

**DRAFT Voter Records Interchange  
Common Data Format Specification**

**Version 1.0**

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This publication is available free of charge from:  
<http://dx.doi.org/10.6028/NIST.SP.1500-102>

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## **Reports on Computer Systems Technology**

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### **Abstract**

This document presents a specification for voter records data interchange related to voter registration, i.e., registration requests from online voter registration made to voter registration systems, and responses to the requests returning from the voter registration system. The specification includes XML (eXtensible Markup Language) and JSON (JavaScript Object Notation) schemas.

### **Keywords**

Common data format (CDF); FPCA; JSON; NVRA; voter registration; VVSG; XML.

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## Executive Summary

Voter records are exchanged between an increasing number of entities. Whether it is voter registration offered during an interaction at the motor vehicles agency (MVA), an update to a voter record using an online portal, records exchanged as part of a voter matching database, or requests for absentee ballots, all of these systems need a common data format to effectively communicate.

However, the data exchanged is generally in a non-uniform format, which causes a number of complications in that each state/territory or sometimes each individual portal application may have its own format that must be interpreted and translated on the receiving end. Voter addresses, in particular, are often provided to VR authorities in formats that are difficult to efficiently store in voter registration databases and subsequently used in various related applications. The collection of accurate voter registration address information is central to the routing of voter registration requests and subsequently in assigning voters to election districts. Each voter records application being developed must then be aware of each state's specific formats or design its own format, which complicates development and inhibits the implementation of digital voter record systems.

The purpose of this specification is to assist election officials and developers in more easily implementing and supporting the development of OVR systems by providing to them a uniform common data format for voter records interchange (VRI), that is, the voter registration requests and responses needed for OVR. The languages used in the common data format are XML (eXtensible Markup Language) and JSON (JavaScript Object Notation).

The advantages of using this specification include:

- Providing a ready data interchange format for online voter registration systems to remove the need for individual OVR system development projects to define their own data models and formats.
- Assisting election officials by reducing or eliminating non-standard exchange formats for voter registration data.
- Providing a baseline CDF (common data format) for voter registration data that can be continually refined to be more efficient and adaptable across all states.
- Providing the foundation for additional use cases in the future, which could include matching driver's license data between the MVA/DMV and OVR systems, automated notifications between the DMV and OVR systems, electronic pollbook record maintenance, cross-state record matching, or facilitating data reporting for the Election Administration and Voting Survey (EAVS).

This specification provides background and explanation of how online voter registration typically works, using the data required by the National Voter Registration Act (NVRA) and Federal Post Card Application (FPCA) voter registration forms, including state-specific additions

to these forms. It then contains an explanation of a UML (Unified Markup Language) model that was created to detail the data elements required in voter registration requests and responses. The UML model was used to generate XML and JSON schemas, which are both explained and used in various implementation examples.

The intended audience of this specification includes election officials, VR system designers and developers, as well as others in the election community including the general public. Some background in election administration and registration is useful in understanding the material in this specification.

## Table of Contents

<b>Executive Summary .....</b>	<b>6</b>
<b>1 Introduction .....</b>	<b>13</b>
1.1 Purpose.....	13
1.2 Audience .....	14
1.3 Motivation and Methodology .....	14
1.4 Document Structure.....	15
<b>2 Overview of Digital OVR Transactions.....</b>	<b>17</b>
2.1 Voter Records Request .....	19
2.2 Voter Records Response .....	24
2.3 Including State-specific Request and Response Items .....	27
2.4 Dealing with Addresses - The U.S. Thoroughfare, Landmark, and Postal Address Data Standard.....	28
2.4.1 Thoroughfare Classes .....	30
2.4.2 Landmark Classes .....	30
2.4.3 Postal Delivery Classes .....	31
2.4.4 General Address Class and Handling Non-U.S. Addresses .....	31
<b>3 Voter Records Interchange UML Model Documentation .....</b>	<b>33</b>
3.1 Class AdditionalInfo .....	33
3.2 Class BallotRequest .....	34
3.3 Class BallotStyle .....	35
3.4 Class ContactMethod .....	36
3.5 Class Election .....	37
3.6 Class ElectionAdministration .....	38
3.7 Class ElectionBasedBallotRequest.....	39
3.8 Class Error .....	40
3.9 Class ExternalIdentifier .....	41
3.10 Class File .....	42
3.11 Class Image .....	43
3.12 Class LatLng.....	44



3.13 Class Location .....	45
3.14 Class Name .....	46
3.15 Class Party.....	47
3.16 Class PermanentBallotRequest .....	48
3.17 Class PhoneContactMethod .....	49
3.18 Class ReportingUnit.....	50
3.19 Class RequestAcknowledgement .....	51
3.20 Class RequestHelper.....	52
3.21 Class RequestProxy .....	53
3.22 Class RequestRejection .....	55
3.23 Class RequestSuccess .....	56
3.24 Class Signature .....	57
3.25 Class TemporalBallotRequest.....	58
3.26 Class Voter .....	59
3.27 Class VoterClassification.....	61
3.28 Class VoterId .....	62
3.29 Class VoterParticipation .....	63
3.30 Class VoterRecord .....	64
3.31 Class VoterRecordResults .....	66
3.32 Class VoterRecordsRequest.....	67
3.33 Class VoterRecordsResponse .....	69
3.34 Enumeration AssertionValue.....	70
3.35 Enumeration BallotReceiptMethod .....	71
3.36 Enumeration ContactMethodType .....	72
3.37 Enumeration IdentifierType .....	73
3.38 Enumeration PhoneCapability.....	74
3.39 Enumeration ReportingUnitType.....	75
3.40 Enumeration RequestError.....	77
3.41 Enumeration RequestForm .....	78
3.42 Enumeration RequestMethod .....	79

3.43 Enumeration RequestProxyType .....	81
3.44 Enumeration SignatureSource .....	82
3.45 Enumeration SignatureType .....	83
3.46 Enumeration SuccessAction .....	84
3.47 Enumeration VoterClassificationType .....	85
3.48 Enumeration VoterHelperType .....	87
3.49 Enumeration VoterIdType .....	88
3.50 Enumeration VoterRequestType .....	89
3.51 Enumeration VoterStatus .....	90
<b>4 XML and JSON Usage Examples .....</b>	<b>91</b>
4.1 Example 1: NVRA-style Voter Registration Request in XML .....	91
4.2 Example 2: NVRA-style Voter Registration Request in JSON .....	96
4.3 Example 3: NVRA-style Voter Records Response in XML .....	100

### List of Appendices

<b>Appendix A— Acronyms .....</b>	<b>102</b>
<b>Appendix B— Glossary .....</b>	<b>104</b>
<b>Appendix C— References .....</b>	<b>106</b>
<b>Appendix D— File Download Locations .....</b>	<b>108</b>

### List of Figures

Figure 1 - National Voter Registration Act (NVRA) form .....	17
Figure 2 - Federal Post Card Application (FPCA) form .....	18
Figure 3 - Voter Registration Use Case .....	20
Figure 4 - Voter Records Request UML Class Diagram .....	22
Figure 5 - Voter Records Request UML Enumerations .....	23
Figure 6 - Voter Records Response UML Class Diagram .....	26

Figure 7 - FGDC Address Types Mapped to Single Address Attribute .....	29
Figure 8 – AdditionalInfo .....	33
Figure 9 - BallotRequest.....	34
Figure 10 - BallotStyle .....	35
Figure 11 – ContactMethod.....	36
Figure 12 - Election .....	37
Figure 13 - ElectionAdministration .....	38
Figure 14 - ElectionBasedRequest .....	39
Figure 15 - Error .....	40
Figure 16 - ExternalIdentifier .....	41
Figure 17 - File.....	42
Figure 18 - Image .....	43
Figure 19 - LatLng .....	44
Figure 20 - Location.....	45
Figure 21 - Name.....	46
Figure 22 - Party .....	47
Figure 23 - PermanentBallotRequest .....	48
Figure 24 - PhoneContactMethod.....	49
Figure 25 - ReportingUnit.....	50
Figure 26 - RequestAcknowledgement.....	51
Figure 27 - RequestHelper .....	52
Figure 28 - RequestProxy .....	53
Figure 29 - RequestRejection .....	55
Figure 30 - RequestSuccess.....	56
Figure 31 - Signature.....	57
Figure 32 - TemporalBallotRequest.....	58
Figure 33 - Voter.....	59
Figure 34 - VoterClassification .....	61
Figure 35 - VoterId.....	62
Figure 36 - VoterParticipation .....	63
Figure 37 - VoterRecord.....	64
Figure 38 - VoterRecordResults .....	66

Figure 39 - VoterRecordsRequest .....	67
Figure 40 - VoterRecordsResponse .....	69
Figure 41 – AssertionValue .....	70
Figure 42 - BallotReceiptMethod .....	71
Figure 43 - ContactMethodType .....	72
Figure 44 - IdentifierType .....	73
Figure 45 - PhoneCapability .....	74
Figure 46 - ReportingUnitType .....	75
Figure 47 - RequestError .....	77
Figure 48 - RequestForm .....	78
Figure 49 - RequestMethod .....	79
Figure 50 - RequestProxyType .....	81
Figure 51 - SignatureSource .....	82
Figure 52 - SignatureType .....	83
Figure 53 - SuccessAction .....	84
Figure 54 - VoterClassificationType .....	85
Figure 55 - VoterHelperType .....	87
Figure 56 - VoterIdType .....	88
Figure 57 - VoterRequestType .....	89
Figure 58 - VoterStatus .....	90
Figure 59 - Example NVRA-style form for a voter address update request .....	91
Figure 60 - Example NVRA-style form for a voter registration request .....	96
Figure 61 - Populated NVRA voter registration response form .....	100

## 1 Introduction

This document is a specification for a common data format (CDF) for voter records data interchange related to voter registration, e.g., registration or ballot requests from online voter portals made to voter registration (VR) systems, and responses to the requests returning from the VR system. The specification includes an XML (eXtensible Markup Language) [1] schema and references a JSON (JavaScript Object Notation) [2] schema.

The primary features of this specification include:

- A data format for voter registration requests and responses when using the NVRA (National Voter Registration Act) [3] or FPCA (Federal Post Card Application) [4] forms and state-specific variations on them.
- A data format for balloting requests and responses when using the FPCA (Federal Post Card Application) [4] forms, as well as state specific forms.
- A data model in UML (Unified Modeling Language) [5] that itemizes and defines the data involved in voter records interchange and that is used to derive the XML and JSON schemas.
- Instructions for implementation and use of the XML and JSON schemas.
- A flexible specification to cover additional use cases for other types of registration transactions, such as for voter record maintenance.

### 1.1 Purpose

The purpose of this specification is to provide data interchange formats in XML and JSON for voter records requests and responses so as to assist election officials and developers in implementing and supporting the development of voter records systems within States.

Advantages of using this specification include:

- Providing a ready data interchange format for online voter registration systems so as to remove the need for individual OVR system development projects to define data models and formats or adapt to other formats specific to States.
- Assisting election officials by reducing or eliminating non-standard exchange formats for voter record data. The current varying systems involved and data produced often do not interoperate, adding more complexity to the process.
- Providing a baseline CDF that can be continually refined. Once jurisdictions adopt the CDF VRI, their experience and feedback will refine the continued development of the specification.
- Providing the foundation for additional use cases in the future, which could include matching driver's license data between the DMV and voter record systems, automated notifications between the DMV and voter record systems, cross-state record matching, or facilitating data reporting for the Election Administration and Voting Survey (EAVS).

## 1.2 Audience

The intended audience of this specification includes election officials, VR system designers and developers, as well as others in the election community including the general public. Some background in election administration and registration is useful in understanding the material in this specification.

## 1.3 Motivation and Methodology

This document was motivated primarily to assist election officials and developers in implementing and supporting voter record systems by reducing or eliminating non-standard exchange formats for voter record data. Additionally, there are sometimes significant variations among different jurisdictions within a state as well among the states themselves in the way they automate voter registration and related parts of voter record management.

NIST and a community of U.S. election officials, analysts, and election system technologists analyzed varying VR scenarios and use cases and their associated data interchanges, to analyze existing practices and to create a standard data interchange format for emerging voter record systems. This specification implements the following use cases:

1. OVR Submission: Digital VR applications forms transmitted within state OVR systems or to state OVR systems by third-party OVR systems, following the formats of the NVRA and FPCA voter registration application forms, including state-specific additions to these forms.
2. VR Update Submission: Similar application forms including: voter registration update (change of name, change of address), change of voter status, and ballot request.
3. OVR Transfer: Subsets of such applications used for third-party OVR assistant organizations to transfer users and user data to state OVR systems.
4. Voter Records Lookup: Requests for information regarding voter records within a VR system, or between a VR system and a third party.

A UML data model was subsequently generated to represent the data associated with voter record requests and responses and to show how the data elements are related and organized. Finally, XML and JSON schemas were generated from the UML data model.

The advantages of using a UML data model as an intermediate step to generating the XML and JSON schemas include that the model is independent of the concrete data formats (or other potential formats that could be derived), and relationships between data elements are easier to correctly define and visualize when they are independent of any specific data format. If changes are needed to the specific XML and JSON formats, one can make changes to the UML model and then generate or derive new versions of the formats.

Much of the data involved in voter record requests consists of voter addresses: current addresses, postal addresses, previous addresses, etc. Rather than implement new and complicated functionality in this specification for representing addresses, it was decided to use the existing U.S. Thoroughfare, Landmark, and Postal Address Data Standard [6] which contains four major classes of addresses that are broken out into 11 different types of addresses. These can be used to represent addresses where voters live and where they receive postal mail (if different), including overseas addresses.

While this specification is focused on digital OVR submission, subsequent versions of this specification may implement additional use cases, including:

- **DMV Match:** Subsets of such digital applications exchanged between state VR systems and DMV (Department of Motor Vehicles) or similar systems, to perform driver's license data matching (if required) as part of OVR processing.
- **DMV Notification:** Data exchanged by DMV (Department of Motor Vehicles) or similar systems and VR systems, as part of NVRA compliance to digitally notify VR systems of DMV records of DMV customers that requested voter registration. May also include: similar data push from DMV of existing DMV records recently updated with change-of-address, as part of semi-automated steps toward permanent voter registration, or other forms of data exchange to VR systems that might facilitate elements of automatic and/or permanent voter registration.
- **Cross-State Records Match:** Data interchange between state VR systems and systems for records matching, e.g., the ERIC (Electronic Registration Information Center) [7].
- **EAVS Submission:** Subsets of voter records externalized from voter records systems for purposes of data aggregation and reporting, including but not limited to EAVS (Election Administration Voting Survey) [8] reporting.

Note that this specification addresses U.S. governmental elections and is not intended for use “as is” in other types of elections or in other countries. However, the specification was written with the intention that it be adaptable to other election environments.

## 1.4 Document Structure

This specification includes the following material:

- Section 2 – overview of the supported voter record transactions, the VRI UML model, and the FGDC address standard.
- Section 3 – VRI UML Model documentation.
- Section 4 – VRI XML and JSON usage examples, including registration requests and responses.
- Appendices – Acronyms, glossary, references, and schema download locations.





## 2 Overview of Digital OVR Transactions

This section presents an overview of the digital OVR voter registration transactions supported by this specification and examples of how they are implemented using the NVRA and FPCA forms (shown in Figures 1 and 2) as well as with state-specific forms, e.g., modifications to the NVRA. It also contains an overview of the U.S. Thoroughfare, Landmark, and Postal Address data standard [6] used by this specification for representing voter addresses.

**Voter Registration Application**  
Before completing this form, review the General, Application, and State specific instructions.

Are you a citizen of the United States of America? <input type="checkbox"/> Yes <input type="checkbox"/> No		This space for office use only.	
Will you be 18 years old on or before election day? <input type="checkbox"/> Yes <input type="checkbox"/> No			
<b>If you checked "No" in response to either of these questions, do not complete form.</b> (Please see state-specific instructions for rules regarding eligibility to register prior to age 18.)			
1	<input type="checkbox"/> Mr. <input type="checkbox"/> Miss <input type="checkbox"/> Mrs. <input type="checkbox"/> Ms.	Last Name	First Name
			Middle Name(s)
			<input type="checkbox"/> Jr. <input type="checkbox"/> II <input type="checkbox"/> Sr. <input type="checkbox"/> IV
2	Home Address		City/Town
	Apt. or Lot #	State	Zip Code
3	Address Where You Get Your Mail If Different From Above		City/Town
		State	Zip Code
4	Date of Birth Month Day Year	5 Telephone Number (optional)	6 ID Number - (See item 6 in the instructions for your state)
7	Choice of Party (see item 7 in the instructions for your State)	8 Race or Ethnic Group (see item 8 in the instructions for your State)	
9 I have reviewed my state's instructions and I swear/affirm that: ■ I am a United States citizen ■ I meet the eligibility requirements of my state and subscribe to any oath required. ■ The information I have provided is true to the best of my knowledge under penalty of perjury. If I have provided false information, I may be fined, imprisoned, or (if not a U.S. citizen) deported from or refused entry to the United States.		Please sign full name (or put mark) ▲ Date: Month Day Year	

If you are registering to vote for the first time: please refer to the application instructions for information on submitting copies of valid identification documents with this form.

**Please fill out the sections below if they apply to you.**

If this application is for a **change of name**, what was your name before you changed it?

A	<input type="checkbox"/> Mr. <input type="checkbox"/> Miss <input type="checkbox"/> Mrs. <input type="checkbox"/> Ms.	Last Name	First Name	Middle Name(s)	<input type="checkbox"/> Jr. <input type="checkbox"/> II <input type="checkbox"/> Sr. <input type="checkbox"/> IV
---	--	-----------	------------	----------------	--

If you were registered before but this is the first time you are registering from the address in Box 2, what was your address where you were registered before?

B	Street (or route and box number)	Apt. or Lot #	City/Town/County	State	Zip Code
---	----------------------------------	---------------	------------------	-------	----------

If you live in a rural area but do not have a street number, or if you have no address, please show on the map where you live.

C		
■ Write in the names of the crossroads (or streets) nearest to where you live. ■ Draw an X to show where you live. ■ Use a dot to show any schools, churches, stores, or other landmarks near where you live, and write the name of the landmark.		
Example	Route #2	
Public School ●	● Grocery Store Woodchuck Road X	

If the applicant is unable to sign, who helped the applicant fill out this application? Give name, address and phone number (phone number optional).

D	
---	--

**Mail this application to the address provided for your State.**

Figure 1 - National Voter Registration Act (NVRA) form

<h1>Voter Registration and Absentee Ballot Request</h1> <h2>Federal Post Card Application (FPCA)</h2>		<p>This form is for absent Uniformed Service members, their families, and citizens residing outside the United States. It is used to register to vote, request an absentee ballot, and update your contact information. See your State's instructions at FVAP.gov.</p>	
<p>Print clearly in blue or black ink.</p>			
<p><b>1. Who are you? Pick one.</b></p>			
<p>I request an absentee ballot for all elections in which I am eligible to vote AND:</p>		<p><input type="checkbox"/> I am on active duty in the Uniformed Services or Merchant Marine -OR- <input type="checkbox"/> I am an eligible spouse or dependent.  <input type="checkbox"/> I am an activated National Guard member on State orders.  <input type="checkbox"/> I am a U.S. citizen living outside the country, and I intend to return.  <input type="checkbox"/> I am a U.S. citizen living outside the country, and my return is uncertain.  <input type="checkbox"/> I am a U.S. citizen living outside the country, and I have never lived in the United States.</p>	
Last name		Suffix (Jr., II)	Sex <input type="checkbox"/> Female <input type="checkbox"/> Male
First name		Previous names (if applicable)	
Middle name		Birth date (MM/DD/YYYY)	/ /
Social Security Number	- -	Driver's license or State ID #	
<p><b>2. What is your address in the U.S. State or territory where you are registering to vote and requesting an absentee ballot?</b></p>			
<p>Your voting materials will not be sent to this address. See instructions on other side of form.</p>			
Street address		Apt #	
City, town, village		State	
County		ZIP	
<p><b>3. Where are you now? You must give your CURRENT address to receive your voting materials.</b></p>			
Your mailing address. (Different from above)		Your mail forwarding address. (If applicable)	
<p><b>4. What is your contact information? This is so election officials can reach you about your request.</b></p>			
<p>Provide the country code and area code with your phone and fax number. Do not use a Defense Switched Network (DSN) number.</p>			
Email:		Phone:	
Alternate email:		Fax:	
<p><b>5. What is your voting preference? Select One.</b></p>			
How do you want to receive voting materials from your election office?		What is your political party for primary elections?	
<input type="checkbox"/> Mail <input type="checkbox"/> Email or online <input type="checkbox"/> Fax			
<p><b>6. What additional information must you provide?</b></p>			
<p>The following need more information: Alaska, Arizona, Puerto Rico, Vermont, and Virginia. (Ex. Proof of residency, employer, etc.) You may also use this space to clarify your voter information. See the <i>Voting Assistance Guide</i> at FVAP.gov.</p>			
<p><b>7. You must read and sign this statement.</b></p>			
<p><b>I swear or affirm, under penalty of perjury, that:</b></p>			
<p>■ The information on this form is true, accurate, and complete to the best of my knowledge. I understand that a material misstatement of fact in completion of this document may constitute grounds for conviction of perjury.</p>			
<p>■ I am a U.S. citizen, at least 18 years of age (or will be by the day of the election), eligible to vote in the requested jurisdiction, and</p>			
<p>■ I am not disqualified to vote due to having been convicted of a felony or other disqualifying offense, nor have I been adjudicated mentally incompetent; or if so, my voting rights have been reinstated; and</p>			
<p>■ I am not registering, requesting a ballot, or voting in any other jurisdiction in the United States, except the jurisdiction cited in this voting form.</p>			
<p><b>Sign here</b> X</p>		<p><b>Today's date</b> (MM/DD/YYYY) / /</p>	
<p><small>This information is for official use only. Any unauthorized release may be punishable by law. Previous editions are obsolete. Standard Form 76 (Rev.09-2017), OMB No. 0704-0503</small></p>			

Figure 2 - Federal Post Card Application (FPCA) form

The forms shown in Figures 1 and 2 are paper-based, whereas states implementing OVR make digital representations of the forms, usually with some state-specific modifications that may request additional data.

## **2.1 Voter Records Request**

The digital NVRA and FPCA forms form the basis for digital OVR registration. The NVRA form is used for U.S. non-military citizen registrations whereas the FPCA form is used by U.S. military, their families, and citizens residing outside the U.S. to register and, if desired, request a ballot at the same time.

The submission of a digital registration form to a VR authority represents a voter records request. The response transmitted back from the VR authority to the submitter includes a status such as "registration-created" or would indicate an error for reasons including "incomplete" or "ineligible". The request consists of a registration request, e.g., initial registration, followed by various information about the voter and the submitter of the request.

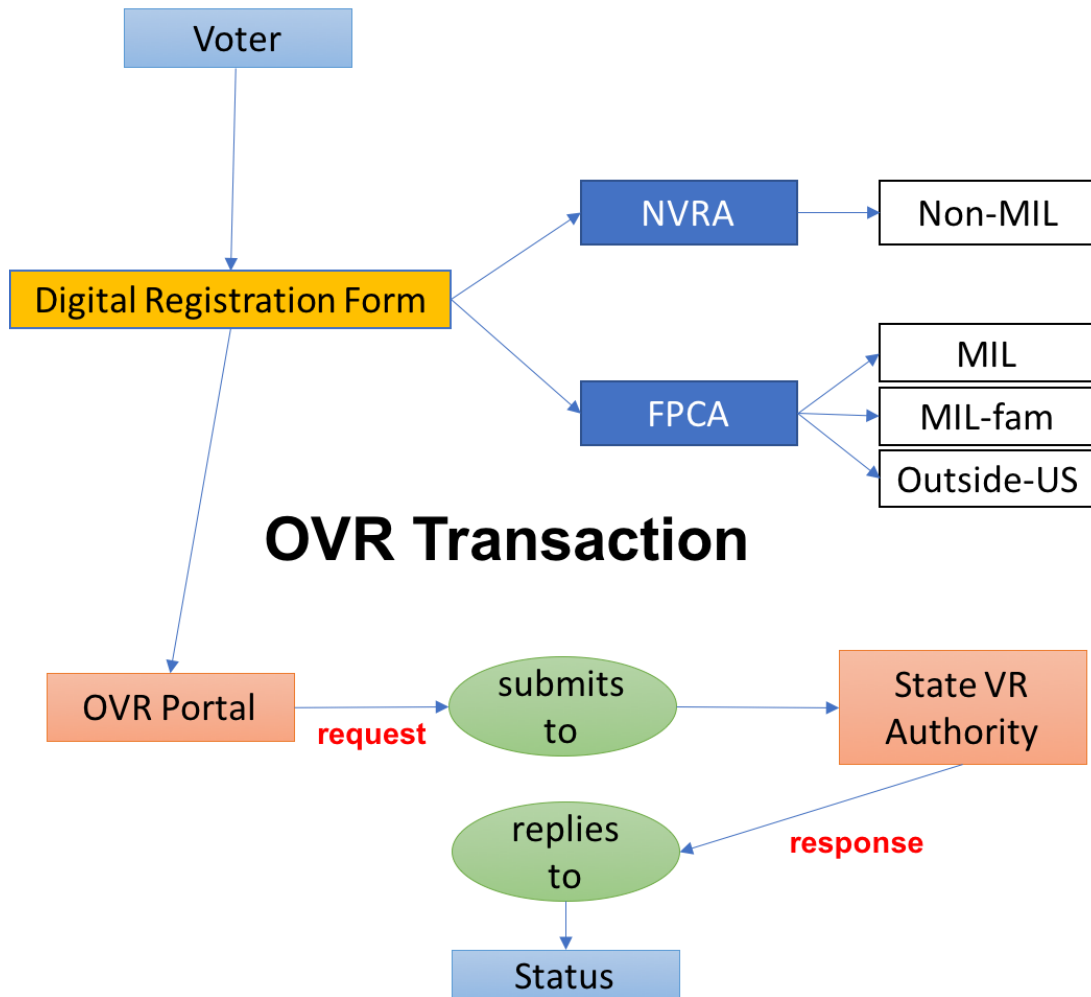


Figure 3 - Voter Registration Use Case

The use case for the digital OVR request, shown in Figure 3, includes:

- A client IT “OVR submitter”,
- A service IT system “VR authority”, and
- The submission, a digital NVRA, FPCA, or otherwise state-specific form via transmission from OVR submitter to VR authority.

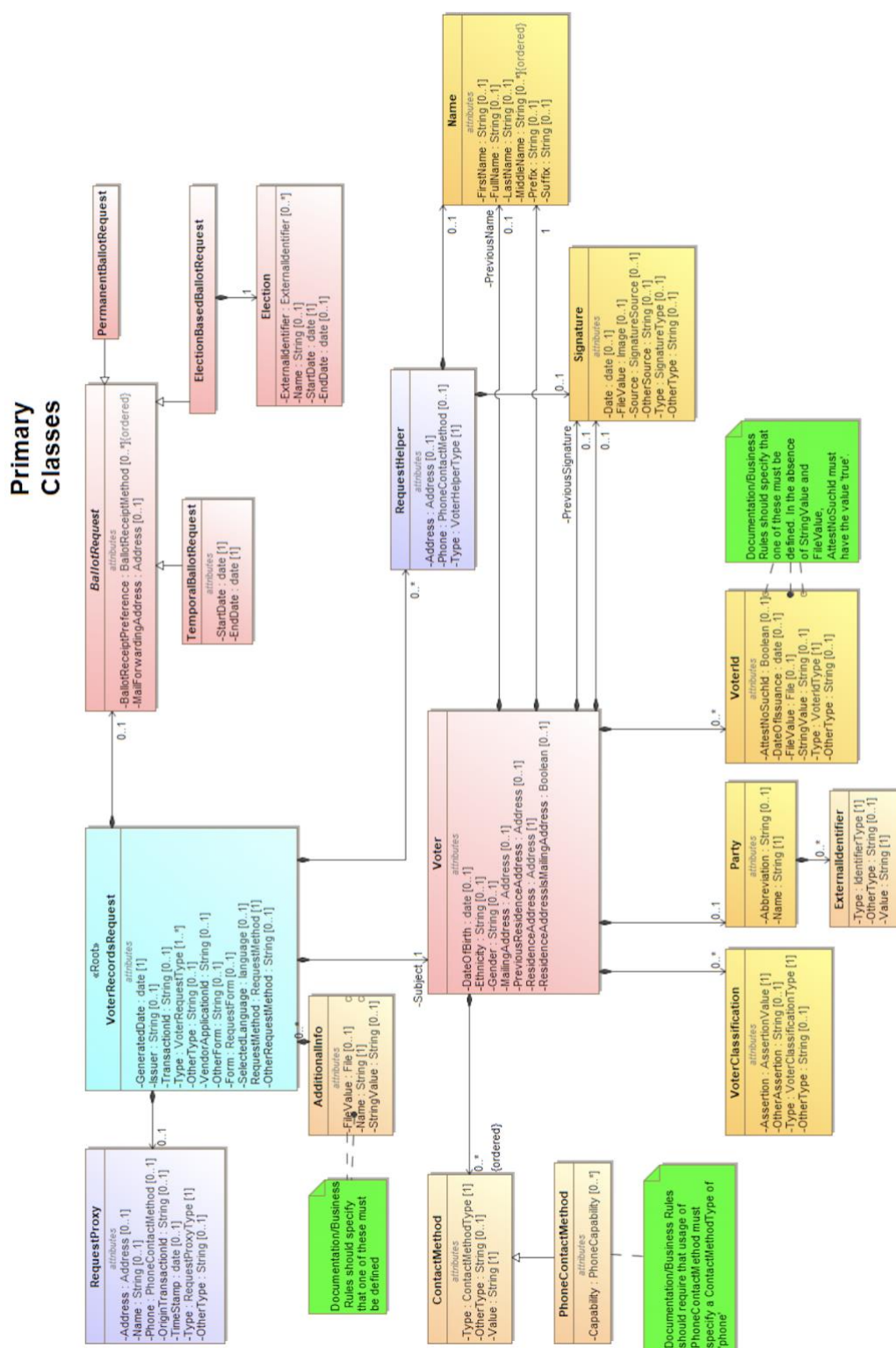
Currently, VR authorities are typically the back-end components of actual state OVR systems, while submitters include clients of state OVR systems such as the DMV/MVA or other clients that are operated by third-party VR organizations and that integrate with OVR systems by sending all or part of an NVRA/FPCA dataset collected by the client from a human registrant.

An OVR transaction, as used in this specification, generally consists of a voter records request followed by a voter records response, although this may vary across U.S. states and territories. The voter records request UML model in Figures 4 and 5 include four types of requests that could be sent from an OVR submitter to a VR system (see the `VoterRequestType` enumeration in Figure 5):

1. Request a registration for a voter using the digital NVRA or FPCA form.
2. Request a lookup for one or more voter registration records.
3. Request a ballot for one more elections as part of the digital FPCA form, or as part of a state specific digital form.
4. Request a state-specific action for a voter using possibly a state-specific digital form.

The `Voter` class is the primary class; it contains information about the voter, including name, addresses, party registration, voter's signature, method of contact, etc. If a third-party registration assistant or proxy is being used, the `RequestHelper` or `RequestProxy` classes are used to include name and other information generally required by the registration forms.

Both the voter records request and response models contain a class `ExternalIdentifier`, which is used to associate an identifier with an item. In the case of the request model, it is used optionally to associate an identifier to the political party, and in the response model, to optionally associate identifiers with political geography such as precincts and districts. The enumerations often contain a value of `Other`, which is to be used when none of the enumeration values apply, and classes that use these enumerations generally contain an `OtherType` or similarly-named attribute to contain that value. For example, in the `ContactMethod` class, if none of the enumeration values of `ContactMethodType` apply, `Other` would be used in the `Type` attribute, and the `OtherType` attribute would contain the value.



## Enumerations

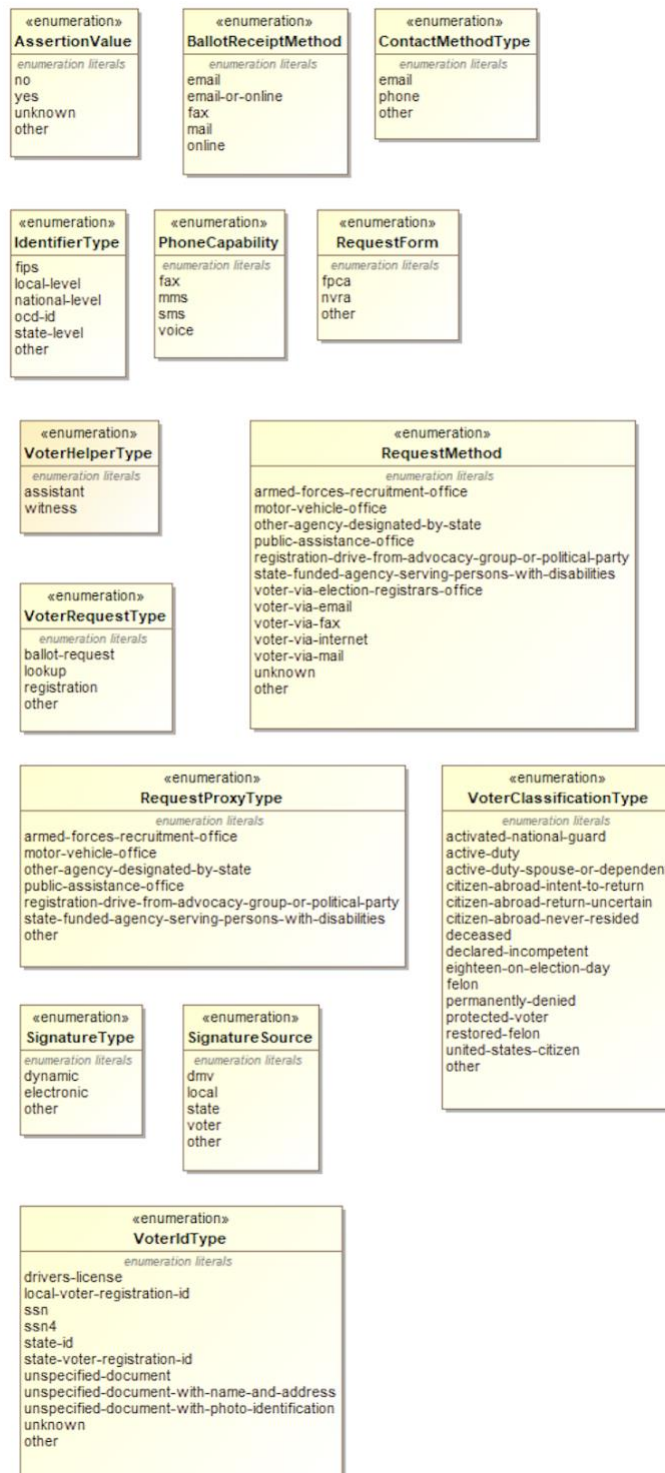


Figure 5 - Voter Records Request UML Enumerations

## 2.2 Voter Records Response

The voter records response simply returns a response to the voter records request. The UML model is simpler than the request model in that a response generally contains little data other than the results of the request, which are:

1. The registration request was acknowledged, but no further status is available.
2. The registration request was rejected, including a reason(s) for the rejection.
3. The registration request succeeded, including the action(s) taken.

The response model also allows for a set of voter records to be returned, if the request Type was set to lookup.

The UML model in Figure 6 shows the `VoterRecordsResponse` class, which has four corresponding types of responses. The first, `RequestAcknowledgement`, represents the typical current practice in online voter registration, where a registration authority operates an online service that receives VR requests and saves them for later processing by local elections offices' staff. In this typical practice, the acceptance of an online VR request is simply an acknowledgement that the request was received without error.

The second type of response, `RequestRejection`, contains the reason(s) for the error that is causing the rejection as well as any additional details. While the various errors that can occur are beyond the scope of this specification, the `RequestError` enumeration lists a series of common errors, including:

1. The request is incomplete in some way including incomplete address or name or birthdate or signatures.
2. A lookup of the voter's identity failed.
3. The voter is ineligible to vote.

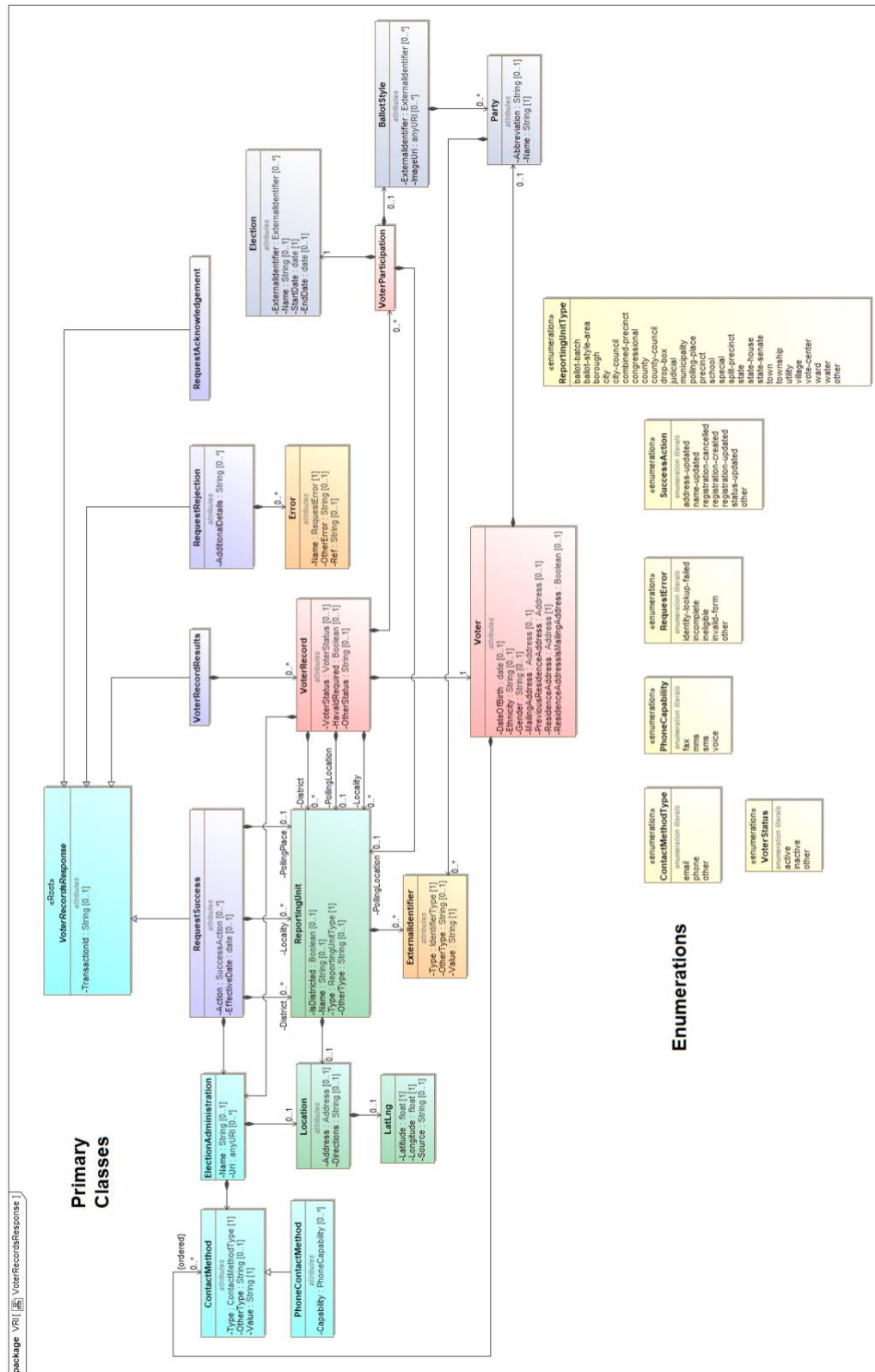
If none of the errors in the enumeration are appropriate, a different error can be specified in the `OtherError` attribute.

The third type of response, `RequestSuccess`, is used for cases where the receiving service is able to process a request to success and notify the sender synchronously. The contents of a `RequestSuccess` are modeled on the information that becomes available to a newly registered voter as a result of successful registration.

In the UML model, the `RequestSuccess` class optionally includes these items: voter's assigned polling place and precinct, the location of the local election authority, and a list of districts that the voter resides in. The successful registration also returns the registration action(s) that occurred, which may differ from what was requested. For example, a request for a new voter



registration may succeed, but if the voter was already registered, the response may indicate a registration update as opposed to a registration create.



### Figure 6 - Voter Records Response UML Class Diagram

The fourth type of response, `VoterRecordResults`, is used when responding to a specific request, that of a lookup of one or more voter's records. The contents of `VoterRecordResults` includes a `VoterRecord` for each potential match.

Each `VoterRecord` contains details about the voter's registration and optionally information regarding the voter's election participation history, voter's assigned polling place and precinct, the location of the local election authority, and a list of districts that the voter resides in.

## 2.3 Including State-specific Request and Response Items

The UML model and associated XML and JSON schemas contain several features to enable state-specific requests and responses. Using these features, it is possible to use this specification as local modifications are needed.

The `AdditionalInfo` class is used for information not addressed in this schema by other attributes, e.g., state-specific data that does not "fit" in any other attribute. The type of data will thus be highly specific to the generating application, and consuming applications must "know" the meaning of the data to make use of it. Each `AdditionalInfo` class would contain the name of the data, and then its value, depending on whether the data represents the value directly as a string or represents a file name.

For example, if a state requires its registration form to include the voter's language, it would need to use the `AdditionalInfo` class to contain a value representing the voter's language. An XML example is as follows, using English as the voter's language:

```
<AdditionalInfo>
  <Name>Language</Name>
  <StringValue>en-US</StringValue>
</AdditionalInfo>
```

The XML and JSON usage examples in Section 4 contain a number of examples showing usage of the `AdditionalInfo` class. Additionally, each enumeration generally contains an "other" value that can be used when none of the enumeration values are sufficient. If "other" is used as the enumeration value, there is an attribute named `OtherType` that can be used to hold the other data. For example, a state may wish to implement a specific "address-update" transaction and would thus need to use "other" for the `Type` attribute in the `VoterRecordsRequest` class. The `OtherType` attribute would then contain the type of registration request, i.e., "address-update", e.g. in XML,

```
<VoterRecordsRequest xmlns:xsd="http://www.w3.org/2001/XMLSchema" ... >
  <GeneratedDate>2017-02-10</GeneratedDate>
  <Issuer>Ohio Secretary of State</Issuer>
  <TransactionId>2a642eb5-169e-4a3b-8899-adc7ea6d00d0</TransactionId>
  <Type>other</Type>
  <OtherType>address-update</OtherType>
  ...
```

## 2.4 Dealing with Addresses - The U.S. Thoroughfare, Landmark, and Postal Address Data Standard

Voter addresses are perhaps the most complex part of a voter registration request or other related data exchanges. As you will see in the examples in this specification, the vast majority of the data in a voter registration request has to do with voter addresses. There are multiple types of voter addresses for VR purposes, e.g.,

- Current registration address,
- Previous registration address,
- Multiple types of addresses for location and mailing purposes, e.g.,
  - Postal mailing address,
  - Structured and unstructured street address,
  - Rural addresses,
  - PO box addresses,
  - Military and diplomatic addresses, and
  - Mailing addresses outside the U.S.

Rather than “re-inventing the wheel” by specifying an address format, this specification makes use of an existing XML-based standard for structuring addresses: the U.S. Thoroughfare, Landmark, and Postal Address Data Standard [6] issued by the Federal Geographic Data Committee (FGDC) [9] and covering the complexity of addresses managed by or encountered by organizations and agencies such as the United States Census and USPS (U.S. Postal Service). Use of the FGDC standard greatly simplifies this specification and leaves maintenance of the standard to a more appropriate management body.

Because the FGDC standard was written for XML and does not include a JSON schema, NIST created a JSON version from the relevant sections of the FGDC XML schema (see Appendix D for download locations).

A complete overview of the FGDC standard and how to use it is beyond the scope of this specification, and readers and developers are encouraged to refer to the FGDC standard documentation [6]. Briefly, the FGDC standard classifies all U.S. addresses into a simple taxonomy of address classes organized into 4 groups:

1. Thoroughfare Classes - 5 address types,
2. Landmark Classes - 2 address types,
3. Postal Deliver Classes - 3 address types, and
4. General Class - 1 address type.

Altogether, there are a total of 11 address types (most are Thoroughfare types, see section 2.4.1 below).

This specification includes the following types of voter addresses:

- ResidenceAddress
- PreviousResidenceAddress,
- MailingAddress, and
- MailForwardingAddress.

To deal with multiple types of voter addresses in a consistent manner, the XML and JSON schemas generated from the UML model map the `<Address>` type to one of the 11 different address types in the FGDC schema, as shown in Figure 7. Note that a namespace prefix of *addr* is used for XML types corresponding to the 11 FGDC address types; *addr\_type* is also used for other address component types that are defined in a schema included by the FGDC schema (shown in other examples in this specification).

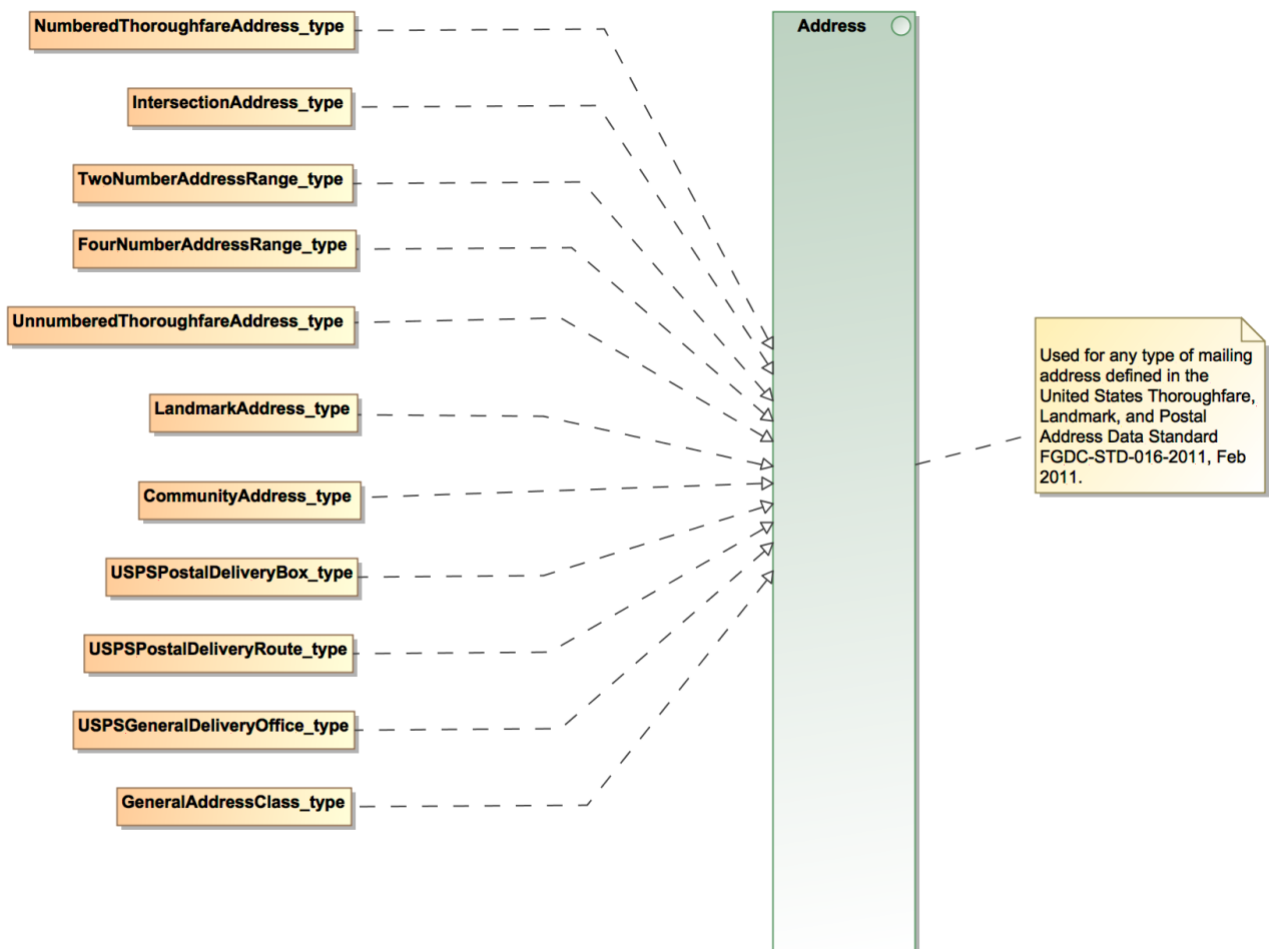


Figure 7 - FGDC Address Types Mapped to Single Address Attribute

Because the FGDC standard is in XML only, a corresponding JSON version of the standard had to be created; the JSON version follows closely the XML version.

### 2.4.1 Thoroughfare Classes

Most business and residential addresses are Thoroughfare addresses; therefore this class will be used most often. It specifies a location by reference to a thoroughfare, i.e., a road or part of a road or other access route along which a delivery point can be accessed. A thoroughfare is typically but not always a road - it may be, for example, a walkway, a railroad, or a river. The thoroughfare address types are:

1. Numbered Thoroughfare Address, e.g., *123 Main Street*.
2. Intersection Address, e.g., *Fifth Avenue and Main Street*.
3. Two Number Address Range, e.g., *405-411 West Green Street*.
4. Four Number Address Range, e.g., *900-962, 901-963 Milton Street*.
5. Unnumbered Thoroughfare Address, e.g., *Forest Service Road 698*.

Of the 5 types listed, *Thoroughfare* Addresses are generally used most often. Unnumbered Thoroughfare Addresses are also used for those areas where no address numbers have been assigned and the addresses often include only the thoroughfare name. A simple XML example showing the Numbered Thoroughfare type used in the *<MailingAddress>* element for “500 W Tuscarawas Ave, Barberton, OH 44203” is as follows:

```
<MailingAddress>
  <NumberedThoroughfareAddress_type>
    <addr:CompleteAddressNumber>
      <addr_type:AddressNumber>500</AddressNumber>
    </addr:CompleteAddressNumber>
    <addr:CompleteStreetName>
      <addr_type:StreetNamePreDirectional>W</StreetNamePreDirectional>
      <addr_type:StreetName>TUSCARAWAS</StreetName>
      <addr_type:StreetNamePostType>AVE</StreetNamePostType>
    </addr:CompleteStreetName>
    <addr_type:CompletePlaceName>
      <PlaceName PlaceNameType="MunicipalJurisdiction">BARBERTON</PlaceName>
    </CompletePlaceName>
    <addr_type:StateName>OH</StateName>
    <addr_type:ZipCode>44203</ZipCode>
  </NumberedThoroughfareAddress_type>
</MailingAddress>
```

### 2.4.2 Landmark Classes

Landmark addresses specify a location by reference to a named landmark. A landmark is a relatively permanent feature of the manmade landscape that has recognizable identity within a

particular cultural context, e.g., a large statue or structure such as an apartment complex. The landmark address types are:

- Landmark Address, e.g., *Statue of Liberty*.
- Community Address, e.g., *123 Urbanizacion Los Olmos*.

### 2.4.3 Postal Delivery Classes

Postal delivery addresses specify points of postal delivery that have no definite relation to the location of the recipient, such as a post office box, rural route box, overseas military address, or general delivery office. The USPS specifies each class in detail in USPS Publication 28[10]. The postal delivery types are:

- USPS Postal Delivery Box, e.g., *PO Box 16953*.
- USPS Postal Delivery Route, e.g., *RR 1, Box 100*.
- USPS General Delivery Office, e.g., *General Delivery*.

### 2.4.4 General Address Class and Handling Non-U.S. Addresses

The general address class provides a "catch-all" way to handle addresses, including non-U.S. addresses. The general address class may include addresses from any or all of the other classes, or addresses whose class is unknown or whose syntax does not conform to any of the thoroughfare, landmark, and postal classes. Although the scope of the FGCD standard is restricted to U.S. addresses, this class was included to facilitate reconciliation with address standards of other nations and to accommodate files that mix addresses from the U.S. and other countries.

There are three types mapped to this class:

- The complete address as a single unparsed string of text, e.g., *PO Box 1511, Ames, IA 50010*.
- The complete address with place, state and zip code parsed out to a single field, e.g., *PO Box 1511; Place State ZIP = Ames, IA 50010*.
- The complete address with place, state, zip code, zip plus 4, and country name are parsed out to separate fields, e.g., *PO Box 1511; Complete Place Name = Ames; State Name = IA; Zip Code = 50010; Country Name = USA*

ISO 3166-1 [12] country codes is favored for country names, e.g., *USA* for United States, *MEX* for Mexico, *GBR* for United Kingdom.

A simple XML example for “*PO Box 1511, Ames, IA 50010-4231, USA*” in which the address components are structured to the extent possible is as follows:

```
<MailingAddress>
  <GeneralAddressClass>
    <addr_type:DeliveryAddress>PO Box 1511</DeliveryAddress>
    <addr_type:CompletePlaceName>
      <addr_type:PlaceName>Ames</PlaceName>
    </CompletePlaceName>
    <addr_type:StateName>IA</StateName>
    <addr_type:ZipCode>50010</ZipCode>
    <addr_type:ZipPlus4>4231</ZipPlus4>
    <CountryName>USA</CountryName>
  </GeneralAddressClass>
</MailingAddress>
```

For non-U.S. or overseas addresses, it may or may not be practical or possible to structure the address similarly. A simple XML example is as follows for “*33, boulevard du Port, F 95510 Cergy-Pontoise cedex, France*”:

```
<MailingAddress>
  <GeneralAddressClass> Cergy-Pontoise University, 33, boulevard du Port, F 95510
    Cergy-Pontoise cedex, France</GeneralAddressClass>
</MailingAddress>
```

The entire address is contained in an unstructured string, however it is possible to specify it with more structure, as follows:

```
<MailingAddress>
  <GeneralAddressClass>
    <DeliveryAddress>33, boulevard du Port</DeliveryAddress>
    <CompletePlaceName>
      <PlaceName>Cergy-Pontoise cedex</PlaceName>
    </CompletePlaceName>
    <ZipCode>F 95510</ZipCode>
    <CountryName>FRA</CountryName>
  </GeneralAddressClass>
</MailingAddress>
```

For additional usage information, the FGDC standard documentation should be consulted [6].



### 3 Voter Records Interchange UML Model Documentation

#### 3.1 Class AdditionalInfo

Used in request messages.

Class for specifying information not addressed in this model by other attributes, e.g. state-specific information that does not “fit” in any other attribute. The information will thus be highly specific to the generating application, and consuming applications must “know” the meaning of the information to make use of it. For this reason, use of this class is discouraged as much as is possible.

The [StringValue](#) and [FileValue](#) attributes are both optional, however exactly one of them must be included.

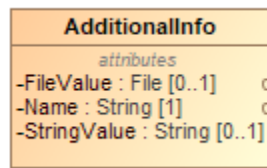


Figure 8 – AdditionalInfo

Attribute	Multiplicity	Type	Attribute Description
FileValue	0..1	<a href="#">File</a>	Used if the value is in a file; contains the filename and MIME type
Name	1	String	Name of the value.
StringValue	0..1	String	Used if the value is a string; contains the string.

### 3.2 Class BallotRequest

Used in request messages.

An abstract class representing a request for a ballot. Classes for specific types of BallotRequest inherit the attributes and define their own.

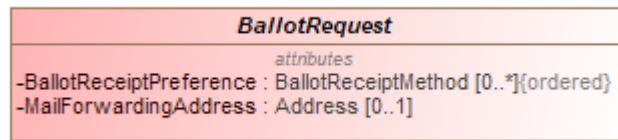


Figure 9 - BallotRequest

Attribute	Multiplicity	Type	Attribute Description
BallotReceiptPreference	0..*	<a href="#">BallotReceiptMethod</a>	The voter's preference on how to receive their ballot in order from their most preferred method to least. If omitted, the default method for the <a href="#">form</a> will be used.
MailForwardingAddress	0..1	<a href="#">Address</a>	

### 3.3 Class BallotStyle

Used in response messages.

For referencing a ballot style defined elsewhere, such as in an Election Management System (EMS).

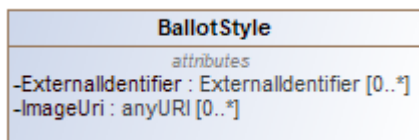


Figure 10 - BallotStyle

Attribute	Multiplicity	Type	Attribute Description
ExternalIdentifier	0..*	<a href="#">ExternalIdentifier</a>	For associating an ID with the ballot style.
ImageUri	0..*	anyURI	URI for a ballot image.
{Party}	0..*	<a href="#">Party</a>	For associating one or more parties with the ballot style.

### 3.4 Class ContactMethod

Used in request and response messages.

[ElectionAdministration](#) optionally includes this class to specify how to contact the election administration.

[Voter](#) optionally includes this class to specify the method for contacting a voter regarding the voter's request. If the voter can be contacted in multiple ways, the application creating the data should order the occurrences of [ContactMethod](#) by priority.

The [PhoneContactMethod](#) class uses [ContactMethod](#) as a base class, and should be used with when the contact method is for a telephone and it is necessary to describe the capabilities of the telephone.

The [Capability](#) attribute is provided by the [PhoneContactMethod](#) class.



Figure 11 – ContactMethod

Attribute	Multiplicity	Type	Attribute Description
OtherType	0..1	String	Used when <a href="#">ContactMethodType</a> value is other.
Type	1	<a href="#">ContactMethodType</a>	The contact method type, e.g. email or phone.
Value	1	String	The value of the ContactMethod. This will be the text value of the phone number, email address, or other mechanism. The values must be free of any formatting characters, such as parentheses or dashes for a phone number.

### 3.5 Class Election

Used in request and response messages.

Describes an election event. Only the date of the election is required. Other attributes may be used to describe the election for which a ballot is requested or a voter participated.

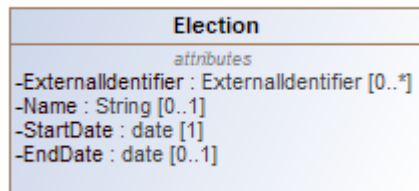


Figure 12 - Election

Attribute	Multiplicity	Type	Attribute Description
EndDate	0..1	date	For an election that spans multiple days, the last day of the election.
ExternalIdentifier	0..*	<a href="#">ExternalIdentifier</a>	For associating an ID with the election.
Name	0..1	String	For including a name for the election; the name could be the same name as appears on the ballot.
StartDate	1	date	The first day of the election.

### 3.6 Class ElectionAdministration

Used in response messages.

[ElectionAdministration](#) optionally includes [ContactMethod](#) to specify contact information for the election authority.

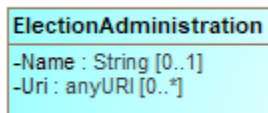


Figure 13 - ElectionAdministration

Attribute	Multiplicity	Type	Attribute Description
{ContactMethod}	0..*	<a href="#">ContactMethod</a>	For including various contact information.
{Location}	0..1	<a href="#">Location</a>	Location of the election authority.
Name	0..1	String	Name of the election authority.
Uri	0..*	anyURI	A URL for the election authority.

### 3.7 Class ElectionBasedBallotRequest

Used in request messages.

Implementation of [BallotRequest](#) in which a ballot for a single election event is requested.

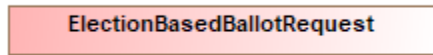


Figure 14 - ElectionBasedRequest

Attribute	Multiplicity	Type	Attribute Description
{Election}	1	<a href="#">Election</a>	The election for which the ballot is requested.

### 3.8 Class Error

Used in response messages.

[RequestRejection](#) includes this class to describe the errors that caused the rejection.



Figure 15 - Error

Attribute	Multiplicity	Type	Attribute Description
Name	1	<a href="#">RequestError</a>	Used to indicate the type of error.
OtherError	0..1	String	Used when <a href="#">Name</a> value is other.
Ref	0..1	String	Reference (e.g. XPath) to the entity that the error applies.



### 3.9 Class ExternalIdentifier

Used in request and response messages.

[BallotStyle](#), [Election](#), [Party](#) and [ReportingUnit](#) optionally include this class for associating a jurisdiction's codes, i.e., identifiers, with political parties or geopolitical units such as counties, towns, precincts, etc. Multiple occurrences of [ExternalIdentifier](#) can be used to associate multiple codes, e.g., if there is a desire to associate multiple codes with an object such as state-specific codes as well as OCD-IDs (Open Civic Data Identifiers).

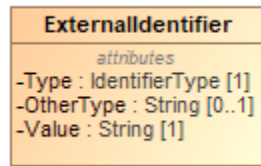


Figure 16 - ExternalIdentifier

Attribute	Multiplicity	Type	Attribute Description
OtherType	0..1	String	Used when <a href="#">Type</a> value is other.
Type	1	<a href="#">IdentifierType</a>	An identifier type, e.g., FIPS.
Value	1	String	The identifier used by the jurisdiction.

### 3.10 Class File

Used in request and response messages.

[VoterId](#) optionally uses this class for [FileValue](#) to specify a filename for voter identification purposes such as for a utility bill. [AdditionalInfo](#) also optionally includes [FileValue](#).

File extends the xsd:base64Binary type to add the attributes for filename and (Multi-Purpose Internet Mail Extensions) MIME type, e.g., application/pdf for a file of type PDF.

The [Image](#) element uses this class as an base class, thus [Image](#) can be used when the type of file is for an image, e.g., image/png.

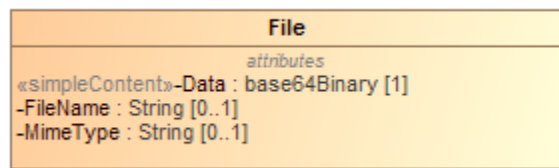


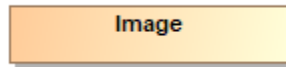
Figure 17 - File

Attribute	Multiplicity	Type	Attribute Description
Data	1	base64Binary	The file content encoded using base64.
FileName	0..1	String	The filename.
MimeType	0..1	String	The MIME type associated with the file.

### 3.11 Class Image

Used in request and response messages.

[Signature](#) optionally includes this class to indicate that a file contains an image of a voter's signature. Image uses [File](#) as a base class, thus attributes of [File](#) can be included in Image.



**Figure 18 - Image**

### 3.12 Class LatLng

Used in response messages.

[Location](#) optionally includes this element to specify the latitude and longitude of a voter's voting location.

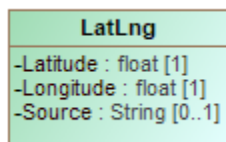


Figure 19 - LatLng

Attribute	Multiplicity	Type	Attribute Description
Latitude	1	float	Latitude of the location.
Longitude	1	float	Longitude of the location.
Source	0..1	String	System used to perform the lookup from location name to lat/lng, e.g., the name of a geocoding service.

### 3.13 Class Location

Used in response messages.

[ElectionAdministration](#) and [ReportingUnit](#) optionally include this element to specify the address and directions to a voter's voting location. The [LatLng](#) element can be included to specify the latitude and longitude of the voting location.

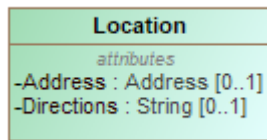


Figure 20 - Location

Attribute	Multiplicity	Type	Attribute Description
Address	0..1	<a href="#">Address</a>	Address of the voting location.
Directions	0..1	String	Directions to the voting location.
{LatLng}	0..1	<a href="#">LatLng</a>	Latitude/longitude of the voting location.

### 3.14 Class Name

Used in request and response messages.

[Voter](#) includes this class for specifying the name of a voter and, optionally, for specifying a previous name of the voter, using [PreviousName](#) instead of [Name](#). [RequestHelper](#) also includes this class for specifying the name of a request helper.

Multiple occurrences of the [MiddleName](#) attribute can be used as needed, e.g., for names with additional middle names or nicknames such as “John Andrew Winston (Jack) Smith”.

All elements are optional, however at least [FullName](#) must be included if the other attributes are not.

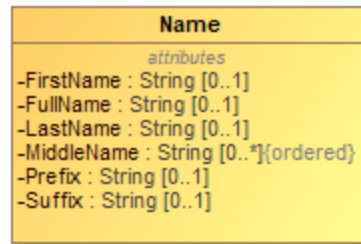


Figure 21 - Name

Attribute	Multiplicity	Type	Attribute Description
FirstName	0..1	String	Person's first (given) name.
FullName	0..1	String	Person's full name.
LastName	0..1	String	Person's last (family) name.
MiddleName	0..*	String	Person's middle name.
Prefix	0..1	String	A prefix associated with the person, e.g., Mr.
Suffix	0..1	String	A suffix associated with the person, e.g., Jr.

### 3.15 Class Party

Used in request and response messages.

[BallotStyle](#) optionally includes this type to specify the associated political party, such as for closed primaries.

[Voter](#) optionally includes this type to specify a voter's political party.

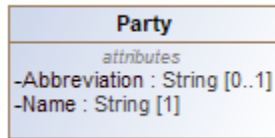


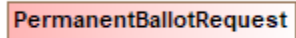
Figure 22 - Party

Attribute	Multiplicity	Type	Attribute Description
Abbreviation	0..1	String	Short name for the party, e.g., “DEM”.
{ExternalIdentifier}	0..*	<a href="#">ExternalIdentifier</a>	For associating an ID with the party.
Name	1	String	Official full name of the party, e.g., “Republican”.

### 3.16 Class PermanentBallotRequest

Used in request messages.

Subtype of [BallotRequest](#) which serves to request ballots for election events that the voter is qualified on a long term basis. Although "permanent", the request may be subject to renewal or cancellation procedures.



PermanentBallotRequest

Figure 23 - PermanentBallotRequest



### 3.17 Class PhoneContactMethod

Used in request and response messages.

[RequestHelper](#), and [RequestProxy](#) use this class to specify a telephone number as well as the capabilities of the telephone, e.g., sms, fax, etc.

PhoneContactMethod is subtype of [ContactMethod](#). Thus, the elements that include [ContactMethod](#) could use [PhoneContactMethod](#) as applicable.

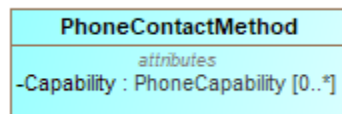


Figure 24 - PhoneContactMethod

Attribute	Multiplicity	Type	Attribute Description
Capability	0..*	<a href="#">PhoneCapability</a>	Specifies the phone's capabilities, e.g., fax, sms.

### 3.18 Class ReportingUnit

Used in response messages.

[RequestSuccess](#) and [VoterRecord](#) include this class so as to provide a list of geopolitical geography associated with the voter's registration, e.g., the voter's precinct, polling place, districts, etc. [VoterParticipation](#) optionally includes this class to specify the polling place used by the voter. The [Type](#) attribute uses the [ReportingUnitType](#) enumeration to specify the type of geopolitical geography being defined. If the reporting unit type is not listed in enumeration [ReportingUnitType](#), use other and include the reporting unit type (that is not listed in the enumeration) in [OtherType](#).

The [IsDistricted](#) boolean is not strictly necessary, as it is possible to identify districts by their [Type](#) attribute. However, if the type of district is not listed in the [ReportingUnitType](#) enumeration and therefore [OtherType](#) is used, then [IsDistricted](#) is necessary. The [IsDistricted](#) boolean can also be used to signify that a [ReportingUnit](#) defined as a jurisdiction, e.g., a county, is also used as a district for, e.g., county-wide contests.

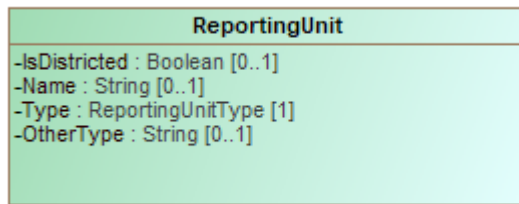


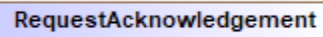
Figure 25 - ReportingUnit

Attribute	Multiplicity	Type	Attribute Description
{ExternalIdentifier}	0..*	<a href="#">ExternalIdentifier</a>	For associating an ID with the <a href="#">ReportingUnit</a> .
IsDistricted	0..1	Boolean	Boolean to indicate that the reporting unit is a district.
{Location}	0..1	<a href="#">Location</a>	Location of the district office.
Name	0..1	String	Name of the reporting unit.
OtherType	0..1	String	Used when <a href="#">Type</a> value is other.
Type	1	<a href="#">ReportingUnitType</a>	Enumerated type of reporting unit, e.g., district, precinct.

### 3.19 Class RequestAcknowledgement

Used in response messages.

For indicating that the request was received but action on the request is pending.



RequestAcknowledgement

Figure 26 - RequestAcknowledgement

### 3.20 Class RequestHelper

Used in request messages.

[VoterRecordsRequest](#) optionally includes this element to specify information about a request helper, i.e., a request assistant or witness involved in a voter's request.

RequestHelper optionally includes the [Name](#) element to specify the registration helper's name and optionally includes the [Signature](#) element if a registration helper's signature is required.



Figure 27 - RequestHelper

Attribute	Multiplicity	Type	Attribute Description
Address	0..1	<a href="#">Address</a>	Address of the request helper.
{Name}	0..1	<a href="#">Name</a>	To specify the name of the helper.
Phone	0..1	<a href="#">PhoneContactMethod</a>	Request helper's phone number.
{Signature}	0..1	<a href="#">Signature</a>	To specify the signature of the helper.
Type	1	<a href="#">VoterHelperType</a>	To specify the type of helper, e.g., assistant.

### 3.21 Class RequestProxy

Used in request messages.

[VoterRecordsRequest](#) optionally includes this class to specify information about a request proxy involved in a voter records request.

[OriginTransactionId](#) can be used to include an optional identifier of the originating external transaction from the proxy, e.g., used for the transaction ID generated by a DMV application enacting a voter registration request to a registration portal application (on behalf of a citizen obtaining a driver's license). This sub-element is not to be confused with TransactionId in

[VoterRecordsRequest](#), which is used to include a transaction ID of the voter records request, e.g., the transaction ID of the registration portal's voter records request.

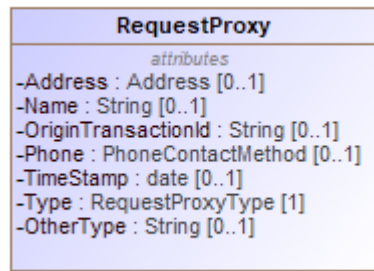


Figure 28 - RequestProxy

Attribute	Multiplicity	Type	Attribute Description
Address	0..1	<a href="#">Address</a>	An address associated with the proxy.
Name	0..1	String	A name associated with the proxy.
OriginTransactionId	0..1	String	An identifier associated with the transaction between the proxy and, e.g., the registration portal.
OtherType	0..1	String	Used when <a href="#">OtherType</a> value is other.
Phone	0..1	<a href="#">PhoneContactMethod</a>	A phone number associated with the proxy.
TimeStamp	0..1	date	The date of the request from the proxy.
Type	1	<a href="#">RequestProxyType</a>	The type of the requesting proxy, e.g., motor-vehicle-office, voter-via-email.



### 3.22 Class RequestRejection

Used in response messages.

For indicating that the request failed. The [Error](#) attribute is used to indicate the type of error that occurred. The [AdditionalDetails](#) attribute can be used to provide more information as to the rejection.

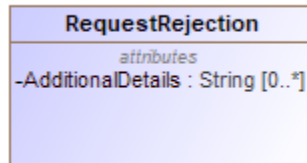


Figure 29 - RequestRejection

Attribute	Multiplicity	Type	Attribute Description
AdditionalDetails	0..*	String	Used to provide additional details as applicable.
{Error}	0..*	<a href="#">Error</a>	For associating a <a href="#">RequestRejection</a> with one or more <a href="#">Error</a> .

### 3.23 Class RequestSuccess

Used in response messages.

For indicating a successful response to a request. The [Action](#) attribute is used to indicate the action that occurred, which may differ from what was requested. For example, a request for a new voter registration may succeed, but if the voter was already registered, the response may indicate a registration update as opposed to a registration create.

The response also includes, optionally, other information useful to the voter, including a description of the voter's polling place, districts (i.e., contests) associated with the polling place, or other geopolitical geographies such as the voter's precinct.



Figure 30 - RequestSuccess

Attribute	Multiplicity	Type	Attribute Description
Action	0..*	<a href="#">SuccessAction</a>	Used to indicate the action that occurred.
{District}	0..*	<a href="#">ReportingUnit</a>	One or more districts associated with the voter's precinct.
EffectiveDate	0..1	date	The effective date of the action.
{ElectionAdministration}	0..1	<a href="#">ElectionAdministration</a>	The election administration that conducts elections for the voter.
{Locality}	0..*	<a href="#">ReportingUnit</a>	Other geographies such as the voter's precinct.
{PollingPlace}	0..1	<a href="#">ReportingUnit</a>	The voter's polling place.



### 3.24 Class Signature

Used in request and response messages.

[Voter](#) optionally includes this class for specifying information about a voter's signature on a registration request. If there is a need to include previous signature that uses a different name, e.g., a maiden name, [Voter](#) uses [PreviousSignature](#) instead of [Signature](#).

[RequestHelper](#) optionally includes this class for specifying information about the helper's signature.

[Source](#) is used to specify the source of the voter's signature, for example, on file at a department of motor vehicles. [FileValue](#) is used to include an image of the voter's signature.

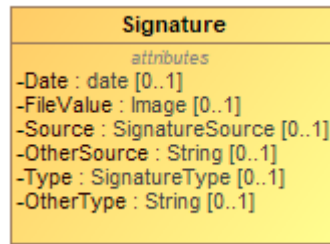


Figure 31 - Signature

Attribute	Multiplicity	Type	Attribute Description
Date	0..1	date	The date of the signature, i.e., when created.
FileValue	0..1	<a href="#">Image</a>	The signature image in base 64 binary.
OtherSource	0..1	String	Used when <a href="#">Source</a> value is other.
OtherType	0..1	String	Used when <a href="#">Type</a> value is other.
Source	0..1	<a href="#">SignatureSource</a>	A source for the signature, e.g., dmv.
Type	0..1	<a href="#">SignatureType</a>	A signature type, e.g., dynamic.

### 3.25 Class TemporalBallotRequest

Used in request messages.

Subtype of [BallotRequest](#) in which election opportunities that the voter is qualified during a given time frame may be requested.

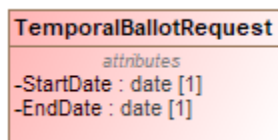


Figure 32 - TemporalBallotRequest

Attribute	Multiplicity	Type	Attribute Description
EndDate	1	date	The date at which the request is no longer effective.
StartDate	1	date	The date at which the request comes into effect.

### 3.26 Class Voter

Used in request and response messages.

Contains attributes specific to identifying a voter.

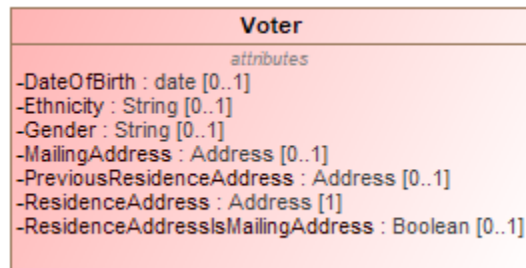


Figure 33 - Voter

Attribute	Multiplicity	Type	Attribute Description
{ContactMethod}	0..*	<a href="#">ContactMethod</a>	How to contact the voter, listed in order of preference.
DateOfBirth	0..1	date	The voter's data of birth in YYYY-MM-DD format.
Ethnicity	0..1	String	The voter's ethnicity.
Gender	0..1	String	Older systems may not understand values other than 'Male' or 'Female' (the only choices available on FPCA).
MailingAddress	0..1	<a href="#">Address</a>	Where the voter receives postal mail, mapped to the FGDC specification Address classes.
{Name}	1	<a href="#">Name</a>	Voter's name.
{Party}	0..1	<a href="#">Party</a>	Voter's political party.
{PreviousName}	0..1	<a href="#">Name</a>	A voter's previous name.
PreviousResidenceAddress	0..1	<a href="#">Address</a>	Where the voter was previously registered,

Attribute	Multiplicity	Type	Attribute Description
			mapped to the FGDC specification Address classes.
{PreviousSignature}	0..1	<a href="#">Signature</a>	Information about a previous voter signature on the registration form.
ResidenceAddress	1	<a href="#">Address</a>	Where the voter is registered or requests to be registered, mapped to the FGDC specification Address classes.
ResidenceAddressIsMailingAddress	0..1	Boolean	If set to true, MailingAddress need not be included.
{Signature}	0..1	<a href="#">Signature</a>	Information about the voter signature on the registration form.
{VoterClassification}	0..*	<a href="#">VoterClassification</a>	How the voter is classified per assertions the voter has made on a registration form.
{VoterId}	0..*	<a href="#">VoterId</a>	Information to provide voter identity.

### 3.27 Class VoterClassification

Used in request and response messages.

[Voter](#) optionally includes this class to describe a voter's classification per criteria on the voter's request form, e.g., united-states-citizen or eighteen-on-election-day.

[VoterClassification](#) includes assertions of the voter in response to the voter request form criteria. For example, an assertion of true may be used with a criterion of united-states-citizen. Assertions can be negative, such as providing an assertion of false for a criterion of felon, an assertion of unknown to indicate that the voter does not know whether they meet or do not meet the specific criteria on the form or an assertion of other, in which the assertion is specified by the value of [OtherAssertion](#).

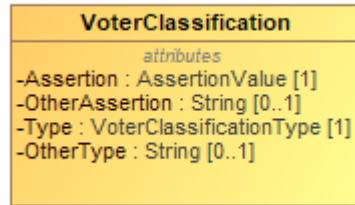


Figure 34 - VoterClassification

Attribute	Multiplicity	Type	Attribute Description
Assertion	1	<a href="#">AssertionValue</a>	A positive, negative, other or unknown assertion
OtherAssertion	0..1	String	An locally defined assertion value.
OtherType	0..1	String	Used when <a href="#">Type</a> value is other.
Type	1	<a href="#">VoterClassificationType</a>	A classification type, e.g., felon.

### 3.28 Class VoterId

Used in request and response messages.

Used to include information about a voter's identification that may be required in a registration request. [Voter](#) includes [VoterId](#).

[AttestNoSuchId](#) is used to attest that the voter has no ID of a specified type, thus it must be included with a value of true if attesting that the voter has no ID for that specified type. It can be included with a value of false to attest that the voter does have an ID of the specified type, in which case either [StringValue](#) or [FileValue](#) must be included; however, it is assumed to be false if not included. The [StringValue](#) and [FileValue](#) sub-elements are both optional, however at least one of them must be included.

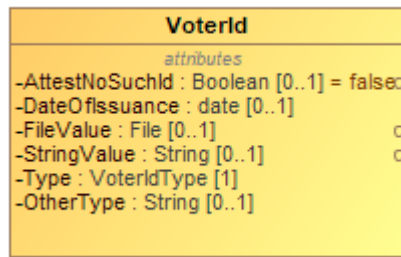


Figure 35 - VoterId

Attribute	Multiplicity	Type	Attribute Description
AttestNoSuchId	0..1	Boolean	Used to attest that the voter has no ID. Assumed to be false if not present.
DateOfIssuance	0..1	date	Date the ID was issued.
FileValue	0..1	<a href="#">File</a>	Used to include a file name for the ID.
OtherType	0..1	String	Used when <a href="#">Type</a> value is other.
StringValue	0..1	String	Used to include the ID as a string.
Type	1	<a href="#">VoterIdType</a>	The type of voter ID.

### 3.29 Class VoterParticipation

Used in response messages.

For indicating an election that the voter participated in. Participation does not imply a counted ballot.

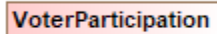
A UML class diagram showing a class named 'VoterParticipation' in a rectangular box with a light pink fill and a black border.

Figure 36 - VoterParticipation

Attribute	Multiplicity	Type	Attribute Description
{BallotStyle}	0..1	<a href="#">BallotStyle</a>	For associating the voter participation to a specific ballot style, such to a partisan ballot in a closed primary.
{Election}	1	<a href="#">Election</a>	For associating the voter participation to a specific election event.
{PollingLocation}	0..1	<a href="#">ReportingUnit</a>	The polling place used by the voter.

### 3.30 Class VoterRecord

Used in response messages.

Used to represent a voter record stored in a Voter Registration Database (VRDB).

VoterRecord optionally contains additional information useful to the voter, including a description of the voter's polling place, districts associated with the voter's precinct, or other geopolitical geographies such as the voter's precinct.

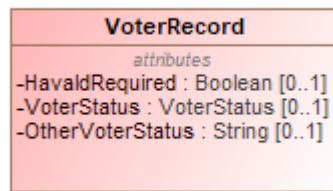


Figure 37 - VoterRecord

Attribute	Multiplicity	Type	Attribute Description
{District}	0..*	<a href="#">ReportingUnit</a>	One or more districts associated with the voter's precinct.
{ElectionAdministration}	0..1	<a href="#">ElectionAdministration</a>	The election administration that conducts elections for the voter.
HavaIdRequired	0..1	Boolean	Indicates that the voter must present identification at the polls per HAVA.
{Locality}	0..*	<a href="#">ReportingUnit</a>	Other geographies such as the voter's precinct.
OtherVoterStatus	0..1	String	Used when <a href="#">VoterStatus</a> value is other.
{PollingLocation}	0..1	<a href="#">ReportingUnit</a>	The voter's polling place.
{Voter}	1	<a href="#">Voter</a>	For details specific to a particular voter.



{VoterParticipation}	0..*	<a href="#">VoterParticipation</a>	For associating a <a href="#">VoterRecord</a> to elections the voter has participated in.
VoterStatus	0..1	<a href="#">VoterStatus</a>	The status of the VoterRecord, possibly to indicate the ability to receive a regular ballot.

### 3.31 Class VoterRecordResults

Used in response messages.

For indicating a successful response to a lookup request.

A lookup for a single voter may result in multiple [VoterRecord](#) being returned. This can occur if the voter has duplicate records in the VRDB, or if the criteria specified in the lookup request was broad.

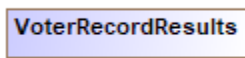


Figure 38 - VoterRecordResults

Attribute	Multiplicity	Type	Attribute Description
{VoterRecord}	0..*	<a href="#">VoterRecord</a>	The voter record(s) returned.

### 3.32 Class VoterRecordsRequest

The root element for request messages.

For defining items pertaining to the status and type of the voter records request and when it was generated. [VoterRecordsRequest](#) includes the [Subject](#) association to specify various information about the voter in question. It includes the [BallotRequest](#) association to handle a request for an ballot; this request may be part of an FPCA form registration or may be submitted independently.

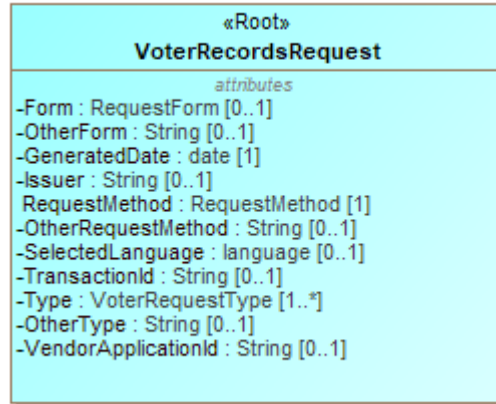


Figure 39 - VoterRecordsRequest

Attribute	Multiplicity	Type	Attribute Description
{AdditionalInfo}	0..*	<a href="#">AdditionalInfo</a>	For including other information not specified by this model.
{BallotRequest}	0..1	<a href="#">BallotRequest</a>	Specifies information relating to a request for a ballot.
Form	0..1	<a href="#">RequestForm</a>	If the request is for a voter registration, the registration form used by the voter.
GeneratedDate	1	date	The date that the voter records request was generated.
Issuer	0..1	String	The name of the issuer of the voter records request transaction, e.g., State of West Virginia Voter Registration Portal.
OtherForm	0..1	String	Used when <a href="#">Form</a> value is other.
OtherRequestMethod	0..1	String	Used when <a href="#">RequestMethod</a> value is other.

Attribute	Multiplicity	Type	Attribute Description
OtherType	0..1	String	Used when <a href="#">RequestType</a> value is other.
{RequestHelper}	0..*	<a href="#">RequestHelper</a>	Included if the registration involves a registration assistant organization.
RequestMethod	1	<a href="#">RequestMethod</a>	The method used by the voter to register.
{RequestProxy}	0..1	<a href="#">RequestProxy</a>	Included if the registration request is via a proxy, e.g., the DMV.
SelectedLanguage	0..1	language	The language specified by the voter, if any.
{Subject}	1	<a href="#">Voter</a>	Specifies information about the voter who is the subject of the request.
TransactionId	0..1	String	An identifier of the voter records request transaction.
Type	1..*	<a href="#">VoterRequestType</a>	The type of request, e.g., registration.
VendorApplicationId	0..1	String	An identifier of the vendor application generating the voter registration request, e.g., X-VRDB Version 3.1.a.

### 3.33 Class VoterRecordsResponse

The root element for response messages.

For defining items pertaining to the status of a response to a voter records request.

[VoterRecordsResponse](#) is an abstract class with four subtypes that get used according to the type of response:

- [RequestAcknowledgement](#), used to indicate an acknowledgement only.
- [VoterRecordResults](#), used to provide a set of voter records.
- [RequestRejection](#), used to indicate a failure and the type of failure.
- [RequestSuccess](#), used to indicate that a successful action occurred and the type of action, which may differ from the type of action requested.

[VoterRecordsResponse](#) optionally includes the [TransactionId](#) attribute associated with the voter records request.

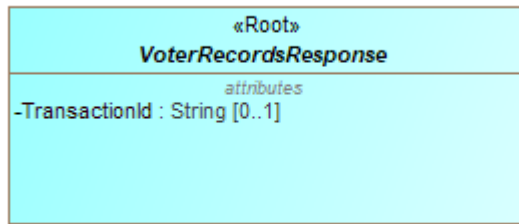


Figure 40 - VoterRecordsResponse

Attribute	Multiplicity	Type	Attribute Description
TransactionId	0..1	String	Transaction ID associated with the voter records request.

### 3.34 Enumeration AssertionValue

Used in request and response messages.

Enumeration for assertions from a voter or a third party such as a department of motor vehicles (DMV) in response to questions on a registration form, used in the [Assertion](#) attribute of [VoterClassification](#).

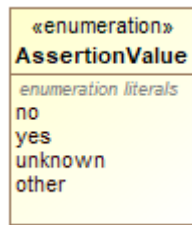


Figure 41 – AssertionValue

Value	Value Description
no	For a voter's or third party's assertion of "no" or "false".
yes	For a voter's or third party's assertion of "yes" or "true".
unknown	For a voter's or third party's assertion of "unknown".
other	For a voter's or third party's assertion of "other".

### 3.35 Enumeration BallotReceiptMethod

Used in request messages.

Enumeration for methods for delivering a ballot to the voter, used in the [BallotReceiptPreference](#) attribute of

[BallotRequest](#). The sub-element may be repeated multiple times with different values as applicable, e.g., to specify both mail and online.

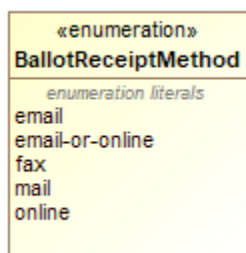


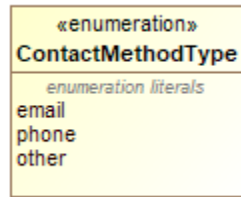
Figure 42 - BallotReceiptMethod

Value	Value Description
email	For email only.
email-or-online	For electronic mail or downloadable from a website (this value is ambiguous, thus the separate values for email and online).
fax	For use of a fax.
mail	For postal mail.
online	For downloadable from a website, e.g., the voter is sent a hypertext link to a ballot.

### 3.36 Enumeration ContactMethodType

Used in request and response messages.

Enumeration for methods for contacting a voter or an election administration office, used in the [Type](#) attribute of [ContactMethod](#).



**Figure 43 - ContactMethodType**

Value	Value Description
email	For electronic mail.
phone	For use of a phone.
other	Used when the type of contact method is not included in this enumeration.



### 3.37 Enumeration IdentifierType

Used in request and response messages.

Enumeration for election data-related codes in the [ExternalIdentifier](#) class.

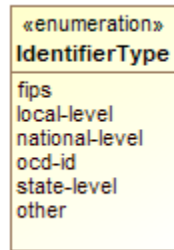


Figure 44 - IdentifierType

Value	Value Description
fips	For FIPS codes.
local-level	For a code that is specific to a county or other similar locality.
national-level	For a code that is used at the national level other than ocd-id.
ocd-id	For Open Civic Data identifiers.
state-level	For a code that is specific to a state.
other	Used when the type of code is not included in this enumeration.

### 3.38 Enumeration PhoneCapability

Used in request and response messages.

Enumeration for telephone capabilities, used in the [Capability](#) attribute of [PhoneContactMethod](#).

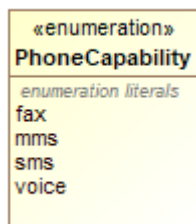


Figure 45 - PhoneCapability

Value	Value Description
fax	For telephones that include facsimile capabilities.
mms	For telephones that contain Multimedia Messaging Service (MMS) capabilities.
sms	For telephones that contain Short Messaging Service (SMS) capabilities.
voice	For telephones that contain voice capabilities.

### 3.39 Enumeration ReportingUnitType

Used in request and response messages.

Enumeration for the type of geopolitical unit, used in the [Type](#) sub-element in the [ReportingUnit](#) element.

«enumeration» ReportingUnitType
ballot-batch ballot-style-area borough city city-council combined-precinct congressional county county-council drop-box judicial municipality polling-place precinct school special split-precinct state state-house state-senate town township utility village vote-center ward water other

Figure 46 - ReportingUnitType

Value	Value Description
ballot-batch	Used for reporting batches of ballots that may cross precinct boundaries.
ballot-style-area	Used for ballot style areas generally composed of precincts.
borough	Used in CT, NJ, PA, other states, and New York City for boroughs. For AK and LA, see county.
city	Used for a city that reports results and/or for the district that encompasses it.

Value	Value Description
city-council	Used for city council districts.
combined-precinct	Used for one or more precincts that have been combined for the purposes of reporting. Used for “Ward” if “Ward” is used interchangeably with “CombinedPrecinct”.
congressional	Used for U.S. Congressional districts.
county	Used for a county and/or for the district that encompasses it. In AK, used for counties that are called boroughs. In LA, used for parishes.
county-council	Used for county council districts.
drop-box	Used for a dropbox for absentee ballots.
judicial	Used for judicial districts.
municipality	Used as applicable for various units such as towns, townships, villages that report votes and/or for the district that encompasses it.
polling-place	Used for a polling place.
precinct	Used also for “Ward” or “District” when these terms are used interchangeably with “Precinct”.
school	Used for a school district.
special	Used for a special district.
split-precinct	Used for splits of precincts.
state	Used for a state and/or for the district that encompasses it.
state-house	Used for a state house or assembly district.
state-senate	Used for a state senate district.
town	Used in some New England states as a type of municipality that reports votes and/or for the district that encompasses it.
township	Used in some mid-western states as a type of municipality that reports votes and/or for the district that encompasses it.
utility	Used for a utility district.
village	Used as a type of municipality that reports votes and/or for the district that encompasses it.
vote-center	Used for a vote center.
ward	Used for combinations or groupings of precincts or other units.
water	Used for a water district.
other	Used for other types of reporting units not included in this enumeration.

### 3.40 Enumeration RequestError

Used in response messages.

Enumeration for registration-related errors, used in the [Error](#) attribute of [RegistrationRejection](#).

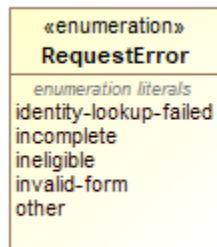


Figure 47 - RequestError

Value	Value Description
identity-lookup-failed	A lookup on the voter's identity failed.
incomplete	The registration request is incomplete.
ineligible	The voter is ineligible to be registered.
invalid-form	The registration form specified is invalid.
other	Used when the type of error is not included in this enumeration.

### 3.41 Enumeration RequestForm

Used in request messages.

Enumeration for types of registration forms, used in the [RegistrationForm](#) attribute of [VoterRecordsRequest](#).

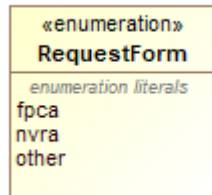


Figure 48 - RequestForm

Value	Value Description
fpca	For the Federal Post Card Application form.
nvra	For the National Voter Registration Act form.
other	Used when the type of form is not included in this enumeration.

### 3.42 Enumeration RequestMethod

Used in request messages.

Enumeration for the method used by the voter to register, used in the [RequestMethod](#) attribute of [VoterRecordsRequest](#).

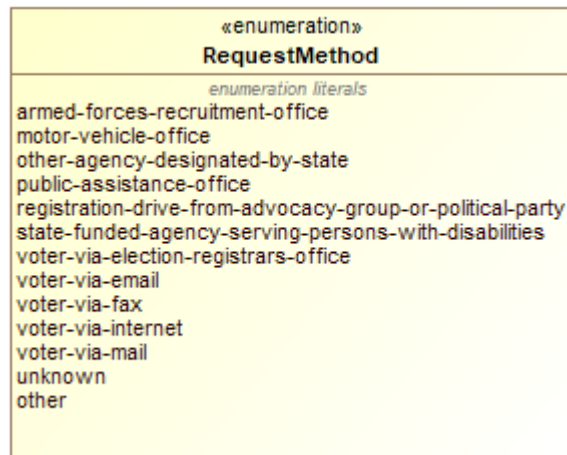


Figure 49 - RequestMethod

Value	Value Description
armed-forces-recruitment-office	The voter assisted by an armed forces recruitment office.
motor-vehicle-office	The voter via an MVA/DMV.
other-agency-designated-by-state	The voter assisted by an unspecified state-designated agency.
public-assistance-office	The voter assisted by a public assistance office.
registration-drive-from-advocacy-group-or-political-party	The voter via a registration drive.
state-funded-agency-serving-persons-with-disabilities	The voter assisted by a state-designated agency serving persons with disabilities.
voter-via-election-registrars-office	The voter via an election or registrar's office.
voter-via-email	The voter via email.
voter-via-fax	The voter via fax.
voter-via-internet	The voter via the Internet, e.g., a website.

Value	Value Description
voter-via-mail	The voter via postal mail.
unknown	The method used is unknown.
other	Used when the type of method is not included in this enumeration.



### 3.43 Enumeration RequestProxyType

Used in request messages.

Enumeration for the registration proxy, e.g., the MVA/DMV , involved in the voter's registration request, used in the [Type](#) attribute of [RegistrationProxy](#).

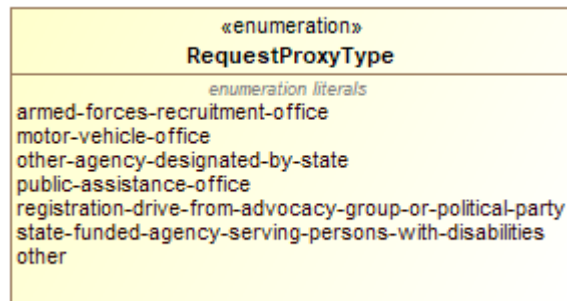


Figure 50 - RequestProxyType

Value	Value Description
armed-forces-recruitment-office	The voter assisted by an armed forces recruitment office.
motor-vehicle-office	The voter via an MVA/DMV.
other-agency-designated-by-state	The voter assisted by an unspecified state-designated agency.
public-assistance-office	The voter assisted by a public assistance office.
registration-drive-from-advocacy-group-or-political-party	The voter via a registration drive.
state-funded-agency-serving-persons-with-disabilities	The voter assisted by a state-designated agency serving persons with disabilities.
other	Used when the type of source is not included in this enumeration.

### 3.44 Enumeration SignatureSource

Used in request and response messages.

Enumeration for source of the voter's signature, used in the [Source](#) sub-element of [Signature](#).

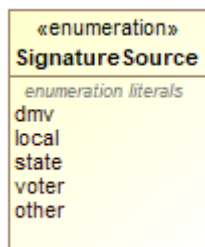


Figure 51 - SignatureSource

Value	Value Description
dmv	For the department of motor vehicles or motor vehicle authority.
local	For an unspecified local source.
state	For an unspecified state source.
voter	The voter has included a signature on the form.
other	Used when the source of the signature is not included in this enumeration.

### 3.45 Enumeration SignatureType

Used in request and response messages.

Enumeration for the type of voter signature, used in the [Type](#) sub-element of [Signature](#).

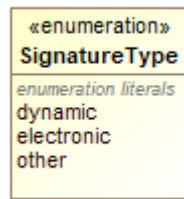


Figure 52 - SignatureType

Value	Value Description
dynamic	For use with biometrics or other artifacts captured as part of the act of the voter signing the registration form.
electronic	For a facsimile of the signature applied to a marking surface, e.g., paper.
other	Used when the type of signature is not included in this enumeration.

### 3.46 Enumeration SuccessAction

Used in response messages.

Enumeration for a response to a voter records request, indicating that the response to the request is successful and the action that occurred, used in the [Action](#) sub-element of [RegistrationSuccess](#). The success action may not necessarily match the requested action.



Figure 53 - SuccessAction

Value	Value Description
address-updated	For indicating that an address was updated.
name-updated	For indicating that a name was updated.
registration-cancelled	For indicating that a registration was cancelled.
registration-created	For indicating that a registration was created.
registration-updated	For indicating that a registration was updated.
status-updated	For indicating that a registration status was updated.
other	Used for other types of success actions not included in this enumeration.

### 3.47 Enumeration VoterClassificationType

Used in request and response messages.

Enumeration for voter status classifications, used in the [Type](#) attribute of [VoterClassification](#). Whether the voter status, e.g., eighteen-on-election-day, is true, false, or unknown depends on the value of the [Assertion](#) attribute.

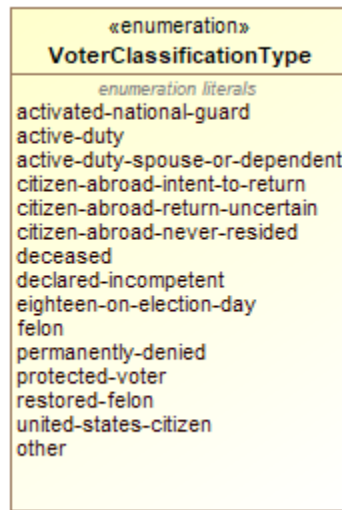


Figure 54 - VoterClassificationType

Value	Value Description
activated-national-guard	The voter is an activated National Guard member on State orders (FPCA).
active-duty	The voter is a member of the Uniformed Services or Merchant Marine on active duty (FPCA).
active-duty-spouse-or-dependent	The voter is an eligible spouse or dependent (FPCA).
citizen-abroad-intent-to-return	The voter is a US citizen residing outside the US and has intention to return (FPCA).
citizen-abroad-return-uncertain	The voter is a US citizen residing outside the US and their return is uncertain (FPCA).
citizen-abroad-never-resided	The voter is a US citizen and has never resided in the US (FPCA).
deceased	The voter is deceased (NVRA).
declared-incompetent	The voter has been declared incompetent (NVRA).

Value	Value Description
eighteen-on-election-day	The voter will be 18 on election day (NVRA).
felon	The voter is a felon (NVRA).
permanently-denied	The voter has not been permanently denied (NVRA).
protected-voter	The voter status is protected (NVRA).
restored-felon	The voter is a restored felon (NVRA).
united-states-citizen	The voter is a United States citizen (NVRA).
other	Used when the type of voter classification is not included in this enumeration.

### 3.48 Enumeration VoterHelperType

Used in request messages.

Enumeration for types of registration helpers, used in the [Type](#) attribute of [RegistrationHelper](#).

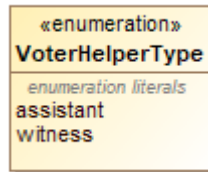


Figure 55 - VoterHelperType

Value	Value Description
assistant	For a registration assistant.
witness	For a registration witness.

### 3.49 Enumeration VoterIdType

Used in request and response messages.

Enumeration for the type of voter ID, used in the [Type](#) attribute of [VoterId](#).

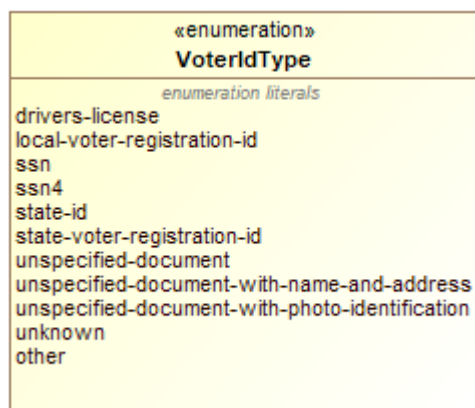


Figure 56 - VoterIdType

Value	Value Description
drivers-license	Used for a driver's license.
local-voter-registration-id	Used for a local voter registration record ID.
ssn	Used for a complete Social Security number.
ssn4	Used for the last four digits of a Social Security number.
state-id	Used for a state ID that is not a state voter registration ID.
state-voter-registration-id	Used for a state's voter registration record ID.
unspecified-document	Used for an unspecified document, not known whether the document contains name, address, or photo ID.
unspecified-document-with-name-and-address	Used for a document that contains the voter's name and address, such as a utility bill.
unspecified-document-with-photo-identification	Used for a document that contains a photograph of the voter.
unknown	Used for documentation that was not captured.
other	Used when the type of ID is not included in this enumeration.



### 3.50 Enumeration VoterRequestType

Used in request messages.

Enumeration for the type of voter records request, used in the [Type](#) attribute of [VoterRecordsRequest](#).

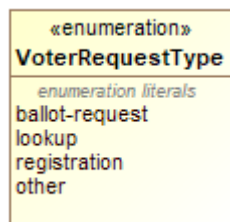


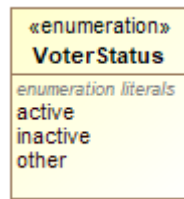
Figure 57 - VoterRequestType

Value	Value Description
ballot-request	For requesting a ballot, possibly in conjunction with an FPCA registration request.
lookup	For a voter registration lookup.
registration	For a voter registration request.
other	Used when the type of request is not included in this enumeration.

### 3.51 Enumeration VoterStatus

Used in response messages.

Enumeration for the status of the voter in a Voter Registration Database.



**Figure 58 - VoterStatus**

Value	Value Description
active	For a voter in active status.
inactive	For a voter in inactive status.
other	Used when the type of voter status is not included in this enumeration.

## 4 XML and JSON Usage Examples

This section contains several examples showing voter records request and responses in XML and JSON, all using the NVRA form. The examples are:

- Voter Registration Request - XML
- Voter Registration Request - JSON
- Voter Registration Response – XML

In the voter records request examples, note that a significant majority of the statements deal with specifying addresses using the FGDC standard [6].

### 4.1 Example 1: NVRA-style Voter Registration Request in XML

Figure 7 shows a fictitious digital NVRA-style registration request for “Jackie Nichole Davidson” in the State of Ohio using XML. This request is for an address update, and an example of the filled-out NVRA-style form is shown.

I am: <input checked="" type="checkbox"/> Registering as an Ohio voter <input checked="" type="checkbox"/> Updating my address <input type="checkbox"/> Updating my name			
1. Are you a U.S. citizen? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No			
2. Will you be at least 18 years of age on or before the next general election? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No			
If you answered NO to either of the questions, do not complete this form.			
3. Last Name DAVIDSON	First Name JACKI	Middle Name or Initial NICHOLE	Jr., II, etc.
4. House Number and Street (Enter new address if changed) 6850 W FRANK AVE NW STE 1		5. City or Post Office NORTH CANTON	6. ZIP Code 44720
7. Additional Mailing Address (If necessary) 2264 W 4TH ST S SIDE A MANSFIELD OH 44906		8. County (where you live) STARK	FOR BOARD USE ONLY SEC4010 (rev. 4/15) City, Village, Twp.  Ward  Precinct  School Dist.  Cong. Dist.  Senate Dist.  House Dist.
9. Birthdate (MM/DD/YYYY) (required) 11/09/1971	10. Ohio Driver's License number OR Last Four Digits of Social Security number (one form of ID required to be listed or provided) AB879456	11. Phone Number (voluntary) +1 (330) 123-9875	
12. PREVIOUS ADDRESS IF UPDATING CURRENT REGISTRATION - Previous House Number and Street 740 POLARIS PKWY STE 1			
Previous City or Post Office LEWIS CENTER	Previous County MONTGOMERY	Previous State Ohio	
13. CHANGE OF NAME ONLY Former Legal Name		Former Signature	
14. I declare under penalty of election falsification I am a citizen of the United States, will have lived in this state for 30 days immediately preceding the next election, and will be at least 18 years of age at the time of the general election.			
Your Signature ↓		Date (MM/DD/YYYY)	

Figure 59 - Example NVRA-style form for a voter address update request

The XML for the voter registration request that contains the information exported from the form is shown below. Note that in lines 16 through 19, the `<AdditionalInfo>` element is being used to indicate that the voter's language preference is English; this is needed because the XML (and JSON) schema does not include a voter-preferred language element but the application at the portal required it. Thus, `<AdditionalInfo>` can be used to add other elements that are required by the application but not present in the schema.

```

1 <!-- DISCLAIMER: All persons listed below are fictitious -->
2 <VoterRecordsRequest xmlns:xsd="http://www.w3.org/2001/XMLSchema" ...
3   <AdditionalInfo>
4     <Name>Language</Name>
5     <StringValue>en_US</StringValue>
6   </AdditionalInfo>
7   <GeneratedDate>2017-02-10</GeneratedDate>
8   <Issuer>Ohio Secretary of State</Issuer>
9   <RequestMethod>voter-via-mail</RequestMethod>
10  <Subject>
11    <ContactMethod>
12      <Type>phone</Type>
13      <Value>3301239875</Value>
14    </ContactMethod>
15    <ContactMethod>
16      <Type>email</Type>
17      <Value>FAKEEMAIL@AOL.COM</Value>
18    </ContactMethod>
19    <DateOfBirth>1971-11-09</DateOfBirth>
20    <MailingAddress>
21      <NumberedThoroughfareAddress_type>
22        <CompleteAddressNumber xmlns="http://www.fgdc.gov/schemas/address/addr">
23          <AddressNumber xmlns="http://www.fgdc.gov/schemas/address/addr_type">2264</AddressNumber>
24        </CompleteAddressNumber>
25        <CompleteStreetName xmlns="http://www.fgdc.gov/schemas/address/addr">
26          <StreetNamePreDirectional
27            xmlns="http://www.fgdc.gov/schemas/address/addr_type">W</StreetNamePreDirectional>
28          <StreetName xmlns="http://www.fgdc.gov/schemas/address/addr_type">4TH</StreetName>
29          <StreetNamePostType
30            xmlns="http://www.fgdc.gov/schemas/address/addr_type">ST</StreetNamePostType>
31          <StreetNamePostDirectional
32            xmlns="http://www.fgdc.gov/schemas/address/addr_type">S</StreetNamePostDirectional>
33        </CompleteStreetName>
34        <CompleteSubaddress xmlns="http://www.fgdc.gov/schemas/address/addr">
35          <SubaddressElement xmlns="http://www.fgdc.gov/schemas/address/addr_type">
36            <SubaddressType>SIDE</SubaddressType>
37            <SubaddressIdentifier>A</SubaddressIdentifier>
38          </SubaddressElement>
39        </CompleteSubaddress>
40        <CompletePlaceName xmlns="http://www.fgdc.gov/schemas/address/addr_type">
41          <PlaceName PlaceNameType="MunicipalJurisdiction">MANSFIELD</PlaceName>
42          <PlaceName PlaceNameType="County"/>
43        </CompletePlaceName>
44        <StateName xmlns="http://www.fgdc.gov/schemas/address/addr_type">OH</StateName>
45        <ZipCode xmlns="http://www.fgdc.gov/schemas/address/addr_type">44906</ZipCode>
46      </NumberedThoroughfareAddress_type>
47    </MailingAddress>
48    <Name>
49      <FirstName>JACKI</FirstName>
50      <LastName>DAVIDSON</LastName>
51      <MiddleName>NICHOLE</MiddleName>
52    </Name>
53    <PreviousResidenceAddress>
54      <NumberedThoroughfareAddress_type>
55        <CompleteAddressNumber xmlns="http://www.fgdc.gov/schemas/address/addr">
56          <AddressNumber xmlns="http://www.fgdc.gov/schemas/address/addr_type">740</AddressNumber>
57        </CompleteAddressNumber>
58        <CompleteStreetName xmlns="http://www.fgdc.gov/schemas/address/addr">
59          <StreetNamePreDirectional xmlns="http://www.fgdc.gov/schemas/address/addr_type"/>
60          <StreetName xmlns="http://www.fgdc.gov/schemas/address/addr_type">POLARIS</StreetName>
61          <StreetNamePostType
62            xmlns="http://www.fgdc.gov/schemas/address/addr_type">PKWY</StreetNamePostType>

```

```

63         <StreetNamePostDirectional xmlns="http://www.fgdc.gov/schemas/address/addr_type"/>
64     </CompleteStreetName>
65     <CompleteSubaddress xmlns="http://www.fgdc.gov/schemas/address/addr">
66         <SubaddressElement xmlns="http://www.fgdc.gov/schemas/address/addr_type">
67             <SubaddressType>STE</SubaddressType>
68             <SubaddressIdentifier>1</SubaddressIdentifier>
69         </SubaddressElement>
70     </CompleteSubaddress>
71     <CompletePlaceName xmlns="http://www.fgdc.gov/schemas/address/addr_type">
72         <PlaceName PlaceNameType="MunicipalJurisdiction">LEWIS CENTER</PlaceName>
73         <PlaceName PlaceNameType="County"/>
74     </CompletePlaceName>
75     <StateName xmlns="http://www.fgdc.gov/schemas/address/addr_type">OH</StateName>
76     <ZipCode xmlns="http://www.fgdc.gov/schemas/address/addr_type">43035</ZipCode>
77 </NumberedThoroughfareAddress_type>
78 </PreviousResidenceAddress>
79 <ResidenceAddress>
80     <NumberedThoroughfareAddress_type>
81         <CompleteAddressNumber xmlns="http://www.fgdc.gov/schemas/address/addr">
82             <AddressNumber
83                 xmlns="http://www.fgdc.gov/schemas/address/addr_type">6850</AddressNumber>
84             </CompleteAddressNumber>
85         <CompleteStreetName xmlns="http://www.fgdc.gov/schemas/address/addr">
86             <StreetNamePreDirectional
87                 xmlns="http://www.fgdc.gov/schemas/address/addr_type">W</StreetNamePreDirectional>
88             <StreetName
89                 xmlns="http://www.fgdc.gov/schemas/address/addr_type">FRANK</StreetName>
90             <StreetNamePostType
91                 xmlns="http://www.fgdc.gov/schemas/address/addr_type">AVE</StreetNamePostType>
92             <StreetNamePostDirectional
93                 xmlns="http://www.fgdc.gov/schemas/address/addr_type">NW</StreetNamePostDirectional>
94             </CompleteStreetName>
95         <CompleteSubaddress xmlns="http://www.fgdc.gov/schemas/address/addr">
96             <SubaddressElement xmlns="http://www.fgdc.gov/schemas/address/addr_type">
97                 <SubaddressType>STE</SubaddressType>
98                 <SubaddressIdentifier>1</SubaddressIdentifier>
99             </SubaddressElement>
100         </CompleteSubaddress>
101         <CompletePlaceName xmlns="http://www.fgdc.gov/schemas/address/addr_type">
102             <PlaceName PlaceNameType="MunicipalJurisdiction">NORTH CANTON</PlaceName>
103             <PlaceName PlaceNameType="County">STARK </PlaceName>
104         </CompletePlaceName>
105         <StateName xmlns="http://www.fgdc.gov/schemas/address/addr_type">OH</StateName>
106         <ZipCode xmlns="http://www.fgdc.gov/schemas/address/addr_type">44720</ZipCode>
107     </NumberedThoroughfareAddress_type>
108 </ResidenceAddress>
109 <VoterClassification>
110     <Assertion>yes</Assertion>
111     <Type>eighteen-on-election-day</Type>
112 </VoterClassification>
113 <VoterClassification>
114     <Assertion>yes</Assertion>
115     <Type>united-states-citizen</Type>
116 </VoterClassification>
117 <VoterClassification>
118     <Assertion>yes</Assertion>
119     <OtherType>ohio-resident</OtherType>
120     <Type>other</Type>
121 </VoterClassification>
122 <VoterClassification>
123     <Assertion>yes</Assertion>
124     <OtherType>bmv-authorization</OtherType>

```

```
125         <Type>other</Type>
126     </VoterClassification>
127     <VoterId>
128         <AttestNoSuchId>false</AttestNoSuchId>
129         <StringValue>AB879456</StringValue>
130         <Type>drivers-license</Type>
131     </VoterId>
132     <VoterId>
133         <AttestNoSuchId>true</AttestNoSuchId>
134         <Type>ssn4</Type>
135     </VoterId>
136 </Subject>
137 <TransactionId>2a642eb5-169e-4a3b-8899-adc7ea6d00d0</TransactionId>
138 <Type>registration</Type>
139 <VendorApplicationId>OLVR 2.0</VendorApplicationId>
140 </VoterRecordsReques
```

## 4.2 Example 2: NVRA-style Voter Registration Request in JSON

Figure 8 shows a fictitious NVRA-style voter registration request for Jane A. Doe in the State of Ohio using JSON.

I am: <input checked="" type="checkbox"/> <b>Registering as an Ohio voter</b> <input type="checkbox"/> <b>Updating my address</b> <input type="checkbox"/> <b>Updating my name</b>			
1. Are you a U.S. citizen? <input checked="" type="checkbox"/> <b>Yes</b> <input type="checkbox"/> <b>No</b> 2. Will you be at least 18 years of age on or before the next general election? <input checked="" type="checkbox"/> <b>Yes</b> <input type="checkbox"/> <b>No</b> If you answered NO to either of the questions, do not complete this form.			
3. Last Name Doe	First Name Jane	Middle Name or Initial A	Jr., II, etc.
4. House Number and Street (Enter new address if changed) 3318 BELMONT AVE		Apt. or Lot #	5. City or Post Office YOUNGSTOWN
7. Additional Mailing Address (if necessary) 2299 E. STATE ST, SALEM, OH 44460		6. ZIP Code 44505	<b>FOR BOARD USE ONLY</b> SEC4010 (rev. 4/15) City, Village, Twp. Ward Precinct School Dist. Cong. Dist. Senate Dist. House Dist.
9. Birthdate (MM/DD/YYYY) (required) 11/12/1993	10. Ohio Driver's License number OR Last Four Digits of Social Security number (one form of ID required to be listed or provided) AA999888	11. Phone Number (voluntary) +1 (330) 614-8004	
12. PREVIOUS ADDRESS IF UPDATING CURRENT REGISTRATION - Previous House Number and Street			
Previous City or Post Office	Previous County	Previous State Ohio	
13. CHANGE OF NAME ONLY Former Legal Name		Former Signature	
14. I declare under penalty of election falsification I am a citizen of the United States, will have lived in this state for 30 days immediately preceding the next election, and will be at least 18 years of age at the time of the general election.			
Your Signature		Date (MM/DD/YYYY)	

Figure 60 - Example NVRA-style form for a voter registration request

An example of the JSON statements for the voter registration request is shown below. Again, “AdditionalInfo” is being used in lines 3 through 14 to add information for elements not included in the JSON (and XML) schema, namely for the voter’s preferred language and whether the voter wishes to volunteer as a poll worker.

```

1  {
2    "@type": "VRI.VoterRecordsRequest",
3    "AdditionalInfo": [
4      {
5        "@type": "VRI.AdditionalInfo",
6        "Name": "Language",
7        "StringValue": "en_US"
8      },
9      {
10       "@type": "VRI.AdditionalInfo",
11       "Name": "IsPollWorker",

```



```

12     "StringValue": "false"
13   }
14 ],
15   "GeneratedDate": "2017-7-30",
16   "Issuer": "Ohio Secretary of State",
17   "TransactionId": "0bb1bfd7-4316-42be-99d5-9c9e3bb9ccc0",
18   "Type": [
19     "registration"
20   ],
21   "VendorApplicationId": "OLVR 2.0",
22   "Subject": {
23     "@type": "VRI.Voter",
24     "DateOfBirth": "1993-11-12T00:00:00",
25     "VoterId": [
26       {
27         "@type": "VRI.VoterId",
28         "Type": "drivers-license",
29         "StringValue": "AA999888",
30         "AttestNoSuchId": false
31       },
32       {
33         "@type": "VRI.VoterId",
34         "Type": "ssn4",
35         "AttestNoSuchId": true
36       }
37     ],
38     "Name": {
39       "@type": "VRI.Name",
40       "FirstName": "JANE",
41       "MiddleName": [
42         "A"
43       ],
44       "LastName": "DOE",
45       "Suffix": ""
46     },
47     "VoterClassification": [
48       {
49         "@type": "VRI.VoterClassification",
50         "Assertion": "yes",
51         "Type": "eighteen-on-election-day"
52       },
53       {
54         "@type": "VRI.VoterClassification",
55         "Assertion": "yes",
56         "Type": "united-states-citizen"
57       },
58       {
59         "@type": "VRI.VoterClassification",
60         "Assertion": "yes",
61         "Type": "other",
62         "OtherType": "swear-accuracy"
63       },
64       {
65         "@type": "VRI.VoterClassification",
66         "Assertion": "yes",
67         "Type": "other",
68         "OtherType": "filled-on-own-behalf"
69       },
70       {
71         "@type": "VRI.VoterClassification",
72         "Assertion": "yes",
73         "Type": "other",

```

```

74         "OtherType": "ohio-resident"
75     },
76     {
77         "@type": "VRI.VoterClassification",
78         "Assertion": "yes",
79         "Type": "other",
80         "OtherType": "bmV-authorization"
81     },
82     {
83         "@type": "VRI.VoterClassification",
84         "Assertion": "yes",
85         "Type": "other",
86         "OtherType": "meets-all-requirements"
87     }
88 ],
89 "ContactMethod": [
90     {
91         "@type": "VRI.ContactMethod",
92         "Type": "phone",
93         "Value": "(330) 614-8004"
94     },
95     {
96         "@type": "VRI.ContactMethod",
97         "Type": "email",
98         "Value": "JDOE@TESTEMAIL.COM"
99     }
100 ],
101 "ResidenceAddress": {
102     "@type": "addr.NumberedThoroughfareAddress_type",
103     "CompleteAddressNumber": {
104         "@type": "addr_type.CompleteAddressNumber_type",
105         "AddressNumber": "3818"
106     },
107     "CompleteStreetName": {
108         "@type": "addr_type.CompleteStreetName_type",
109         "StreetNamePreDirectional": {
110             "@type": "addr_type.StreetNamePreDirectional_type",
111             "Value": ""
112         },
113         "StreetName": "BELMONT",
114         "StreetNamePostType": {
115             "@type": "addr_type.StreetNamePreType_type",
116             "Value": "AVE"
117         },
118         "StreetNamePostDirectional": {
119             "@type": "addr_type.StreetNamePreDirectional_type",
120             "Value": ""
121         }
122     },
123     "CompletePlaceName1": {
124         "@type": "addr_type.CompletePlaceName_type",
125         "PlaceName": [
126             {
127                 "@type": "addr_type.PlaceName_type",
128                 "PlaceNameType": "MunicipalJurisdiction",
129                 "Value": "YOUNGSTOWN"
130             },
131             {
132                 "@type": "addr_type.PlaceName_type",
133                 "PlaceNameType": "County",
134                 "Value": "78"
135             }

```

```

136         ]
137     },
138     "StateName": "OH",
139     "ZipCode": "44505"
140 },
141 "MailingAddress": {
142     "@type": "addr.NumberedThoroughfareAddress_type",
143     "CompleteAddressNumber": {
144         "@type": "addr_type.CompleteAddressNumber_type",
145         "AddressNumber": "2299"
146     },
147     "CompleteStreetName": {
148         "@type": "addr_type.CompleteStreetName_type",
149         "StreetNamePreDirectional": {
150             "@type": "addr_type.StreetNamePreDirectional_type",
151             "Value": "E"
152         },
153         "StreetName": "STATE",
154         "StreetNamePostType": {
155             "@type": "addr_type.StreetNamePreType_type",
156             "Value": "ST"
157         }
158     },
159     "CompletePlaceName1": {
160         "@type": "addr_type.CompletePlaceName_type",
161         "PlaceName": [
162             {
163                 "@type": "addr_type.PlaceName_type",
164                 "PlaceNameType": "MunicipalJurisdiction",
165                 "Value": "SALEM"
166             },
167             {
168                 "@type": "addr_type.PlaceName_type",
169                 "PlaceNameType": "County",
170                 "Value": "COLUMBIANA"
171             }
172         ]
173     },
174     "StateName": "OH",
175     "ZipCode": "44460"
176 }
177 },
178 "RequestMethod": "voter-via-internet",
179 "Form": "other",
180 "OtherForm": "4010"
181 }

```

### 4.3 Example 3: NVRA-style Voter Records Response in XML

Form No. 10-J. Prescribed by Secretary of State (06-14)

### ACKNOWLEDGMENT NOTICE

R.C. 3501.01(V), 3503.19(C)(1)

**Your application to register to vote or update your registration has been received and accepted. For the purpose of voting, you are assigned to:**

Precinct AKRON 4-F

City, Township, Village Akron

Your polling place is: PERKINS BUILDING

630 MULL AVE

AKRON, OH 44313

**Your application to register to vote or update your registration has been rejected because:**

<input type="checkbox"/> Form was not signed	<input type="checkbox"/> Address was incomplete
<input type="checkbox"/> Name given was incomplete	<input type="checkbox"/> Birth date was not supplied
<input type="checkbox"/> Other required information not provided:	

**Figure 61 - Populated NVRA voter registration response form**

This final example shows a fictitious digital NVRA-style registration response, successful, in the State of Ohio using XML. An example of the populated response form is shown in Figure 9. The XML for the voter registration response that contains the information used to populate the form is as follows:

```

1 <?xml version="1.0" encoding="UTF-8"?>
2 <!-- DISCLAIMER: All persons and places listed below are fictitious -->
3 <VoterRecordsResponse xsi:type="RegistrationSuccess" xmlns:xsd="http://www.w3.org/2001/XMLSchema"
4   xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
5   xmlns="NIST_V0_voter_records_interchange.xsd"
6   xsi:schemaLocation="NIST_V0_voter_records_interchange.xsd
7   NIST_V0_voter_records_interchange.xsd"
8   xmlns:addr="http://www.fgdc.gov/schemas/address/addr"
9   xmlns:addr_type="http://www.fgdc.gov/schemas/address/addr_type">
10  <Action>registration-created</Action>
11  <Districts>
12    <Name>Akron</Name>
13    <Type>municipality</Type>
14  </Districts>
15  <EffectiveDate>2017-07-31</EffectiveDate>
16  <ElectionAdministration>
17    <ContactMethod>
18      <Type>phone</Type>
19      <Value>3306435200</Value>
20    </ContactMethod>

```

```
21     <Location>
22       <Address>
23         <GeneralAddressClass_type>
24           <addr:USPSGeneralDeliveryPoint>470 GRANT ST</addr:USPSGeneralDeliveryPoint>
25           <addr_type:PlaceStateZip>AKRON, OH 44311</addr_type:PlaceStateZip>
26         </GeneralAddressClass_type>
27       </Address>
28     </Location>
29     <Name>Summit</Name>
30 </ElectionAdministration>
31 <PollingPlace>
32   <Location>
33     <Address>
34       <GeneralAddressClass_type>
35         <addr:USPSGeneralDeliveryPoint>630 MULL AVE</addr:USPSGeneralDeliveryPoint>
36         <addr_type:PlaceStateZip>AKRON, OH 44313</addr_type:PlaceStateZip>
37       </GeneralAddressClass_type>
38     </Address>
39   </Location>
40   <Name>PERKINS BUILDING</Name>
41   <Type>polling-place</Type>
42 </PollingPlace>
43 <Locality>
44   <Name>AKRON 4-F</Name>
45   <Type>precinct</Type>
46 </Locality>
47 </VoterRecordsResponse>
```

**Appendix A—Acronyms**

Selected acronyms and abbreviations used in this document are defined below.

CDF	Common Data Format
EAC	Election Assistance Commission
EAVS	EAC Election Administration and Voting Survey
FIPS	Federal Information Processing Standard
FPCA	Federal Post Card Application
FWAB	Federal Write-in Absentee Ballot
JSON	JavaScript Object Notation
MMS	Multimedia Messaging Service
MIME	Multipurpose Internet Mail Extensions
NIST	National Institute of Standards and Technology
NVRA	National Voter Registration Act
OCD-ID	Open Civic Data Identifiers
OVR	Online Voter Registration
SMS	Short Message Service
SP	Special Publication
UML	Unified Modeling Language
UOCAVA	Uniform and Overseas Citizens Assistance in Voting Act
VR	Voter Registration
VVSG	Voluntary Voting Systems Guidelines
XML	eXtensible Markup Language



## Appendix B—Glossary

Selected terms used throughout this document are defined below. In some of the definitions, there is ancillary information that is not part of the definition but helpful in understanding the definition; this ancillary information is preceded with “*Note:*”. Synonyms are preceded with “*Syn:*”.

<b>Election district:</b>	Administrative area in which voters are entitled to vote in contests that are specific to that area.
<b>Election official:</b>	Any person who is involved with administering or conducting an election, including government personnel and temporary election workers. This may include any county clerk and recorder, election judge, member of a canvassing board, central election official, election day worker, member of a board of county commissioners, member or secretary of a board of directors authorized to conduct public elections, representative of a governing body, or other person engaged in the performance of election duties as required by the election code.
<b>Polling place:</b>	Location at which voters may cast in-person ballots under the supervision of election workers during one or more specific time periods.
<b>Precinct:</b>	Election administration division corresponding to a geographic area that is the basis for determining which contests the voters legally residing in that area are eligible to vote on.
<b>Registration assistant:</b>	An organization whose purpose includes assisting voters in registering to vote.
<b>Registration proxy:</b>	An organization that submits a voter registration request on behalf of the voter, e.g., a DMV office that submits a voter registration request for a voter.
<b>Registration witness:</b>	An individual who witnesses a voter’s registration, i.e., the voter signing his/her registration form.
<b>Reporting unit:</b>	An administrative division that reports votes or to which votes are associated, e.g., state, county, city, precinct, etc.



<b>Schema:</b>	A file containing definitions of data elements and attributes with rules for usage, e.g., for XML.
<b>UOCAVA voter:</b>	An overseas voter or an active duty member of the U.S. military, either within or outside the United States, including any accompanying spouse and family members who are eligible to vote in their last place of residence in the United States. The Uniformed and Overseas Citizens Absentee Voting Act is commonly referred to as UOCAVA.

**Appendix C—References**

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- [11] Open Civic Data, *OCD Identifiers*, <http://opencivicdata.readthedocs.org/en/latest/ocdids.html> [accessed 2/1/2016].

- [12] ISO 3166-1 Country Codes, <https://www.iso.org/obp/ui/#search> [accessed 11/08/2017].

## Appendix D—File Download Locations

The files associated with this specification are available for download from a NIST repository, whose address is:

<https://github.com/usnistgov/VoterRecordsInterchange>

These files are also available from:

<http://vote.nist.gov>

The files include:

- This specification,
- UML model,
- XML and JSON schemas, and
- Example files.