



Location Intelligence

GeoStan™ Geocoding Suite

Spring 2019 Release

Technical Notes



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Technical Support

The Technical Notes and Installation Guides for the different Pitney Bowes products are available for viewing and download from the Pitney Bowes Software Support Web site. To access these documents, sign in to <https://www.pitneybowes.com/us/support/products/software/geostan-support.html>, select **Documentation**, and then select **Technical Product Info** for the Technical Notes (or **Installation Guides** for the installation documentation). With this release, we have rebranded the “Centrus Product Suite” to “GeoStan Geocoding Suite”. This change will be reflected on the Support site as well, see the updated link above.

Note: Although we will continue to provide Level 1 technical support for the Centrus Product Suite in its version as of the Spring 2018 release, any future product updates will only be provided for the GeoStan Geocoding Suite in its Spring 2019 release version.

Product Version Information

The Spring 2019 release includes the following products and versions:

- AddressBroker™ 4.8
- Demographics Library 39.04
- Geographic Determination Library™ 39.04
- GeoStan™ 32.00
- GeoStan Canada 39.04
- Spatial+™ 39.04

Regulatory Changes

The implementation date for CASS Cycle O has been deferred by the United States Postal Service® (USPS®) until August 2021. The USPS Coding Accuracy Support System (CASS™) Cycle N will be valid through July 31, 2021. The USPS reserves the right to modify the “valid through” date in the future if conditions warrant it. The geocoder application shipped with GeoStan is CASS Certified for Cycle N in the Spring 2019 release version.

Highlights and General Enhancements

AddressBroker 4.8 and GeoStan 32.00

- **Added Master Location Data (MLD) Extended Attributes**
Extended Attributes are now available with MLD. This new feature provides access to extended attributes associated with an addressable location that has a pbKey. When matching addresses with MLD, you can now seamlessly return additional property information associated with the address, such as APN, Elevation, Address Type, Lot Size, etc. See the full list of fields detailed below.
- **Added Residential Delivery Indicator (RDI™)**
This United States Postal Service (USPS®) data product identifies whether a delivery type is classified as residential or business. If you are shipping to residences, you may lower costs by shipping with the Postal Service™ and avoid residential delivery surcharges typically charged by other shipping companies. See more detail below.
- **Improvements to Singleline Address Matching**
Several enhancements to singleline matching; see [Singleline Matching Enhancements](#) below.

Product Updates

AddressBroker 4.8

MLD Extended Attributes including APN and Elevation

Added Master Location Data (MLD) Extended Attributes

Extended Attributes are now available with MLD. This new feature provides access to extended attributes associated with an addressable location that has a pbKey. When matching addresses with MLD, you can now seamlessly return additional property information associated with the address, such as APN, Elevation, Address Type, Lot Size, etc. See the full list of fields detailed below.

Requirements

The following are required to access MLD Extended Attributes:

- Master Location Dataset (.gsd and .gsi files).
- Streets data set.
- MLD Extended Attributes data set (extatt*.dld files).
- It is recommended that the vintages of the MLD and MLD Extended Attributes data sets be within 4 months of each other.

Implementation

To return MLD Extended Attributes:

1. Install the MLD, Streets, and MLD Extended Attributes data sets.
2. Define the data sets' and license paths in your application.
3. Request the desired MLD Extended Attributes output fields from AddressBroker.

NOTE: The existing AddressBroker output fields, **Parcel Centroid Elevation** and **ApnID**, will transparently return elevation (in feet) and APN values from the MLD Extended Attributes when loaded. **ParCenElevationMeters** returns elevation in meters.

MLD Extended Attributes output fields (optional)

| Output Field Name | Data Type N—numeric C—char string | Width— includes null terminator | Number of decimals if numeric | Description |
|-------------------|---|------------------------------------|-------------------------------|--|
| AddressType | C | 2 | 0 | Address Type regarding number of units: S – Single unit M – Multiple units P – Post Office box X – Unknown |
| ApnID | C | 46 | 0 | Assessor's parcel number. |
| IncorpPlaceInd | C | 2 | 0 | Incorporated Place Indicator. I – Incorporated place N – Not an incorporated place X – Unknown |
| LotSize | N | 11 | 0 | Lot size of the parcel expressed in square feet; 0 if none. |

| Output Field Name | Data Type N—numeric C—char string | Width— includes null terminator | Number of decimals if numeric | Description |
|-----------------------|---|------------------------------------|-------------------------------|---|
| LotSizeMeters | N | 11 | 0 | Lot size of the parcel expressed in square meters; 0 if none. |
| MECLat | N | 13 | 0 | Latitude of Minimum Enclosing Circle expressed with an implied 6 digits of decimal precision; 0 if none. |
| MECLon | N | 13 | 0 | Longitude of Minimum Enclosing Circle expressed with an implied 6 digits of decimal precision; 0 if none. |
| MECRadius | N | 12 | 1 | Radius of Minimum Enclosing Circle (in square feet) expressed as a whole number. For example: 1234 means 1,234 feet. |
| MECRadiusMeters | N | 12 | 1 | Radius of Minimum Enclosing Circle (in meters) expressed with 1 digit of decimal precision. |
| Parcen Elevation | N | 7 | 1 | Elevation above sea level (in feet) expressed with 1 digit of decimal precision. For example: 12.5 feet. |
| ParCenElevationMeters | N | 7 | 1 | Elevation above sea level (in meters) expressed with 1 digit of decimal precision. For example: 12.5 meters. |
| ResidentialBusiness | C | 2 | 0 | Usage Indicator: R – Residential use B – Business use M – Mixed use – residential and business X – Unknown use |
| TigerFaceID | C | 10 | 0 | TIGER Face Identifier. This field can be used to match to all Census geocodes using external data; 0 if none. |
| TigerPlace | C | 8 | 0 | TIGER Place code; 0 if none. |
| UrbanAreaID | C | 6 | 0 | TIGER Urban Area Identifier. Defines the urban area if any; 0 if none. |
| UrbanAreaPop | N | 11 | 0 | Census population of the urban area; 0 if none. |
| Urbanicity | | 2 | 0 | Urbanicity Indicator. An indicator that defines, per the Census, the Urbanicity of the Address using TIGER UACE codes for categorization. |

Residential Delivery Indicator (RDI™)

This United States Postal Service (USPS®) data product identifies whether a delivery type is classified as residential or business. If you are shipping to residences, you may lower costs by shipping with the Postal Service™ and avoid residential delivery surcharges typically charged by other shipping companies.

Note: To use RDI, Delivery Point Validation (DPV) must also be initialized.

New processing control property RDI_DATAPATH (Optional)

Specifies the folder name and path for the Residential Delivery Indicator (RDI™) data, rdi.db. It is only required if you are using the RDI functionality in your application.

| String Property Name | Property ID AB_* = C/C++/.NET/Java Property ID ABX_* = ActiveX | Data Type | Description |
|----------------------|---|-----------|---|
| "RDI_DATAPATH" | AB_RDI_DATAPATH | String | Path to RDI data; string value is RDIDATAPATH |

New Output Field (Optional)

To retrieve the indicator, use this AddressBroker output field:

| Field | Data Type N— numeric C—char string | Length (with null terminator) | Number of decimals if numeric | Description |
|------------|--|----------------------------------|-------------------------------|---|
| RDIRetCode | C | 2 | 0 | USPS Residential Delivery Indicator (RDI) return code: <ul style="list-style-type: none"> • Y = Residence • N = Business • Blank = Address was not presented to RDI or RDI data not loaded t |

Known Issues

- Alias addresses are not returned with the alias match results.
- Spatial attribute output field names cannot be the same as AddressBroker output field names.
- Placing tabs in InitList causes the AddressBroker server to stop.
- The AddressBroker batch application does not allow spaces in path names.
- If using DPV™ and LACSLink™ data, we do not recommend limiting the memory being used by AddressBroker. Because of the size of these files, we recommend that AddressBroker operate on a dedicated server, so that the maximum amount of memory is available for processing.

AddressBroker 4.8 and GeoStan 32.00

Singleline Matching Enhancements

Several improvements were made to singleline matching:

| Description |
|---|
| <p>Improved singleline matching for PO Boxes when entered as POST OFFICE BOX, or when the number is preceded by #.</p> <p>Improvements have been made in handling of street names that could also be city names in singleline address processing. For example:</p> <p>Input address: BOX 58 ASHAWAY RI 02804</p> <p>Previous match: 58 ASHAWAY RD, 02804</p> <p>New match: BOX 58, ASHAWAY RI 02804</p> <p>Input address: BARCLAY PLZ APT 68G NEW WINDSOR NY 12553</p> <p>Previous match: 68G NEW ST, NEW WINDSOR, NY 12553</p> <p>New match: 68G BARCLAY PLZ, NEW WINDSOR, NY 12553</p> |
| <p>Enhancements have been made in singleline POI matching to recognize one or more embedded POIs. For example:</p> <p>Input address: FIRST SHORE FEDERAL SAVINGS & LOAN W GREEN ST & PEARL ST SNOW HILL</p> <p>Result: FIRST SHORE FEDERAL SAVINGS & LOAN, SNOW HILL MD 21863</p> |
| <p>Improved standard singleline addr2 handling. For example:</p> <p>Input address: MARVIN R BECK PT 1108 E PATTERSON/ POB 160 KIRKSVILLE MO 63501</p> <p>Previous match: PO BOX 160</p> <p>New match: 1108 E PATTERSON ST</p> |
| <p>Improved handling of singleline input addresses with missing or out of range house numbers. Matches and non-matches are now returned more accurately.</p> |
| <p>Improved handling and reporting of singleline matching of addresses containing multiple intersections when using Master Location Data.</p> <p>For example: 8th & laurel & 9th 21851.</p> |
| <p>Enhancements have been made in POI matching for the following cases:</p> <ul style="list-style-type: none">• Singleline input address containing a POI that ends with a city name that matches a given ZIP Code. For example: CHARTER HOSP OF DENVER 80228• Singleline input address containing a POI that ends with a state name that matches a given ZIP Code. For example: BANK OF COLORADO 80720• Two-line or singleline input address containing a POI that ends with a number. For example: KBIQ 102 7 80920 |

Matching Enhancements

Additional improvements were made to matching:

| Description |
|---|
| Improved handling and matching of PO Box addresses that contain a “#” sign in front of the box number; for example, PO BOX #14. |

New GS_IS_ALIAS return values:

- “A13” is returned when a match is made to ZIPMove data.
- “A14” is returned when a match is made to the expanded centroid file us_cent.gsc (file contained in the Master Location Structure Centroid data set).

Fixed Change Requests

These are the change requests and software defects addressed in this release of AddressBroker and GeoStan. Please review this list carefully to determine whether the following corrections apply to your situation.

| Item Number | Change Request | Description | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|----------------------|----------------|--|----------|--------------|------------|---------------|----------|--------|---------|--|--|--|---------|------|-------|----------|--------------|------------|-------------|----------|--------|---------|----------------|-------------|----|-------|------|-----|---------|----|-------|------|-------|--|--|--|--|--|--|--|--|--|---------|------|-------|----------|--------------|------------|-------------|----------|--------|---------|----------------|-------------|----|-------|------|------|---------|----|-------|------|--------|--|--|--|--|--|--|--|--|--|---------|------|-------|----------|--------------|------------|-------------|----------|--------|---------|---------------|---------------|----|---|------|-----|---------------|----|-------|------|-------|--|--|--|--|--|--|--|--|--|---------|------|-------|----------|--------------|------------|-------------|----------|--------|---------|---------------|---------------|----|-------|------|------|---------------|----|-------|------|
| CENTRUS-11100 | Case 18929830 | <p>Corrected an issue where the output ZIP was not being corrected on a matched address, if the input ZIP was invalid or missing and the Prefer Zip Over City option was being used.</p> <p>Example: Incorrect ZIP</p> <table border="1"> <thead> <tr> <th colspan="10">Before</th> </tr> <tr> <th>Address</th> <th>CITY</th> <th>State</th> <th>POSTCODE</th> <th>outMatchCode</th> <th>outLocCode</th> <th>outCityPref</th> <th>outState</th> <th>outZip</th> <th>outZIP4</th> </tr> </thead> <tbody> <tr> <td>107 PRESTON RD</td> <td>Cheektowaga</td> <td>NY</td> <td>H2N1Y</td> <td>S800</td> <td>AS0</td> <td>BUFFALO</td> <td>NY</td> <td>H2N1Y</td> <td>3626</td> </tr> </tbody> </table> <table border="1"> <thead> <tr> <th colspan="10">After</th> </tr> <tr> <th>Address</th> <th>CITY</th> <th>State</th> <th>POSTCODE</th> <th>outMatchCode</th> <th>outLocCode</th> <th>outCityPref</th> <th>outState</th> <th>outZip</th> <th>outZIP4</th> </tr> </thead> <tbody> <tr> <td>107 PRESTON RD</td> <td>Cheektowaga</td> <td>NY</td> <td>14211</td> <td>S800</td> <td>AP05</td> <td>BUFFALO</td> <td>NY</td> <td>14211</td> <td>3626</td> </tr> </tbody> </table> <p>Example: Missing Zip</p> <table border="1"> <thead> <tr> <th colspan="10">Before</th> </tr> <tr> <th>Address</th> <th>CITY</th> <th>State</th> <th>POSTCODE</th> <th>outMatchCode</th> <th>outLocCode</th> <th>outCityPref</th> <th>outState</th> <th>outZip</th> <th>outZIP4</th> </tr> </thead> <tbody> <tr> <td>8649 11TH AVE</td> <td>SILVER SPRING</td> <td>MD</td> <td>0</td> <td>S800</td> <td>AS0</td> <td>SILVER SPRING</td> <td>MD</td> <td>00000</td> <td>3203</td> </tr> </tbody> </table> <table border="1"> <thead> <tr> <th colspan="10">After</th> </tr> <tr> <th>Address</th> <th>CITY</th> <th>State</th> <th>POSTCODE</th> <th>outMatchCode</th> <th>outLocCode</th> <th>outCityPref</th> <th>outState</th> <th>outZip</th> <th>outZIP4</th> </tr> </thead> <tbody> <tr> <td>8649 11TH AVE</td> <td>SILVER SPRING</td> <td>MD</td> <td>20903</td> <td>S800</td> <td>AP02</td> <td>SILVER SPRING</td> <td>MD</td> <td>20903</td> <td>3203</td> </tr> </tbody> </table> | Before | | | | | | | | | | Address | CITY | State | POSTCODE | outMatchCode | outLocCode | outCityPref | outState | outZip | outZIP4 | 107 PRESTON RD | Cheektowaga | NY | H2N1Y | S800 | AS0 | BUFFALO | NY | H2N1Y | 3626 | After | | | | | | | | | | Address | CITY | State | POSTCODE | outMatchCode | outLocCode | outCityPref | outState | outZip | outZIP4 | 107 PRESTON RD | Cheektowaga | NY | 14211 | S800 | AP05 | BUFFALO | NY | 14211 | 3626 | Before | | | | | | | | | | Address | CITY | State | POSTCODE | outMatchCode | outLocCode | outCityPref | outState | outZip | outZIP4 | 8649 11TH AVE | SILVER SPRING | MD | 0 | S800 | AS0 | SILVER SPRING | MD | 00000 | 3203 | After | | | | | | | | | | Address | CITY | State | POSTCODE | outMatchCode | outLocCode | outCityPref | outState | outZip | outZIP4 | 8649 11TH AVE | SILVER SPRING | MD | 20903 | S800 | AP02 | SILVER SPRING | MD | 20903 | 3203 |
| Before | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Address | CITY | State | POSTCODE | outMatchCode | outLocCode | outCityPref | outState | outZip | outZIP4 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 107 PRESTON RD | Cheektowaga | NY | H2N1Y | S800 | AS0 | BUFFALO | NY | H2N1Y | 3626 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| After | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Address | CITY | State | POSTCODE | outMatchCode | outLocCode | outCityPref | outState | outZip | outZIP4 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 107 PRESTON RD | Cheektowaga | NY | 14211 | S800 | AP05 | BUFFALO | NY | 14211 | 3626 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Before | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Address | CITY | State | POSTCODE | outMatchCode | outLocCode | outCityPref | outState | outZip | outZIP4 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 8649 11TH AVE | SILVER SPRING | MD | 0 | S800 | AS0 | SILVER SPRING | MD | 00000 | 3203 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| After | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Address | CITY | State | POSTCODE | outMatchCode | outLocCode | outCityPref | outState | outZip | outZIP4 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 8649 11TH AVE | SILVER SPRING | MD | 20903 | S800 | AP02 | SILVER SPRING | MD | 20903 | 3203 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| CENTRUS-11341 | Case 20071807 | When doing last line geocoding and “Correct Lastline” is on, the Pref City now returns correctly. Example: Denver CO 80223 returns as Denver, not Aurora. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| CENTRUS-10996 | Case 17733972 | Fixed a stack overflow crash encountered using DPV and LACSLink data in CASS match mode. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

GeoStan 32.00

MLD Extended Attributes including APN and Elevation

Added Master Location Data (MLD) Extended Attributes

Extended Attributes are now available with MLD. This new feature provides access to extended attributes associated with an addressable location that has a pbKey. When matching addresses with MLD, you can now seamlessly return additional property information associated with the address, such as APN, Elevation, Address Type, Lot Size, etc. See the full list of fields detailed below.

Requirements

The following are required to access MLD Extended Attributes:

- Master Location Dataset (.gsd and .gsi files).
- Streets data set.
- MLD Extended Attributes data set (extatt*p.dld files).
- It is recommended that the vintages of the MLD and MLD Extended Attributes data sets be within 4 months of each other.

Implementation

1. Set up your data.
 - Install the MLD and streets data sets and their associated license files. Note the paths to these folders.
 - Install the MLD Extended Attributes data set. The MLD Extended Attributes data set needs to be unzipped and copied to a folder. Note the path to this folder.
 - Define the data paths to DVDMLD, DVDMLD2 and the folder where you installed the MLD Extended Attributes data set, as well as any other geocoding data sets you have installed for your application. Define the paths to the associated license files and passwords.
2. The MLD Extended Attributes data is delivered in 5 separate .dld files, `extatt*p.dld`, where "*" is a number. When installed, GeoStan will automatically detect and load these files, and set the Status File MLD Extended Attributes property. When initializing GeoStan, you can optionally query the Status File MLD Extended Attributes property to confirm the `extatt*p.dld` files loaded successfully.

| | |
|--------------|----------------------------------|
| C | GS_STATUS_FILE_MLD_EXTENDED_ATTR |
| JAVA | STATUS_FILE_MLD_EXTENDED_ATTR |
| .NET | GS_STATUS_FILE_MLD_EXTENDED_ATTR |
| COBOL | GS-STATUS-FILE-EXTEND-ATTR |

C sample code:

```
GsPropGetBool (&statusProps, GS_STATUS_FILE_MLD_EXTENDED_ATTR, &bVal);  
  
if (!bVal) {  
    printf("MLD Extended Attribute data failed to initialize.\n");  
    exit(1);  
}
```

3. Process the match by calling the Find Properties function.

4. The following table describes how to return APN and elevation data when available.

APN & Elevation are returned using the existing enums. Elevation is returned in feet using the existing enum. Optionally, elevation data can now be returned in meters using the appropriate, new enum. The following table details the existing enums for returning APN & Elevation, with elevation in feet. The second enum for elevation provides the elevation in meters.

| | |
|--------------|--|
| C | <p>For APN: Use GsDataGet to return GS_APN_ID.</p> <p>For elevation: Use GsDataGet to return GS_PARCEN_ELEVATION or GS_PARCEN_ELEVATION_METERS</p> |
| JAVA | <p>For APN: Use getData to return APN_ID.</p> <p>For elevation: Use getData to return PARCEN_ELEVATION or PARCEN_ELEVATION_METERS</p> |
| .NET | <p>For APN: Use GsDataGet to return GS_APN_ID.</p> <p>For elevation: Use GsDataGet to return GS_PARCEN_ELEVATION or GS_PARCEN_ELEVATION_METERS</p> |
| COBOL | <p>For APN: Use GSDATGET to return GS-APN-ID.</p> <p>For elevation: Use GsDataGet to return GS-PARCEN-ELEVATION or GS-PARCEN-ELEVATION-METERS</p> |

C sample code:

```
GsDataGet(gs, GS_OUTPUT, GS_APN_ID, apn, sizeof(apn));
GsDataGet(gs, GS_OUTPUT, GS_PARCEN_ELEVATION, elevation,
          sizeof(elevation));
```

MLD Extended Attributes

Additional enums for the MLD Extended Attributes dataset are listed below for each API.

C or .NET

| GeoStan enum C or .NET | Width— includes null terminator | Description |
|----------------------------|--|--|
| GS_ADDRTYPE | 2 | Address Type regarding number of units: <ul style="list-style-type: none"> • S – Single unit • M – Multiple units • P – Post Office box • X – Unknown |
| GS_APN_ID | 46 | Assessor's Parcel Number (APN). |
| GS_INC_IND | 2 | Incorporated Place Indicator. <ul style="list-style-type: none"> • I – Incorporated place • N – Not an incorporated place • X – Unknown |
| GS_LOTSIZE | 11 | Lot size of the parcel expressed in square feet; 0 if none. |
| GS_LOTSIZE_METERS | 11 | Lot size of the parcel expressed in square meters; 0 if none. |
| GS_MEC_LAT | 13 | Latitude of Minimum Enclosing Circle expressed with an implied 6 digits of decimal precision; 0 if none. Example: 34809676 means 34.809676 |
| GS_MEC_LON | 13 | Longitude of Minimum Enclosing Circle expressed with implied 6 digits of decimal precision; 0 if none. Example: -92447089 means -92.447089. |
| GS_MEC_RAD | 12 | Radius of Minimum Enclosing Circle (in feet) expressed as a whole number. Example: 1234 means 1,234 feet. |
| GS_MEC_RAD_METERS | 12 | Radius of Minimum Enclosing Circle (in meters) expressed with 1 digit of decimal precision; 0 if none. Example: 123.4 meters. |
| GS_PARCEN_ELEVATION | 7 | Elevation of the geocode at the parcel centroid in feet. |
| GS_PARCEN_ELEVATION_METERS | 7 | Elevation of the geocode at the parcel centroid in meters. |
| GS_RESBUS | 2 | Usage indicator <ul style="list-style-type: none"> • R – Residential use • B – Business use • M – Mixed use – residential and business • X – Unknown use |
| GS_TFID | 10 | TIGER Face Identifier. This field can be used to match to all Census geocodes using external data; 0 if none. |
| GS_PLACE | 8 | TIGER Place code; 0 if none. |

| | | |
|----------------------|----|---|
| GS_UACE | 6 | TIGER Urban Area Identifier. Defines the urban area if any; 0 if none. |
| GS_UACEPOP | 11 | Census population of the urban area; 0 if none. |
| GS_URBANICITY | 2 | Urbanicity Indicator. An indicator that defines per the Census the Urbanicity of the Address using TIGER UACE codes for categorization. <ul style="list-style-type: none"> • L – Large Urban Area (50,000 or greater population) • S – Small Urban Area (2,500-50,000 population) • R – Rural • X – Unknown |

COBOL

| GeoStan enum COBOL | Width— includes null terminator | Description |
|-------------------------------|--|---|
| GS-ADDRTYPE | 2 | Address Type regarding number of units: <ul style="list-style-type: none"> • S – Single unit • M – Multiple units • P – Post Office box • X – Unknown |
| GS-APN-ID | 46 | Assessor’s Parcel Number (APN). |
| GS-INC-IND | 2 | Incorporated Place Indicator. <ul style="list-style-type: none"> • I – Incorporated place • N – Not an incorporated place • X – Unknown |
| GS-LOTSIZE | 11 | Lot size of the parcel expressed in square feet; 0 if none. |
| GS-LOTSIZE-METERS | 11 | Lot size of the parcel expressed in square meters; 0 if none. |
| GS-MEC-LAT | 13 | Latitude of Minimum Enclosing Circle expressed with an implied 6 digits of decimal precision; 0 if none. Example: 34809676 means 34.809676 |
| GS-MEC-LON | 13 | Longitude of Minimum Enclosing Circle expressed with implied 6 digits of decimal precision; 0 if none. Example: -92447089 means -92.447089. |
| GS-MEC-RAD | 12 | Radius of Minimum Enclosing Circle (in feet) expressed as a whole number. Example: 1234 means 1,234 feet. |
| GS-MEC-RAD-METERS | 12 | Radius of Minimum Enclosing Circle (in meters) expressed with 1 digit of decimal precision; 0 if none. Example: 123.4 meters. |

| GeoStan enum COBOL | Width— includes null terminator | Description |
|----------------------------|--|---|
| GS-PARCEN-ELEVATION | 7 | Elevation of the geocode at the parcel centroid in feet. |
| GS-PARCEN-ELEVATION-METERS | 7 | Elevation of the geocode at the parcel centroid in meters. |
| GS-RESBUS | 2 | Usage indicator <ul style="list-style-type: none"> • R – Residential use • B – Business use • M – Mixed use – residential and business • X – Unknown use |
| GS-TFID | 10 | TIGER Face Identifier. This field can be used to match to all Census geocodes using external data; 0 if none. |
| GS-PLACE | 8 | TIGER Place code; 0 if none. |
| GS-UACE | 6 | TIGER Urban Area Identifier. Defines the urban area if any; 0 if none. |
| GS-UACEPOP | 11 | Census population of the urban area; 0 if none. |
| GS-URBANICITY | 2 | Urbanicity Indicator. An indicator that defines per the Census the Urbanicity of the Address using TIGER UACE codes for categorization. <ul style="list-style-type: none"> • L – Large Urban Area (50,000 or greater population) • S – Small Urban Area (2,500-50,000 population) • R – Rural • X – Unknown |

| GeoStan enum Java | Width— includes null terminator | Description |
|-----------------------------|--|--|
| ADDRTYPE | 2 | Address Type regarding number of units: <ul style="list-style-type: none"> • S – Single unit • M – Multiple units • P – Post Office box • X – Unknown |
| GS_APN_ID | 46 | Assessor’s Parcel Number (APN). |
| INC_IND | 2 | Incorporated Place Indicator. <ul style="list-style-type: none"> • I – Incorporated place • N – Not an incorporated place • X – Unknown |
| LOTSIZE | 11 | Lot size of the parcel expressed in square feet; 0 if none. |
| LOTSIZE_METERS | 11 | Lot size of the parcel expressed in square meters; 0 if none. |
| MEC_LAT | 13 | Latitude of Minimum Enclosing Circle expressed with an implied 6 digits of decimal precision; 0 if none. Example: 34809676 means 34.809676 |
| MEC_LON | 13 | Longitude of Minimum Enclosing Circle expressed with implied 6 digits of decimal precision; 0 if none. Example: -92447089 means -92.447089. |
| MEC_RAD | 12 | Radius of Minimum Enclosing Circle (in feet) expressed as a whole number. Example: 1234 means 1,234 feet. |
| MEC_RAD_METERS | 12 | Radius of Minimum Enclosing Circle (in meters) expressed with 1 digit of decimal precision; 0 if none. Example: 123.4 meters. |
| PARCEN_ELEVATION | 7 | Elevation of the geocode at the parcel centroid in feet. |
| PARCEN_ELEVATION_M ETERS | 7 | Elevation of the geocode at the parcel centroid in meters. |
| RESBUS | 2 | Usage indicator <ul style="list-style-type: none"> • R – Residential use • B – Business use • M – Mixed use – residential and business • X – Unknown use |
| TFID | 10 | TIGER Face Identifier. This field can be used to match to all Census geocodes using external data; 0 if none. |
| PLACE | 8 | TIGER Place code; 0 if none. |
| UACE | 6 | TIGER Urban Area Identifier. Defines the urban area if any; 0 if none. |
| UACEPOP | 11 | Census population of the urban area; 0 if none. |

| GeoStan enum Java | Width— includes null terminator | Description |
|----------------------|--|---|
| URBANICITY | 2 | Urbanicity Indicator. An indicator that defines per the Census the Urbanicity of the Address using TIGER UACE codes for categorization. <ul style="list-style-type: none"> • L – Large Urban Area (50,000 or greater population) • S – Small Urban Area (2,500-50,000 population) • R – Rural • X – Unknown |

Geotest and Geocoder Updates

New File Status Values

If the MLD Extended Attributes data has been successfully loaded, the **Initialization Status** will return file status information on the 5 extatt*p.dld files – their file location and vintage. The **Files Loaded** information will also show “**MLD Extended Attributes data: TRUE**”.

New Elevation Return Value

The returned parcel centroid elevation is now returned in both feet and meters, as shown in the red text below.

```
Firm:
Address:          4750 Walnut St Ste 200
Address2:
Puerto Rico Urb:
Last Line:       Boulder CO 80301

Found:

4750 WALNUT ST STE 200
BOULDER, CO 80301-2532

short address:
4750 WALNUT ST STE 200
BOULDER, CO 80301-2532

MatchCode = S800
MMResultCode = S8HPNTSCZA
LocCode = AP02 Lon = -105240967 Lat = 40018297
```

Parcel centroid elevation = 5238 ft, 1596.4 m

```
Distances: Search = Offset = Centerline Offset = Squeeze = Nearest = Pct Geocode =
SegID = 947855759 PtID = 101156545 pbKey = P00003PZ7WE9 APN = 146328014015 Datatype = MASTER LOCATION
Block = 080130122032110 County Name = BOULDER COUNTY DPBC = 50 High Rise DFLT = N RR DFLT = RR/HR
DFLT = CLOSE MATCH = T
```

Geocoder Output fields

Parcel Centroid Elevation

To retrieve the elevation in feet, use the existing output field:

| Field | Length (with null terminator) | Description |
|---------------------------|----------------------------------|---|
| outParCenElevation | 7 | Elevation, in feet, at the parcel centroid. |

The new, optional output field returns the elevation of the geocode at the parcel centroid in meters.

| Field | Length (with null terminator) | Description |
|---------------------------------|----------------------------------|---|
| outParCenElevationMeters | 7 | Elevation, in meters, at the parcel centroid. |

Additional Geocoder Output Fields

| Field | Length (with null terminator) | Description |
|-------------------------|----------------------------------|--|
| outAddrType | 2 | Address Type regarding number of units: <ul style="list-style-type: none">• S – Single unit• M – Multiple units• P – Post Office box• X – Unknown |
| outAPNID | 46 | Assessor's Parcel Number (APN) |
| outInclnd | 2 | Incorporated Place Indicator. <ul style="list-style-type: none">• I – Incorporated place• N – Not an incorporated place• X – Unknown |
| outLotSize | 11 | Lot size of the parcel expressed in square feet; 0 if none. |
| outLotSizeMeters | 11 | Lot size of the parcel expressed in square meters; 0 if none. |
| outMecLat | 13 | Latitude of Minimum Enclosing Circle expressed with an implied 6 digits of decimal precision; 0 if none. Example: 34809676 means 34.809676 |
| outMecLon | 13 | Longitude of Minimum Enclosing Circle expressed with implied 6 digits of decimal precision; 0 if none. Example: -92447089 means -92.447089. |
| outMecRad | 12 | Radius of Minimum Enclosing Circle (in feet) expressed as a whole number. Example: 1234 means 1,234 feet. |

| Field | Length (with null terminator) | Description |
|-----------------|----------------------------------|---|
| outMecRadMeters | 12 | Radius of Minimum Enclosing Circle (in meters) expressed with 1 digit of decimal precision; 0 if none. Example: 123.4 meters. |
| outPlace | 8 | TIGER Place code; 0 if none. |
| outResBus | 2 | Usage indicator <ul style="list-style-type: none"> • R – Residential use • B – Business use • M – Mixed use – residential and business • X – Unknown use |
| outTFID | 10 | TIGER Face Identifier. This field can be used to match to all Census geocodes using external data; 0 if none. |
| outUACE | 6 | TIGER Urban Area Identifier. Defines the urban area if any; 0 if none. |
| outUACEPop | 11 | Census population of the urban area; 0 if none. |
| outUrbanCity | 2 | Urbanicity Indicator. An indicator that defines per the Census the Urbanicity of the Address using TIGER UACE codes for categorization. <ul style="list-style-type: none"> • L – Large Urban Area (50,000 or greater population) • S – Small Urban Area (2,500-50,000 population) • R – Rural • X – Unknown |

Residential Delivery Indicator (RDI™)

The Residential Delivery Indicator (RDI™) is a United States Postal Service (USPS®) data product that identifies whether a delivery type is classified as residential or business. If you are shipping to residences, you may lower costs by shipping with the Postal Service™ and avoid residential delivery surcharges typically charged by other shipping companies.

Added a new enumerator (enum) and output status properties to support RDI.

Note: To use RDI, Delivery Point Validation (DPV) must also be initialized.

New Init Property

Opens the USPS RDI file (rdi.db) needed to return a value for the Residential Delivery Indicator; maximum of 255 characters.

Requires Delivery Point Validation (DPV).

| | |
|--------------|------------------------------|
| C | GS_INIT_RDI_DIRECTORY |
| COBOL | GS-INIT-RDI-DIRECTORY |
| JAVA | INIT_RDI_DIRECTORY |
| .NET | GS_INIT_RDI_DIRECTORY |

New Status RDI File Property

The new file status confirms the USPS RDI data (rdi.db) has loaded. Boolean. True = file loaded successfully. Default = False.

| | |
|--------------|-----------------------------|
| C | GS_STATUS_RDI_FILE_ALL |
| COBOL | GS- STATUS- RDI - FILE- ALL |
| JAVA | STATUS_RDI_FILE_ALL |
| .NET | GS_STATUS_RDI_FILE_ALL |

New RDI output enum

USPS Residential Delivery Indicator (requires DPV-confirmed ZIP+4)

Y= Residence, N = Business, Blank = Address was not presented to RDI or RDI data not loaded.

| | |
|--------------|-------------------|
| C | GS_RDI_RETCODE |
| COBOL | GS- RDI - RETCODE |
| JAVA | RDI_RETCODE |
| .NET | GS_RDI_RETCODE |

New Property RDI_DATAPATH (Optional)

Specifies the folder name and path for the Residential Delivery Indicator (RDI™) data, rdi.db. It is only required if you are using the RDI functionality in your application.

Syntax

RDI_DATAPATH = path/<file>

Type

String of path and file name.

C++ Example

RDI_DATAPATH = s:data\April05

Implementation

1. Set the `GS_INIT_RDI_DIRECTORY` init property to the directory containing the USPS RDI data (rdi.db).
Note: maximum of 255 characters.
2. Verify the `GS_STATUS_RDI_FILE_ALL` property is "True". This indicates the RDI data loaded successfully.
3. Process the addresses.
4. Values are returned in the GeoStan output field `GS_RDI_RETCODE`.
 - Y – address is a residence
 - N – address is a business
 - Blank – address was not presented to RDI or RDI data not loaded

Added output field (optional) for RDI

To retrieve the indicator, use this GeoStan output field:

| Output Field | Data Type | Width— | Number of | Description |
|-------------------|----------------------------|-----------------------------|------------------------|--|
| | N—numeric C—char string | includes null terminator | decimals if numeric | |
| RDIRetCode | C | 2 | 0 | USPS Residential Delivery Indicator (RDI) return code description: <ul style="list-style-type: none"> • Y = Residence • N = Business • Blank = Not processed through RDI. |

Geocoder and Geotest Changes

Added keywords to support Residential Delivery Indicator (RDI)

When using keywords in the Geocoder format file, remember:

- Keywords are not case sensitive.
- Lines that begin with open brackets ([) or semicolons (;) are comment lines
- The application ignores blank lines.
- Do not put quotation marks around strings.

| Keyword | Description |
|----------------------|---|
| outRDIRetCode | USPS Residential Delivery Indicator (requires DPV-confirmed ZIP+4) <ul style="list-style-type: none"> ▪ Y - Address is a residence ▪ N - Address is a business ▪ Blank - Address was not presented to RDI or RDI data not loaded |
| RDIDirectory | Directory containing Residential Delivery Indicator (RDI) data. |

Added support for RDI

- Initializing Geotest: updated the test.ini file by adding Line 15 (Optional) RDI data directory.
- Using Geotest: updated command line usage format with *RDIDataDir (-rp)*, the name of the directory containing RDI data.

```
geotest searchPath ZIP4File licenseFile password (-sp searchpath -z ZIP4File -l
licenseFile -lpw password) [-dp DPVDataDir -dk DPVSecurityKey] [-lp
LACSLinkDataDir -lk LACSLinkSecurityKey] [-tp SuiteLinkDataDir] [-rp
RDIDataDir][-gc] [-fml fileMemoryLimit] [-q] [-i initProps] [-c cacheSize] [-fp
findPropsPath]
```

Fixed Change Requests

The list below represents the change requests and software defects addressed in this release of GeoStan. Please review this list carefully to determine whether the following corrections apply to your situation.

| Item Number | Change Request | Description |
|----------------------|----------------|---|
| CENTRUS-10630 | | Fixed an issue where an input address with a post-directional resulted in incorrect multimatch returns. |
| CENTRUS-10758 | Case 14964838 | Corrected inconsistent results for an address by modifying the way USPS Preferred aliases are returned outside of the CASS match mode. |
| CENTRUS-11004 | | Improved handling of input addresses containing underscores; for example, __4750 Walnut St. 80301_. |
| CENTRUS-11005 | | Improved handling and matching of PO Box addresses that contain a “#” sign in front of the box number; for example, PO BOX #14. |
| CENTRUS-11030 | Case 17993814 | Fixed an issue where an input address containing multiple, single alpha characters and spaces was returning a segmentation fault error. 1 BOX T T #A now matches. |
| CENTRUS-11031 | Case 17999041 | Fixed an issue where an input address containing an intersection in the address line resulted in a multi-match which caused a crash. W Elkhorn Ave & S Monterey Ave., Cantua Creek, CA 93608 now processes correctly and returns match information. |
| CENTRUS-11032 | | Corrected an issue where multiple “NADCON files not found” error messages were returned when the files were not installed. |
| CENTRUS-11130 | | Fixed an issue where a system error was returned when only the “Return ZIP Code centroids” Centroid preference was selected, and no input ZIP was included when using 2-line address input. Now a non-match is returned instead. |

Known Issues

- To support DPV processing with point data, in addition to enabling the `GS_FIND_DPV` property, a new Find property must be set. The new `GS_FIND_ENABLE_CLASSIC_SORT` property sets the sort order to prioritize parcel centroids over other centroids. Setting this property restores the previous behavior to produce the expected DPV confirmation results for records that should DPV confirm. Default = False.

| | |
|--------------|---|
| C | <code>GS_FIND_ENABLE_CLASSIC_SORT</code> |
| COBOL | <code>GS- FIND- ENABLE- CLASSI C- SORT</code> |
| JAVA | <code>FIND_ENABLE_CLASSI C_SORT</code> |
| .NET | <code>GS_FIND_ENABLE_CLASSI C_SORT</code> |

- The false-positive report files are hard-coded in Geocoder, with the names `DPVfalsePos.rpt` and `LACStfalsePos.rpt`.
- DPV, LACSLink, and SuiteLink statistics are cumulative, containing a single set of statistics for all records processed thus far from all processes and threads.
- When you initialize DPV, LACSLink, and SuiteLink, GeoStan stores the directory paths in memory. If you terminate GeoStan with DPV and LACSLink, you will receive a success indicator, which means that GeoStan has changed the DPV, LACSLink, and SuiteLink data directory paths. However, the success is because GeoStan already has the paths loaded in memory, not because you have successfully changed the DPV, LACSLink, and SuiteLink directory. To successfully reset the DPV, LACSLink, and SuiteLink directory path, you must restart GeoStan.
- If using DPV, LACSLink, and SuiteLink data, we do not recommend limiting the memory being used by GeoStan. Because of the size of these files, we recommend that GeoStan operate on a dedicated server, so that the maximum amount of memory is available for processing.
- When using auxiliary files, if House Number Parity, Side of Street, and Segment Direction contain erroneous input values, the following behavior occurs:
 - House Number Parity** - GeoStan rejects the record as invalid.
 - Side of Street** - GeoStan accepts the record and uses the centerline of the street as the address location.
 - Segment Direction** - GeoStan accepts the record but changes the value to F (forward).

NOTE: If the value is left blank, GeoStan uses the default value.

- Due to limitations with the Windows platform, the `geocoder.exe` sample application cannot support output files over 2 GB.

Spatial+ 39.04

Known Issues

- Importing an ESRI shape file fails if the associated DBF file contains fields with widths greater than 128 characters.

GeoStan Canada 39.04

As of GeoStan Canada 38.04, Visual Basic is no longer supported.

Centrus Utilities (Geocoder, WinSplit and GSD Split)

Geocoder

Expanded search options with findSearchArea

Use this new configuration option to search within a city, its finance areas (groups of ZIP Codes as defined by the USPS), or by specifying the radius searched in miles.

To assist in finding a match when the input address contains limited or inaccurate city or ZIP Code information, set **findSearchArea** to one of the following:

| findSearch Area options | Description |
|-------------------------|---|
| 0 | (default) Searches the specified city. |
| 1 | Searches the entire Finance Area for possible streets. Note: This option has no effect when performing a ZIP centroid match. |
| 2 | Search area expanded; this value has two options: <ul style="list-style-type: none">• findExpandedRadius - specify the radius in miles (up to 99) to search around the area defined by the Last-line lookup information. The default radius setting is 25 miles.• findExpLimitState<ul style="list-style-type: none">○ 0 = Allow search to cross state boundaries. To limit the search to the state, even if the radius extends past state borders, set this property to True (the default setting).○ 1 = default Search is limited to existing state Note: The search area cannot be changed in CASS match mode. |

Fixed Change Requests

Change requests and software defects addressed in this release of Centrus Utilities are listed below. Please review carefully to determine whether the following corrections apply to your situation.

| Item Number | Change Request | Description |
|---------------|----------------|--|
| CENTRUS-11371 | Case 20582695 | Fixed an issue where region files created by GSD Split were unable to be displayed on a map. |

Known Issues

- When using any external indexes in a GSI file (such as POI, State-wide Intersection and Enhanced Alias), you cannot use WinSplit or GSD Split.
- If data required to run WinSplit and GSD Split is not on a local directory, the utilities create empty files when extracting data from the use.gsd, uste.gsd, usw.gsd, and ustw.gsd files. Delete any empty GSD files to avoid mistaking them for valid GSD files.

Database Compatibility

NOTE: There are no data format changes to the street and point data sets for this release.

Platform-Specific Changes

New Platform

- No changes in this release
- Official support for Windows Server 2019 is expected by the year-end

Retired Platform

Please note that we are no longer supporting:

- HPUX 11i
- SUSE Linux 10

Platform Retirement Notice

This is the last release we will support the following platforms:

- Windows 7
- Windows Server 2008

Minimum Supported Levels

The minimum supported level for JAVA is 1.7.

AIX

By default, AIX processes use 256 MB of memory. With this release of GeoStan, the memory usage has been increased and we have seen some undesired behavior. To avoid encountering this behavior please update your environment with the variable list below prior to starting your daemon:

```
export LDR_CNTRL=MAXDATA=0xN0000000  
rc.osseal start
```

NOTE: where N is in 0xN0000000, N can be any number 1 through 8.

For Further Assistance

If you have any questions about this release, please refer to the contact information on our website:

<https://www.pitneybowes.com/us/contact-dcs.html>

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