



Streamlining Zip-Plus-4's for Sales Tax with GIS

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Utah Automated Geographic
Reference Center





About AGRC

- AGRC Responsibilities
 - Facilitate effective GIS-related efforts in Utah
 - Provide stewardship, maintenance, and access for Utah's State Geographic Information Database (SGID)
 - Where ever possible, encourage enterprise GIS solutions





AGRC Products & Services

- State Geographic Information Database (SGID)
- GIS Technology Transfer (Training)
- GIS Solution Services
 - GIS database development
 - GIS applications
 - Digital Cartography
 - Spatial Analysis
- Internet Mapping Services (including ArcIMS)



About the Utah State Tax Commission

- Mission: collect revenue for the state and local governments and to equitably administer tax and assigned motor vehicle laws.
- Project Partners
 - Division of Sales Tax
 - Business Need
 - Technology Management Group
 - Internal IT Group
 - Division of Property Tax
 - Municipal Boundaries GIS Data Steward



Streamlined Sales Tax

- SST
 - The **point of delivery** is where a purchaser takes possession of tangible personal property or makes first use of a service, whichever comes first.
 - **The sales tax rate to charge will be determined by the point of delivery.**
 - The purchaser's **nine-digit ZIP code** determines the location of a transaction when goods or services are delivered.
 - If a nine-digit ZIP code is located within two or more jurisdictions, the seller should collect and report tax at the jurisdiction with the lowest rate



Mobile Telecommunications Sourcing Act

- **MTSA**

- Providers of telecommunication services are required to report the locations of where services are delivered on their sales and use tax returns.
- U.S. Code §4-4-120 (Mobile Telecommunications Sourcing Act) and Utah Code §59-12-207 specify that the **nine-digit zip code** of the customer's "place of primary use" shall determine the delivery location for taxing purposes



Problem Statement

- Must know location of 9 digit zipcodes (zip+4) for implementation of SST & MTSA taxes
- Must assign correct taxing jurisdiction for each zip+4



Analysis Resources:

- USPS AIS Zip+4 Product (subscription)
- GIS data
 - 5 Digit Zip Code Polygons
 - Post Office Location Points
 - Address Locator Service
 - Statewide street centerline feature class with address and zone attributes
 - Municipal Taxing Jurisdiction Polygons (cities, counties, transit special sales tax districts)
- ArcGIS ArcView 9.0+ License
 - Model Builder, Python
 - Visual Basic for Applications



What is a Zip+4?

- 9 digit routing code used for sorting mail
- Typical Zip+4 represents 10-15 households (one side of a residential block)
- But, can be PO Box location, General Delivery, Building, Floor, Business, Etc.
- USPS Address Information System (AIS) database stores tabular description of the range of delivery locations for each zip+4
 - Zip+4 Type
 - (If applicable) Street Name, StreetType, PreDir, SuffDir
 - RangeStart, RangeEnd
 - No explicit geography !!
 - 553,000 records for Utah (pop 2.5 million)



How to find a Zip+4?

- PO Box & GD Zip+4's
 - Build Point Feature Class of Postal Office Facilities
 - AIS City State Product
 - Locate: Post Offices, Branches, Community Post Offices
 - Method: Geocode & Manual Placement
 - Join & Assign point location of postal facility using AIS CityStateID as key field (VBA script)
 - Result: One point feature for each PO Box & GD Zip+4
 - Overlay Analysis (Identity) to assign Tax Area IDs from Municipal Tax Area Polygons to Zip+4 Point Features



How to find a Zip+4?

- Street Address Based Zip+4's
 - Method #1
 - Determine those 5 digit zip codes that are completely contained within Municipal Taxing Areas
 - Assign Municipal Tax Area IDs to Zip+4 within each of the contained Zip+4s
 - Don't need to find exact location in this case



How to find a Zip+4?

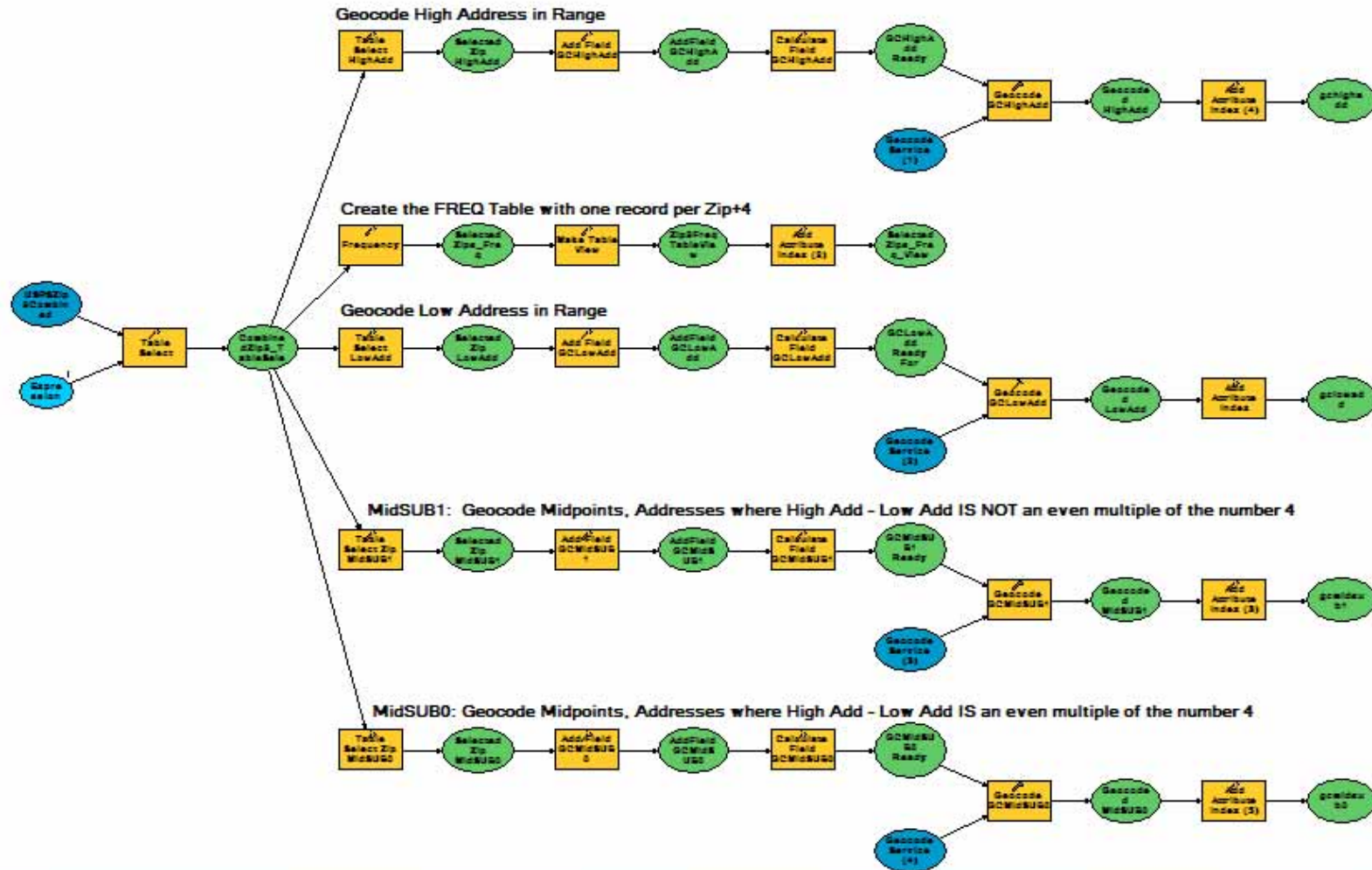
- Street Address Based Zip+4's
 - Method #2
 - For each Zip+4, determine low, middle, and high address in range (ModelBuilder)
 - Geocode low, middle, and high addressed (ModelBuilder)
 - Build a line from valid geocoded points for each zip+4 (VBA)
 - Line represents Zip+4 location
 - Overlay Analysis to assign Tax Area IDs from Municipal Tax Area Polygons to Zip+4 Line Features (VBA)
 - If zip+4 in multiple tax area jurisdictions, Assign to Lowest Rate





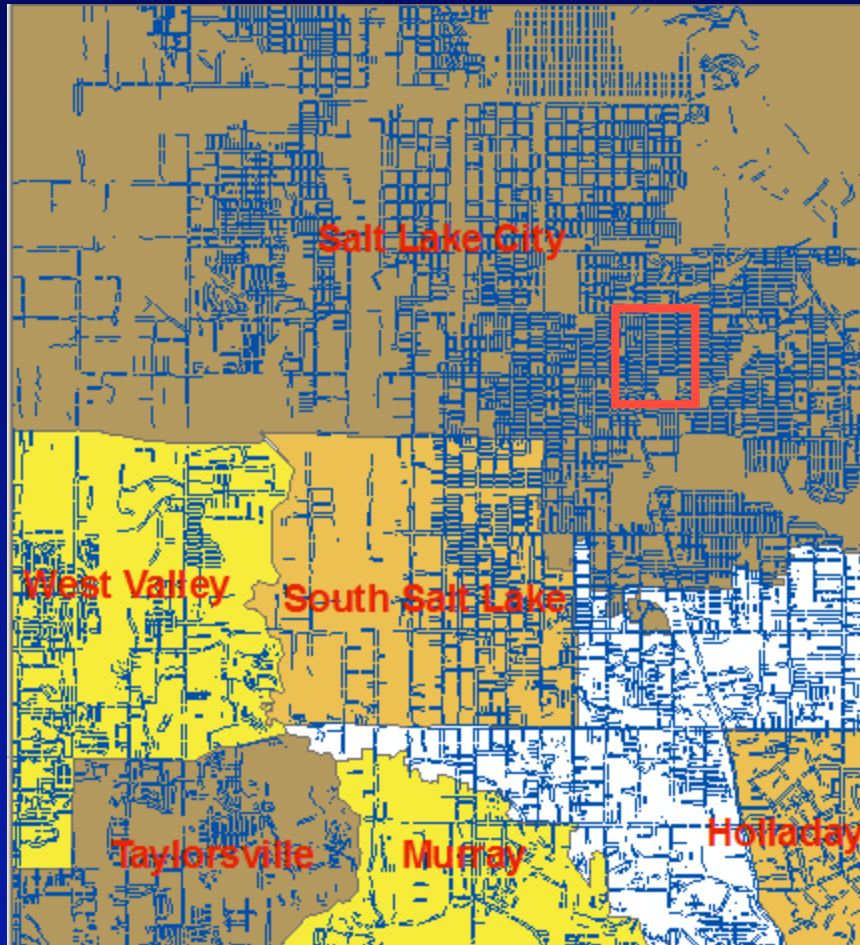
Geocode From, Middle, and To Addresses for each Zip4

Model Preconditions: USPS Zip4 data has been converted into a geodatabase table, address locator serviced defined and utilizing current street data



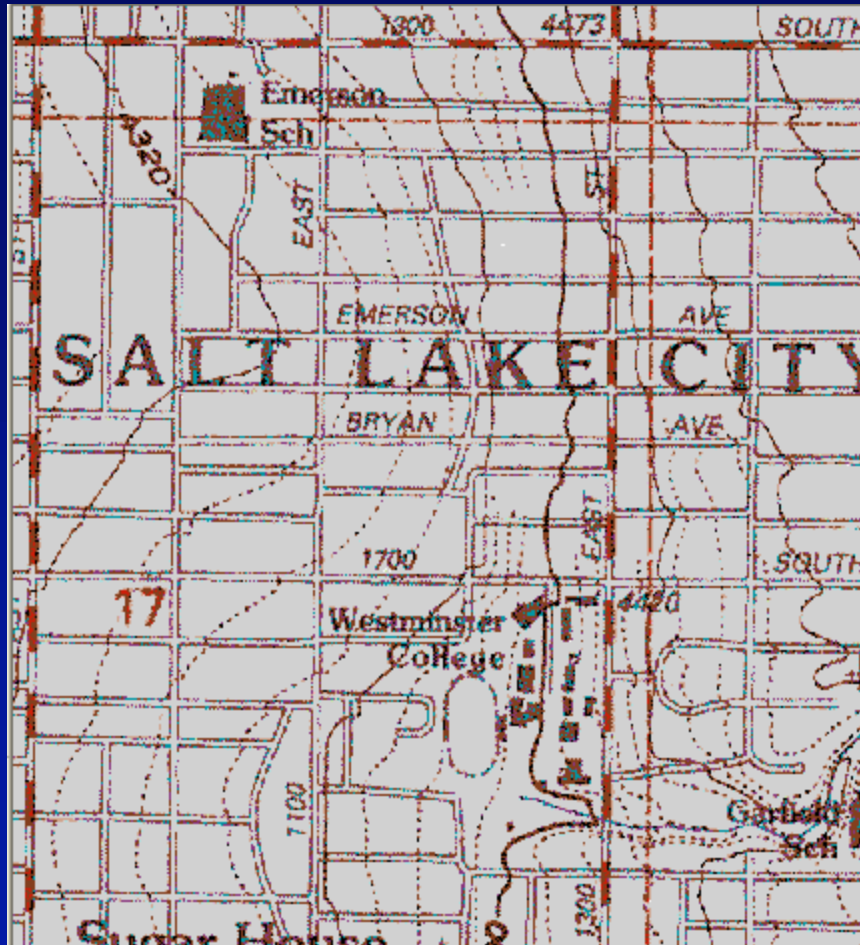
Street Zip+4s Lines

derived from geocoding low, mid, high addresses



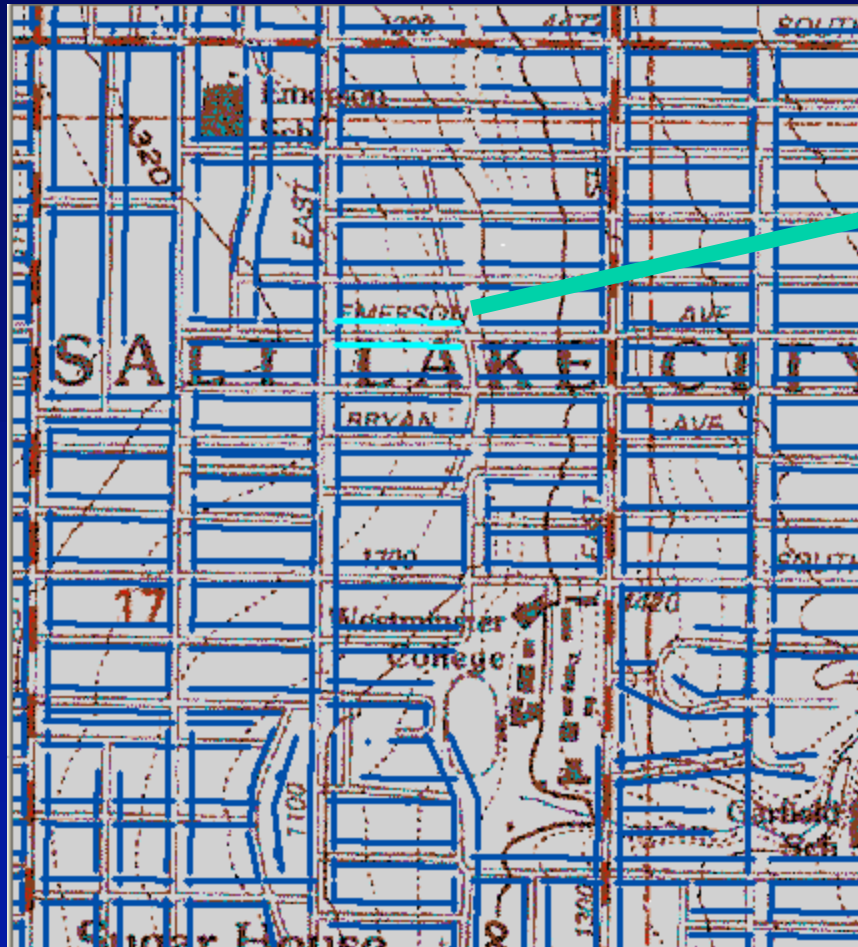
Street Zip+4s Lines

derived from geocoding low, mid, high addresses



Street Zip+4s Lines

derived from geocoding low, mid, high addresses



Identify Results

Layers: <Top-most layer>

Location: (427575.689771 4509912.418293)

Field	Value
OBJECTID	448900
SHAPE	Polyline
Street or Intersection	<null>
Zip9	841052529
Zip5	84105
RecType	S
PreDir	<null>
Name	EMERSON
Type	AVE
SufDir	<null>
LowAdd	1100
HighAdd	1198
EvenOdd	E
PrefKey	Z16259
GCLineLength	209.010558
GCLinePtCount	3
GCRpt	LUM8ZH MIM8ZH H0M82R
SHAPE_Length	209.010558
GCMchPOD	18000
GCMchMTSA	18122



Lowest Rate

- Street Address Based Zip+4's
 - Method #3
 - Assign unmatched zip+4's to county tax area jurisdiction using AIS Zip+4 county attribute
 - Rationale: County governments provide some services to all zip+4s within county
 - Added benefit:
 - Gives cities incentive to provide complete and correct GIS street centerline data
 - » Better data → More revenue



Manual Corrections

- USTC logs reported problems
- Point feature class of corrected zip+4 locations is maintained.
- Overlay Analysis (Identity) to assign Tax Area IDs from Municipal Tax Area Polygons to Manual Correction Point Features
- Manual Corrections takes precedence all other methods



Assignment Method Hierarchy

1. Manual Corrections
2. PO Box & GD Zip+4s
3. Street Address: Zip+4 with parent Zip5 completely contained within Tax Jurisdiction
4. Street Address: Geocode Derived Lines
5. Street Address: Lowest Rate



Final Output

- Each Zip+4 assigned to a taxing jurisdiction
- Product is fixed width text file modeled on the Mobile Telecommunications Sourcing Act Electronic Database Standards
- Includes:
 - zip+4 descriptive info from AIS
 - taxing jurisdiction ID number
 - assignment Method
 - FIPS
 - longitude & latitude
- Simplified Product & Web Services

Address Entered:

9000 S State Street
Sandy UT

USPS Standardized Address:

9000 S STATE ST
SANDY UT 84070-2610

Sales tax rate detail:

Zip+4: 84070-2610
County/City Code: 18000
Tax Rate: 6.60%

Taxable Amount:	N/A
Tax Due:	N/A
Total Due:	N/A



Questions???

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