Vermont Geocoding Service

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VERMONT
VERMONT CENTER FOR GEOGRAPHIC INFORMATION

VT Geocode Service URL: https://maps.vcgi.vermont.gov/arcgis/rest/services/EGC_services/GCS_E911_COMPOSITE_SP_v2/GeocodeServer

What is Geocoding? Geocoding is the act of converting addresses to display their geographic locations on a map. A geocoder such as the VT Geocoding Service enables this conversion by matching known input addresses with their respective point locations on a map.

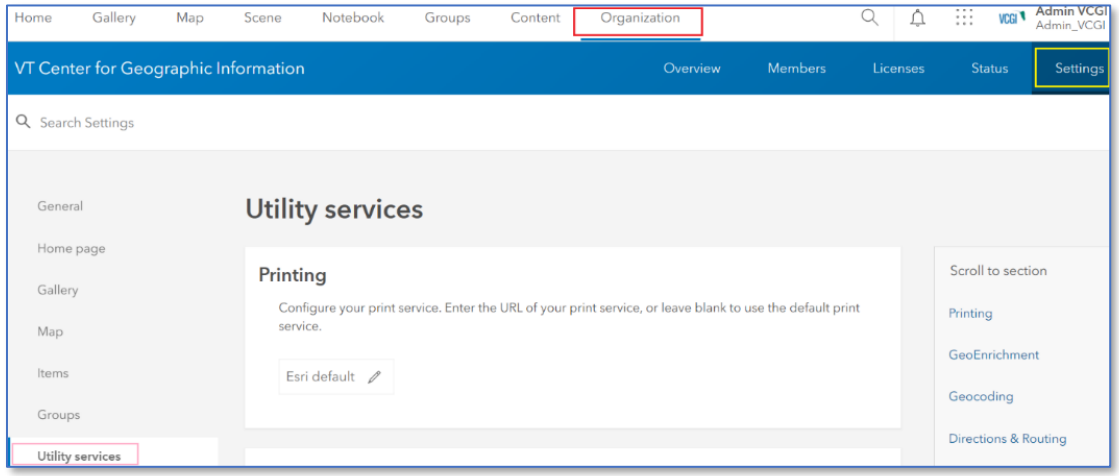
Purpose of Geocoding Service:
Vermont's geocoding service is designed to provide a single, comprehensive, statewide service that meets the general needs of the Vermont GIS community. Vermont geocoding service (also known as a "locator" service) is regularly updated with address information from the Vermont Enhanced 9-1-1 system (E911), specifically address points and road centerlines. The service can be used within ArcGIS Pro, ArcGIS Online, QGIS or integrated into custom web applications (*beyond the scope of this document*). It supports complex geocoding capabilities such as interactive search, batch geocoding and reverse geocoding.

System Prerequisites: at least one of these are required

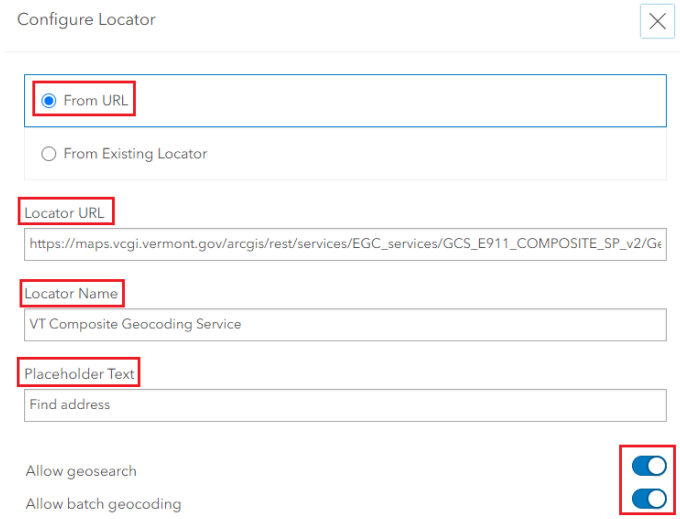
1. ArcGIS Pro 2.4+
2. ArcGIS Online account
3. QGIS 3.22+

Document Outline:

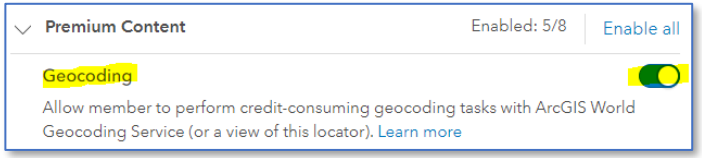
1. **Adding the service to your ArcGIS Online Organization -** Once a geocoder/locator is added to your Organization it can be accessed by all members of your organization, via ArcGIS Online and ArcGIS Pro. This is the best option in most cases.
   a. Log into ArcGIS Online using your organization's administrator account, click the Organization tab at the top followed by Settings and then Utility Services on the left; scroll down to the Geocoding section.



- Click Add button and choose "From URL"
- Enter the above service URL in the "Locator URL" box
- The locator will now be available as a search source in web maps and can be configured as a search source for application widgets. It will also be available in ArcGIS Pro.

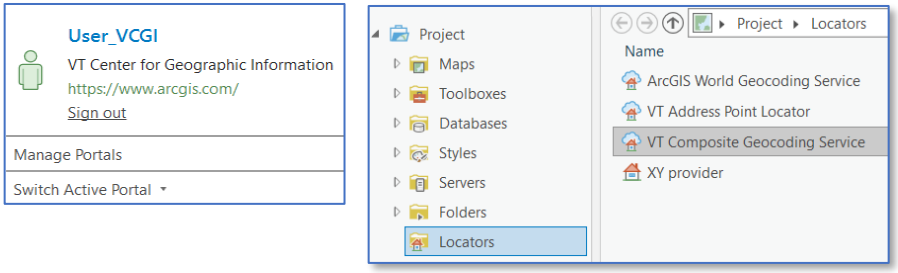


NOTE: If you've created and assigned users to custom ArcGIS Online roles, you'll need to make sure that the custom role has Geocoding permissions under the Premium Content section for that role. Otherwise, the user will not be able to use the geocoder in ArcGIS Pro.



2. Using the Locator (Geocoder) in ArcGIS Pro

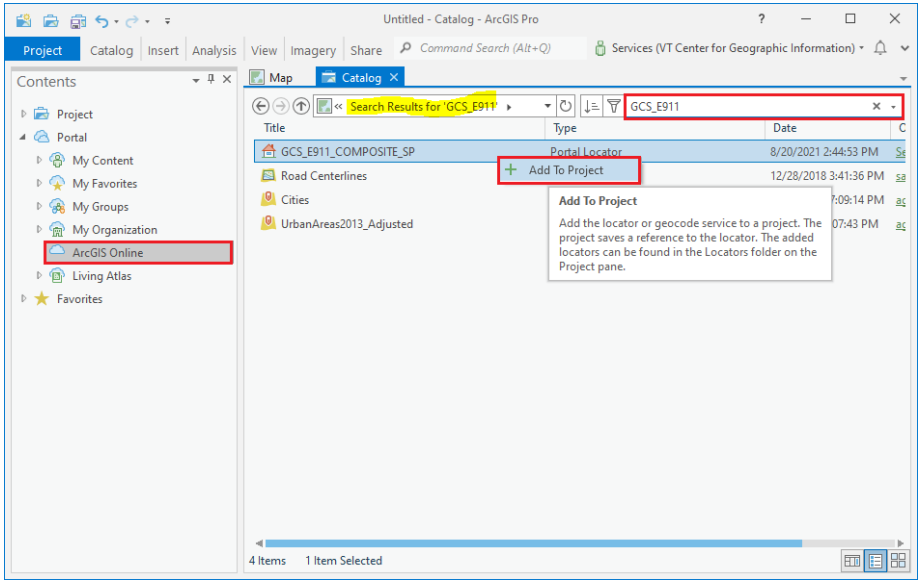
NOTE: If you've already added the locator to your ArcGIS Online organization (Step 1 above), setting that organization as the active portal in ArcGIS Pro will make the geocoding service **automatically available in all your Pro projects** (best/easiest solution). You can jump to section 2.b. If adding the locator to your ArcGIS Online organization was not possible **see Step 2.a below**.



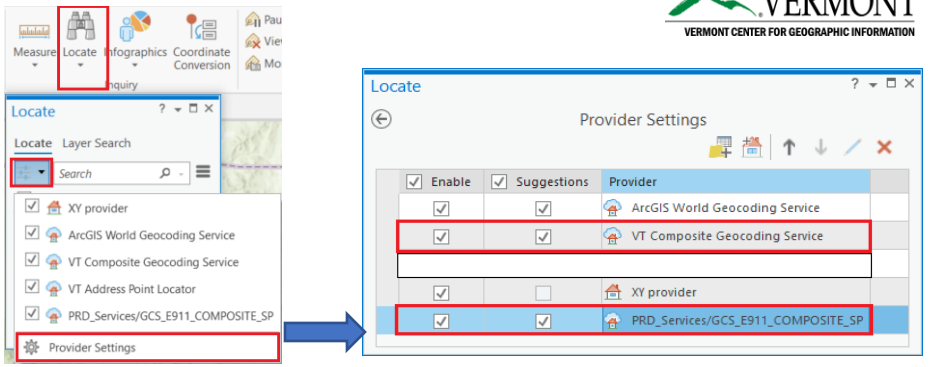
Locator is available in all projects after adding it to your ArcGIS Online organizational account. **This is the preferred configuration.**

a. Add the Service (skip this step if you already added the locator to your ArcGIS Online organization)**:** If adding the locator to your ArcGIS Online organization wasn't possible (Step 1), follow these steps to add the service directly into ArcGIS Pro instead:

1. From the "View tab" select "Catalog View"
2. Click on "ArcGIS Online" (or "All Portal") under "Portal", then enter the following string into the *Search ArcGIS Online* entry box: 'GCS_E911'
    - Right-click "GCS_E911_COMPOSITE_SP" and select "Add to Project". NOTE: The locator will be available the next time you open this specific project, however, it will not be available when you open a new project. There is no option to "Favorite" a locator.

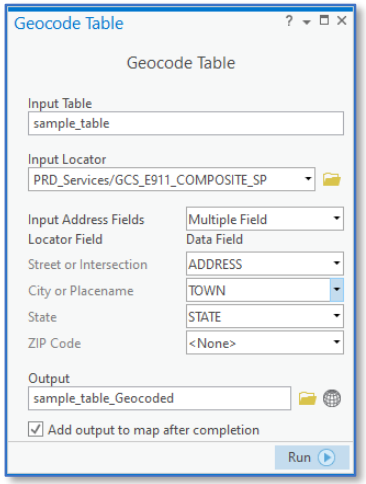


b. Interactive Geocoding: To use the "suggest" capabilities in the Locate tool (in the Map ribbon), make sure that Locator (**GCS_E911_COMPOSITE_SP** or "**VT Composite Geocoding Service**" if you added it to your ArcGIS Online organization in Step 1) service is enabled and suggestions is turned on.

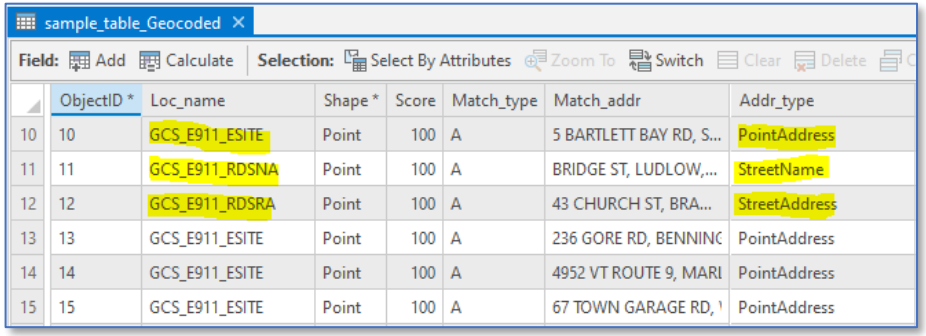


c. Batch Geocoding: Address tables can be loaded into ArcGIS Pro and batch geocoded

1. Add table to an ArcGIS Pro "map"
2. Right-click table and select "Geocode Table"
3. Scroll down and select "Go to tool"
4. Select Locator (**GCS_E911_COMPOSITE_SP** or "**VT Composite Geocoding Service**" if you added it to your ArcGIS Online organization in Step 1) as the Input Locator
5. Match the appropriate "Locator Field" to the table's "Data Field"
6. Run the tool



Make sure to carefully review any output locations where the Addr_type value is returned as "StreetName". This means that the input location was only matched to a street name (placing the point at a mid-point along the street). It did not match to an explicit address point (PointAddress) or at an approximated location along the street address range (StreetAddress). Records where Addr_Type = 'PointAddress' have the most accurate XY locations. *Refer to this ArcGIS help article on how to "rematch" addresses*.



	ObjectID *	Loc_name	Shape *	Score	Match_type	Match_addr	Addr_type
10	10	GCS_E911_ESITE	Point	100	A	5 BARTLETT BAY RD, S...	PointAddress
11	11	GCS_E911_RDSNA	Point	100	A	BRIDGE ST, LUDLOW,...	StreetName
12	12	GCS_E911_RDSRA	Point	100	A	43 CHURCH ST, BRA...	StreetAddress
13	13	GCS_E911_ESITE	Point	100	A	236 GORE RD, BENNINC	PointAddress
14	14	GCS_E911_ESITE	Point	100	A	4952 VT ROUTE 9, MARI	PointAddress
15	15	GCS_E911_ESITE	Point	100	A	67 TOWN GARAGE RD, '	PointAddress

d. Tips and Tricks: Geocoding addresses can be tricky and frustrating. Here are a few tips to consider when using Vermont's GCS_E911_COMPOSITE_SP geocoding service.

Clean your data first: Review your address data and clean it up first before trying to geocode it. PO boxes will not geocode. Addresses should be fully qualified in either a single field or multiple fields/columns (*multiple columns can make it easier to manage*) with the following information

- **STREET ADDRESS:** House/Building number (eg: 247) and Street name (eg: Main St)
- **TOWN/CITY:** Town/city name (eg: Montpelier, Barre City, Barre Town) – *see note below*
- **STATE:** Include the state (eg: VT, NH, NH, etc)
- **ZIP CODE:** Include the zip code (eg: 05405), *which in some cases can help resolve issues with E911 town vs mailing town*.

ADDRESS	TOWN	STATE	ORIGADDRES	ORIGTOWN
1 MAIN ST	NEWPORT CITY	VT	1 Main	NEWPORT
271 NORTH MAIN ST	RUTLAND CITY	VT	271 No. Main St.	RUTLAND
96 WESTERN AVE	NEWPORT CITY	VT	96 Western	NEWPORT
162 NORTH MAIN STREET	BARRE CITY	VT	162 North Main Street	BARRE
PROFESSIONAL DRIVE	MORRISTOWN	VT	Professional Drive	MORRISVILLE
197 HARREL ST	MORRISTOWN	VT	197 Harrel St	MORRISVILLE
29 SUNSET DRIVE	MORRISTOWN	VT	29 Sunset	MORRISVILLE
VT ROUTE 15	MORRISTOWN	VT	Route 15	MORRISVILLE
140 SOUTH MAIN ST	SAINT ALBANS TOWN	VT	140 South Main St	ST. ALBANS
155 LAKE ST	SAINT ALBANS TOWN	VT	155 Lake St.	ST. ALBANS
5 LEMNAH ST	SAINT ALBANS TOWN	VT	5 Lemnah St	ST. ALBANS
HOME HEALTH CIRCLE	SAINT ALBANS TOWN	VT	Home Health Circle	ST. ALBANS
1 JUSTICE SQUARE	RUTLAND CITY	VT	1 Justice Square	RUTLAND
13 COTTAGE ST	RUTLAND CITY	VT	13 Cottage St	RUTLAND
47 NORTH MAIN ST	BARRE CITY	VT	47 North Main St.	BARRE

E911 Town/City names: For best results you should align your town names with VT E911 town names (download CSV and/or shapefile here). It's also important to distinguish between "town" vs "city" such as "Rutland City" vs "Rutland Town". The address and town should be the official E911 address/town-name for that location. *NOTE: With the release of the v2 Geocoder on 9/15/2023, support for "mailing town" has been improved. However, it requires that your data contain valid Zip Codes.*

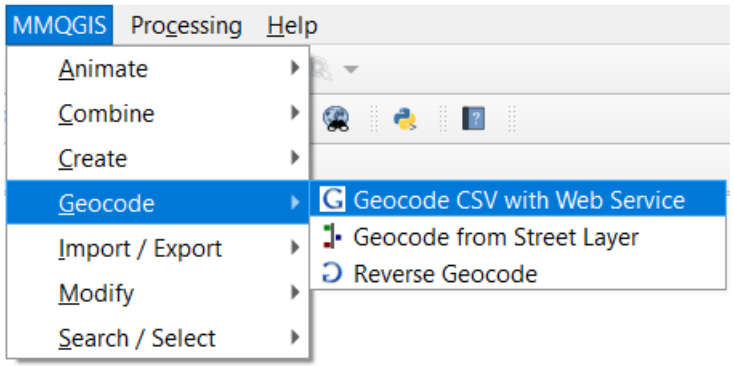
3. Using the Locator (Geocoder) in QGIS

a. Install Plugin: startup QGIS

1. From the "Plugins" pulldown select → "Manage and Install Plugins"
2. Click on "All" and enter "MMQGIS"[1] in the search box. Highlight "MMQGIS" and select "Install Plugin"

b. Batch Geocoding: Addresses in a CSV table can be batch geocoded in QGIS

1. From the MMQGIS pulldown select → Geocode → Geocode CSV with Web Service
2. Select a CSV file containing addresses split into the following fields/columns
    a. ***Address***: Street address such as "123 Main Street"
    b. ***Town*:** Municipality such as Barre City, Barre Town, Burlington, Essex Junction, etc.
    c. ***State:*** *optional, but testing has shown that the geocoder generates a higher match rate when State is provided even if they are all "VT"*
3. Select the appropriate fields for "Address" and "City"



[1] https://michaelminn.com/linux/mmqgis/

4. Select “Esri Server” under Web Service
5. Enter “Esri Server URL”: https://maps.vcgi.vermont.gov/arcgis/rest/services/EGC_services/GCS_E911_COMPOSITE_SP_v2/GeocodeServer/findAddressCandidates
6. Specify output file names
7. Click “Apply” to run the tool

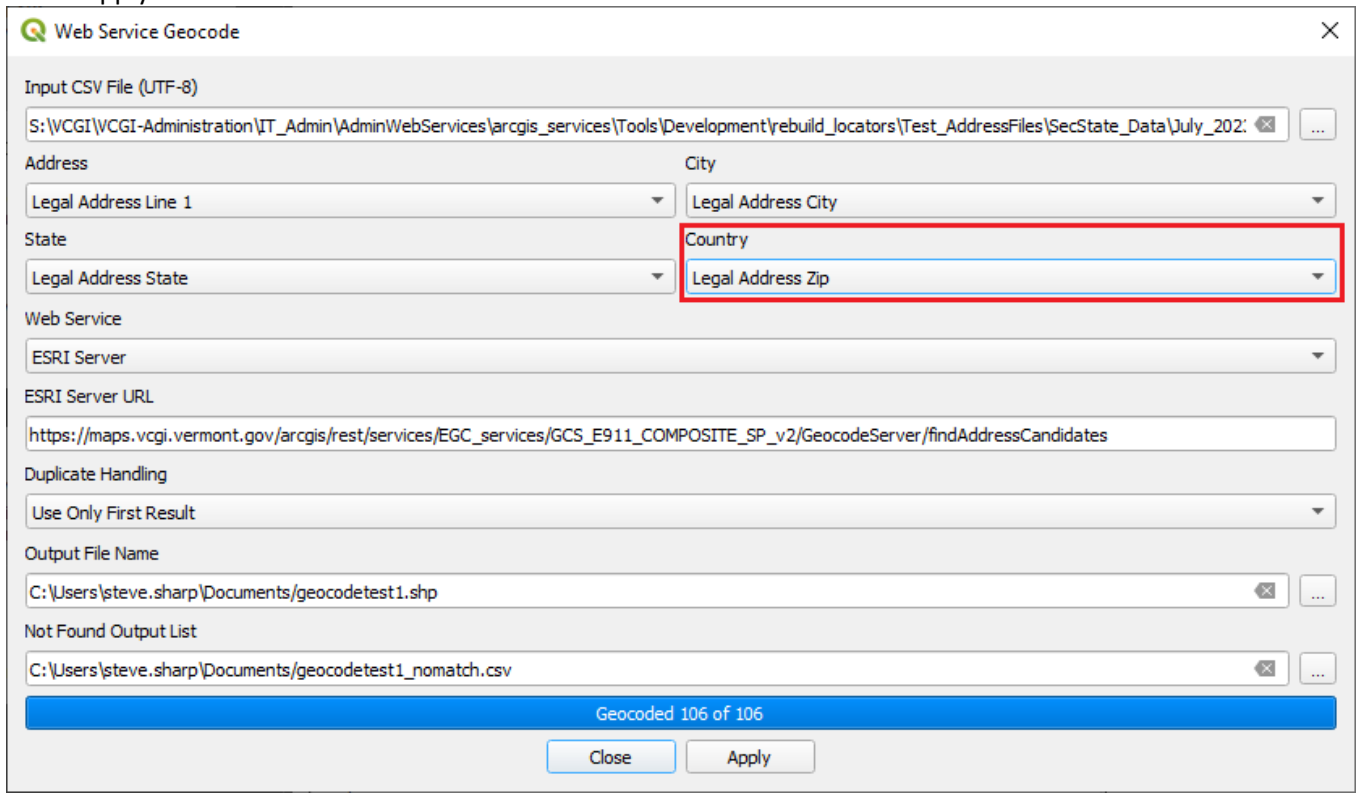
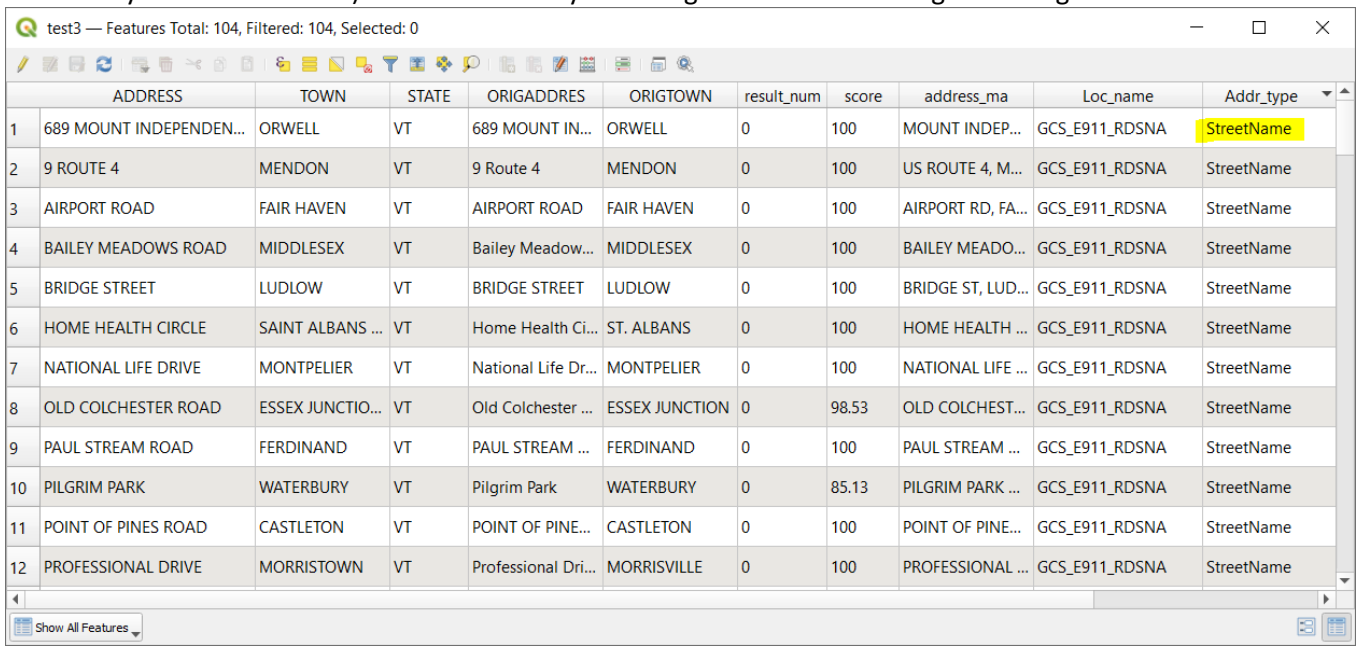


Figure 1 - If you have Zip Codes, place that field into the Country option.

8. Review results. Make sure to carefully review any output locations where the Addr_type value is returned as “StreetName”. This means that the input location was only matched to a street name (placing the point at a mid-point along the street). It did not match to an explicit address point (PointAddress) or at an approximated location along the street address range (StreetAddress). Records where Addr_Type = ‘PointAddress’ have the most accurate XY locations.

   Also make note of records/address written to the “Not Found Output List”. Adjust address and/or town (eg: change “Barre” to “Barre City” or “Barre Town”) as needed and try matching the not found list against the geocoder.



	ADDRESS	TOWN	STATE	ORIGADDRES	ORIGTOWN	result_num	score	address_ma	Loc_name	Addr_type
1	689 MOUNT INDEPENDEN...	ORWELL	VT	689 MOUNT IN...	ORWELL	0	100	MOUNT INDEP...	GCS_E911_RDSNA	StreetName
2	9 ROUTE 4	MENDON	VT	9 Route 4	MENDON	0	100	US ROUTE 4, M...	GCS_E911_RDSNA	StreetName
3	AIRPORT ROAD	FAIR HAVEN	VT	AIRPORT ROAD	FAIR HAVEN	0	100	AIRPORT RD, FA...	GCS_E911_RDSNA	StreetName
4	BAILEY MEADOWS ROAD	MIDDLESEX	VT	Bailey Meadow...	MIDDLESEX	0	100	BAILEY MEADO...	GCS_E911_RDSNA	StreetName
5	BRIDGE STREET	LUDLOW	VT	BRIDGE STREET	LUDLOW	0	100	BRIDGE ST, LUD...	GCS_E911_RDSNA	StreetName
6	HOME HEALTH CIRCLE	SAINT ALBANS ...	VT	Home Health Ci...	ST. ALBANS	0	100	HOME HEALTH ...	GCS_E911_RDSNA	StreetName
7	NATIONAL LIFE DRIVE	MONTPELIER	VT	National Life Dr...	MONTPELIER	0	100	NATIONAL LIFE ...	GCS_E911_RDSNA	StreetName
8	OLD COLCHESTER ROAD	ESSEX JUNCTIO...	VT	Old Colchester ...	ESSEX JUNCTION	0	98.53	OLD COLCHEST...	GCS_E911_RDSNA	StreetName
9	PAUL STREAM ROAD	FERDINAND	VT	PAUL STREAM ...	FERDINAND	0	100	PAUL STREAM ...	GCS_E911_RDSNA	StreetName
10	PILGRIM PARK	WATERBURY	VT	Pilgrim Park	WATERBURY	0	85.13	PILGRIM PARK ...	GCS_E911_RDSNA	StreetName
11	POINT OF PINES ROAD	CASTLETON	VT	POINT OF PINE...	CASTLETON	0	100	POINT OF PINE...	GCS_E911_RDSNA	StreetName
12	PROFESSIONAL DRIVE	MORRISTOWN	VT	Professional Dri...	MORRISVILLE	0	100	PROFESSIONAL ...	GCS_E911_RDSNA	StreetName

c. **Tips and Tricks:** see section 2.d