



Overseas Voting Initiative
THE COUNCIL OF STATE GOVERNMENTS

PROCESS MODELING PILOT

Executive Summary

In 2020, The Council of State Governments Overseas Voting Initiative partnered with the Pennsylvania Department of State to better understand the processes and data that touch Pennsylvania's military and overseas voters — who are eligible under the Uniform and Overseas Citizen Absentee Voting Act (UOCAVA) — with the goal of improving data collection for the Election Administration and Voting Survey (EAVS) Section B Data Standard. This effort involved several meetings with state and local election officials in order to understand their workflow.

The Overseas Voting Initiative team found that Pennsylvania's processes broadly align with those previously developed

by the National Institute of Standards and Technology and Election Assistance Commission Election Modeling Working Group. Furthermore, the team discovered areas where operational as well as technological constraints preclude the collection of EAVS Section B data points. Data processing could be improved through the implementation of checks and controls in the Voter Registration Database to ensure business rules are consistently applied. Findings in this document should aid in development of a new Voter Registration Database, underway in Pennsylvania.

Why model?

Modeling provides a simplified conceptualization of reality. Modeling processes can be used in a wide variety of contexts — reaching consensus between and among stakeholders, arriving at best practices and educating new employees during onboarding, among others.

The purpose of the Pennsylvania UOCAVA process modeling pilot was to improve the EAVS Section B (ESB) Data Standard

data by examining the processes that feed it. Through this process modeling exercise, Pennsylvania Department of State and the OVI team sought to discover where data points are captured, where errors are potentially introduced and where the processes may be improved to capture the data. The NIST election models were used as a starting point.

The Pennsylvania Pilot

Scope

This effort examined the lifecycle of the Uniform and Overseas Citizen Absentee Voting Act voting, from assertion of UOCAVA protections to the return of the ballot through determination of countability.

Methodology

This effort was conducted remotely. The tools used include teleconferencing and screen sharing software. Additionally, the pilot used an online business process management tool called

Signavio, which provides online modeling and collaboration from an intuitive web interface. Each participant was provided an account and given a demonstration on how to use the tool. The models were displayed as they were built during calls, allowing for real time collaboration on the end product.

The following National Institutes of Standards and Technology Election Modeling process models were used as a starting point:

- Maintain remote voter list².

¹ <https://eavs-section-b-data-standard.readthedocs.io/en/latest/>

² https://pages.nist.gov/ElectionModeling/diagrams.html#Process_18_5_1_11940316_1500467059636_224364_23800

- Send ballot by mail³ or send ballot electronically⁴.
- Receive and process ballot package⁵.

The OVI team annotated the model with details about the collection of ESB data. These annotations link data points in the ESB Data Standard to where they are collected in the processing of UOCAVA registrations and ballots. The facts regarding the collection of these data points were confirmed during interviews with election officials.

The team held four meetings with state and local election officials between September 2020 and April 2021.

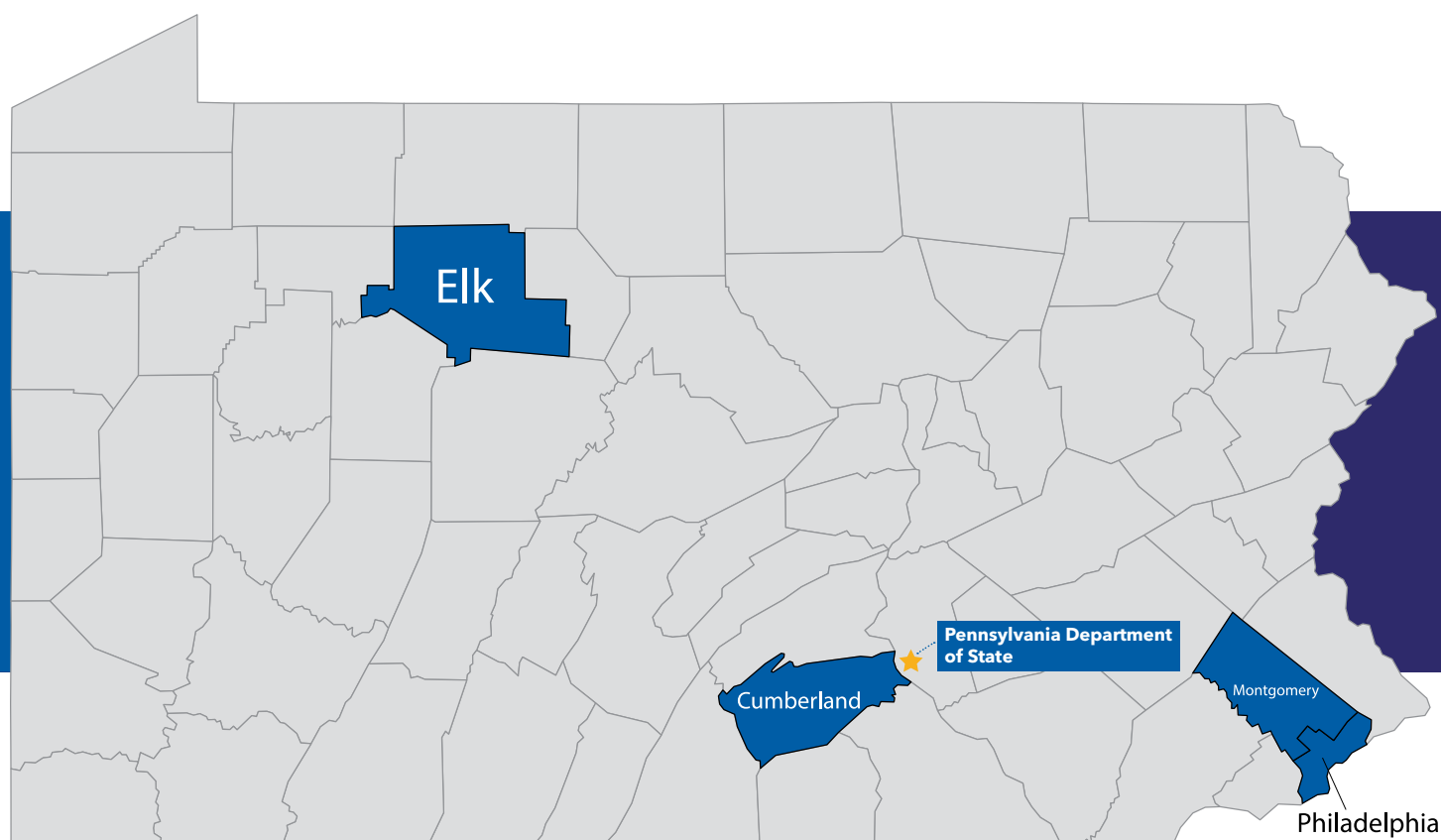
Participants

Several jurisdictions were assembled to ensure the resulting models reflected the diversity of the conduct of elections in Pennsylvania. The jurisdictions varied in total population size and number of UOCAVA voters served.

The pilot involved the following jurisdictions:

- Pennsylvania Department of State
- Cumberland County, Pennsylvania
- Elk County, Pennsylvania
- Montgomery County, Pennsylvania
- Philadelphia County, Pennsylvania

Assembled Pennsylvania Jurisdictions



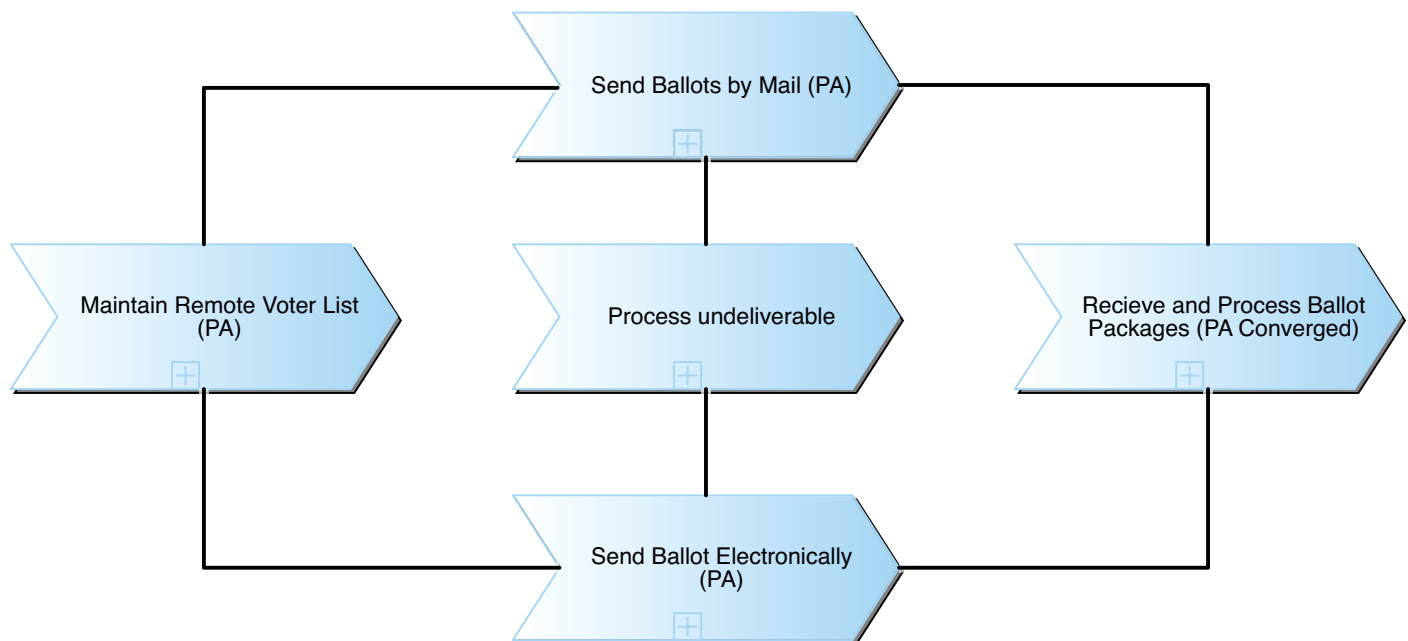
³ <https://pages.nist.gov/ElectionModeling/diagrams.html#Process> 18 5 1 11940316 1500467073311 581606 23840

⁴ <https://pages.nist.gov/ElectionModeling/diagrams.html#Process> 18 5 1 11940316 1500467081699 810212 23880

⁵ <https://pages.nist.gov/ElectionModeling/diagrams.html#Process> 18 5 1 11940316 1500467309814 661011 24185

Results

The modeling effort led to the development of five processes, shown below.



Each meeting added details to the models. The areas that were expanded include the handling of incomplete UOCAVA ballot/registration requests, as well as state specific details, such as the handling of emailed ballots.

A Mix of Paper and Digital

Although Pennsylvania has a web portal that permits non-military domestic voters to request an absentee ballot, the only electronic request method available to UOCAVA voters is electronic mail (email). Ballots may also be requested by postal mail.

The processes used by localities in Pennsylvania, regardless of size, favor paper routing and management. Emailed requests are printed and otherwise treated as those requested via postal mail. However, jurisdictions did not express dissatisfaction with this approach, likely reflecting a vast experience in managing paper-based processes.

Understanding data gaps

One of the key goals of the modeling pilot was to better understand gaps in ESB data collection. The OVI team tracked 13 key data points across the five developed processes models mentioned above.

Eight of the 13 data points were collected using the Commonwealth's Voter Registration Database. Two more were collected, but not to the level of detail requested by Section B of EAVS. Three data points were not captured.

Table 1: Activities that touch ESB Data Standard Data

Diagram	Activity	BallotReceivedDate	BallotReceivedMethod	BallotRejectionType	BallotTransmissionDate	BallotTransmissionMethod	BallotType	RequestDate	RequestStatusType	RequestType	VoterMailingCountry	VoterType
Maintain Remote Voter List	Enter request into VRDB							x		x	x	x
	Determine eligibility to vote a full ballot						x					
	Record ballot transmission method					x						
Process undeliverable	Record undeliverable ballot status on voter record			x								
Receive and Process Ballot Packages (PA)	Update voter record with ballot package received	x	x									
	Record countability information			x								
	Log sent date in VRDB				x							
Send Ballot Electronically (PA)	Set ballot type						x					
	Notify voter by email				x							
	Email documents				x							

The data points not collected were all related to UOCAVA ballot requests (e.g., Federal Post Card Application). Several points, such as RequestMethod and RequestType, reflect a lack of a structure data field in which to store the data in the VRDB. According to jurisdictions, the VRDB provides little decision support. For example, it does not help users determine if an

application is complete or if a voter is eligible for UOCAVA protections. Additionally, the VRDB does not handle or track effectively common exception case logic (e.g., duplicate requests, incomplete or invalid requests). Instead, these scenarios fall outside the VRDB.

Table 2: Analysis of Tracked ESB Data Points

Attribute	Notes	Suggestions for improvement
BallotReceivedDate ⁶	None	None
BallotReceivedMethod ⁷	Always mail (no other option)	None
BallotRejectionType ⁸	None	None
BallotTransmissionDate ⁹	Autogenerated by system on print/email	None
BallotTransmissionMethod ¹⁰	Mail or email, but have ballot marking system for Americans with Disabilities Act voters	None
BallotType ¹¹	Can classify federal ballot based on VoterType	None
RequestDate ¹²	Captured, but defaults to current date	Do not set a default date
RequestMethod ¹³	Not collected in VRDB	Collect in VRDB
RequestStatusReasonType ¹⁴	Duplicates and incompletes are not captured within the VRDB	Allow rejected applications to be captured, with reasons for rejection
RequestStatusType ¹⁵	Pending and rejection statuses are not captured	Allow pending/rejected requests to be captured
RequestType ¹⁶	FPCA requests not captured in VRDB	Ensure request type FPCA and FWAB are captured
VoterMailingCountry ¹⁷	Captured, but freeform	Consider using a standard list of countries
VoterType ¹⁸	Does not capture all FPCA categories (no military dependent)	Update system with current FVAP/FPCA categories

⁶ <https://eavs-section-b-data-standard.readthedocs.io/en/latest/csv/index.html#ballotreceiveddate>

⁷ <https://eavs-section-b-data-standard.readthedocs.io/en/latest/csv/index.html#ballotreceivedmethod>

⁸ <https://eavs-section-b-data-standard.readthedocs.io/en/latest/csv/index.html#ballotrejectiontype>

⁹ <https://eavs-section-b-data-standard.readthedocs.io/en/latest/csv/index.html#ballottransmissiondate>

¹⁰ <https://eavs-section-b-data-standard.readthedocs.io/en/latest/csv/index.html#ballottransmissionmethod>

¹¹ <https://eavs-section-b-data-standard.readthedocs.io/en/latest/csv/index.html#ballottype>

¹² <https://eavs-section-b-data-standard.readthedocs.io/en/latest/csv/index.html#requestdate>

¹³ <https://eavs-section-b-data-standard.readthedocs.io/en/latest/csv/index.html#requestmethod>

¹⁴ <https://eavs-section-b-data-standard.readthedocs.io/en/latest/csv/index.html#requeststatusreasontype>

¹⁵ <https://eavs-section-b-data-standard.readthedocs.io/en/latest/csv/index.html#requeststatustype>

¹⁶ <https://eavs-section-b-data-standard.readthedocs.io/en/latest/csv/index.html#requesttype>

¹⁷ <https://eavs-section-b-data-standard.readthedocs.io/en/latest/csv/index.html#votermailingcountry>

¹⁸ <https://eavs-section-b-data-standard.readthedocs.io/en/latest/csv/index.html#votertype>

Risks

In interviews with election officials during the pilot, several items of note could affect the quality of the data in the database. Many are a consequence of the system relying on human judgment to enter data and categorize transactions accurately. Controls were not discussed during the pilot interviews. It is possible that adequate controls are in place to manage these risks.

Table 3: Risks to accurate data collection

Process step description	Risks	Cause	Consequence
Determine if the application is prima facie complete.	Voter uses incorrect form for UOCAVA protections	Voter does not use the correct form for UOCAVA protections, i.e., FPCA form	Voter may not receive UOCAVA protections they are otherwise eligible for
Determine if the application duplicates an existing request.	Inconsistent application of business rules	PA VRDB does not control when an application is considered duplicate	Consistency is outside system control
Update the existing FPCA request to reflect new details.	Duplicates not tracked	Localities update existing application instead of entering duplicate	System is not aware of additional "duplicate" requests being received
	Processing duplicates causes reporting issues	Design flaw in PA VRDB	Processing of duplicates within the system can cause an imbalance in applications received and ballots sent, which is an accounting issue

Conclusion

The pilot successfully helped the Pennsylvania Department of State and the Overseas Voting Initiative understand the process and specific pain points in collecting ESB data. Many of the issues with collecting data were due to a legacy Voter Registration Database, so the pilot process also was able to point to specific, actionable suggestions on how several data points could be better collected. Further, we identified areas of focus for future business process automation. The Pennsylvania Department of State is currently looking at a new Voter

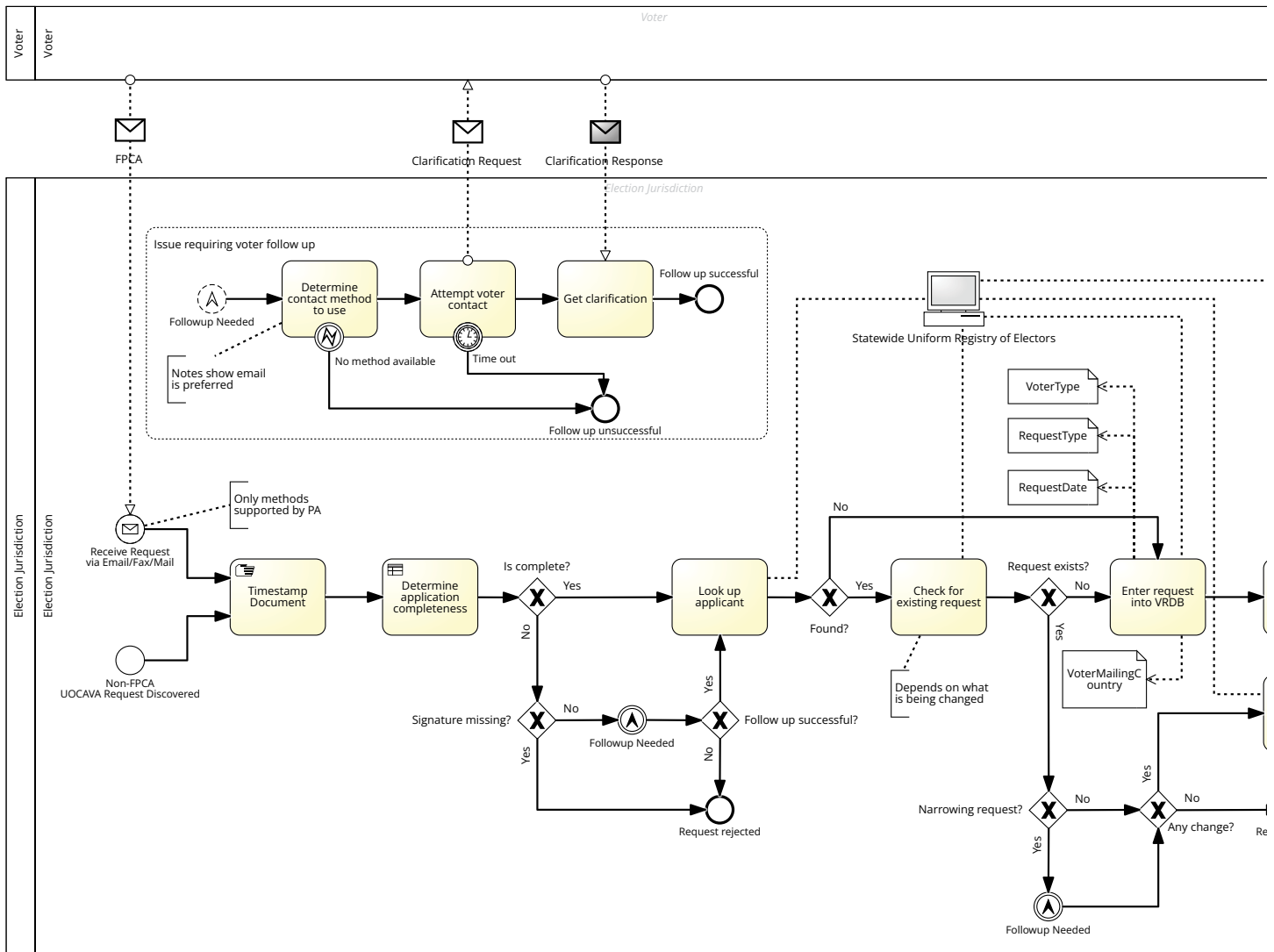
Registration Database, and the identified deficiencies could be transformed into requirements for improved functionality.

The approach piloted for Pennsylvania is transferable to other jurisdictions. The NIST-EAC Election Model served as a useful baseline, reducing the time and effort required to describe the Uniform and Overseas Citizen Absentee Voting Act process. Creating a new baseline from the Pennsylvania models should further reduce the effort required to model other state's processes.

Appendix A

Maintain Remote Voter List (PA)

Diagram (pt. 1)



Elements

Process elements

Receive Request via Email/Fax/Mail

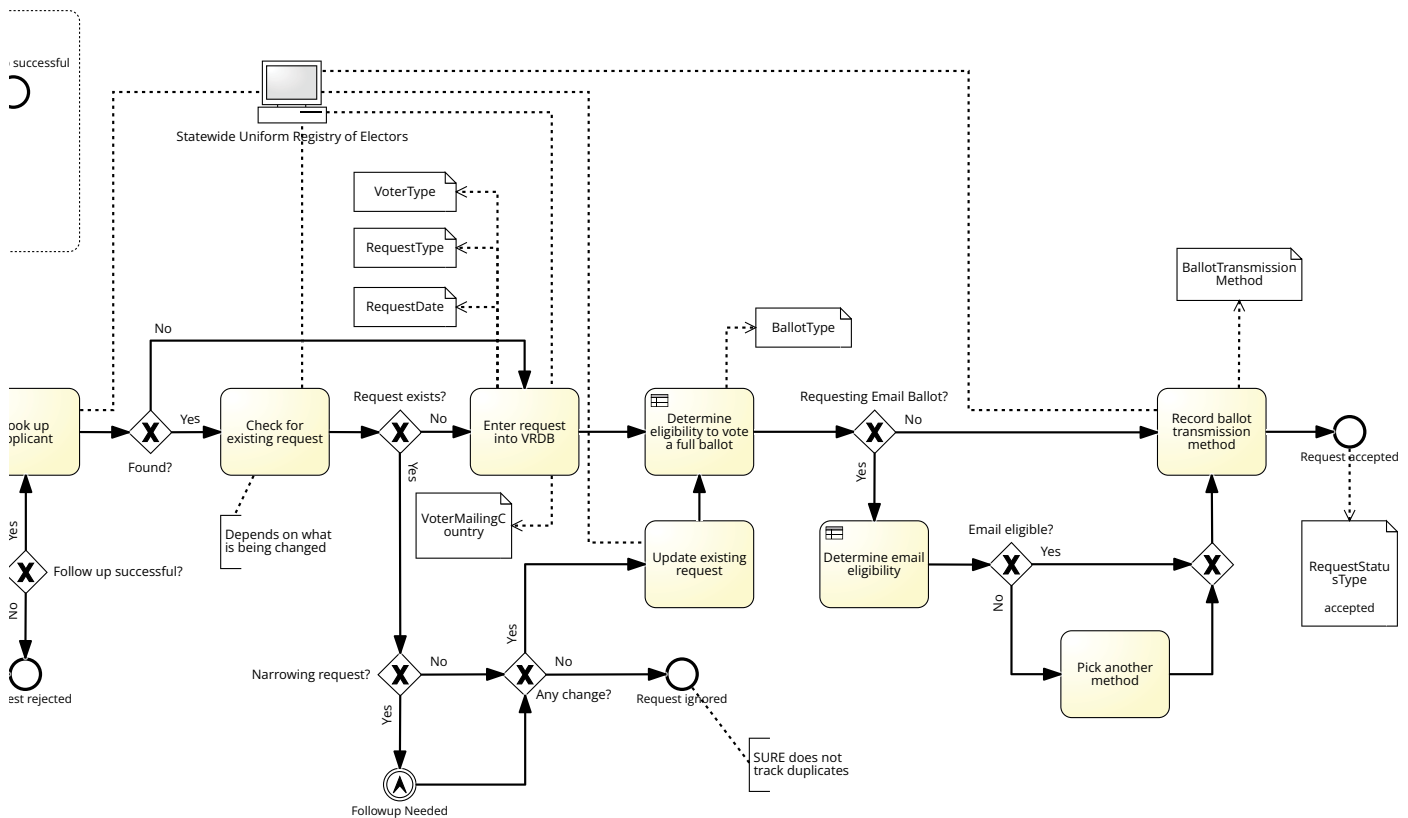
Start Message Event

Data objects: FPCA

Non-FPCA UOCAVA Request Discovered

Start Event

This could be if a voter uses a standard request but otherwise indicates they reside overseas.



Timestamp Document

Task

Affix a timestamp to the document. Current practice is to print documents that come digitally (e.g. fax or email)

Task type: Manual

Determine application completeness

Task

Determine if the application is complete on its face.

Risks:

- Voter uses incorrect form for UOCAVA

Task type: Business rule

Is complete?

Exclusive (XOR) Gateway

Signature missing?

Exclusive (XOR) Gateway

Follow-up Needed

Intermediate Escalation Event

Follow up successful?

Exclusive (XOR) Gateway

Look up applicant

Task

Look up the applicant in the VRDB.

IT Systems: Statewide Uniform Registry of Electors

Found?

Exclusive (XOR) Gateway

Check for existing request

Task

Determine if the application duplicates an existing request.

Risks:

- Inconsistent application of business rules

IT Systems: Statewide Uniform Registry of Electors

Request exists?

Exclusive (XOR) Gateway

Narrowing request?

Exclusive (XOR) Gateway

Follow-up Needed

Intermediate Escalation Event

Any change?

Exclusive (XOR) Gateway

Request ignored

End Event

Update existing request

Task

Update the existing FPCA request to reflect new details.

Risks:

- Duplicates not tracked
- Processing duplicates causes reporting issues

IT Systems: Statewide Uniform Registry of Electors

Enter request into VRDB

Task

Enter the filled form data into the VRDB.

Data objects:

RequestDate

RequestType

VoterMailingCountry

VoterType

IT Systems: Statewide Uniform Registry of Electors

Determine eligibility to vote a full ballot

Task

Determine if the voter should be classified as a "federal voter", who is only eligible to vote on federal contests.

Data objects: BallotType

Task type: Business rule

Requesting Email Ballot?

Exclusive (XOR) Gateway

Determine email eligibility

Task

Determine if the applicant resides outside the United States. Usually this means they check if address is outside United States. This can be hard because military addresses do not always include country information and may be formatted differently than non-military addresses. Sometimes other information, such as the voter's UOCAVA classification is used.

Task type: Business rule

Email eligible?

Exclusive (XOR) Gateway

Pick another method

Task

Determine another method to send the ballot.

Exclusive (XOR) Gateway

Exclusive (XOR) Gateway

Record ballot transmission method

Task

Record the method the voter wishes to have their ballot transmitted.

Data objects: BallotTransmissionMethod

IT Systems: Statewide Uniform Registry of Electors

Request accepted

End Event

Data objects: RequestStatusType

Request rejected

End Event

Issue requiring voter follow up

Event Subprocess

Follow-up Needed

Start Escalation Event

Is interrupting: no

Determine contact method to use

Task

Determine how to best contact the applicant. Some jurisdictions may be limited in which contact methods they are allowed to use. For example, some may be forbidden to call foreign phone numbers.

No method available

Intermediate Error Event

Attempt voter contact

Task

Attempt to make contact with the applicant.

Data objects: Clarification Request

Time out

Intermediate Timer Event

Incomplete are aged out usually after election ends for the corresponding applications. This applies to FPCA as well. If they request in primary, but do not fix, they must resubmit for general.

Follow-up unsuccessful

End Event

Get clarification

Task

Get clarification from the applicant.

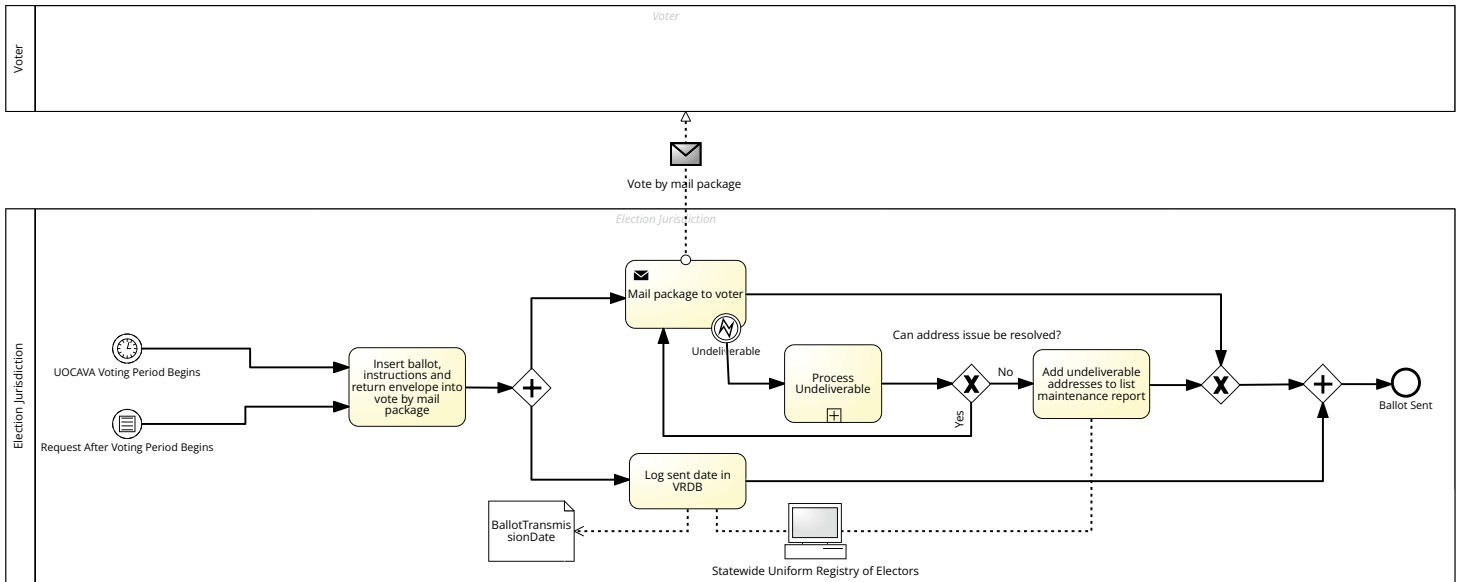
Data objects: Clarification Response

Follow-up successful

End Event

Send Ballot by Mail (PA)

Diagram



Description

Most UOCAVA ballots are sent electronically. This process is included for completeness purposes.

Elements

Process elements

UOCAVA Voting Period Begins

Start Timer Event

Request After Voting Period Begins

Start Conditional Event

Insert ballot, instructions and return envelope into vote by mail package

Task

Build a package of materials required for the vote by mail voter to cast and return their ballot.

Parallel Gateway

Parallel Gateway

Mail package to voter

Task

Mail the vote by mail package to the voter.

Data objects: Vote by mail package

Task type: Send

Undeliverable

Intermediate Error Event

Process Undeliverable

Collapsed Subprocess

Perform additional undeliverable processing (in separate task)

Subprocess reference: [Process undeliverable ballot \(PA\)](#)

Can address issue be resolved?

Exclusive (XOR) Gateway

Add undeliverable addresses to list maintenance report

Task

Add voter to list maintenance report for purposes of confirming their current address.

IT Systems: Statewide Uniform Registry of Electors

Exclusive (XOR) Gateway

Exclusive (XOR) Gateway

Log sent date in VRDB

Task

Note when the ballot package was mailed to the voter.

Data objects: BallotTransmissionDate

IT Systems: Statewide Uniform Registry of Electors

Parallel Gateway

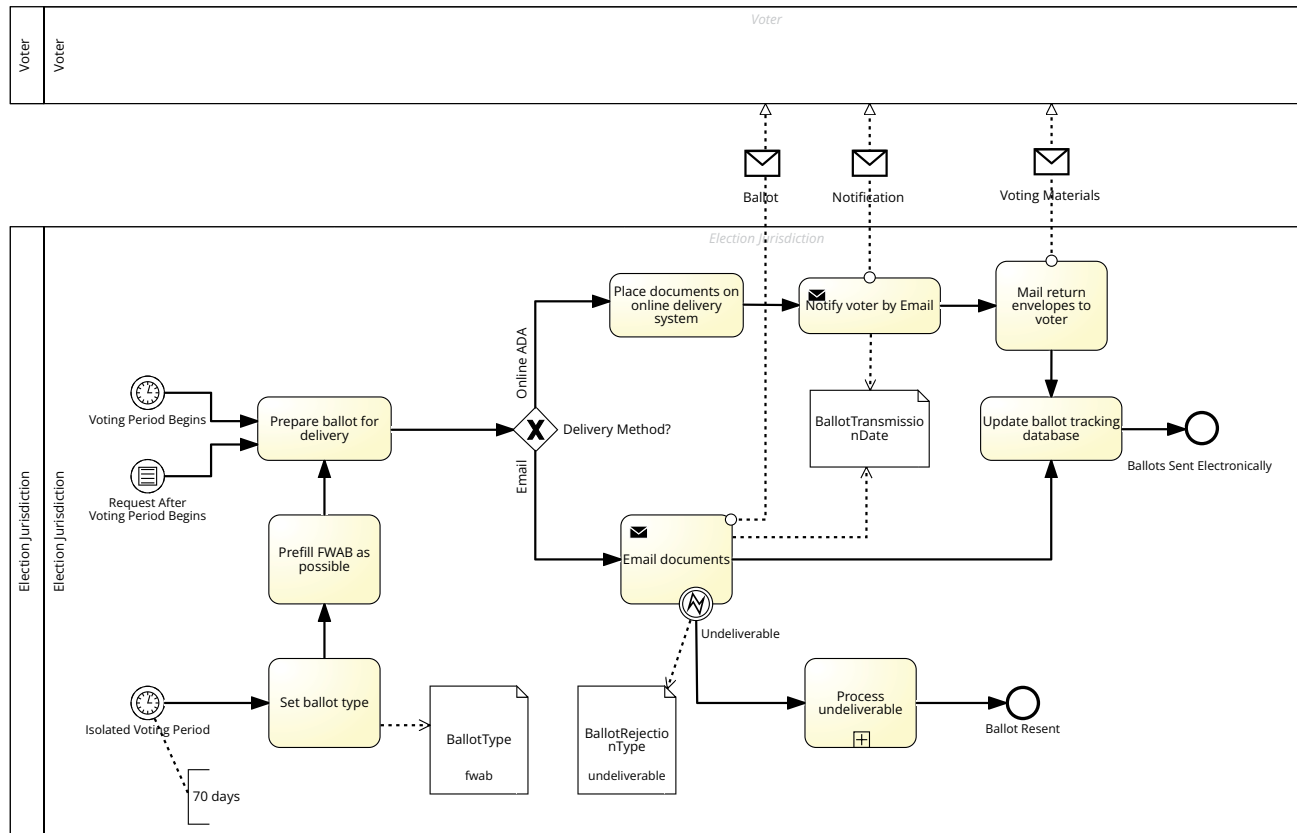
Parallel Gateway

Ballot Sent

End Event

Send Ballot Electronically (PA)

Diagram



Elements

Process elements

Voting Period Begins

Start Timer Event

Request After Voting Period Begins

Start Conditional Event

Isolated Voting Period

Start Timer Event

Set ballot type

Task

Set the ballot type the voter will receive.

Data objects: BallotType

Prefill FWAB as possible

Task

Prefill the FWAB with details about the contests on the ballot as well as known at the time.

Prepare ballot for delivery

Task

Prepare the electronic ballot package to be delivered. The exact details will vary based on the delivery method.

Risks:

- Ballot not certified by deadline

Delivery Method?

Exclusive (XOR) Gateway

Place documents on online delivery system

Task

Make the ballot package available via an online delivery system (e.g. a web application).

Notify voter by Email

Task

Send the ballot package via electronic mail. This is generated by a third party for ADA ballots.

Data objects:

BallotTransmissionDate

Notification

Task type: Send

Mail return envelopes to voter

Task

Mail envelopes to voter for their use during ballot return.

Data objects: Voting Materials

Email documents

Task

Send the ballot package to the voter via email.

Data objects:

Ballot

BallotTransmissionDate

Task type: Send

Undeliverable

Intermediate Error Event

Data objects: BallotRejectionType

Process undeliverable

Collapsed Subprocess

Subprocess reference: [Process undeliverable ballot \(PA\)](#)

Ballot Resent

End Event

Update ballot tracking database

Task

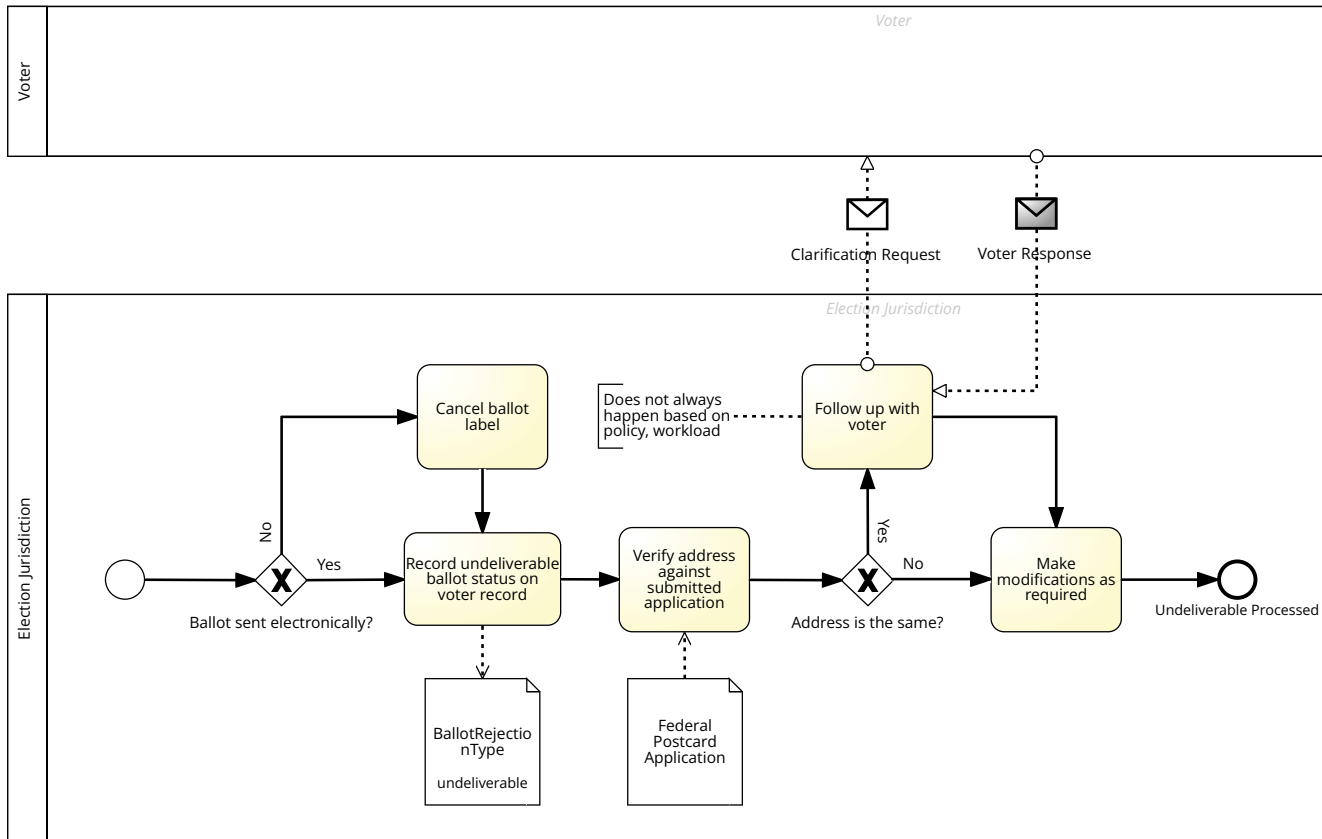
Note when the ballot package was transmitted or otherwise made available to the voter.

Ballots Sent Electronically

End Event

Process undeliverable ballot (PA)

Diagram



Elements

Process elements

Start Event

Start Event

Ballot sent electronically?

Exclusive (XOR) Gateway

Cancel ballot label

Task

Cancel the ballot label in the VRDB.

Record undeliverable ballot status on voter record

Task

If the ballot was returned undeliverable, note the fact on the voter's record.

Data objects: BallotRejectionType

Verify address against submitted application

Task

Verify that the address was correctly entered into the VRDB.

Data objects: Federal Postcard Application

Address is the same?

Exclusive (XOR) Gateway

Follow up with voter

Task

Try to establish contact with the voter to correct the address issue.

Data objects:

Clarification Request

Voter Response

Make modifications as required

Task

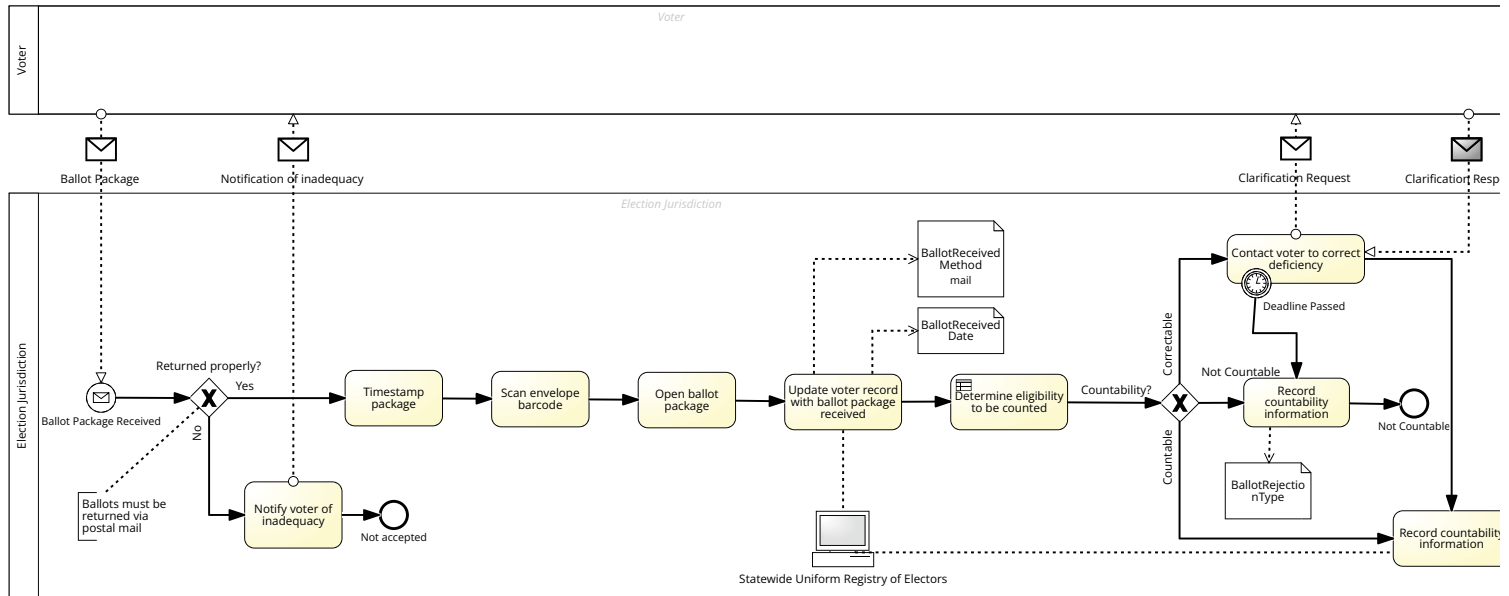
Modify the address to resolve the issue, if applicable.

Undeliverable Processed

End Event

Receive and Process Ballot Packages (PA)

Diagram (pt. 1)



Elements

Process elements

Ballot Package Received

Start Message Event

Data objects: Ballot Package

Message name: Ballot Package

Returned properly?

Exclusive (XOR) Gateway

Timestamp package

Task

Affix a timestamp to the returned ballot package.

Scan envelope barcode

Task

Scan the envelope's barcode so the corresponding record in the VRDB can be retrieved.

Open ballot package

Task

Open the ballot package so its contents can be inspected.

Update voter record with ballot package received

Task

Update the voter record to indicate that the ballot package has been received by the election jurisdiction.

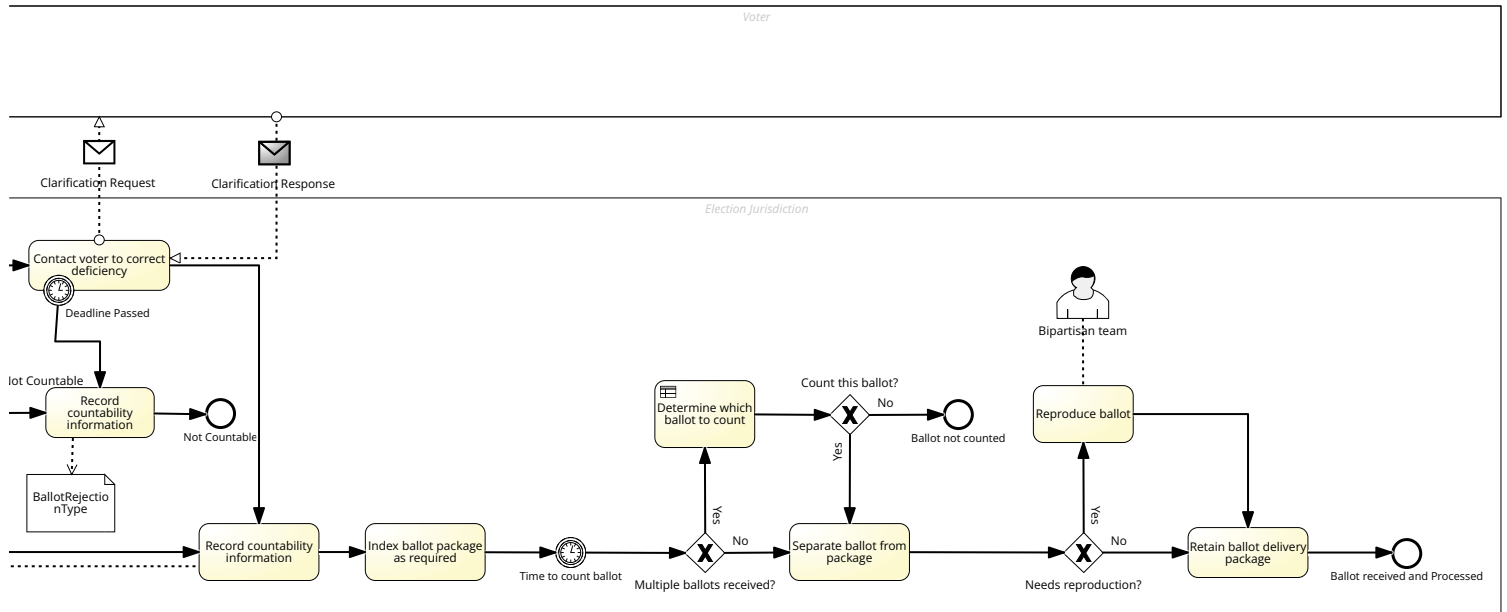
Data objects:

BallotReceivedDate

BallotReceivedMethod

IT Systems: Statewide Uniform Registry of Electors

Diagram (pt. 2)



Determine eligibility to be counted

Task

Determine whether the ballot can be counted. This may be based on a variety of factors, such as timeliness, completeness of the ballot package, and eligibility to vote.

Task type: Business rule

Countability?

Exclusive (XOR) Gateway

Contact voter to correct deficiency

Task

If the ballot package is deficient, the voter may be contacted to correct the deficiency. There is usually a limited time window for this correction to occur.

Data objects:

Clarification Request

Clarification Response

Deadline Passed

Intermediate Timer Event

Record countability information

Task

Record the countability of the ballot in the VRDB.

Data objects: BallotRejectionType

Not Countable

End Event

Record countability information

Task

Record the countability of the ballot in the VRDB.

IT Systems: Statewide Uniform Registry of Electors

Index ballot package as required

Task

Index the ballot package so that it can be counted in its appropriate batch.

Time to count ballot

Intermediate Timer Event

Seven days after the election?

Time cycle: 7 days

Multiple ballots received?

Exclusive (XOR) Gateway

Determine which ballot to count

Task

Determine which ballot to be counted. A full-face ballot would take precedence over a SWI or FWAB.

Task type: Business rule

Count this ballot?

Exclusive (XOR) Gateway

Ballot not counted

End Event

Separate ballot from package

Task

Separate the voter's identification information from the ballot.

Needs reproduction?

Exclusive (XOR) Gateway

Reproduce ballot

Task

Replace damaged or improperly marked ballots (e.g., the voting system tabulation scanner cannot read the ballot) with a new ballot that preserves the voter's intent.

Additional process participants: Bipartisan team

Retain ballot delivery package

Task

Retain the ballot package (i.e. the voter identification information) according to retention schedules.

Ballot Received and Processed

End Event

Notify voter of inadequacy

Task

Notify the voter that they must return their ballot by postal mail.

Data objects: Notification of inadequacy

Not accepted

End Event