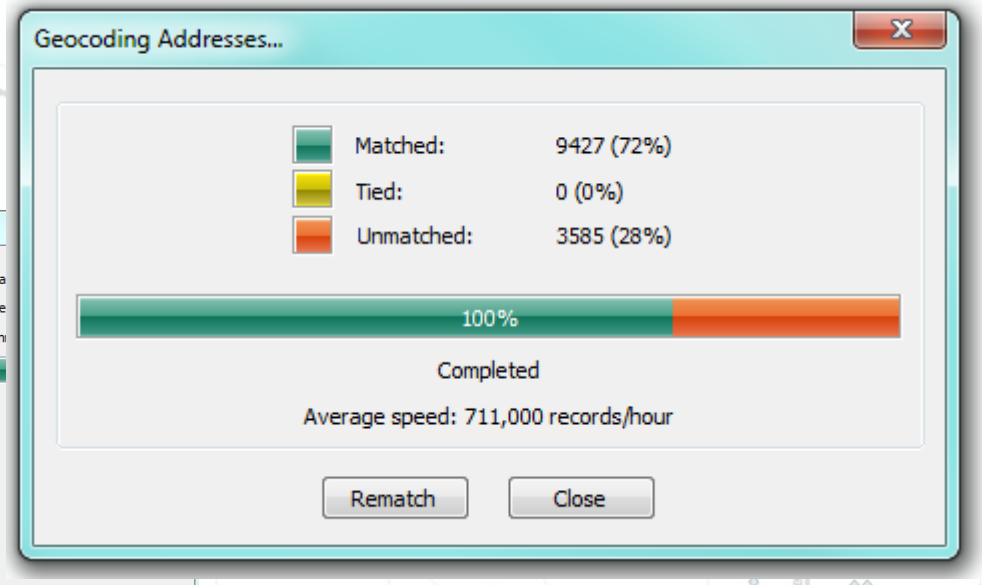


Geocoding Example

Check Results

Unmatched addresses can be matched manually





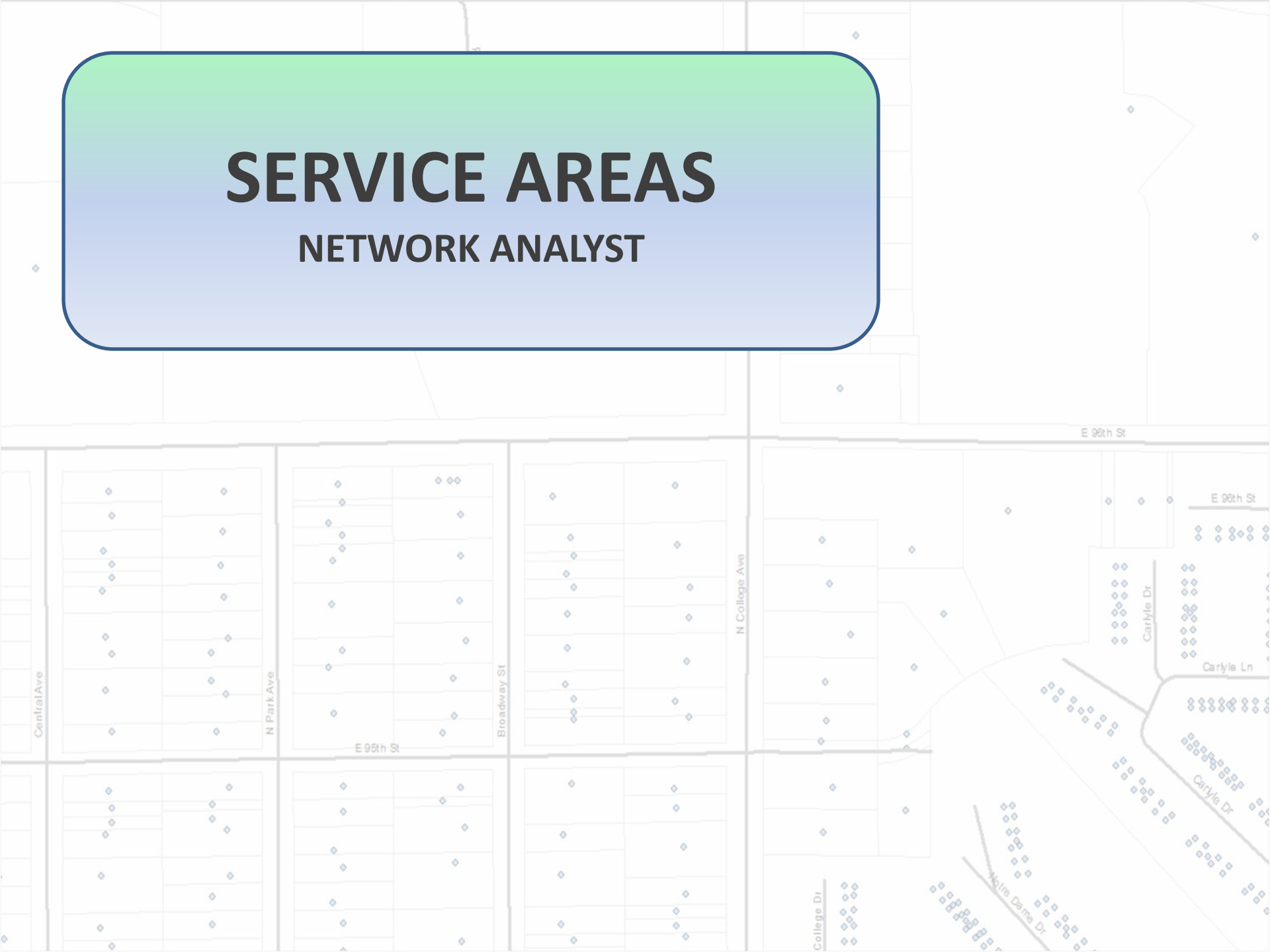
Some records may not be matched due to data entry errors !!!

NOTE

QUESTIONS ABOUT GEOCODING?

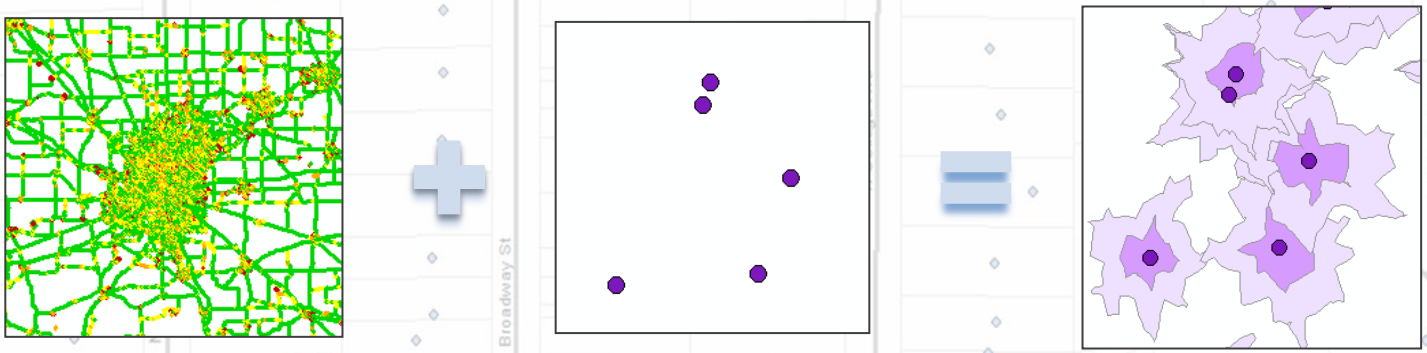
SERVICE AREAS

NETWORK ANALYST



What is a Service Area?

Network Dataset + Facility Locations = Polygon Service Area



Polygon(s) representing the area accessible within a specified distance of a given location on a network.

Service Area Definitions

Network Analyst – ArcGIS Extension that allows user to solve complex routing questions

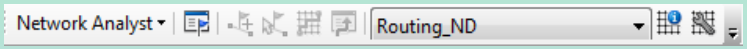
Network Dataset – A dataset which stores the relationships and connectivity between a collection of network elements (edges, junctions, and turns).

Facilities – Point locations that serve as the starting point for routing and service area creation

Service Area Analysis Layer – stores all inputs, parameters and results of analysis

Service Area Example

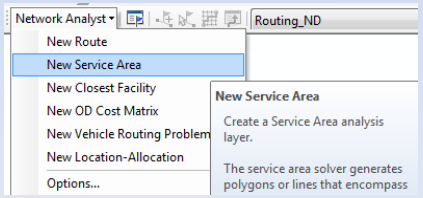
1. Select Network Analyst Extension and add Network Analyst Toolbar

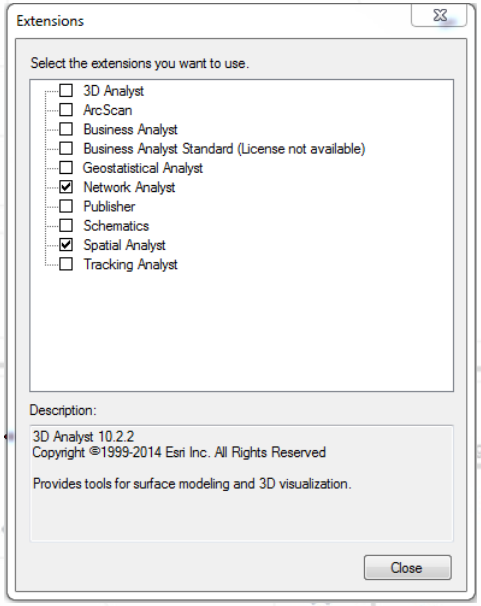


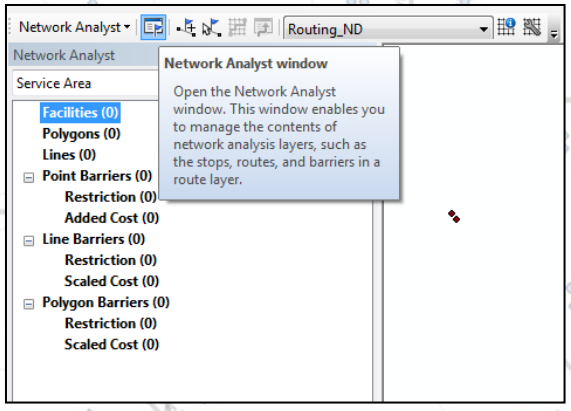
2. Add Network and point dataset to your map

3. Open Network Analysis Window

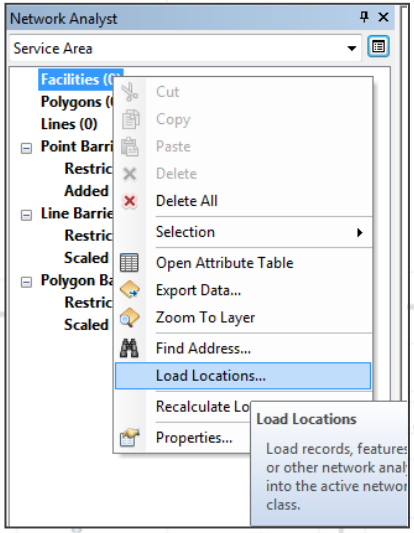
4. Select 'New Service Area' from Network Analyst Toolbar



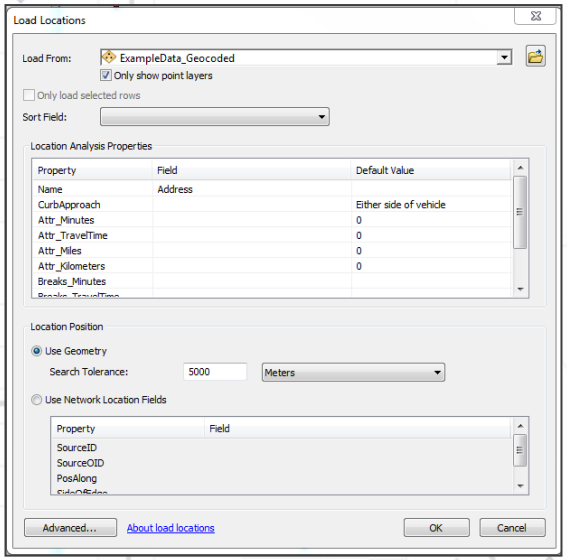


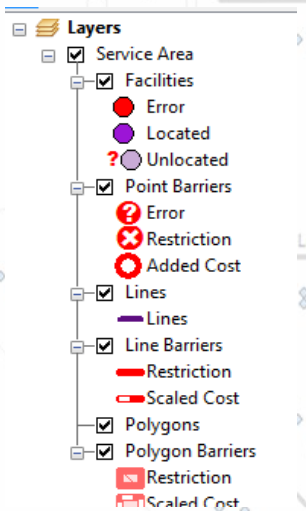


Service Area Example



5. Right-click on Facilities in the Network Analyst Window and choose Load Locations…



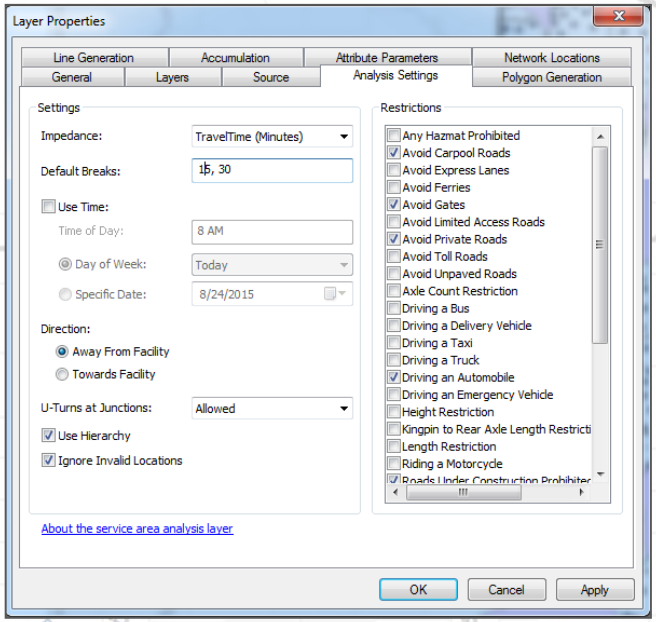


6. Ensure that new facilities have been located within the analysis layer.

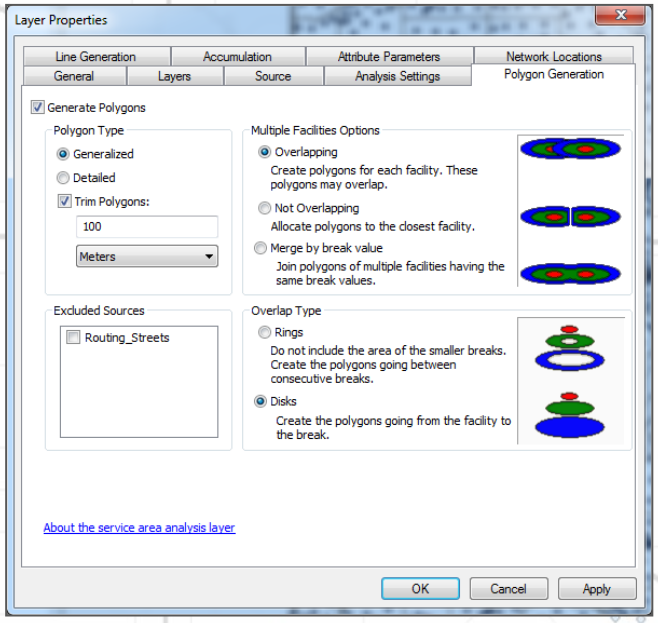
Service Area Example

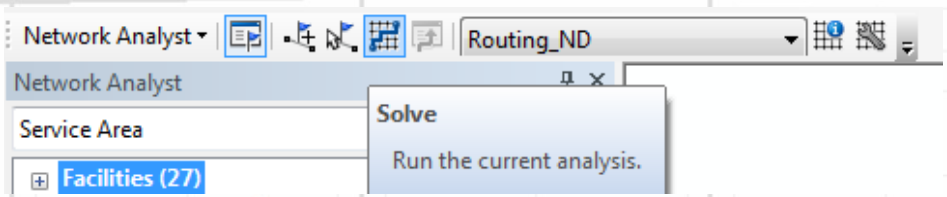
7. Set analysis layer properties

Analysis Settings



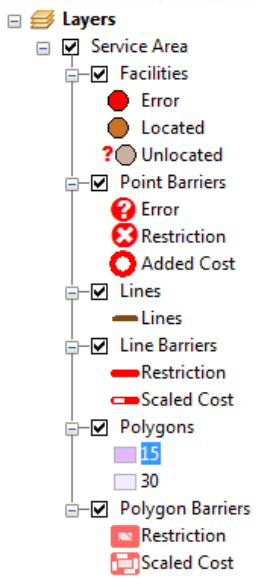
Polygon Generation



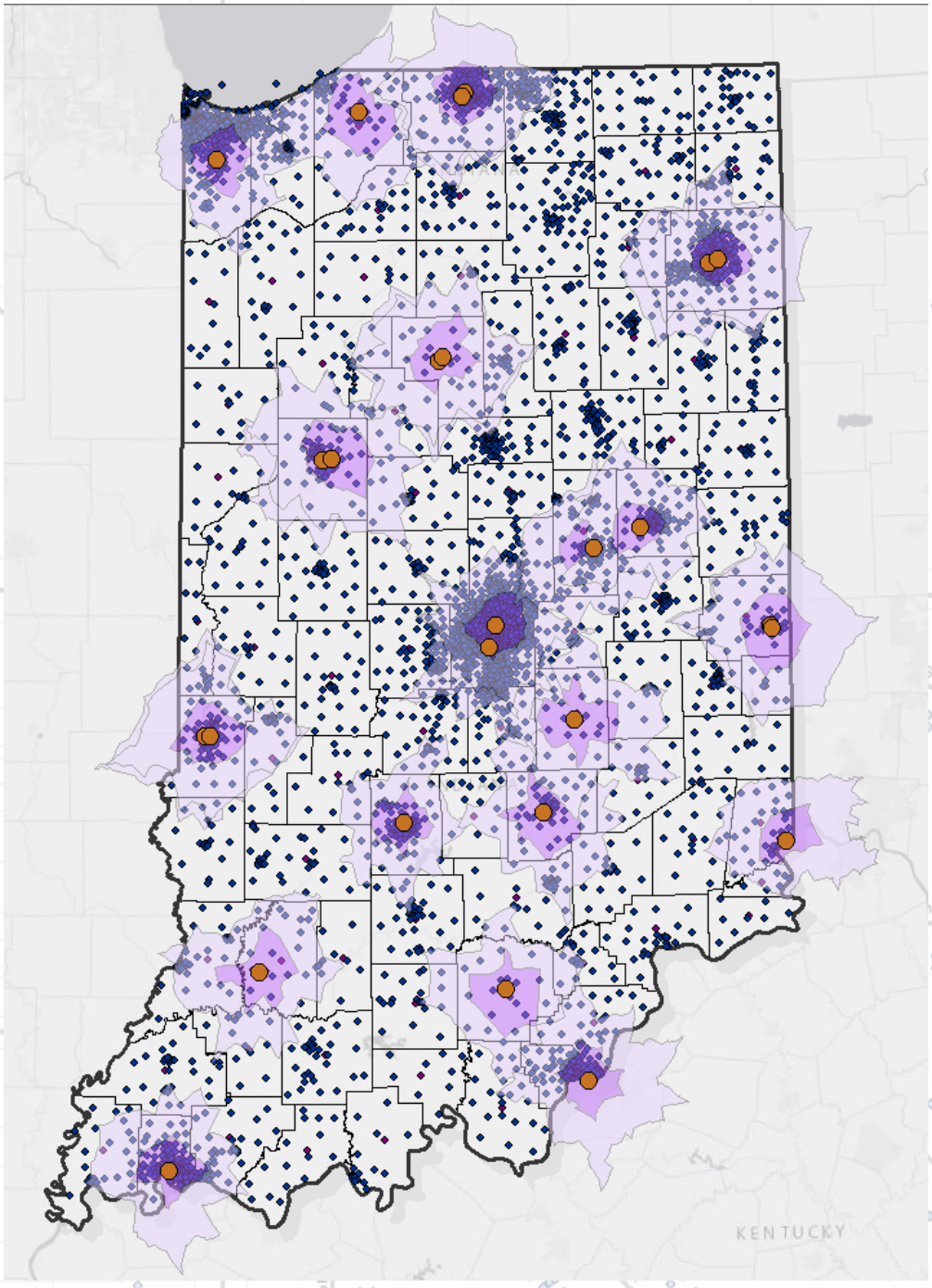


8. Select Solve from the Network Analyst toolbar to create service areas!

Results!



Network Analyst results are stored within the Network Analyst Layer. Results can be made permanent by exporting to a new feature class.



QUESTIONS ABOUT CREATING SERVICE AREAS?

JOINING

Tabular & Spatial

What is a Join?

Tabular Join:

Attributes from the join table are joined to the target features based on a common field.

INPUT

OBJECT ID#	Landuse Code
1	2
2	0
3	1

Join Fields

+

Landuse Code	Landuse Type
0	Unclassified
1	shrub
2	water

OUTPUT

OBJECT ID#	Landuse Code	Join Table Landuse Code	Join Table Landuse Type
1	2	2	water
2	0	0	Unclassified
3	1	1	shrub

Image Source: http://help.arcgis.com/en/arcgisdesktop/10.0/help/

Spatial Join:

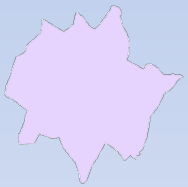
Attributes from the join features are joined based on a spatial relationship with the target feature.

INPUT

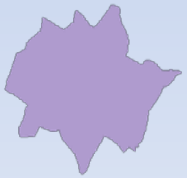
JOIN FEATURE

+

TARGET FEATURE



OUTPUT FEATURE



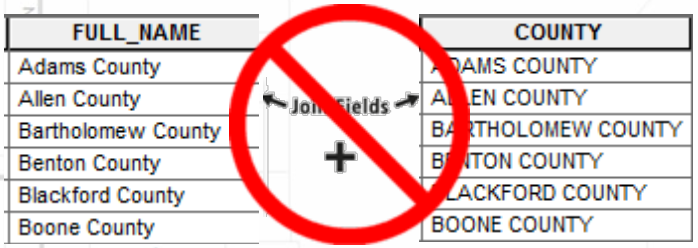
Name	Count_	Sum_POP1	Sum_HU100
215 W High Street :	18	24497	10129
501 E. Court Ave. :	89	115466	51851
1701 Pilgrim Blvd. :	58	73092	32091
1 NW M.L.King Jr. B	152	172806	80435

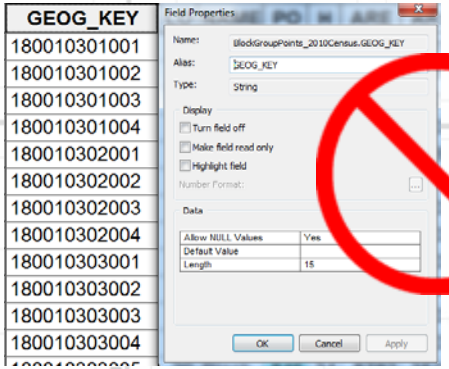
* Output data contains attributes from both input datasets with the geography of the target features

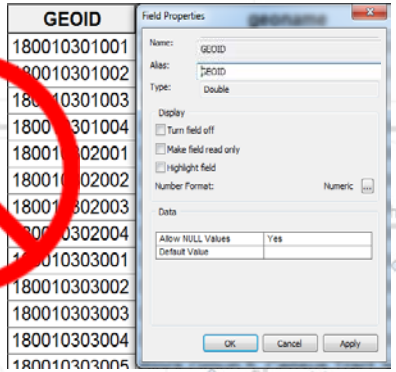
Tabular Joins

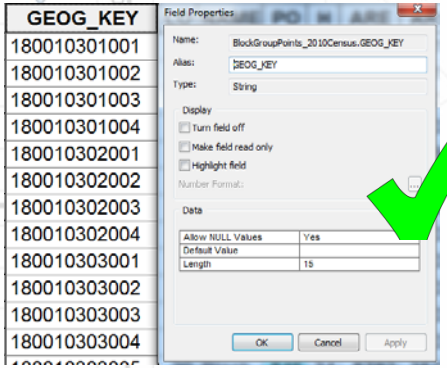
A common field must be found in both the target and join tables

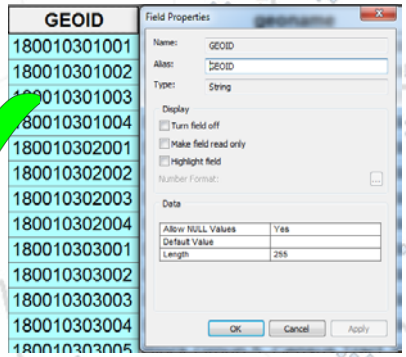
- Joins are case sensitive.
- Join fields must be of the same data type.
- Input values should be unique. If values are not unique only the first instance will be joined to the target dataset.











tip!

.TXT, .CSV, .DBF, .XLSX, .MDB Files can be viewed and joined to other tables in ArcMap

Tabular Join Example

Joining Income Data to Block Group Points

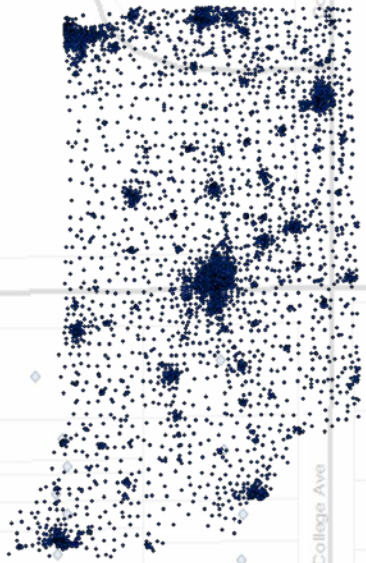
Table - BlockGroupPoints_2010Census

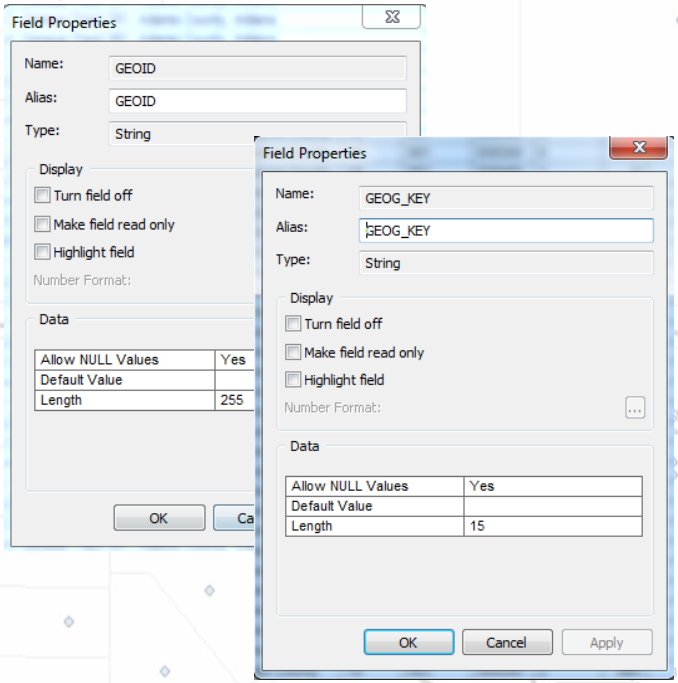
BlockGroupPoints_2010Census

GEOG_KEY	LOGRECNO	NAME
180010301004	2029	Block Group 4
180010302001	2031	Block Group 1
180010302002	2032	Block Group 2
180010302003	2033	Block Group 3
180010302004	2034	Block Group 4
180010303001	2036	Block Group 1
180010303002	2037	Block Group 2
180010303003	2038	Block Group 3
180010303004	2039	Block Group 4
180010303005	2040	Block Group 5
180010303006	2041	Block Group 6
180010304001	2043	Block Group 1
180010304002	2044	Block Group 2
180010304003	2045	Block Group 3
180010305001	2047	Block Group 1
180010305002	2048	Block Group 2
180010305003	2049	Block Group 3
180010305004	2050	Block Group 4
180010306001	2052	Block Group 1
180010306002	2053	Block Group 2
180010306003	2054	Block Group 3
180010306004	2055	Block Group 4
180010307001	2057	Block Group 1
180010307002	2058	Block Group 2
180010307003	2059	Block Group 3
180010307004	2060	Block Group 4
180010307005	2061	Block Group 5

ACS5yr_LowModINCOME$

GEOID	
180010301001	Block Group 1, Census Tract 30
180010301002	Block Group 2, Census Tract 30
180010301003	Block Group 3, Census Tract 30
180010301004	Block Group 4, Census Tract 30
180010302001	Block Group 1, Census Tract 30
180010302002	Block Group 2, Census Tract 30
180010302003	Block Group 3, Census Tract 30
180010302004	Block Group 4, Census Tract 30
180010303001	Block Group 1, Census Tract 30
180010303002	Block Group 2, Census Tract 30
180010303003	Block Group 3, Census Tract 30
180010303004	Block Group 4, Census Tract 30
180010303005	Block Group 5, Census Tract 30
180010303006	Block Group 6, Census Tract 30
180010304001	Block Group 1, Census Tract 30
180010304002	Block Group 2, Census Tract 30
180010304003	Block Group 3, Census Tract 30
180010305001	Block Group 1, Census Tract 30
180010305002	Block Group 2, Census Tract 30
180010305003	Block Group 3, Census Tract 30
180010305004	Block Group 4, Census Tract 30
180010306001	Block Group 1, Census Tract 30
180010306002	Block Group 2, Census Tract 30
180010306003	Block Group 3, Census Tract 30
180010306004	Block Group 4, Census Tract 30
180010307001	Block Group 1, Census Tract 30
180010307002	Block Group 2, Census Tract 30





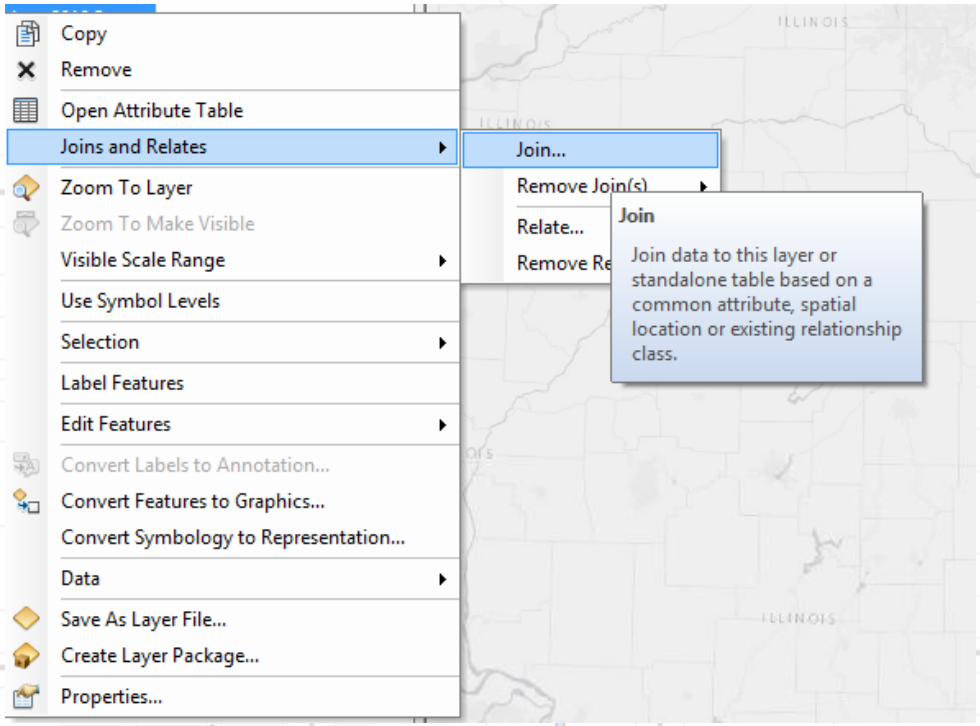
Example Data:

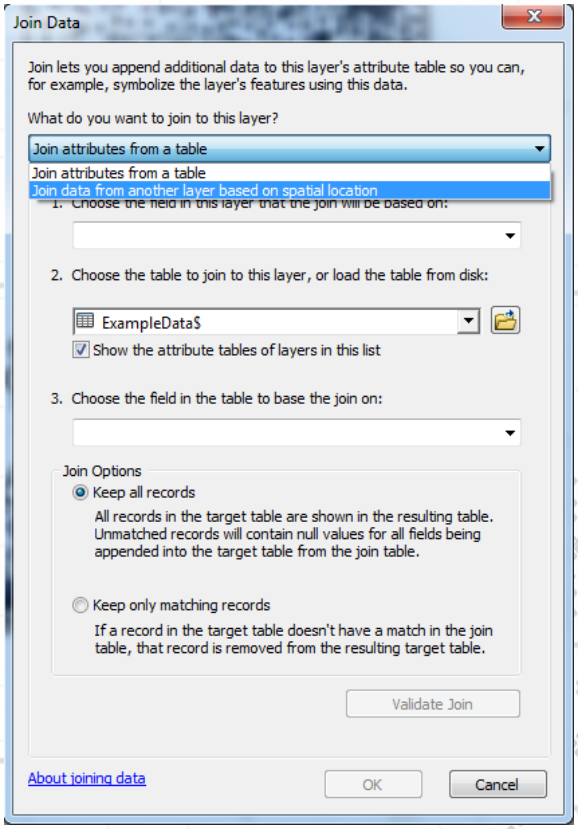
1. Target Features: 2010 Census Block Group points
2. Join Table: American Community Survey 5-yr (2006 – 2010) Low and Moderate Income Summary Data

Tabular Join Example

Set up Join Parameters

Begin by right-clicking on the target dataset and selecting ‘Joins and Relates’

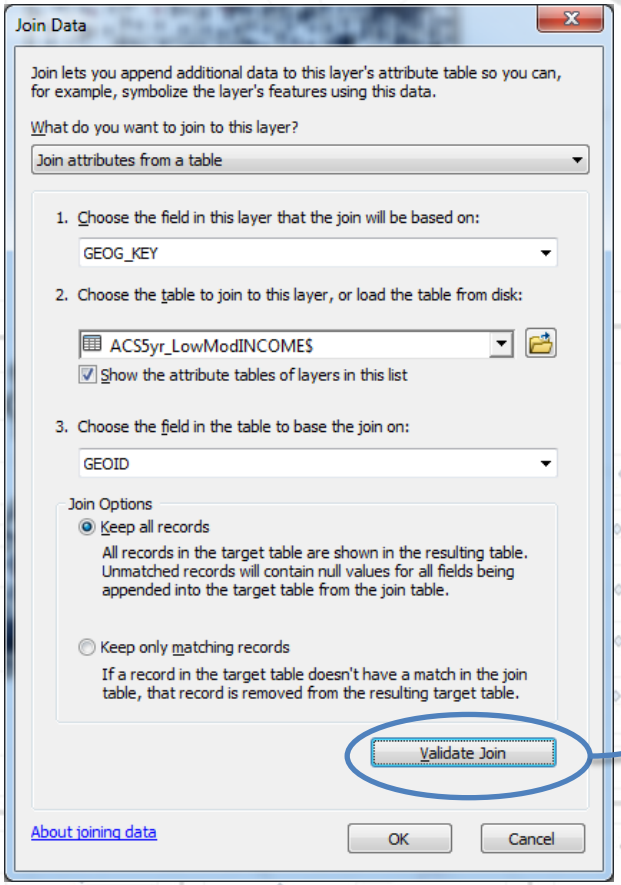


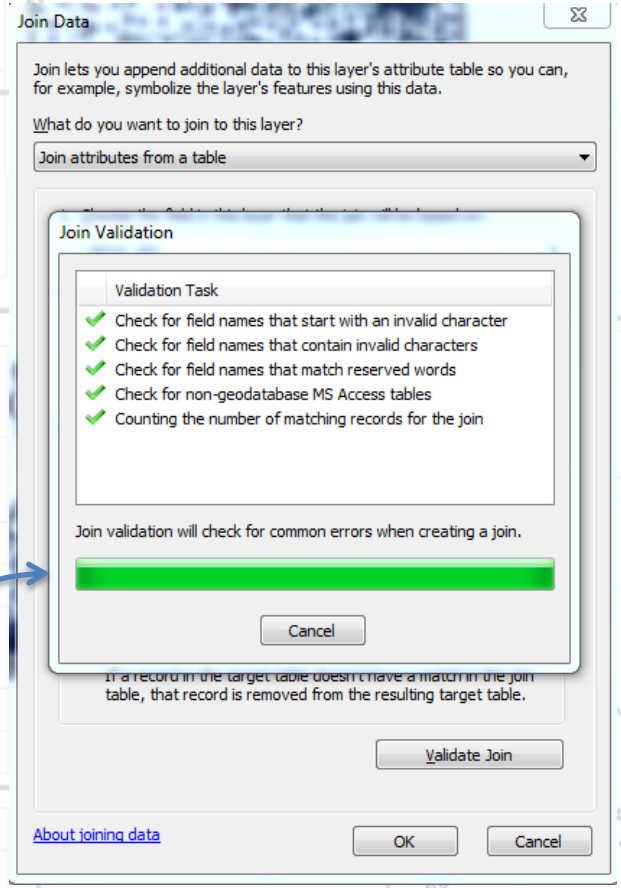


- Join can be 1:1 or Many :1
- Can choose to keep all records or only matching records.

Tabular Join Example

Validate the Join Parameters





Use Table Join Validation to Check for Errors

Tabular Join Example

Joining Income Data to Block Group Points

Joined data appears to the right of the target data table

Table

BlockGroupPoints_2010Census

GEOG_KEY	LOGRE	NAME	POP100	HU100	AREALAND	AREAWA	GEOG	ESRI_OI	GEOID	geoname	stu	countyname	state	county	tract	blkgrp	low	lowmod	LMMI	lowmo	lowmod_pct
180390001002	63725	Block Group 2	940	430	1175439	32821	Point	940	1803900010	Block Group 2, Census Tract 1, Elkhart Cou	IN	Elkhart County	18	039	000100	2	90	565	755	1105	0.5113
180530001001	80552	Block Group 1	1961	1013	2082832	0	Point	1179	1805300010	Block Group 1, Census Tract 1, Grant Count	IN	Grant County	18	053	000100	1	585	1040	1215	2170	0.4793
180530001002	80553	Block Group 2	1328	623	583614	0	Point	1180	1805300010	Block Group 2, Census Tract 1, Grant Count	IN	Grant County	18	053	000100	2	500	805	1195	1445	0.5571
180530001003	80554	Block Group 3	775	384	550720	0	Point	1181	1805300010	Block Group 3, Census Tract 1, Grant Count	IN	Grant County	18	053	000100	3	40	195	315	535	0.3645
181050001001	188782	Block Group 1	1769	719	386632	0	Point	3254	1810500010	Block Group 1, Census Tract 1, Monroe Cou	IN	Monroe Count	18	105	000100	1	860	860	880	940	0.9149
181050001002	188783	Block Group 2	2098	1009	544257	0	Point	3271	1810500010	Block Group 2, Census Tract 1, Monroe Cou	IN	Monroe Count	18	105	000100	2	1880	2005	2050	2075	0.9663
181050001003	188784	Block Group 3	1267	687	318267	0	Point	3272	1810500010	Block Group 3, Census Tract 1, Monroe Cou	IN	Monroe Count	18	105	000100	3	590	660	740	790	0.8354
181410001001	237471	Block Group 1	751	277	1122735	0	Point	3801	1814100010	Block Group 1, Census Tract 1, St. Joseph	IN	St. Joseph Co	18	141	000100	1	380	460	470	490	0.9388
181410001002	237472	Block Group 2	688	313	495990	0	Point	3802	1814100010	Block Group 2, Census Tract 1, St. Joseph	IN	St. Joseph Co	18	141	000100	2	315	555	805	925	0.6
181410001003	237473	Block Group 3	637	260	647491	0	Point	3803	1814100010	Block Group 3, Census Tract 1, St. Joseph	IN	St. Joseph Co	18	141	000100	3	175	275	440	690	0.3986
181570001001	255670	Block Group 1	1197	536	535729	0	Point	4178	1815700010	Block Group 1, Census Tract 1, Tippecanoe	IN	Tippecanoe C	18	157	000100	1	355	730	1075	1235	0.5911
181570001002	255671	Block Group 2	1639	649	3119449	177162	Point	4179	1815700010	Block Group 2, Census Tract 1, Tippecanoe	IN	Tippecanoe C	18	157	000100	2	525	730	900	1000	0.73
181630001001	262160	Block Group 1	647	417	1228007	13412	Point	4321	1816300010	Block Group 1, Census Tract 1, Vanderburg	IN	Vanderburgh	18	163	000100	1	295	390	415	435	0.8966
181630001002	262161	Block Group 2	610	316	1050583	24108	Point	4322	1816300010	Block Group 2, Census Tract 1, Vanderburg	IN	Vanderburgh	18	163	000100	2	110	250	290	515	0.4854
181630001003	262162	Block Group 3	671	337	321918	0	Point	4323	1816300010	Block Group 3, Census Tract 1, Vanderburg	IN	Vanderburgh	18	163	000100	3	365	575	710	845	0.6805
180390002001	63727	Block Group 1	1547	568	12836299	341523	Point	941	1803900020	Block Group 1, Census Tract 2, Elkhart Cou	IN	Elkhart County	18	039	000200	1	220	465	700	1530	0.3039
180390002002	63728	Block Group 2	1129	431	1685692	0	Point	942	1803900020	Block Group 2, Census Tract 2, Elkhart Cou	IN	Elkhart County	18	039	000200	2	120	350	695	945	0.3704
180390002003	63729	Block Group 3	3522	1174	4576469	85872	Point	943	1803900020	Block Group 3, Census Tract 2, Elkhart Cou	IN	Elkhart County	18	039	000200	3	1315	2060	2560	3640	0.5659
180390002004	63730	Block Group 4	1259	348	556015	0	Point	944	1803900020	Block Group 4, Census Tract 2, Elkhart Cou	IN	Elkhart County	18	039	000200	4	355	505	545	590	0.8559
180530002001	80556	Block Group 1	723	399	733998	0	Point	1182	1805300020	Block Group 1, Census Tract 2, Grant Count	IN	Grant County	18	053	000200	1	410	505	535	755	0.6689
180530002002	80557	Block Group 2	619	271	737433	0	Point	1183	1805300020	Block Group 2, Census Tract 2, Grant Count	IN	Grant County	18	053	000200	2	365	510	730	730	0.6986
180530002003	80558	Block Group 3	1212	539	1063498	0	Point	1184	1805300020	Block Group 3, Census Tract 2, Grant Count	IN	Grant County	18	053	000200	3	370	885	1145	1410	0.6277
180530002004	80559	Block Group 4	1371	644	1257775	0	Point	1185	1805300020	Block Group 4, Census Tract 2, Grant Count	IN	Grant County	18	053	000200	4	595	870	995	1280	0.6797
180670002001	104715	Block Group 1	1642	819	1638363	0	Point	1538	1806700020	Block Group 1, Census Tract 2, Howard Co	IN	Howard Coun	18	067	000200	1	500	1145	1605	1820	0.6291
180670002002	104716	Block Group 2	602	402	683263	0	Point	1539	1806700020	Block Group 2, Census Tract 2, Howard Co	IN	Howard Coun	18	067	000200	2	325	350	425	470	0.7447
180670002003	104717	Block Group 3	1321	747	1483885	0	Point	1540	1806700020	Block Group 3, Census Tract 2, Howard Co	IN	Howard Coun	18	067	000200	3	530	955	1070	1390	0.6871
181410002001	237475	Block Group 1	902	399	555800	0	Point	3804	1814100020	Block Group 1, Census Tract 2, St. Joseph	IN	St. Joseph Co	18	141	000200	1	400	575	635	970	0.5928
181410002002	237476	Block Group 2	861	366	338012	0	Point	3805	1814100020	Block Group 2, Census Tract 2, St. Joseph	IN	St. Joseph Co	18	141	000200	2	125	345	460	650	0.5308
181410002003	237477	Block Group 3	858	391	368005	0	Point	3806	1814100020	Block Group 3, Census Tract 2, St. Joseph	IN	St. Joseph Co	18	141	000200	3	510	1020	1055	1085	0.9401
181410002004	237478	Block Group 4	805	304	1520726	0	Point	3807	1814100020	Block Group 4, Census Tract 2, St. Joseph	IN	St. Joseph Co	18	141	000200	4	245	465	665	775	0.6
181570002001	255673	Block Group 1	888	374	385324	0	Point	4180	1815700020	Block Group 1, Census Tract 2, Tippecanoe	IN	Tippecanoe C	18	157	000200	1	345	500	635	860	0.5814
181570002002	255674	Block Group 2	1037	463	439649	0	Point	4181	1815700020	Block Group 2, Census Tract 2, Tippecanoe	IN	Tippecanoe C	18	157	000200	2	280	425	585	885	0.4802

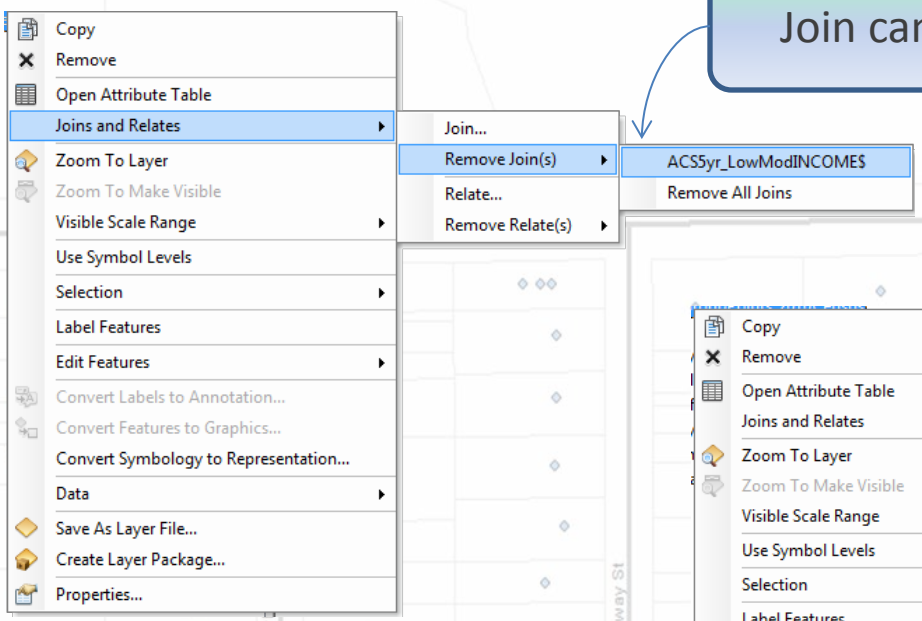
18 (0 out of 4814 Selected)

BlockGroupPoints_2010Census

Tabular Join Example

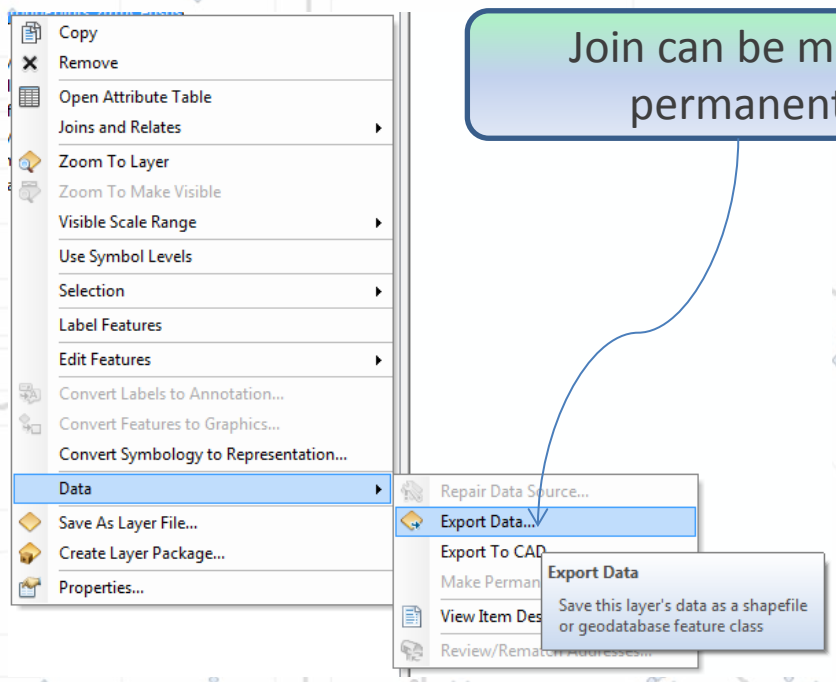
Remove or Make Permanent

Join can be removed



OR

Join can be made permanent



Spatial Joins

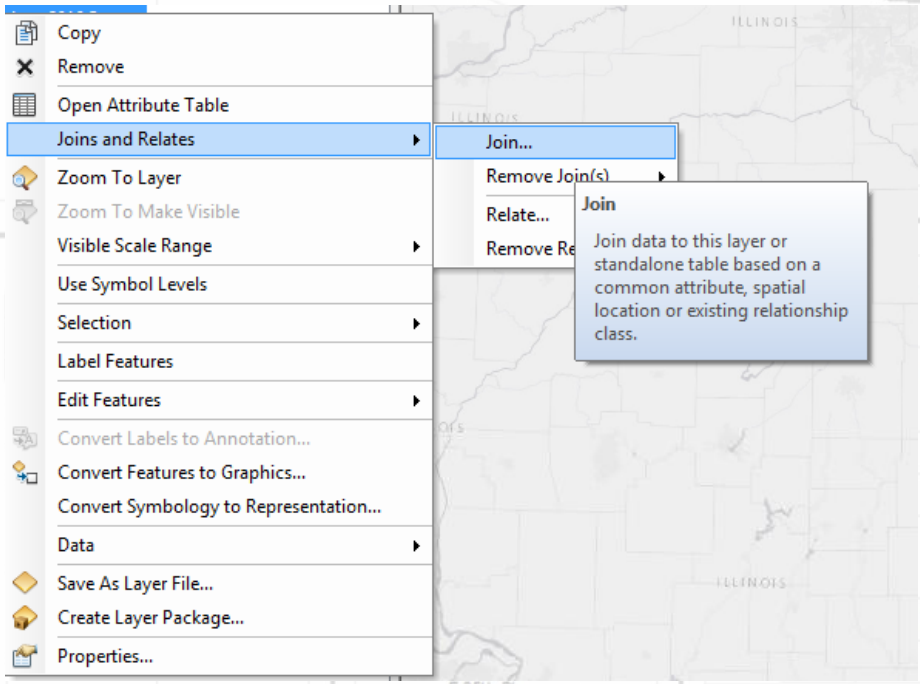
- Target and Join Features should have the same coordinate system
- Output is written to a new feature class containing:
  - Geometry of target feature class
  - Attributes of both target and join features
- Join can be made between different geometry types

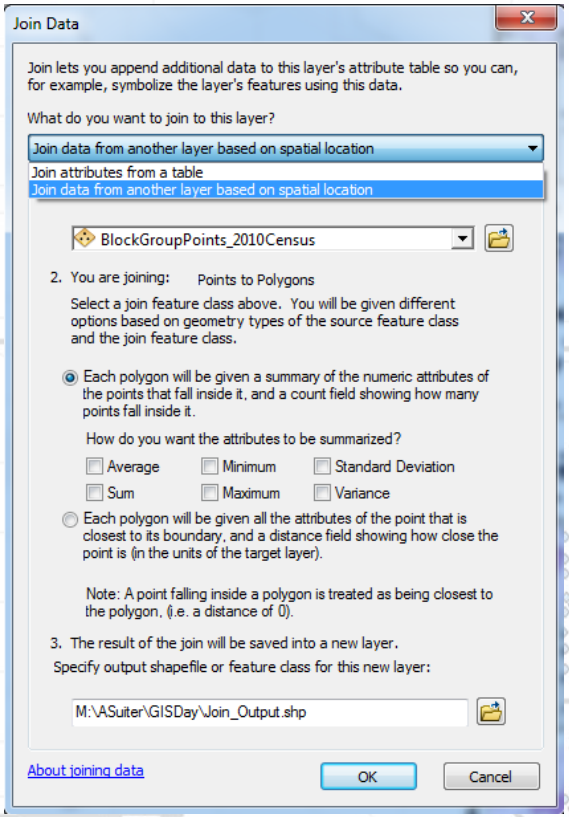
Image Source: http://help.arcgis.com/en/arcgisdesktop/10.0/help/

Spatial Join Example

Joining Block Group Points to Service Areas

Begin by right-clicking on the target dataset and selecting 'Joins and Relates'



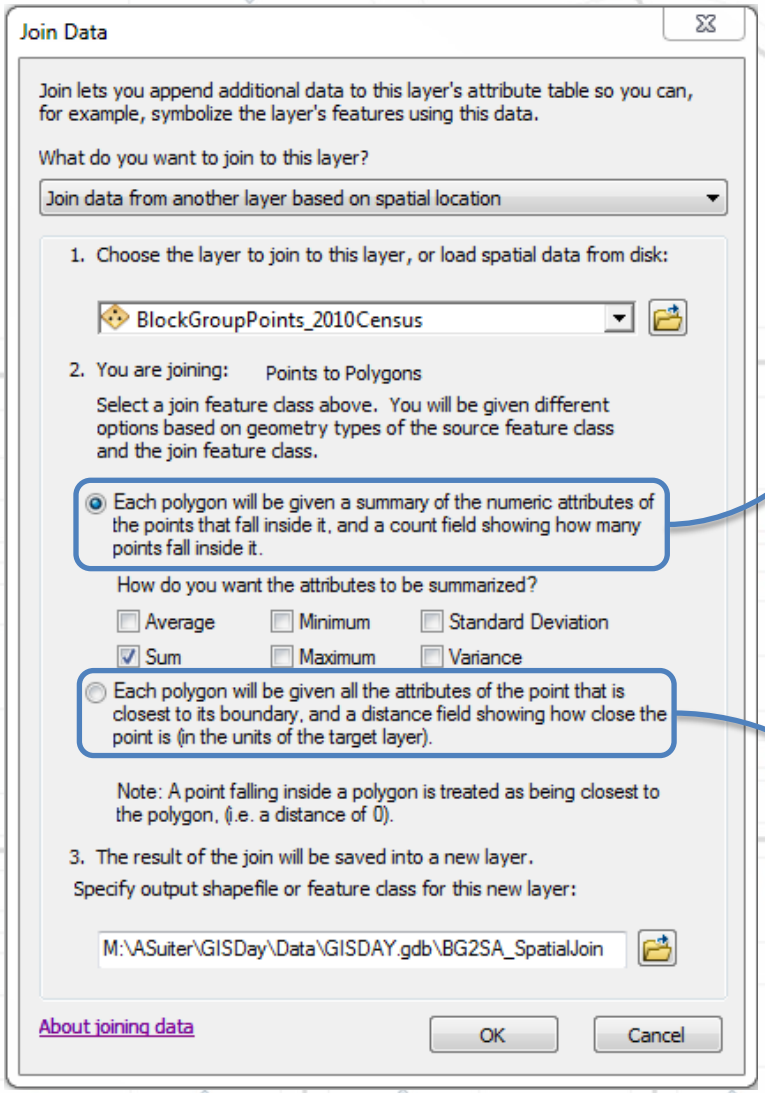


Example Data:

1. Target Features: 15 and 30 min. Service Areas for Geocoded Addresses
2. Join Table: 2010 Census Block Group Points with table join

Spatial Join Example

Set up Join Parameters



Summarize numeric attributes of join feature to target feature based on spatial location

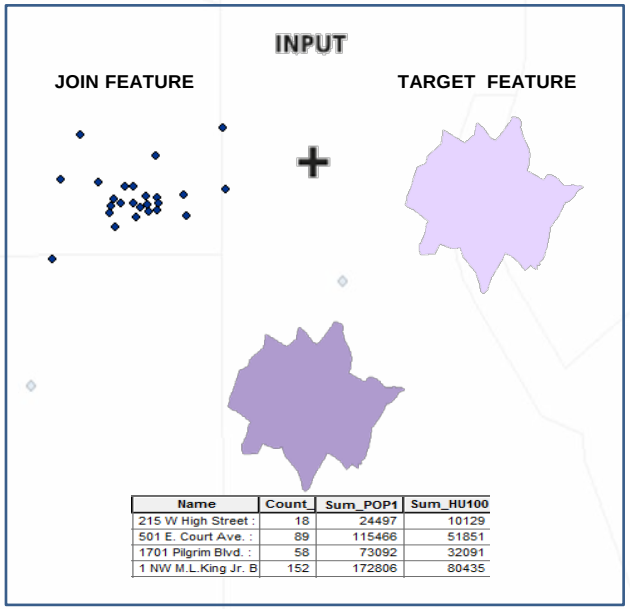
OR

Assign attributes of join feature to target feature based on spatial location.

** Attribute assignment varies based on join and target feature geometry

Spatial Join Example

View Results



Name	Count_	Sum_POP1	Sum_HU100
215 W High Street :	18	24497	10129
501 E. Court Ave. :	89	115466	51851
1701 Pilgrim Blvd. :	58	73092	32091
1 NW M.L.King Jr. B	152	172806	80435

Joined data appears to the right of the target data table along with a count of the number of features summarized

Table

SpatialJoin_Output

OBJECTID_1 *	OBJECTID	Shape *	FacilityID	Name	FromBreak	ToBreak	Count_	Sum_LOGRECNO	Sum_POP100	Sum_HU100	Sum_AREALAND	Sum_AREAWATR	Shape_Length	Shape_Area
1	1	Polygon	8	301 Main Street : 0 - 30	0	30	126	28536139	198266	81731	2832937577	14281437	2.995086	0.284029
2	2	Polygon	8	301 Main Street : 0 - 15	0	15	87	22248651	151149	62695	369294395	3694331	1.029935	0.053068
3	3	Polygon	10	301 E. Main Street : 0 - 30	0	30	62	16813163	79099	35624	1684598039	17223899	2.638052	0.273685
4	4	Polygon	10	301 E. Main Street : 0 - 15	0	15	33	9360782	50430	23502	337210203	3037329	0.941904	0.054327
5	5	Polygon	2	2900 W 93rd Ave : 0 - 30	0	30	362	57111176	548610	227106	1661521745	27741548	2.660935	0.198185
6	6	Polygon	2	2900 W 93rd Ave : 0 - 15	0	15	81	11977053	148560	60905	331331623	2059970	0.893845	0.041074
7	7	Polygon	27	520 South 9th St. : 0 - 30	0	30	63	17045269	80218	36070	1782081358	17558326	2.703667	0.276949
8	8	Polygon	27	520 South 9th St. : 0 - 15	0	15	33	9360782	50430	23502	337210203	3037329	0.964686	0.056626
9	9	Polygon	15	1 NW M.L.King Jr. Blvd : 0 - 30	0	30	214	54994297	252028	112667	1531037457	20066917	2.639137	0.236988
10	10	Polygon	15	1 NW M.L.King Jr. Blvd : 0 - 15	0	15	152	39944010	172806	80435	305916114	4202877	0.934188	0.040149
11	11	Polygon	11	201 E. Walnut : 0 - 30	0	30	75	7914104	72905	30802	2040850980	27685517	2.746109	0.251745
12	12	Polygon	11	201 E. Walnut : 0 - 15	0	15	18	751884	18764	7941	376506557	3874817	1.149846	0.04892
13	13	Polygon	16	33 S. 3rd Street : 0 - 30	0	30	131	30878920	141742	61261	1971688466	28623954	2.830152	0.280619
14	14	Polygon	16	33 S. 3rd Street : 0 - 15	0	15	80	21696894	92310	39318	469696651	9503163	1.254256	0.056052
15	15	Polygon	25	1718 Wabash Ave. : 0 - 30	0	30	128	29759292	139362	60139	1726538337	26300255	2.60882	0.236938
16	16	Polygon	25	1718 Wabash Ave. : 0 - 15	0	15	77	20883214	84879	36294	323820982	6298639	0.941832	0.046232
17	17	Polygon	18	806 Martinsburg Rd : 0 - 30	0	30	51	10269703	72214	30440	2501073233	15356809	2.452147	0.239007
18	18	Polygon	18	806 Martinsburg Rd : 0 - 15	0	15	13	3646736	16330	7047	438230089	2177066	1.050867	0.056422
19	19	Polygon	12	501 E. Court Ave. : 0 - 30	0	30	130	6719883	182103	78763	1048466888	8866453	3.365536	0.257271
20	20	Polygon	12	501 E. Court Ave. : 0 - 15	0	15	89	4149881	115466	51851	203088749	2681431	1.06111	0.04063
21	21	Polygon	13	120 W. 7th Street : 0 - 30	0	30	118	21894637	167201	71683	1455820195	28170687	2.570412	0.176158
22	22	Polygon	13	120 W. 7th Street : 0 - 15	0	15	79	14917997	117298	49415	332114963	550952	0.937674	0.03555
23	23	Polygon	14	234 Washington Street : 0 - 30	0	30	113	7377889	153996	65724	2463669946	14591964	2.906006	0.256894
24	24	Polygon	14	234 Washington Street : 0 - 15	0	15	50	1017619	65347	28548	520952810	5209245	1.12128	0.056836
25	25	Polygon	5	407 S. Harrison Street : 0 - 30	0	30	201	33198388	311645	132686	2635640875	6117540	3.04004	0.28386
26	26	Polygon	5	407 S. Harrison Street : 0 - 15	0	15	26	6076886	32210	13962	628260680	2731585	1.388683	0.062988
27	27	Polygon	17	215 W High Street : 0 - 30	0	30	40	2757406	56956	23220	901605896	9322190	2.666643	0.209129
28	28	Polygon	17	215 W High Street : 0 - 15	0	15	18	798375	24497	10129	144145665	4126127	0.8213	0.03522
29	29	Polygon	22	660 North 36th St. : 0 - 30	0	30	136	28375728	207498	85189	2645180265	12216795	2.941619	0.282026
30	30	Polygon	22	660 North 36th St. : 0 - 15	0	15	88	22504521	153457	63310	526389070	3710704	0.993705	0.055924
31	31	Polygon	4	251 E. Ohio Street : 0 - 30	0	30	806	131808127	1293047	572509	2364278326	27039882	3.633131	0.253966

1 (0 out of 52 Selected)

SpatialJoin_Output

QUESTIONS ABOUT JOINING?