Test Report - VxScan Feature Acceptance Criteria: Administrative Functions

Dates of testing: May 1, 2024 - Oct 30, 2025
Updated Nov 3, 2025 by Pius Wong

Summary

This report documents a series of small-scale tests related to ballot paper path functions in VxScan. They address internal VotingWorks requirements as well as some VVSG requirements listed below.

Applicable VVSG Requirements

Some of the tests listed here *indirectly* support testing these VVSG requirements below, although they are not the final tests for these requirements:

- 1.1.6-F – Ability to clear mis-fed ballots
- 1.2-E – Respond gracefully to stress of system limits
- 1.2-G – Misfeed rate benchmark
- 2.6-A – Surviving device failure
- 2.7-A – Assessment of reliability
- 2.7-B – Continuous operation – typical environmental conditions
- 2.7-D – Ability to support maintenance and repair physical environment conditions – non-operating
- 2.7-E – Ability to support transport and storage physical environment conditions – non-operating
- 3.1.6-M – Ballot stock specification

Devices Under Test

- VxScan, v4.0, Build 0
- Ballot Receptacle prototype, LP2-1

Results

Tests were performed on each of the following design feature requirements listed below, with results informing design refinement. Followup plans are included for each test, if applicable.

1. Paper path, valid ballot: System scans valid ballots in standard conditions, for a variety of documented paper types

a. Source of requirement

i. 1.1.6-F – Ability to clear mis-fed ballots
ii. 1.2-G – Misfeed rate benchmark
iii. 2.7-A – Assessment of reliability
iv. 2.7-B – Continuous operation – typical environmental conditions
v. 3.1.6-M – Ballot stock specification

b. Acceptance criteria

i. Description

1. Scans a variety of paper types

ii. Metrics Evaluated

1. Misfeed rate when VxScan + Ballot Receptacle system scans under normal conditions, in any scan orientation, with these ballots:
    a. short ballot (8.5x11"), 28 bond, 50+ sheets
    b. short ballot (8.5x11"), 40-47 bond / 65 cover, 50+ sheets
    c. long ballot (8.5x22"), 28 bond, 50+ sheets
    d. long ballot (8.5x22"), 40-47 bond / 65 cover, 50+ sheets

   Include regular ballots, undervotes, and write-in votes.
2. Were any actual or potential hazards or system damage observed?

3. Can we verify valid CVR files were saved on the USB stick?

iii. **Acceptable Metrics**

1. For metric #1 above:
    a. 0 misfeeds, or <=1/500 misfeed rate
    b. 0 misfeeds, or <=1/500 misfeed rate
    c. 0 misfeeds, or <=1/500 misfeed rate
    d. 0 misfeeds, or <=1/500 misfeed rate
2. no
3. yes

iv. **Unacceptable Failure Modes**

1. For metric #1 above:
    a. 1+ misfeeds, or >1/500 misfeed rate
    b. 1+ misfeeds, or >1/500 misfeed rate
    c. 1+ misfeeds, or >1/500 misfeed rate
    d. 1+ misfeeds, or >1/500 misfeed rate
2. yes (e.g. injury to person, overheated electronics, etc)
3. no

v. **Source of Metrics**

1. VVSG 1.2-G: 1/500 misfeed rate benchmark
2. VotingWorks internal requirements

c. Test Results

i. For metric #1 above:
    1. 1a – fail
    2. 1b – fail
    3. 1c – pass
    4. 1d – not tested

ii. For metric #2 above: no hazards observed

iii. For metric #3 above: yes

iv. Testing performed by VotingWorks in Austin, TX, and Bellingham, WA.

d. Summary Results

i. Fail (partial), in May 2024

e. Other Notes

i. Error seen saying "ballot not counted" wrongly when scanning too quickly back to back (but it is counting) -- can fix this in software.

ii. Froze when scanning long ballot.

f. Followup Plan

i. Retest two new builds (unit 2 and unit 3) with better production finishes instead of rough prototype finishes, and with updated software to address error handling, in July 2024.

g. Followup Test Results

i. Passed additional internal tests at VotingWorks in Austin, TX, from Jul 1, 2024 to Jul 15, 2024.
    1. 0.0% misfeed rate (0 out of 3704 scans)
        a. across all paper weights

b. lengths 11-22”
c. Various paper brands and matte finishes: Office Depot, Hammermill, HP, Neenah, FedEx, and stock from 3 local printers in Austin, TX
d. New paper (previously unscanned) and old paper (previously scanned)
e. 30-49% relative humidity, 74-95F.

2. No hazards observed.
    a. No clipping of paper edges on the machine was observed upon rejection/retraction.
3. Yes, CVR files verified to be saved.

ii. Passed additional internal tests at VotingWorks in Austin, TX, from Jan 18, 2025 to Jan 28, 2025, for three production units analyzed for additional R&D and QC. Misfeed rates were measured of 0.07% (2 out of 3000 scans), 0.17% (5 out of 3006 scans), and 0.10% (3 out of 3033 scans).

1. All misfeed rates were lower than the desired 0.20% misfeed threshold from VVSG (1 out of 500 scans)
2. 5 of the detected misfeeds were found to be from preventable causes not clearly the fault of the system: large debris on ballot, and misplaced or skewed feeding of the ballot.

2. Paper path, rejected ballot: System appropriately handles multiple sheets inserted at the same time (MSD)

a. Source of requirement

i. 1.1.6-F – Ability to clear mis-fed ballots
ii. 1.2-E – Respond gracefully to stress of system limits
iii. 2.7-A – Assessment of reliability
iv. 2.7-B – Continuous operation – typical environmental conditions
v. VotingWorks internal requirements

b. Acceptance criteria

i. Description

1. Rejects multiple ballots appropriately.
2. Accepts single ballots appropriately.

ii. Metrics Evaluated

1. Insert the following types of multiple sheet cases, using valid ballots, in any scan orientation. Try each case at least 3x. Are the multiple sheets all rejected without jamming?
    a. double sheet, no offset, inserted straight
    b. double sheet, offset by half the length, inserted straight
    c. double sheet, offset by 3/4 the length, inserted straight
    d. double sheet, no offset, inserted skew or corner-first

e. triple sheet, no offset, inserted straight

2. Were the rejected ballots resting stable in the system for retrieval?
3. Confirm results from Test #1 using heavy paper. Does a single sheet of the heaviest paper correctly get accepted, and not rejected as multiple sheets?

iii. Acceptable Metrics

1. Yes to all questions above

iv. Unacceptable Failure Modes

1. No to any questions above

v. Source of Metrics

1. VVSG 1.1.6-F – Ability to clear mis-fed ballots
2. VVSG 1.2-E – Respond gracefully to stress of system limits
3. VotingWorks internal requirements

c. Test Results

i. For metric #1 above: Pass – although it was difficult to test two sheets where the second sheet was 1/2 and 3/4 offset from the first.
ii. For metric #2 above: yes
iii. For metric #3 above: yes
iv. Testing performed by VotingWorks in Austin, TX, and Bellingham, WA, using both production software and PDIScanDemo test software, in May 2024

d. Summary Results

i. Pass, in May 2024

e. Other Notes

i. n/a

f. Followup Plan

i. Retest new build with better production finishes instead of rough prototype finishes, and with updated software to address error handling, in July 2024.
ii. Discuss possible idea of future testing scanning with VxScan twisted out of alignment on the ballot receptacle to an extreme to see if that causes jams.
iii. Discuss possibility of making the ballot receptacle slot wider to lessen the chance of jamming between VxScan and the ballot receptacle.

g. Followup Test Results

i. Passed additional internal tests at VotingWorks in Austin, TX, from Jul 1, 2024 to Jul 15, 2024.
    1. Yes, MSD rejects ballots.
    2. Yes, rejected ballots rest stable.
    3. Yes, heavy paper does not falsely trigger MSD.
ii. Additional exploratory testing showed no misfeeds when inserting edge-case disrupted or non-flat paper: folded, curled leading edges, corner folded, curled trailing edges, crumpled/wrinkled

iii. No clipping of paper edges on the machine was observed upon rejection/retraction.
iv. Multi-sheet detection (MSD) calibration functioned properly for all paper weights/thicknesses tested.

3. Paper path, rejected ballot: System rejects invalid ballots in standard conditions, for a variety of documented paper types

a. Source of requirement

i. 1.1.6-F – Ability to clear mis-fed ballots
ii. 1.2-E – Respond gracefully to stress of system limits
iii. 2.7-A – Assessment of reliability
iv. 2.7-B – Continuous operation – typical environmental conditions
v. VotingWorks internal requirements

b. Acceptance criteria

i. Description

1. Rejects invalid ballots

ii. Metrics Evaluated

1. Insert the following types of invalid ballots, in any scan orientation:
    a. overvote (only if flagged in election)
    b. wrong election
    c. blank sheet
    d. invalid markings

    Try these invalid ballots on the following paper types.
    e. short ballot (8.5x11""), 28 bond
    f. short ballot (8.5x11""), 40-47 bond / 65 cover
    g. long ballot (8.5x22""), 28 bond
    h. long ballot (8.5x22""), 40-47 bond / 65 cover

    Try each case at least 3x. Are the invalid ballots all rejected without jamming, and with alerts?
2. Were the rejected ballots resting stable in the system for retrieval?
3. Were any actual or potential hazards or system damage observed?

iii. Acceptable Metrics

1. Metric #1: yes
2. Metric #2: yes
3. Metric #3: no

iv. Unacceptable Failure Modes

1. Metric #1: no
2. Metric #2: no (falling down)
3. Metric #3: yes

v. Source of Metrics

1. VVSG 1.1.6-F – Ability to clear mis-fed ballots

2. VVSG 1.2-E – Respond gracefully to stress of system limits
3. VotingWorks internal requirements

c. Test Results

i. Pass, for 28 bond paper only; other paper to be tested
ii. Testing performed by VotingWorks in Austin, TX, in May 2024.

d. Summary Results

i. Inconclusive, in May 2024

e. Other Notes

i. n/a

f. Followup Plan

i. Retest new build with better production finishes instead of rough prototype finishes, and with updated software to address error handling, in July 2024.

g. Followup Test Results

i. Passed additional internal tests, for 28-47# bond paper, both 11” and 22” long, at VotingWorks in Austin, TX, from Jul 1, 2024 to Jul 15, 2024.
    1. Yes, invalid ballots are rejected.
    2. Yes, rejected ballots rest stable.
    3. No, no hazards were observed.
i. Continued normal results as of October 2025.

4. Paper path, valid ballot: System scans valid ballots in standard conditions with low misfeed rates

a. Source of requirement

i. 1.1.6-F – Ability to clear mis-fed ballots
ii. 1.2-G – Misfeed rate benchmark
iii. 2.7-A – Assessment of reliability
iv. 2.7-B – Continuous operation – typical environmental conditions
v. VotingWorks internal requirements

b. Acceptance criteria

i. Description

1. Scans with reliably low misfeed rate

ii. Metrics Evaluated

1. Misfeed rate when VxScan + ballot receptacle system scans under normal conditions, in any scan orientation, with these ballots:
    a. worst-case paper type from Test #1, 3000+ sheets
2. Were any actual or potential hazards or system damage observed?

iii. Acceptable Metrics

1. Metric 1: <=6 misfeeds, or <=1/500 misfeed rate
2. Metric 2: no

iv. **Unacceptable Failure Modes**
    1. Metric #1: >6 misfeeds, or <=1/500 misfeed rate
    2. Metric #2: yes
v. **Source of Metrics**
    1. VVSG 1.2-G: 1/500 misfeed rate benchmark
    2. VotingWorks internal requirements

c. Test Results

i. Metric #1:
    1. Fail, for 11” paper. 5100+ sheets fed. 13 sheets “hung” at the back of scanner. Average of 1/392 “hangs.”
    2. Pass, for long paper 21+”
ii. Metric #2: No hazards observed.
iii. Testing performed by VotingWorks in Bellingham, TX, in May 2024.

d. Summary Results

i. Fail, for 11” paper, in May 2024
ii. Pass, for 22” paper, in May 2024

e. Other Notes

i. Failures from paper sticking/hanging in back of scanner.

f. Followup Plan

i. Retest new build with better production finishes instead of rough prototype finishes, and with updated software, in July 2024.

g. Followup Test Results

i. Pass (partial), in additional internal tests, at VotingWorks in Austin, TX, on Jul 5, 2024.
    1. 0% misfeed rate (0 out of 1600 scans), 11” paper
    2. No hazards observed.
ii. Pass, in additional internal tests, at VotingWorks in Austin, TX, from Aug 6, 2024 to Aug 10, 2024. 21-45%RH and 75-95F.
    1. 0.07% misfeed rate (4 out of 5882 scans).
        a. 28-60lb bond
        b. 11” length
        c. Various paper brands: FedEx, and stock from 2 local printers in Austin, TX
        d. New paper (previously unscanned)
        e. 30-49% relative humidity, 74-95F.
        f. Misfeed causes: 1 from vertical lines on timing marks, 1 from ballot getting stuck on full pile of ballots in ballot receptacle, 2 misfeed causes unknown and not reproducible
    2. No hazards observed.
ii. Continued normal results as of October 2025.

5. Paper path, valid ballot: System scans valid ballots with realistic paper disruptions

a. Source of requirement

i. 1.1.6-F – Ability to clear mis-fed ballots
ii. 1.2-E – Respond gracefully to stress of system limits
iii. 2.7-A – Assessment of reliability
iv. 2.7-B – Continuous operation – typical environmental conditions
v. VotingWorks internal requirements

b. Acceptance criteria

i. Description

1. Scans reasonably mildly disrupted paper ballot ballots

ii. Metrics Evaluated

1. Scan each the following types of mildly disrupted paper ballots, using the worst-case paper type from Test #1. Try each case at least 3x, in either scan orientation:
    a. folded 1x (middle)
    b. folded 2x (trifold)
    c. curled leading edge
    d. torn (at corners, sides)
    e. wet (droplets of water or alcohol)
    f. dirty (juicy marker write-in smudges; paper dust, etc)
    g. stored in >60% relative humidity for 24+ hours
    h. any other disruptions of interest

   For each mildly disrupted paper ballot type, answer this question (y/n):

   - *Does the system accept the ballot appropriately without causing failures?*
     OR
     If the disruption is excessive, does the system reject/misfeed the ballot appropriately, while alerting the user?

iii. Acceptable Metrics

1. Yes for all cases above

iv. Unacceptable Failure Modes

1. No for any case above
2. System jams with difficulty removing the ballot.
3. Damages system.
4. Damages ballot more.
5. Leaves significant debris in system.
6. Rejects ballot without alerts.
7. Rejects ballot that only has a mild disruption.
8. System freezes for several seconds, or requiring restart.

v. Source of Metrics

1. VotingWorks internal requirements

c. Test Results

i. a. yes
ii. b. yes
iii. c. yes - but audible clipping/rubbing heard internally
iv. d. yes
v. e. yes
vi. f. yes
vii. g. yes - but slightly harder to get in infeed, stickier/more friction
viii. h. yes to the following:
    1. extra colored marks
    2. crumpled paper
ix. Testing performed by VotingWorks in Austin, TX, on Jul 3, 2024

d. Summary Results

i. Pass, for all tested paper disruptions.
ii. Noting that if audible internal clipping/rubbing is observed, that could be a sign of curled paper, and if a stickier infeed is observed, that could be a sign of paper stored in high humidity.

e. Other Notes

i. Corroborates preliminary passing tests of just some cases, performed by VotingWorks in Bellingham, WA, in May 2024.

f. Followup Plan

i. Continued monitoring of units used internally and in the field.

g. Followup Test Results

i. Continued normal results as of October 2025.

6. Paper path, rejected ballot: System handles jams appropriately, or fails gracefully

a. Source of requirement

i. 1.1.6-F – Ability to clear mis-fed ballots
ii. 1.2-E – Respond gracefully to stress of system limits
iii. 2.6-A – Surviving device failure
iv. VotingWorks internal requirements

b. Acceptance criteria

i. Description

1. Paper jams can be removed.
2. Paper jams do not cause system damage or failure.

ii. Metrics Evaluated

1. Intentionally try to cause jams using validly completed ballots of both light and heavy paper types:
    a. short ballot (8.5x11""), 28 bond
    b. short ballot (8.5x11""), 40-47 bond / 65 cover

Try to cause the following types of jams, at least 3x each:

c. hold the ballot as it scans
d. let the ballot go to scan, then try to pull it out mid-scan
e. push the ballot into the scan as it scans
f. insert badly crumpled ballot
g. insert badly curled ballot
h. insert badly torn ballot
i. insert very wet ballot (water, alcohol)
j. insert folded ballot that was never unfolded
k. insert out-of-spec lightweight paper (<28 bond)
l. insert out-of-spec heavyweight paper (>47 bond)

For each disrupted paper ballot type, answer these questions (y/n):

- *If the system jams, can the jam be removed easily?*
- *Does the system continue to work normally after clearing the jam?*

iii. Acceptable Metrics

1. Yes, for all cases.
2. Any accepted/rejected ballots must not damage the system or other ballots. Cleaning the system is allowed.
3. The ballots themselves can get damaged/spoiled further.

iv. Unacceptable Failure Modes

1. No, for any case.
2. System jams with difficulty removing the ballot.
3. Damages system.
4. Leaves significant debris in system that cannot be easily cleaned.
5. Rejects ballot without alerts.
6. System freezes for several seconds, or requiring restart.

v. Source of Metrics

1. VVSG 1.2-E – Respond gracefully to stress of system limits
2. VotingWorks internal requirements

c. Test Results

i. Yes, for 28-43# bond paper, with one anomaly:
   1. Ballots with a corner fold sometimes were accepted, up to 4x4""
ii. Testing performed by VotingWorks in Austin, TX, in Jul 3, 2024 to Jul 8, 2024.

d. Summary Results

i. Pass.
ii. Still recommended to train users to only use new paper ballots within system specifications, although it will withstand some unintentional stresses in paper types.

e. Other Notes

i. Possibly a destructive test, to be done near the end of testing a unit.

ii. Soaked wet ballots that then were dried and very wrinkled caused misfeeds 9% of the time, but never jammed.

f. Followup Plan

i. The anomalies discovered are very unexpected and not part of normal use; system training will emphasize using fresh ballots and paper within system specifications.

ii. Continued monitoring of units used internally and in the field.

g. Followup Test Results

iii. Continued normal results as of October 2025.

7. Paper path, cleanability: System can be cleaned appropriately.

a. Source of requirement

i. VotingWorks internal requirements

b. Acceptance criteria

i. Description

1. Resists any damage or change in function from cleaning.

ii. Metrics Evaluated

1. Open the scanner, and wipe down with microfiber cloth and lens spray, and microfiber cloth and isopropyl alcohol. Inspect the scanner and close it up.
    a. Does the scanner and system resist any damage from cleaning?
    b. Does the scanner still scan appropriately?

iii. Acceptable Metrics

1. a) yes (resists functional and cosmetic damage)
2. b) yes

iv. Unacceptable Failure Modes

1. a) no
2. b) no (e.g. doesnt scan ballots, MSD doesn't work)

v. Source of Metrics

1. VotingWorks internal requirements

c. Test Results

i. Pass

ii. Testing performed by VotingWorks in Austin, TX, May to August 2024.

d. Summary Results

i. Pass.

e. Other Notes

i. Specialized cleaning sheets not needed for cleaning. Much more access to scanner than previous v3 designs allows opening the scanner up fully for access.

f. Followup Plan

i. Continued monitoring of units used internally and in the field.

g. Followup Test Results

iv. Continued normal results as of October 2025.

8. Paper path, unexpected inputs: System handles unexpected inputs appropriately.

a. Source of requirement

i. VotingWorks internal requirements

b. Acceptance criteria

i. Description

1. Rejects unexpected inputs into the infeed.
2. Fails gracefully at unexpected inputs into the infeed.

ii. Metrics Evaluated

1. Attempt to insert the following into the scanner infeed, and observe the system.
    a. plastic sheet
    b. fabric / clothing
    c. paper with tape on it
    d. cleaning sheets for a scanner
    e. smart card
    f. USB stick
    g. pliers / snake tool
    h. other items that might unintentionally go in by users
    i. other items that might go in by bad actors

    For each case, does the system avoid catastrophic damage?

iii. Acceptable Metrics

1. Yes to all
2. The system can error out, jam, etc, as long as it does not cause any hazards or permanently destructive damage.

iv. Unacceptable Failure Modes

1. No to any
2. Hazards, permanent damage

v. Source of Metrics

1. VotingWorks internal requirements

c. Test Results

i. For Metric #1:

1. a) doesn't feed in clear plastic, rejects others
2. b) infeed blocks input
3. c) no effect
4. d) rejected and no effect

5. e) infeed blocks input, OR rejected and no effect
6. f) infeed blocks input
7. g) infeed blocks input
8. h) All OK: plastic bag, sticky note, pieces of sticky note; may require cleaning but still leaves evidence
9. i) None others found; not testing obviously destructive actions that leave evidence and are not part of the design to handle (e.g. pouring in liquid, etc)

ii. Testing performed by VotingWorks in Austin, TX, May 2024 to October 2025.

d. Summary Results

i. Pass

e. Other Notes

i. Potentially destructive inputs should be saved for last. These tests are not explicitly required by VVSG but can be helpful for internal concerns.

f. Followup Plan

i. Continued monitoring of units used internally and in the field.

g. Followup Test Results

i. Continued normal results as of October 2025.

9. Paper path, valid ballot: System scans valid ballots in hotter environmental conditions.

a. Source of requirement

i. 1.1.6-F – Ability to clear mis-fed ballots
ii. 1.2-G – Misfeed rate benchmark
iii. 2.7-A – Assessment of reliability
iv. 2.7-B – Continuous operation – typical environmental conditions

b. Acceptance criteria

i. Description

1. Scans a variety of paper types in a hotter environment

ii. Metrics Evaluated

1. Misfeed rate when VxScan + ballot receptacle system scans under hotter conditions (95°F ambient temp), in any scan orientation, with these ballots:
    a. short ballot (8.5x11""), 28 bond, 50+ sheets
    b. short ballot (8.5x11""), 40-47 bond / 65 cover, 50+ sheets

   The "hotter conditions" is defined as an ambient temperature around the MCM of at least 95°F. This can come from a space heater, sunlight, or some other means.
   Include regular ballots, undervotes, and write-in votes.
2. Were any actual or potential hazards or system damage observed?

3. Can we verify valid CVR files were saved on the USB stick?

iii. Acceptable Metrics

1. Metric #1: 0 misfeeds, or <=1/500 misfeed rate
2. Metric #2: no
3. Metric #3: yes

iv. Unacceptable Failure Modes

1. Metric #1: 1+ misfeeds, or >1/500 misfeed rate
2. Metric #2: yes (e.g. injury to person, overheated electronics, etc)
3. Metric #3: no

v. Source of Metrics

1. VotingWorks internal requirements

c. Test Results

i. 11” ballot, 28lb: pass (0 misfeeds of 50 scans)
ii. 11” ballot, 43-46lb: pass (0 misfeeds of 343 scans)
iii. Testing performed by VotingWorks in Austin, TX, Jul 15, 2024.

d. Summary Results

i. Pass

e. Other Notes

i. 22” ballots were not tested at higher temperatures because they were previously identified to have better misfeed rates than 11” ballots at room temperature, due to their long length helping it align properly within the entire paper path. The shortest 11” ballots are the worst-case identified length in terms of misfeeds, due to more possible movement within the system.

f. Followup Plan

i. Continued monitoring of units used internally and in the field.

g. Followup Test Results

v. Continued normal results as of October 2025.

10. Shock testing, transit testing: Paper path subsystems and parts are robust..

a. Source of requirement

i. VotingWorks internal requirements
ii. VVSG 2.7-D – Ability to support maintenance and repair physical environment conditions – non-operating

b. Acceptance criteria

i. Description

1. Paper path parts resist damage to benchtop drops during assembly and maintenance.

ii. Metrics Evaluated

1. Take the major components of the paper path (infeed, outfeed, etc). Drop them according to benchtop drop tests standards for all sides/edges (lifting one edge 4", or 45 degrees, or perfect balance point), and examine the damage. Does it resist catastrophic damage from the drop?

iii. Acceptable Metrics

1. Yes

iv. Unacceptable Failure Modes

1. No
2. Broken parts, lost debris, deformation, etc

v. Source of Metrics

1. VotingWorks internal requirements

c. Test Results

i. See larger document: ***Test Report - VxScan Drop Test, Bench Handling***.
ii. Evaluation performed by VotingWorks in Austin, TX.

d. Summary Results

i. Pass

e. Other Notes

i. n/a

f. Followup Plan

i. Improve fastener strategy with locknuts and threadlocker adhesive, in newer refinements of VxScan builds.
ii. Continued monitoring of units used internally and in the field.

g. Followup Test Results

i. Continued normal results as of October 2025.

11. Transit Testing: Administrative features survive forces seen in transport

a. Source of requirement

i. VotingWorks internal requirements
ii. VVSG 2.7-D – Ability to support maintenance and repair physical environment conditions – non-operating

b. Acceptance criteria

i. Description

1. List of items most at risk for failure during transport

ii. Metrics Evaluated

1. Identify components at risk of failure due to vibration. Add this to a list to test later.

iii. Acceptable Metrics

1. Known, limited number of items identified (~10) to test and monitor later.

iv. **Unacceptable Failure Modes**
1. Unknown number of items at risk.

v. **Source of Metrics**
1. VotingWorks internal requirements

c. **Test Results**
i. Possible administrative item features to monitor for vulnerability to transit or tests are hinges, metal surfaces, fasteners, latching alignment.
ii. Evaluation performed by VotingWorks in Austin, TX.

d. **Summary Results**
i. Pass

e. **Other Notes**
i. Mechanical connections and cosmetic surfaces were noted as features to more closely inspect in future tests related to transport.

f. **Followup Plan**
i. Continued monitoring of units used internally and in the field, in various transportation modes (ground via car, ground via freight, air).

g. **Followup Test Results**
i. Continued normal results as of October 2025, including for items/features listed for closer monitoring.