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Introduction to the Migration Guide for Data Packs

Beginning July 31, 2023, SAS will no longer support or provide updates to the following data packs:

- US Address Verification (USPS)
- North America Postal Level Geocode (includes PhonePlus)
- Canada Address Verification (Canada Post SERP (Software Evaluation and Recognition System) version 2, release 2 (V2R2))
- US Street Level Geocode (except for Loqate geocode data)

Users who want to perform US/Canada address verification and geocode jobs, must migrate to the Loqate data packs listed below, prior to July 31, 2023.

- Loqate US Data
- Loqate Data (includes Canada)

After July 31, 2023, the SAS Data Management Studio jobs that rely on the discontinued data packs fail, and you will receive license errors. The nodes that are affected by these changes include the following:

Data Job Nodes

- Address Update Lookup
- Address Verification (US/Canada)
- US City/State/ZIP Lookup
- US City/State/ZIP Validation
- Geocoding
- Street-level Geocoding
- Canadian Postal Lookup
- Distributed Address Verification
- Distributed Geocoding

Process Job Nodes

- Address Update Audit Report
- Address Update Monthly Reports
- Address Update Process Summary Report

The SAS Data Management Studio and Server 2.9: Migration Guide for Data Packs provides information about how to migrate your US and Canada Address Verification jobs, along with Geocoding jobs to use the **Loqate** node.

Before You Begin

The SAS Data Management Studio and Server 2.9: Migration Guide for Data Packs shows users how to complete the following tasks:

- Update system files to use the **Loqate** node for United States and Canada address verification and geocoding.
- Update existing data jobs to use the **Loqate** node instead of the **Address Veri**fication (US/Canada) node.

NOTE: Migration to Loqate for US/Canada address verification and geocoding is supported for SAS Data Management Studio and SAS Data Management Server 2.7 and later. If you have an earlier version of the software, contact your SAS account manager for a supported version of SAS Data Management Studio and SAS Data Management Server.

Preparing Your System

Obtain a License

Contact your SAS account manager to obtain new license files that include the required Loqate US/Canada data pack products.

Required Patches

Next, you must apply patches to SAS Data Management Studio and SAS Data Management Server to enable the Loqate data for US and Canada.

Access the SAS Note at **http://support.sas.com/kb/69827** to access the hot fix for this step.

Download Reference Data – United States

Before you begin, you must log in to the SAS Support website to download the Loqate US enrichment data.

NOTE: American Samoa, Guam, Northern Mariana Islands, Puerto Rico, and the US Virgin Islands are included in the Loqate US Data Pack.

Please follow these steps:

- Navigate to the SAS Downloads site: https://support.sas.com/downloads/browse.htm?fil=3&cat=16.
- 2. Click Loqate US Data.

All Downloads

Downloads

DataFlux Data Updates

Version / Release A - Z Release Date

- Any SAS Release
 - Canada Address Verification (Canada Post SERP Current Version 2 Release 2, V2R2)
 - Logate Data
 - Logate US Data
 - North America Postal Level Geocode (includes PhonePlus)
 - US Address Verification (USPS)
 - US Street Level Geocode
- 3. Download both the **Loqate US Data** and the **Loqate US Data Setup** files for your operating system.
- 4. Once the files are downloaded, run the Loqate US Data Setup file (-xc.exe or -xc.tar.gz). Setup creates a subdirectory for the data files just like a normal reference file installation (for example, C:\Program Files\SAS\Veri-fyData\data\XXXX\world).
- 5. Unzip the Loqate US Data file (-usx.zip or -usx.tar.gz) into the directory that was created as part of the Loqate US Data Setup file setup.

Download Reference Data - Canada

Before you begin, you must log in to the SAS Support website to download the Loqate Canada enrichment data. Please follow these steps:

- Navigate to the SAS Downloads site: https://support.sas.com/downloads/browse.htm?fil=3&cat=16.
- 2. Click Loqate Data.
- 3. Download the **Loqate Canada Data** files for your operating system.



Loqate Datapacks for World Regions

Important Notes:

- Update March 30, 2023 A new package was added for Canada. The Brazil package was split into two packages, Brazil Part 1 and Brazil -
- Update January 25, 2023 The following countries were moved from the South Western Europe package into a new package that was adde ES, GI, and PT.

Loqate Data									
Platform	Description	Request Download	Size	Release Date	ReadME				
Microsoft® Windows®	Africa	dfdpworld_2303_vdata-af.exe	634MB	2023-03					
Microsoft® Windows®	Brazil - Part 1	dfdpworld_2303_vdata-br.exe	694MB	2023-03					
Microsoft® Windows®	Brazil - Part 2	dfdpworld2303vdata-brg.exe	1.4GB	2023-03					
Microsoft® Windows®	Canada	dfdpworld_2303_vdata-cc.exe	1.3GB	2023-03					
Microsoft® Windows®	Central America	dfdpworld_2303_vdata-ca.exe	990MB	2023-03					

Once the file is downloaded, run the Loqate Canada Data file (-cc.exe or - cc.tar.gz). Setup creates a subdirectory for the data files (for example, C:\Program Files\SAS\VerifyData\data\XXXX\world).

Copy Loqate License Key into the Data Folder

Once the Loqate reference data is downloaded and installed, copy a license.lfs file from the SASDataManagementStudio/version/bin folder to the Loqate data folder.

Note: If you are using SAS Data Management Studio version 2.7 or if you do not get output after running the job, your license.lfs is expired. Contact SAS Technical Support for an updated license.lfs file.

1. Navigate to the bin folder in your Data Management Studio directory. For example: C:\Program Files\SASHome\SASDataManagementStudio\2.9\bin.

Files > SASHome > DataFluxDataManag	ementStudio > 2.9 > bin	```	5	Q	
Name ^	Date modified	Туре	Size		
🚳 libapr-1.dll	8/5/2019 11:43 AM	Application exten	16	9 KB	
📿 libcheck.exe	6/8/2020 5:18 PM	Application	3	7 KB	
libdmtk.dll	8/4/2020 5:17 PM	Application exten	36	4 KB	
🗋 license.lfs	7/17/2020 8:13 AM	LFS File	118 KE		
LicenseManagerModule.dll	7/13/2020 5:17 PM	Application exten	6	4 KB	
🖳 LicMan.exe	7/13/2020 5:17 PM	Application	4	7 KB	

2. Copy the license.lfs file.

3. Paste the license.lfs file into the Loqate data folder.

Windows (D:) > Program Files > Data	aFlux > VerifyData > data > 2204	> world ~	ۍ م
Name ^	Date modified	Туре	Size
format.lfs	4/22/2022 10:04 AM	LFS File	74,234 KB
🗋 license.lfs	7/8/2022 2:04 PM	LFS File	127 KB
🔊 loqate.ini	4/22/2022 10:04 AM	Configuration sett	5 KB
Lx_AA.Ifs	4/22/2022 10:04 AM	LFS File	98 KB

- Navigate to the app.cfg file. For example, C:\Program Files\SASHome\SASDataManagementStudio\2.9\folder\app.cfg.
- 5. Edit the app.cfg file to include the VERLQT/LOQATE_DATA_PATH entry. For example, the Windows path to the Loqate data, VERLQT/LOQATE_DATA_PATH-H=C:\Program Files\SAS\VerifyData\data\XXXX\world.

Job Modifications

United States

This section covers changes that are required for the United States data for address verification. Follow the steps below to modify your SAS Data Management Studio job to use a **Loqate** node instead of the **Address Verification (US/Canada)** node.

NOTE: Refer to the section, **Introduction to the Migration Guide for Data Packs** for information about migrating your SAS Data Management Studio **Address Verification (US/Canada)** jobs to **Logate**.

SAS Job Using the Address Verification (US/Canada) Node

1. In this screenshot, there is a text input file on the left side of the data flow and an HTML output on the right. The **Address Verification (US/Canada)** node, in the center of the flow, is set up to process US addresses.



- In the following screenshot, you can review the properties of the Address Verification (US/Canada) node for the United States. In this example, there are three parts:
 - Part 1 These are the **Input** fields for the node. Please remember that you need at a minimum an address line and either a city and state or a

ZIP code for the node to be able to verify an address.

- Part 2 In the **Options** window, you can tell the node which parts and pieces of the reference data to use when verifying US addresses. It is recommended to use DPV, LACS, and eLOT. Please note that these options are different in the **Logate Address Verification** node.
- Part 3 Determine which output fields are needed and select those for output in the node.

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	9	9219 S. BISHOP ST.	CHICAGO IL 60620	9219 S BISHOP	ST	CHICAGO	IL	Correct Large Volume Receivers	
	10	2078 FRANKLIN AVE EAST	SEATTLE WA 98102	2078 FRANKLIN	AVEE	SEATTLE	WA	Pass valid addresses through	5
	11	1250 N. 113TH ST.	MILWAUKEE WI 53226	1250 N 113TH	ST	MILWAUKEE	WI		-
	12	522 MONTROSE DRIVE	GREENSBORO NC 27410	522 MONTROS	E DR	GREENSBORO	NC	OK Cancel	5

3. Next, a **Loqate** node is added to the design canvas and the source and targets are connected to the **Loqate** node.

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5	4 3856 RUSKIN ST.	HOUSTON TX 77005		

- 4. Once you have configured the **Loqate** node, you can delete the **Address Veri**fication (US/Canada) node.
- 5. The **Loqate** node is now added, and the source and targets are connected to the **Loqate** node.

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4 3856 RUSKIN ST.	HOUSTON TX 77005				

6. Here is the **Properties** for the **Address** tab within the **Loqate** node.

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		PostalCodeSecondary	US_ZIP4	
		PremiseNumber	US_Street_Number	_
		AccuracyCode	AccuracyCode	
		CountryName	Country	
		SuperAdministrativeArea	SuperAdministrativeArea	
		SubAdministrativeArea	SubAdministrativeArea	
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- Part 1 These are the **Input** fields for the node. Remember that you need, at a minimum, an address line and either a city and state or a ZIP code for the node to be able to verify an address.
- Part 2 Determine which output fields are needed and select those for output. See the Field Mappings document for a detailed explanation of the different field output tokens, as the names are different within the Loqate node.

NOTE: To rename the **Output Names**, double-click the **Output Name** field and select **Rename**.

• Part 3 - Select **USA** as the default country code.



Configuring the Settings Tab within the Loqate Node

1. In the next screenshot, the **Properties** for the **Settings** tab, within the Loqate node, you see the following information:

- Part 1 You can rename the node in the name field in case you are performing branching within a job and have multiple Loqate nodes.
- Part 2 Determine the output casing for the Loqate node. The options include the following:
 - Upper (SAN FRANCISCO)
 - Title (San Francisco)
 - Lower (san francisco)

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Output2	
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- 2. In the next screenshot, the **Properties** for the **Additional Outputs** tab is shown.
 - Part 1 Select which input fields get passed along to the output file. Note that by default no input fields are passed along, they will need to be selected by the user and after selection they can be renamed.



Previewing Address Verification (US/Canada) Output

The following screenshot displays the preview of the configured **Address Verification (US/Canada)** node. This shows the original data and the validated address data. You can tell that this is validated and enriched data because the output now has a ZIP+4 field, as well as a parsed last line field. Please note the **Numeric Result Code** field, which shows you the level of verification achieved.

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Previewing Loqate Output

Next, see the preview for the **Address Verification (US/Canada)** node. This shows the original data and the validated address data. You can tell this is validated and enriched data because the output now has a ZIP+4 field, as well as a parsed last line field. Please note the **AccuracyCode** field, which shows you the level of verification achieved.

NOTE: By renaming columns, you can replicate all the output fields that were generated in the **Address Verification (US/Canada)** node preview. An **Expression** node can be added that converts the **Loqate Accuracy Code** over to a **US_Result_Code** field, if needed.

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	2 692 BIRCH STREET	SCRANTON PA 18505	692 Birch St	Scranton	PA	18505-4255	18505	4255	692	V44-I44-P7-100	
	3 269 ALDEN ST.	SPRINGFIEL MA 01109	269 Alden St	Springfield	MA	01109-3707	01109	3707	269	V44-I44-P7-098	
	4 3856 RUSKIN ST.	HOUSTON TX 77005	3856 Ruskin St	Houston	ТХ	77005-4331	77005	4331	3856	V44-I44-P7-100	
	5 7920 WOODMONT AVE. SUITE 200	BETHESDA MD 20814	7920 Woodmont Ave Ste 200	Bethesda	MD	20814-3099	20814	3099	7920	V44-I55-P7-100	
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Canada

Background

This section covers changes that are required for the Canada data for address verification. Follow the steps below to modify your SAS Data Management Studio job to use a **Loqate** node instead of the **Address Verification (US/Canada)** node.

NOTE: Refer to the section, **Introduction to the Migration Guide for Data Packs** for information about migrating your SAS Data Management Studio **Address Verification (US/Canada)** jobs to **Logate**.

Step 1 - SAS Job Using the Address Verification (US/Canada) Node

In this initial screenshot, there is a text input file on the left side of the data flow and an HTML output on the right. The **Address Verification** node in the center of the flow is set up to process Canadian addresses.

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a Ad	3 8200 JONES RD	104	RICHMOND	BC	V6Y 3Z2		
peu	4 2490 2ND AVE W	203	VANCOUVER	BC	V6K 1J6		
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	6 7421 AMBASSADOR CRES		WHISTLER	BC	VON 1B7		
	7 456 ROSELAWN AVE		TORONTO	ON	M5N 1J8		
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Step 2 – Reviewing the Properties of the Address Verification (US/Canada) Node

In the screenshot below, you see the properties of the **Address Verification (US/Canada)** node for Canada.

- Part 1 These are the **Input** fields for the node. Remember that you need, at a minimum, an address line and either a city and state or a ZIP code for the node to be able to verify an address.
- Part 2 In the **Options** window, you can tell the node which parts of the reference data to use when verifying Canadian addresses. Please note that these options are different in the **Logate Address Verification** node.
- Part 3 Determine which output fields you need and select those for output in the node.

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Step 3 – Adding the Loqate Node to a SAS Job

In the screenshot below, a **Loqate** node is added to the design canvas and the source and targets are connected to the **Loqate** node. Once everything is configured, the **Address Verification (US/Canada)** node can be deleted.

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Step 4 – Configuring the Address Tab within the Loqate Node

In the next screenshot, you see the **Properties** for the **Address** tab within the **Loqate** node.

Part 1 - These are the **Input** fields for the node. Remember that you need, at a minimum, an address line and either a city and state or a ZIP code for the node to be able to verify an address.

Part 2 -Determine which output fields you need and then select them for output. Please review the **Field Mappings** document for a detailed explanation of the different field output tokens, as the names are different within the **Logate** node.

NOTE: You can rename Output Names by, double-clicking the **Output Name** field and rename.

Part 3 - Select CAN as the default country code.

In the **Output** field ribbon , click the **Moved Checked to Top** icon to move all the selected output fields to the top of the list.

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Configuring the Settings Tab within the Loqate Node

In the next screenshot, you can see the properties for the **Settings** tab within the **Loqate** node.

- Part 1 You can choose to rename the node in the **Name** field in case you are performing branching within a job and have multiple **Logate** nodes.
- Part 2 Determine the output casing for the **Loqate** node. The options available include the following:
 - Upper (VANCOUVER)
 - Title (Vancouver)
 - Lower (vancouver)
- Part 3 Determine the output script for the **Logate** node. For example:
 - Latn Latin (Montreal)
 - Native (Montréal)

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Configuring the Additional Outputs Tab within the Loqate Node

In the screenshot below, you see the **Properties** of the **Additional Outputs** tab within the **Loqate** node.

Part 1 - Select which input fields are passed to the output file. Please note that by default no input fields are passed. You must select the fields.

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Previewing Address Verification (US/Canada) Output

In the next screenshot, a configured **Address Verification (US/Canada)** node is being previewed to show the original data and the validated address data. You can tell that this is validated and enriched data because the output has a <code>ZIP/Postal_Code</code> and the <code>Canada_Result_Code</code> that contains a <code>O</code> indicating that it was successfully verified. The <code>Canada_Result_Code</code> can tell you why verification of the address failed.

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Previewing Loqate Output

In the screenshot below, a configured **Loqate** node is previewed to show the original data and the validated address data. You know that this is validated and enriched data because the output now has a populated ZIP/Postal_Code. Note that the **AccuracyCode** field "V" shows you that a complete match was made between the input and the reference data.

NOTE: By renaming columns, you can replicate all the output fields that were generated in the **Address Verification (US/Canada)** node preview. An **Expression** node can be added that converts the **Loqate Accuracy Code** field over to a **Canada_Result_Code** field if that is the desired output.

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Geocode

NOTE: Refer to the section, **Introduction to the Migration Guide for Data Packs** for information about migrating your SAS Data Management Studio **Address Verification (US/Canada)** jobs to **Logate**.

Optional Address Verification Steps

Adding Expression Engine Language (EEL) Code for Loqate Accuracy Code Equivalency with the US Numeric Result Code

In the example below, an **Expression** node has been added to the job flow with an EEL to create a Result Code equivalency between the **Loqate Accuracy Code** and the US_Numeric_Result_Code.

NOTE: The EEL shown below is a sample and is not representing all potential US_Numeric_Result_Codes.



Adding EEL Code for Loqate Accuracy Code Equivalency with the Canada Result Code

The next example displays an **Expression** node that has been added to the job flow with an EEL to create a Result Code equivalency between the **Loqate Accuracy Code** and the Canada_Result_Code.

NOTE: The EEL shown below is a sample and does not represent all potential Canada_Result_Codes.



Reference Information

Loqate Reference Data Source for SAS Data Management Server

Only after configuration is validated and jobs have been edited in SAS Data Management Studio can a similar configuration be set up for SAS Data Management Server. It is important that your Loqate jobs run successfully in SAS Data Management Studio before you proceed to this next step.

Adding a Loqate Reference Data Source to SAS Data Management Server

Your SAS Data Management Server instance can be installed on several platforms. However, you need to modify the app.cfg file for your SAS Data Management Server instance. Here is an example for Windows:

- 1. Navigate to the **etc** folder in your SAS Data Management Server directory. For example: C:\Program Files\SASHome\SASDataManagementServer\2.9\etc.
- 2. Edit the app.cfg file and add a VerLQT/Loqate_Date Path entry for example, VERLQT/LOQATE_DATA_PATH=C:\Program Files\SAS\VerifyData\data\XXXX\world.
- 3. Confirm that your SAS Data Management Server points to the correct Loqate Data directory.

Loqate Output Fields

For more information about Loqate and its address or geocoding output fields, see the following websites for additional information:

- Address Output Fields: https://support.logate.com/documentation/fielddescrip/addfields/
- Geocode Output Fields: https://support.logate.com/documentation/fielddescrip/geocode-fields/
- GeoAccuracy Code: https://support.loqate.com/documentation/reportcodes/geoaccuracy-code/
- Address Verification Code: https://support.loqate.com/documentation/reportcodes/address-verificationcode/

Note: Environments and circumstances are different. This document does not document every scenario. Please contact SAS Technical Support if you need assistance.

Canadian Result Codes

Indicates whether the address was successfully verified. In case the address was not successfully verified, the Canada Return Codes shown in the following table indicate the cause of address verification failure.

DESCRIPTION
No Error Occurred
Internal Error
Cannot load database
Invalid - Unspecified reason
Invalid civic number
Invalid street
Invalid unit
Invalid delivery mode
Invalid delivery installation
Invalid city
Invalid province
Invalid postal code
Address is not Canadian

Canadian Result Codes

US Result Codes

Indicates whether the address was successfully verified. In case the address was not successfully verified, a US Return Code indicates the cause of address verification failure, as shown in the following table:

TEXT RESULT CODE	NUMERIC RESULT CODE	DESCRIPTION
OK	0	Address was verified successfully.
PARSE	11	Error parsing address. Components of the address might be missing.
CITY	12	Could not locate city/state or ZIP in the USPS database. At least (city and state) or ZIP must be present in the input.
MULTI	13	Ambiguous address. There were two or more possible matches for this address with different data.
NOMATCH	14	No matching address found in the USPS data.
OVER	15	One or more input strings is too long (maximum 100 char- acters).

US Result Codes

Loqate Address Verification Code

A Logate Address Verification Code can be broken into the following parts:



See https://support.loqate.com/documentation/reportcodes/address-verification-code/ for more information.

Address Verification Code – Verification Status

CODE	DESCRIPTION
V	Verified – A complete match was made between the input data and a single record from the available reference data
Р	Partially Verified - A partial match was made between the input data and a single record from the available reference data
А	Ambiguous - More than one close reference data match
R	Reverted - Record could not be verified to the specified minimum acceptable level. The output fields contain the input data
U	Unverified - Unable to verify. The output fields contain the input data
-	Address Verification Code - Verification Status

Post-Processed Verification Match Level

The post-processed verification match level gives the level to which the input data matches the available reference data once all changes and additions performed during the verification process have been taken into account.

CODE	DESCRIPTION						
5	Delivery Point (PostBox or SubBuilding)						
4	Premise (Premise or Building)						
3	Thoroughfare						
2	Locality or PostalCode						
1	AdministrativeArea						
0	None						

Post-Processed Verification Match Level

Pre-Processed Verification Match Level

The pre-processed verification match level gives the level to which the input data matches the available reference data prior to any changes or additions performed during the verification process.

CODE	DESCRIPTION
5	Delivery Point (PostBox or SubBuilding)
4	Premise (Premise or Building)
3	Thoroughfare
2	Locality or PostalCode
1	AdministrativeArea
0	None

Pre-Processed Verification Match Level

Parsing Status

CODE	DESCRIPTION
Ι	Identified and Parsed – All input data has been able to be identified and placed into components.
U	Unable to parse – Not all input data has been able to be identified and parsed.

Parsing Status

Lexicon Identification Match Level

The lexicon identification match level gives the level to which the output data has some recognized form, through the use of pattern matching. For example, a numeric value could be a premise number and lexicon matching 'rd' could be a ThoroughfareType, 'Road'; 'London' could be a Locality.

CODE	DESCRIPTION
5	Delivery Point (PostBox or SubBuilding)
4	Premise (Premise or Building)
3	Thoroughfare
2	Locality or PostalCode
1	AdministrativeArea
0	None

Lexicon Identification Match Level

Context Identification Match Level

The context identification match level gives the level to which the output data can be recognized based on the context in which it appears. This is the least accurate form of matching and is based on identifying a word as for example, a Thoroughfare based on it being preceded by something that could be a Premise. Then followed by something that could be a Locality, the latter items being identified through a match against the reference data or the lexicon.

CODE	DESCRIPTION
5	Delivery Point (PostBox or SubBuilding)
4	Premise (Premise or Building)
3	Thoroughfare
2	Locality or Postal Code
1	AdministrativeArea
0	None

Context Identification Match Level

Postcode Status

P8 PostalCodePrim P7 PostalCodePrim	ary and PostalCodeSecondary verified ary verified, PostalCodeSecondary added or changed ary verified
P7 PostalCodePrim	ary verified, PostalCodeSecondary added or changed ary verified
D6 DectalCodeDrim	ary verified
Po PostalCouePhili	
P5 PostalCodePrim	ary verified with small change
P4 PostalCodePrim	ary verified with large change
P3 PostalCodePrim	ary added
P2 PostalCodePrim	ary identified by lexicon
P1 PostalCodePrim	ary identified by context
P0 PostalCodePrim	ary empty

Postcode Status

Matchscore

The matchscore indicates how much the input data has been changed during the verification process to achieve the post-processed verification match level. The result 100% means that no changes have been made. Data additions are not measured by the matchscore, only changes. Generally, a matchscore of 95 or above indicates that only a character or two have been changed during the process. If the input data is less clean, then a threshold of 80 might be considered, since significantly larger changes to the input data are then allowed. Note that this value gives no indication of the level of verification, that is given by the post-processed verification match level.

Geocoding Status

CODE	DESCRIPTION	
Р	A single geocode was found matching the input address.	
Ι	A geocode was able to be interpolated from the input address's location in a range.	
А	Multiple candidate geocodes were found to match the input address, and an average of these was returned.	
U	A geocode was not able to be generated for the input address.	
Geocoding Status		

GeoAccuracy Code – Geocoding Level

CODE	DESCRIPTION
4	Premise (Premise or Building)
3	Thoroughfare
2	Locality
1	AdministrativeArea
0	None

GeoAccuracy Code - Geocoding Level

GeoDistance Definition

This field holds the radius of accuracy in meters, giving an indication of the likely maximum distance between the given geocode and the physical location. Please note that this field is derived from and therefore dependent on the accuracy and coverage of the underlying reference data.