Elections-Related GIS: design-build exercises in Utah

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Utah's 2001 Redistricting Product
Precinct Assignment, Pre-GIS
Catalysts

Utah County Republican Rep. Craig Frank out; finds out he didn't live in House district after all

By Lee Ryle Roche, Deseret News
Published: Monday, Jan. 10 2011 6:00 p.m. MST

Rep. Craig Frank, R-Cedar Hills (left)
Scott G. Winterton, Deseret News
Enlarge photo

SALT LAKE CITY — Former Rep. Craig Frank, R-Cedar Hills, said he found out Friday he didn’t legally represent District 57 when he was fooling around on a new House website.

Frank said he clicked on a feature that allows users to find out who their state lawmaker is by typing in their address. “I clicked on that for fun, to look for myself,” he said. “To my surprise, my picture didn’t come up.”

Instead, he discovered was that he and his family actually had moved out of District 57 two years ago, making him ineligible to serve and leaving residents of the Cedar Hills area without a representation.
Block Assignment File for
S.B. 3002 19th Substitute
Congressional Boundaries Designation

A block assignment file is an electronic text file that identifies and assigns each of Utah's 115,406 census blocks to a particular district.

A census block is any one of the 115,406 individual geographic areas into which the United States Census Bureau has divided the state of Utah, to each of which the Census Bureau has attached a discrete population tabulation from the 2010 decennial census.

Block Assignment File
Official Text File: [download]
View as Map Boundaries using: RedistrictUtah.com

File Name: SB3002S19_BlockAssignment.txt
Security Code: d7ad401074b340539a41b596a9b04d0

About the security code: The security code associated with the block assignment file is used to assist in confirming that the information in the file remains unchanged throughout its usage.
Adjust Block-Based District Boundaries

• Off of Residences

• To More Accurate County Boundaries
Basic GIS Foundation

Address Locator Web Services
- first point then centerline
- zip or placename

Heads-Up Address QC & Editing

Spatial Query Web Services
- Voter Residence to Precinct (Assignment)
- Precinct to District (QC)

Interactive Maps for Public Information
Embeddable Precinct Map

Clerks place/edit address points within VISTA app

4155 S Cecil
Precinct/SubPrecinct Data Model

In the Utah VISTA database, Precincts and Sub-Precincts are tracked using a unique identifier of up to 10 characters to represent a specific voting unit (wherein all voters in a specified precinct receive the same ballot). Precincts are identified using up to 5 characters; example: 5J001A or 007. Sub Precincts are identified using a 6 character precinct identifier, a ** character, and up to 3 characters for the Sub Precinct identifier; example: 50000332W.

The Utah Governor's office is requesting that counties provide Precinct - Sub Precinct plan boundaries (all precincts in their county are, where applicable, sub precincts) in a digital geographic file format so the boundaries can be represented on map displays to be built into VISTA and other voter information applications. While the standards speak to digital files, paper or other map-based products may be acceptable if they convey the information required.

In order to simplify the integration of county-defined Precinct - Sub Precinct Areas into a statewide dataset, we ask that Precincts and Sub Precinct geographic boundary submissions meet the following requirements:

### Boundary Geometry:
- **GIS Format Data Files:** All new Precinct - Sub Precinct Area data should be provided in a shapefile (please include the .shp, .dbf, .prj, and .shx component files) or flat geodatabase format. An empty shapefile and flat geographic database schema are available for download at:
- **Full, Seamless Coverage:** Ballot Area polygons should seamlessly cover the full geographic extent of the county. The following topological rules should hold valid: 1) must not overlap; and 2) must not have gaps.
- **One Record Per Unique Precinct - Sub Precinct Area:** Each VISTA Precinct or Sub Precinct will have only and only one geographic area record. Where two or more areas have the same VISTA Precinct or Sub Precinct identification number, these should be merged into a single geographic feature and corresponding attribute record. No Precinct level colons should be submitted if that Precinct is subdivided into Sub Precincts.
- **Standard Coordinate System:** Ideally, all submissions will represent Precinct - Sub Precinct Areas using Universal Transverse Mercator coordinates (NAD83, Zone 12 North). However, boundaries stored in other industry standard coordinate systems will be accepted if they are both defined within the data model and documented in the metadata (see below).

### Descriptive Attributes:
- **Database Field/Column Definitions:** The table below indicates the field names and definitions for attributes requested for each Precincts and Sub Precinct record.

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>County ID</td>
<td>Numeric</td>
<td>2</td>
</tr>
<tr>
<td>VoteID</td>
<td>Text</td>
<td>10</td>
</tr>
<tr>
<td>Vote Sub Area ID</td>
<td>Composed of the VISTA Precinct ID and the VISTA Sub Precinct ID. Vote Areas must exactly match one, and only one precinct or sub precinct in the state VISTA database.</td>
<td>B3000:CFD, S001A, S00035W2, 007, 12E</td>
</tr>
<tr>
<td>Precinct ID</td>
<td>Text</td>
<td>5</td>
</tr>
<tr>
<td>SubPrecinct ID</td>
<td>Text</td>
<td>4</td>
</tr>
</tbody>
</table>

Database Field/Column Definitions: The table below indicates the field names and definitions for attributes requested for each Precincts and Sub Precinct record.
Goal: District – Precinct – Municipal Agreement
Why GIS ??

• Visualization
• Automation
• Transparency
• Flexibility
• Precision/Integration (with boundaries!)

Why Not ??

• General Unfamiliarity with GIS Technology
• Unfamiliarity with Existing Data & Services
## Precinct Assignment, Pre-GIS

### Table: Precinct Segments for E 1050 N

<table>
<thead>
<tr>
<th>Prec</th>
<th>Min</th>
<th>Max</th>
<th>Side</th>
<th>Res</th>
<th>Voters</th>
</tr>
</thead>
<tbody>
<tr>
<td>BO05I-S-</td>
<td>100</td>
<td>804</td>
<td>E</td>
<td>31</td>
<td>49</td>
</tr>
<tr>
<td>BO05I-S-</td>
<td>101</td>
<td>373</td>
<td>O</td>
<td>18</td>
<td>37</td>
</tr>
<tr>
<td>BO03I-S-</td>
<td>443</td>
<td>965</td>
<td>O</td>
<td>19</td>
<td>37</td>
</tr>
<tr>
<td>BO04I-S-</td>
<td>826</td>
<td>960</td>
<td>E</td>
<td>6</td>
<td>12</td>
</tr>
<tr>
<td>BO04I-S-</td>
<td>915</td>
<td>1007</td>
<td>O</td>
<td>8</td>
<td>20</td>
</tr>
</tbody>
</table>

### Diagram:

- **Even**
  - BO05I-S-
  - BO03I-S-
  - BO04I-S-

- **Odd**
  - BO05I-S-
  - BO03I-S-
  - BO04I-S-
Address Points & Precincts Mgt