

GIS & 911: From Your Phone to the St George Communications Center



Location matters

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Overview

- **911 & Next-Generation 911 (NG911)**
 - **Background**
 - **St George Communications Center**
 - **Computer-Aided Dispatch (CAD)**
 - **Old and New**
 - **GIS Data & Quirks**
 - **Recent Data Updates**
 - **Final Thoughts**



Old 911 System (E911)

- Analog system reliant on data tables to route 911 calls to appropriate Public Safety Answering Point (PSAP)
 - Master Street Address Guide (MSAG) - streets
 - Maintained by PSAPs
 - Automatic Location Identification (ALI) - addresses
 - Maintained by telecom
- Landline/VOIP calls linked to static addresses with pre-determined PSAP
- Wireless calls routed based on cell tower sector, then lat/lon information (typical accuracy within ~30-500 m)

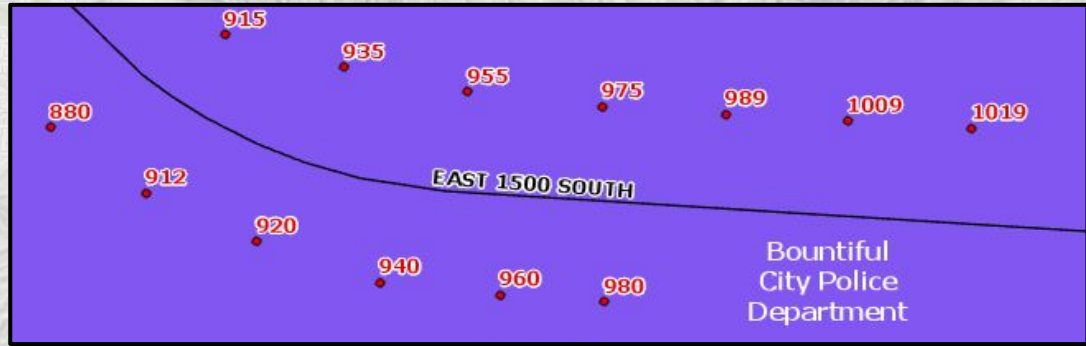


MSAG Table

	A	B	C	D	E	F	G	H	I	J	K	L
1	DIR	STREET	LOW	HIGH	COMM	ST	O_E	ESN	DATE MODIFIED	EXCHANGE	ENTITY	MSAG
37	E	500 SOUTH	1	600	NEPHI	UT	B	430	4/29/1996		29	JUABUT
38	E	570 SOUTH	400	600	NEPHI	UT	B	430	4/29/1996		29	JUABUT
39	E	600 NORTH	1	900	NEPHI	UT	B	430	4/29/1996		29	JUABUT
40	E	600 SOUTH	1	300	NEPHI	UT	B	430	4/29/1996		29	JUABUT
41	E	635 SOUTH	498	498	NEPHI	UT	B	430	4/29/1996		29	JUABUT
42	E	700 NORTH	1	950	NEPHI	UT	B	430	4/29/1996		29	JUABUT

New Next Generation 911 (NG911)

- **Calls will be routed to PSAPs based on GIS data depending on caller location**
 - PSAP boundaries
 - Road centerlines (RCL)
 - Address points (AP)
- **Dynamic routing possible by changing PSAP boundaries during emergencies, downtime, or high call volume**
- **Internet Protocol (IP)-based communications system with upgraded call handling equipment**
 - Enables additional data streams (text, photos, video, health sensors, IoT, etc.)



St George Communications Center

- **24/7/365 services for Washington County**
- **Located at the St George Police Department**
- **Public Safety Answering Point and Dispatch Center**
 - Answer public 911 calls
 - Dispatch police, fire, emergency medical services



Computer-Aided Dispatch (CAD)

- Used to aid dispatchers in quickly and effectively sending the correct responding units to an emergency
- The Old: table-driven systems - Spillman Classic
 - Like MSAG, each street assigned left/right attributes/response zones
 - Tables built from GIS data, but doesn't explicitly use GIS in the CAD software
 - EVERYTHING needs an address that perfectly matches a RCL (name, address range, city code)
 - Forces the creation of "fake" road segments
 - Can't utilize unit address points...only base addresses
 - Richfield CC, Uintah Basin CC, Beaver SO, Millard SO
- Slow data update process (and prone to human error)
 - Make data edits
 - Assign attributes from polygons
 - Rebuild alias table
 - Export data to text files

Old CAD - Spillman Classic

- Electric Theater - 68 E Tabernacle St, St George

#gbstreet	stsegid	citycd	oddzip	evenzip	begx	begy	begnumb	endx	endy	endnumb	name	side	locatn	prefix
2459	IVI	84738	84738	-113675422	37160982	176	-113674765	37160988	199	E	400 S			
2460	STG	84770	84770	-113583319	37108187	1	-113581201	37108196	99	E	TABERNACLE ST			
2461	STG	84770	84770	-113583319	37108187	1	-113583305	37109901	99	N	MAIN ST			
2462	STG	84770	84770	-113583332	37104805	1	-113581213	37104799	99	E	200 S			

Street
Table

#gbaddr	prefix	number	numbsuf	street	citycd	dirnum	stnumb	x	y	cross	display	locatn
17077	W	1020 N		STG		1778	-113621737	37126089				
17078	E	240 S		STG		2379	-113532887	37104779				
17079	S	RIVER RD		STG		2719	-113544458	37061914				
17080	E	EVERGREEN DR		STG		1620	-113549108	37060559				
17081	E	TABERNACLE ST		STG		68	-113581936	37107874				
17082	N	RIDGECREST CIR		STG		571	-113602556	37118115				

Address
Table

#gbsaka	stalias	stname	citycd	begnumb	endnumb	prefix
17083	N	55 W CIR	STG	426	-11358	
17084	N	660 W	STG	46	-113596087	
17085	W	HAMPTON RD	STG	881	-113	
		HEALTH AND PERF CNTR	STG	652	652	
		HPC CENTER	STG	652	652	
		ELECTRIC THEATER	STG	68	68	
		CRISIS CENTER	HUR	330	330	
		EAGLE RANCH ACADEMY	STG	115	115	
		DRUG COURT	STG	300	300	

Alias
Table



Old CAD - Spillman Classic

- 65 E Tabernacle St, St George, UT

```
#gbstreet|stsegid|citycd|oddzip|evenzip|begx|begy|begnumb|endx|endy|endnumb|name|side|locatn|prefix
2459|IVI|84738|84738|-113675422|37160982|176|-113674765|37160988|199|E 400 S||
2460|STG|84770|84770|-113583319|37108187|1|-113581201|37108196|99|E TABERNACLE ST|||
2461|STG|84770|84770|-113583319|37108187|1|-113583305|37109901|99|N MAIN ST|||
2462|STG|84770|84770|-113583332|#gbzone|stsegid|seq|layer|oddzone|evnzone|||
```

```
#gbaddr|prefix|number|numbsuf
|7077||W 1020 N|STG||1778|-11
|7078||E 240 S|STG||2379|-113
|7079||S RIVER RD|STG||2719|-
|7080||E EVERGREEN DR|STG||16
|7081||E TABERNACLE ST|STG||6
|7082||N RIDGECREST CIR|STG||
|7083||N 55 W CIR|STG||426|-1
|7084||N 660 W|STG||46|-11359
|7085||W HAMPTON RD|STG||881|
```

```
2458|3|FZ|HF1N|HF1N
2458|4|FA|HF1N|HF1N
2459|1|LZ|SCIN|SCIN
2459|2|LA|SCIN|SCIN
2459|3|FZ|SCIF|SCIF
2459|4|FA|SCIF|SCIF
2460|1|LZ|P2|P2
2460|2|LA|P2|P2
2460|3|FZ|PF2|PF2
2460|4|FA|PF2|PF2
2460|5|EZ|SG4|SG4
2460|6|EA|SG4|SG4
2461|1|LZ|P1|P2
2461|2|LA|P1|P2
2461|3|FZ|PF2|PF2
```

Zones Table

```
display|locatn
```

```
egnumb|endnumb|prefix
T|STG|200|200|
CENTER DR|STG|652|652|
STG|652|652|
T|STG|68|68|
330|
```

```
EAGLE RANCH ACADEMY|W 1470 S|STG|115|115|
DRUG COURT|W TABERNACLE ST|STG|300|300|
```


New CAD - Spillman Geovalidation

- **The New: GIS-driven systems (ArcGIS Server required)**
 - **Spatial queries to determine which response zones a point falls within**
 - **Can better utilize address points, units, etc.**
 - **Not everything needs an address anymore**
 - **POIs - trailhead, peaks, natural features**
 - **Road Features - mile markers, overpasses**
 - **St George Dispatch implemented Geovalidation in Feb 2022**
 - **Weber Area 911, Central Utah 911, Layton**
 - **VECC on something similar (Versaterm)**
- **Many other agencies are in the queue to upgrade/migrate**
 - **Takes time to migrate data, procure and set up server/hardware, schedule with Spillman, transition, etc.**
- **Simpler data update process (less prone to human error)**
 - **Make data edits**
 - **Send file geodatabase to dispatch center**

New CAD - Spillman Geovalidation

- Electric Theater
- 68 E Tabernacle St, St George



St George Dispatch - The Data

- StGeorgeDispatch_Data.gdb
 - StGeorge_Dispatch_AddressPoints
 - StGeorge_Dispatch_Boundaries_Counties
 - StGeorge_Dispatch_CITYCD
 - StGeorge_Dispatch_Common_Place_Points
 - StGeorge_Dispatch_COMMUNITY
 - StGeorge_Dispatch_EMS_Zones
 - StGeorge_Dispatch_Fire_Zones
 - StGeorge_Dispatch_Law_Zones
 - StGeorge_Dispatch_Mileposts
 - StGeorge_Dispatch_POI
 - StGeorge_Dispatch_Railroads
 - StGeorge_Dispatch_Rivers
 - StGeorge_Dispatch_SGFD_Stations
 - StGeorge_Dispatch_Streets_All
 - StGeorge_Dispatch_Streets_CAD
 - StGeorgeDispatch_Municipalities
 - tbzones

- **City Codes - the address system**
- **Address Points**
- **Road Centerlines**
- **Common Places**
- **POIs - mile markers, exits, overpasses, reservoirs, OHV areas, trailheads**
- **Response Areas**
 - **Law Zones**
 - **Fire Zones**
 - **EMS Zones**
- **Additional Layers**

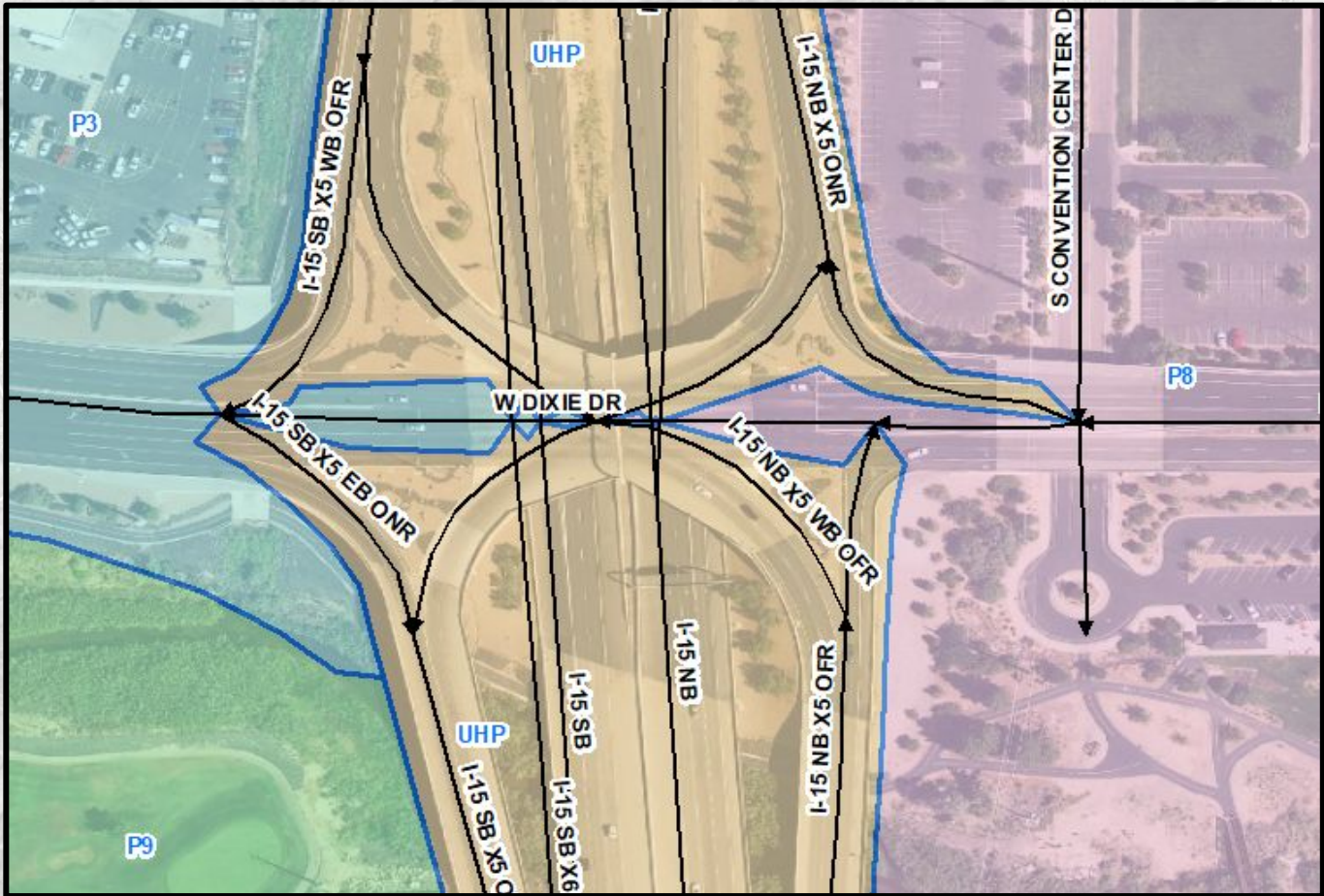
St George Dispatch - Update Process

- Quarterly GIS data updates (big)
 - Check for municipality boundary changes
 - Update associated city code, law, fire boundaries
 - Add new data from statewide database (address points and road centerlines)
 - Aggregated from county data, which is sourced by municipalities
 - Spatial search with new/missing points flagged for review
 - Changes requested by dispatch via email or Google Sheet
- Additional updates, as needed (small)

	A	B	C	D	E	F	G	H	
1	GBSAKA ADDITIONS								
2	STREET NAME	CITYCD	BEG #	END #	ALIAS/STREET ALIAS	Date Added	Added By	Done?	AGRC Comments
3204	E SNOW CANYON PKWY	IVI	1175	1175	CANYON CROSSING GAS STE 101	12/4/2021	CMUSGRAVE	Y	
3205	W CANYON VIEW DR	STG	1871	1871	GRIP FITNESS	11/26/2021	DALLRED	Y	
3206	W CANYON VIEW DR	STG	1871	1871	THE RINQ	11/26/2021	DALLRED	Y	
3207	W CANYON VIEW DR	STG	1871	1871	THE RINK	11/26/2021	DALLRED	Y	
3208	W CANYON VIEW DR	STG	1871	1871	SKATING RINK	11/26/2021	DALLRED	Y	
3209	W CANYON VIEW DR	STG	1871	1871	THE GRIP FITNESS	11/26/2021	DALLRED	Y	
3210	S 900 E	STG	423	423	VINTAGE AT CANYONLANDS	12/10/2021	CMUSGRAVE	Y	
3211	E TABERNACLE ST	STG	852	852	VINTAGE AT TABERNACLE	12/10/2021	CMUSGRAVE	Y	
3212	E MALL DR	STG	2825	2825	PROFESSIONAL PARK PHARMACY 2	1/6/2022	CMUSGRAVE	Y	
3213	W CANYON VIEW DR	STG	1871	1871	THE RINQ	3/28/2022	MHIGLEY	Y	
3214	S AUTO MALL DR	STG	1333	1333	CHICK FIL A	4/16/2022	MHIGLEY	Y	
									Last one of this update (18 May 2022)

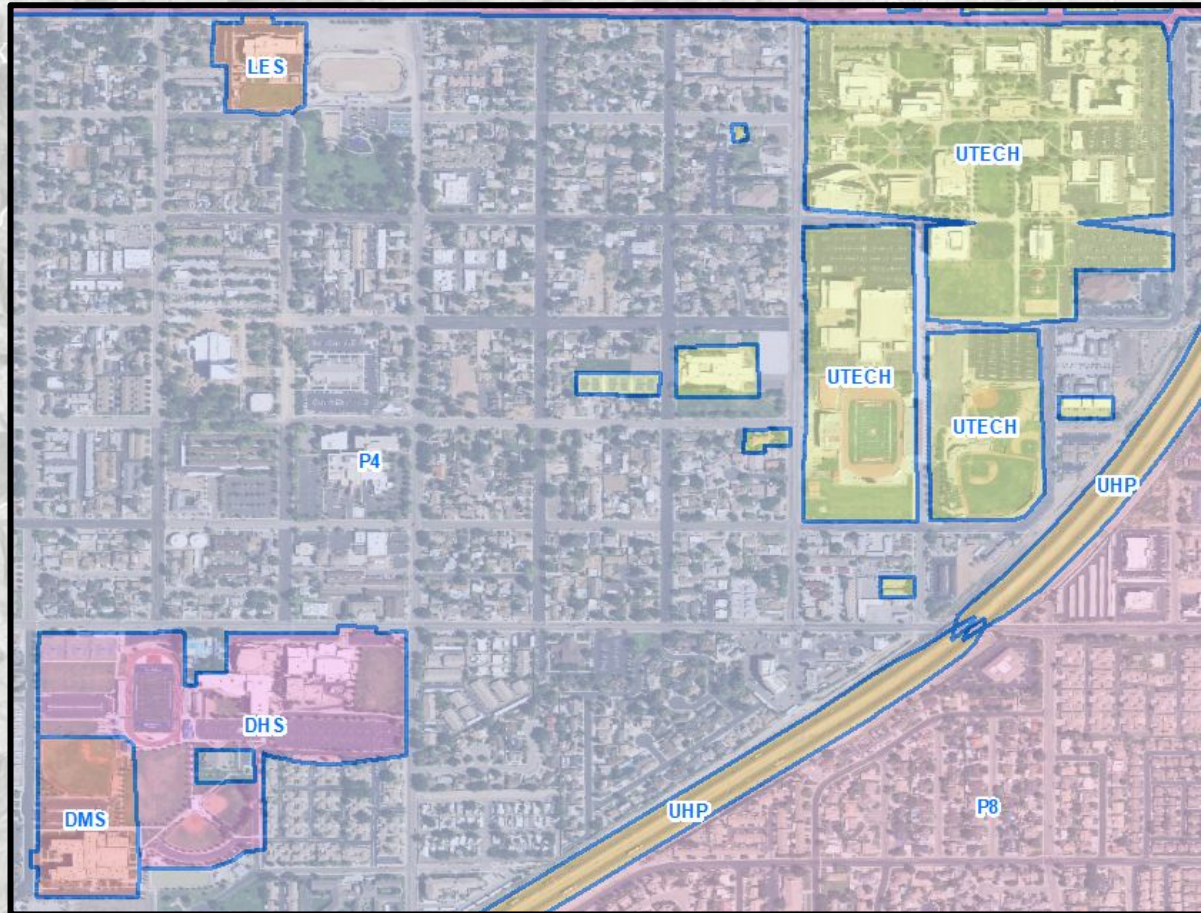
CAD GIS Data Quirks

- **Interstate Law Zones**
 - UHP zones along I-15, exits, on-ramps
 - SGPD zones along surface streets



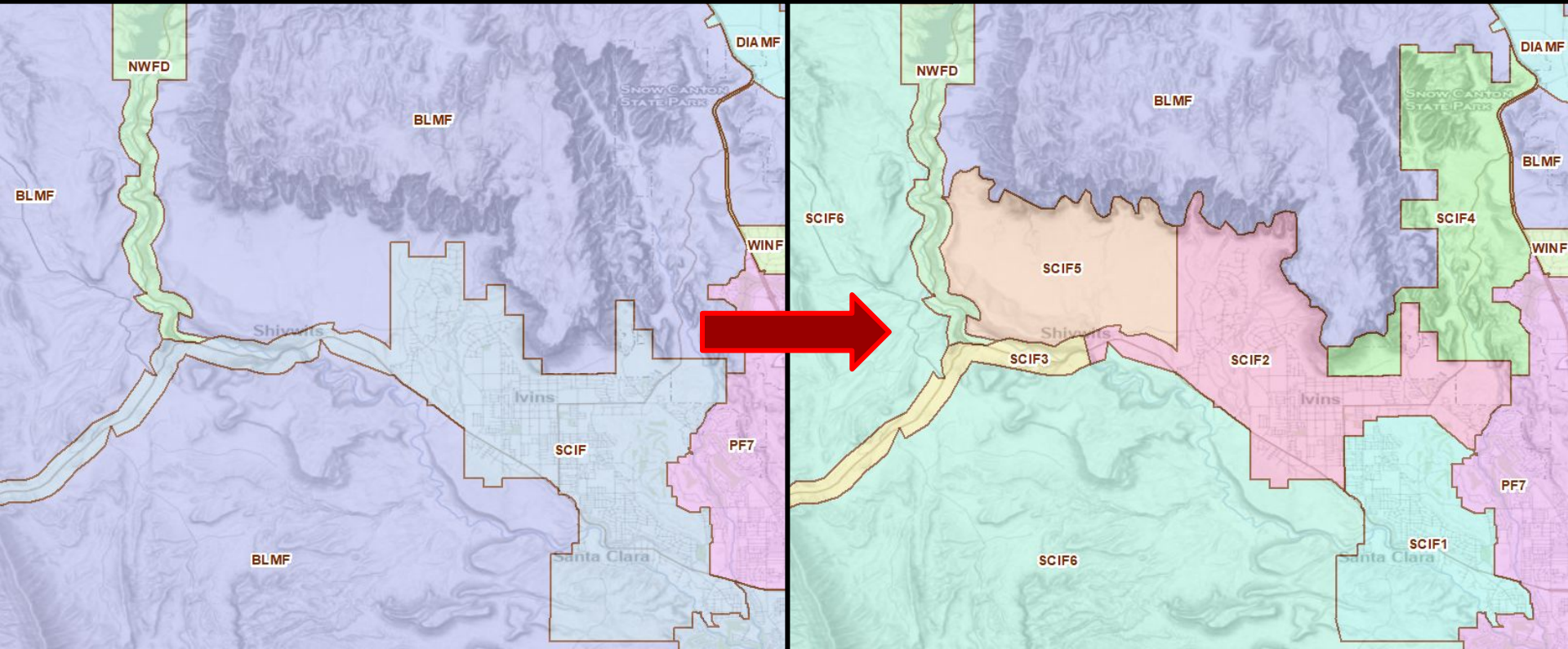
CAD GIS Data Quirks

- Clery Act crime reporting
- College campus and schools separated from standard law zones



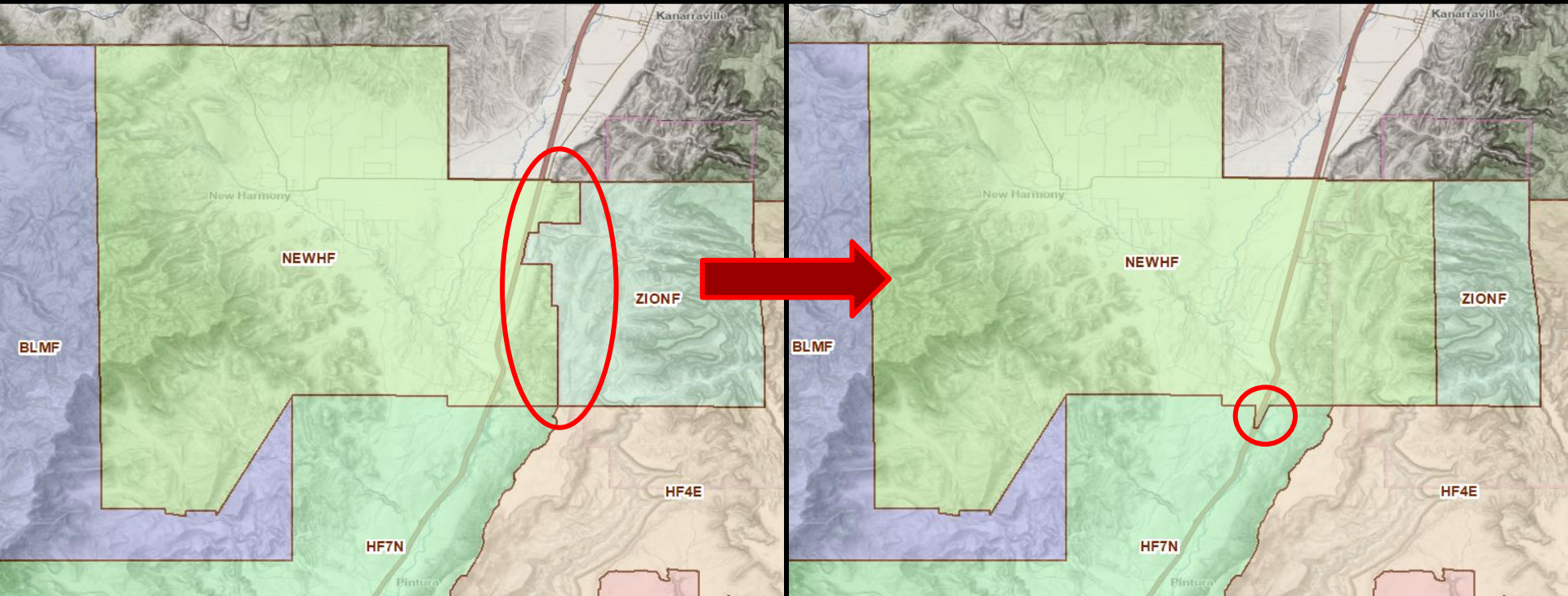
St George Dispatch - Recent Updates

- Santa Clara Fire Zone changes (Aug 2022)



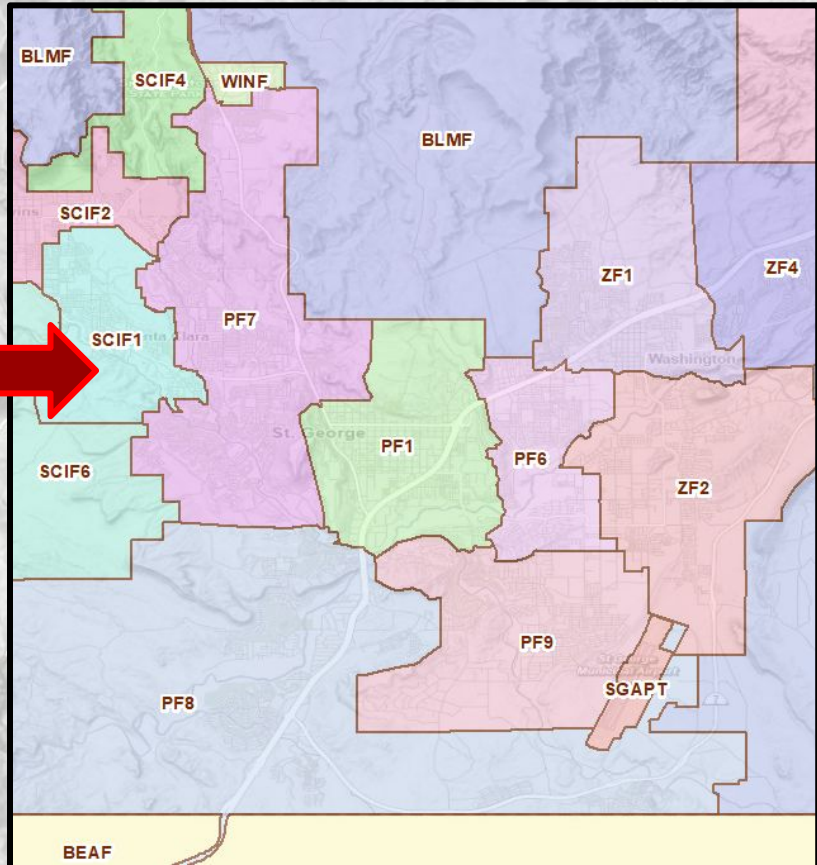
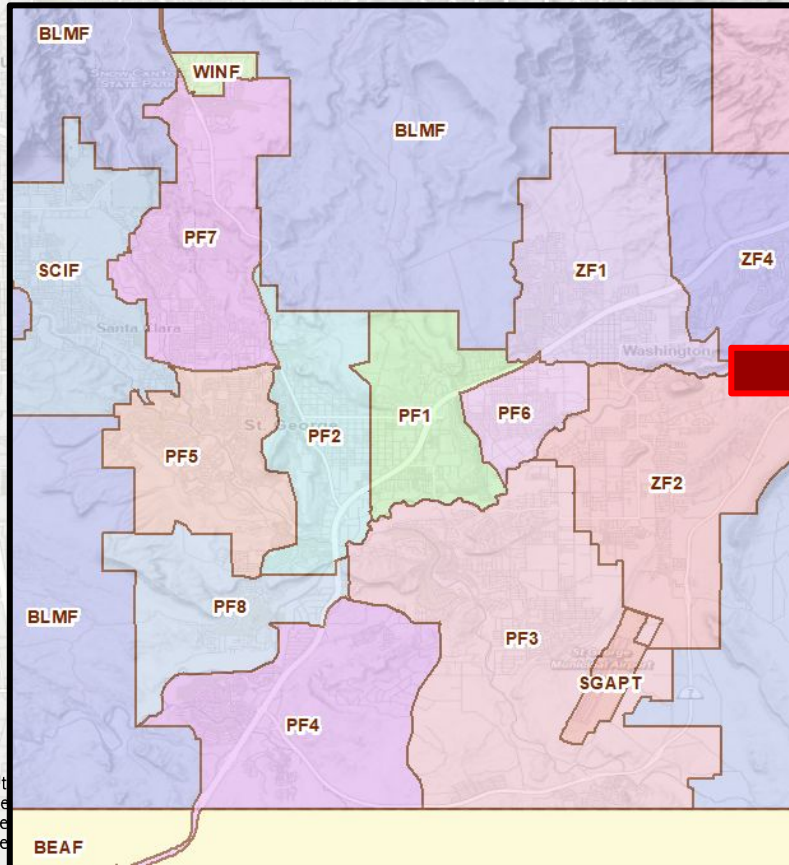
St George Dispatch - Recent Updates

- New Harmony Fire Zone changes (Jul 2022)



St George Dispatch - Recent Updates

- St George Fire Zone changes (Jul 2022)



Utah Geological Survey

St George Dispatch - Recent Updates

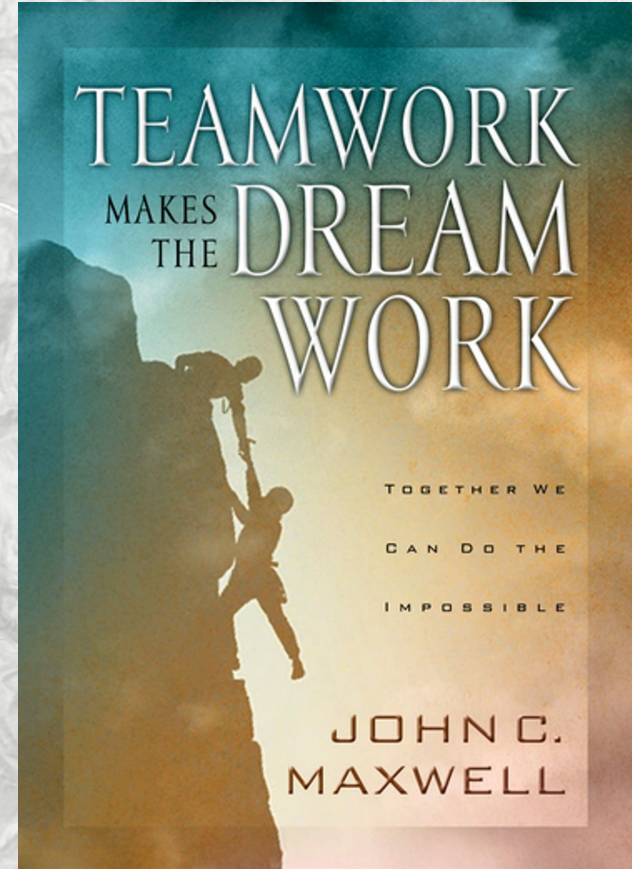
- **Other data updates**
 - Added new Gunlock State Park law zone
 - Washington City fire zone changes
 - Expanded Sprindale PD law zone to cover Rockville town
 - Dixie State University → Utah Tech University
 - EMS zone expansion north of St George
 - Added milepost locations for Southern Pkwy (SR-7) extension
- **Average quarterly data update:**
 - 975 new address points
 - 170 new road segments
 - 15 new common places



St. George is the fastest-growing metro in the US again, Census says

Final Thoughts

- **Over the last several years, GIS has revolutionized 911**
 - Call routing (NG911)
 - Call dispatching (CAD systems)
- **Leveraging GIS for 911 enables faster changes and more accurate data/dispatching**
- **Many data/system improvements have been implemented at the St George 911 Communications Center in the last year**
- **Relationships drive progress**



Questions?



Location matters

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