

# This is Democracy?

## Problems with Electronic Voting Machines

R. Scott Granneman

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The right to vote freely for the candidate of one's choice is of the essence of a democratic society, and any restrictions on that right strike at the heart of representative government.

Chief Justice Earl Warren  
Reynolds v. Sims (1964)









Touch **Print Next Page** to print and verify the next page.  
OR

Touch **Reject Ballot** if you need to go back and make changes.

**DTE:** you may reject your printed ballot a maximum of three times, after which you will no longer be allowed to make further changes and your vote will be cast.  
Please contact a pollworker if you are experiencing any problems.

**PRESIDENT**

(Vote for ONE)

THOMAS JEFFERSON

**COMMISSIONERS FOR NATIONAL PASTIMES**  
(Vote for TWO)

JIM THORPE

PEGGY FLEMING

**COMMISSIONER OF AMERICAN LITERATURE**  
(Vote for ONE)

(No Vote Cast)

**MINISTER OF TRANSPORTATION**  
(Vote for ONE)

ORVILLE WRIGHT

**POET LAUREATE**  
(Vote for ONE)

ROBERT FROST

**MINISTER OF COMIC RELIEF**  
(Vote for ONE)

LILY TOMLIN

**Minister of Art**  
(Vote for One)

Andrew Warh

**Reject Ballot**

**Print Next Page**

Ballot Information  
Election  
Ballot Number  
Ballot Type  
Ballot Status  
Ballot Date  
Ballot Time  
Ballot Location  
Ballot Machine  
Ballot Model  
Ballot Version  
Ballot Language  
Ballot Color  
Ballot Size  
Ballot Weight  
Ballot Material  
Ballot Finish  
Ballot Texture  
Ballot Smell  
Ballot Taste  
Ballot Sound  
Ballot Feel  
Ballot Look  
Ballot Sound  
Ballot Feel  
Ballot Look



DO NOT USE

Touch **Print Next Page** to print and verify the next page.  
OR  
Touch **Reject Ballot** if you need to go back and make changes.

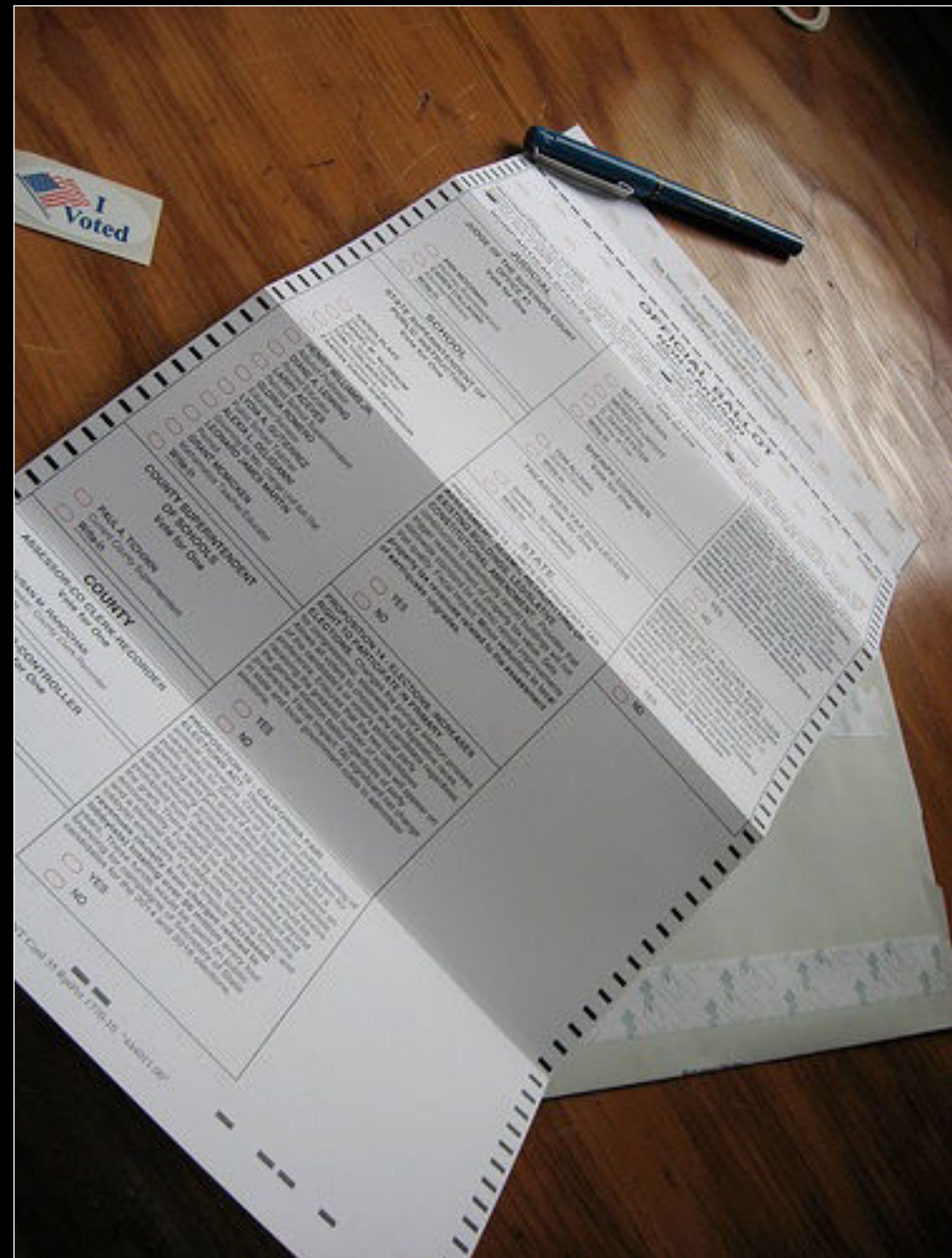
**DTE:** you may reject your printed ballot a maximum of three times, after which you will no longer be allowed to make further changes and your vote will be cast.  
Please contact a pollworker if you are experiencing any problems.

PRESIDENT (Vote for ONE)	
THOMAS JEFFERSON	
COMMISSIONERS FOR NATIONAL PASTIMES (Vote for TWO)	
JIM THORPE	
PEGGY FLEMING	TERATU
COMMISSIONER OF AN	(Vote
(S)	
INGS OR OFFI	ON
(Vote)	
ORVILLE	NET LAUR
(Vote for ONE)	
ROBERT FRODO	MASTER OF COMIC RELIEF (Vote for ONE)
LILY TOMLIN	Minister of Art (Vote for One)
Andrew Wuth	

**Reject Ballot** **Print Next Page**

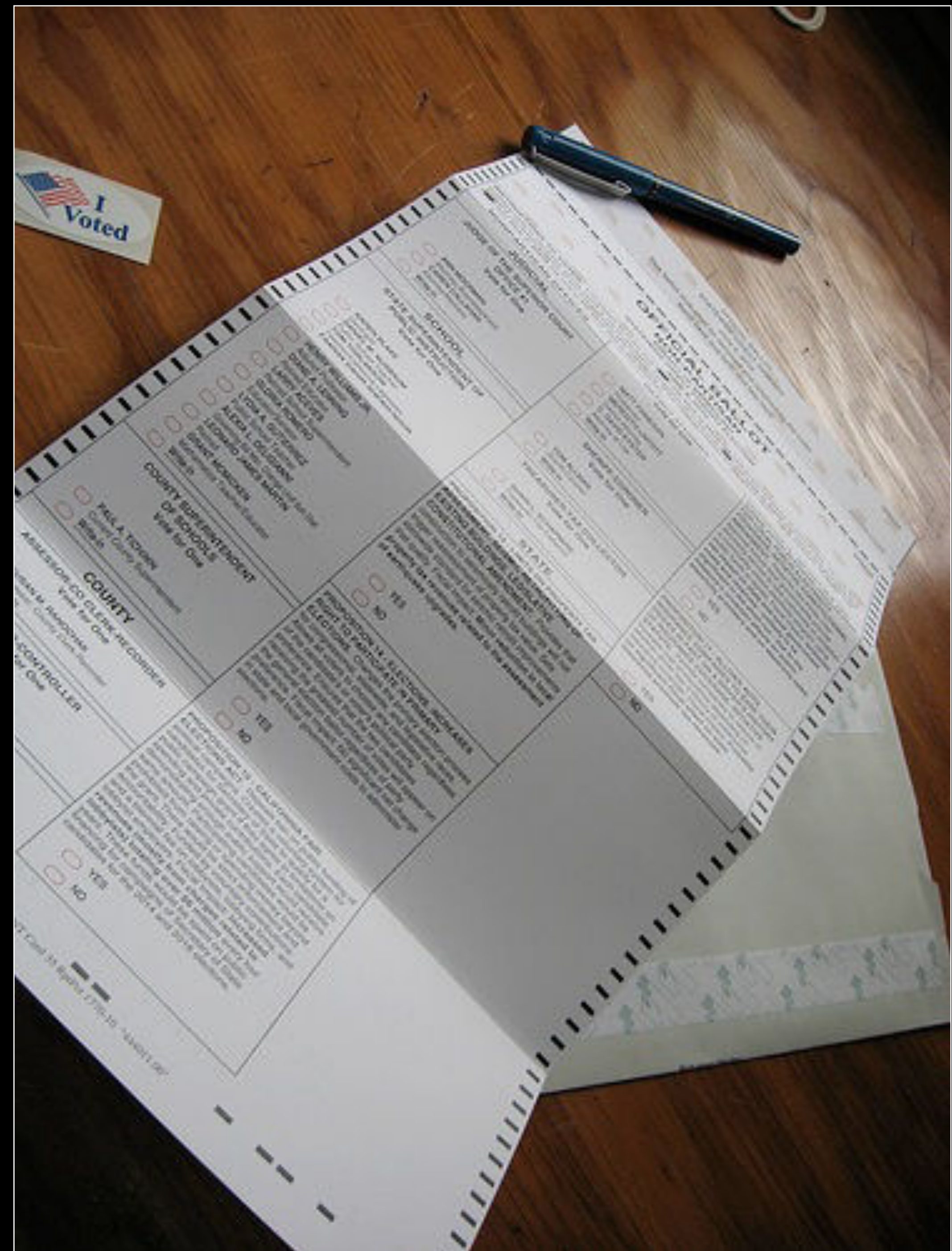
Instructions for Ballot  
1. Touch **Print Next Page**  
2. Verify your vote  
3. Touch **Print Next Page**  
4. Touch **Reject Ballot**  
5. Touch **Print Next Page**  
6. Touch **Reject Ballot**  
7. Touch **Print Next Page**  
8. Touch **Reject Ballot**  
9. Touch **Print Next Page**  
10. Touch **Reject Ballot**







“I’d like the paper  
ballot, please.”



Voting



A voting system has 4 required characteristics

1. Accuracy
2. Anonymity
3. Scalability
4. Speed





George Caleb Bingham's (1811–1879) is one of the greatest American painters of the 19th century

*Self-Portrait of the Artist,*  
1834–35

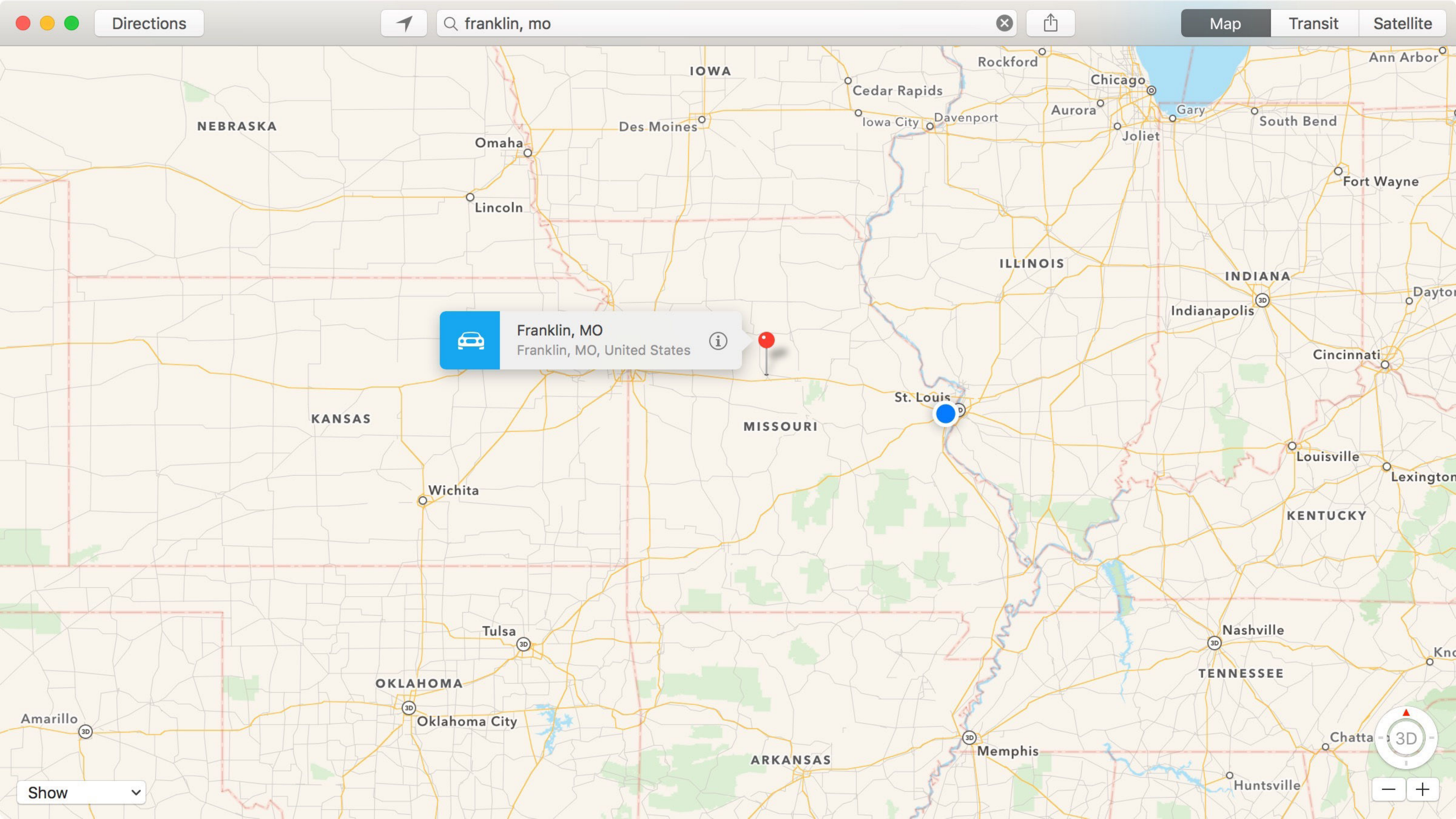




Born 1811 in Augusta  
County, VA

Family moved to Franklin,  
MO in 1819





Directions



franklin, mo



Map

Transit

Satellite



Franklin, MO

Franklin, MO, United States



MISSOURI

St. Louis

ILLINOIS

INDIANA

Indianapolis

Cincinnati

KENTUCKY

TENNESSEE

ARKANSAS

OKLAHOMA

NEBRASKA

IOWA

Des Moines

Omaha

Lincoln

KANSAS

Wichita

Tulsa

Oklahoma City

Amarillo

Rockford

Cedar Rapids

Iowa City

Davenport

Aurora

Chicago

Joliet

Gary

South Bend

Ann Arbor

Fort Wayne

Dayton

Louisville

Lexington

Nashville

Memphis

Huntsville

Chattanooga

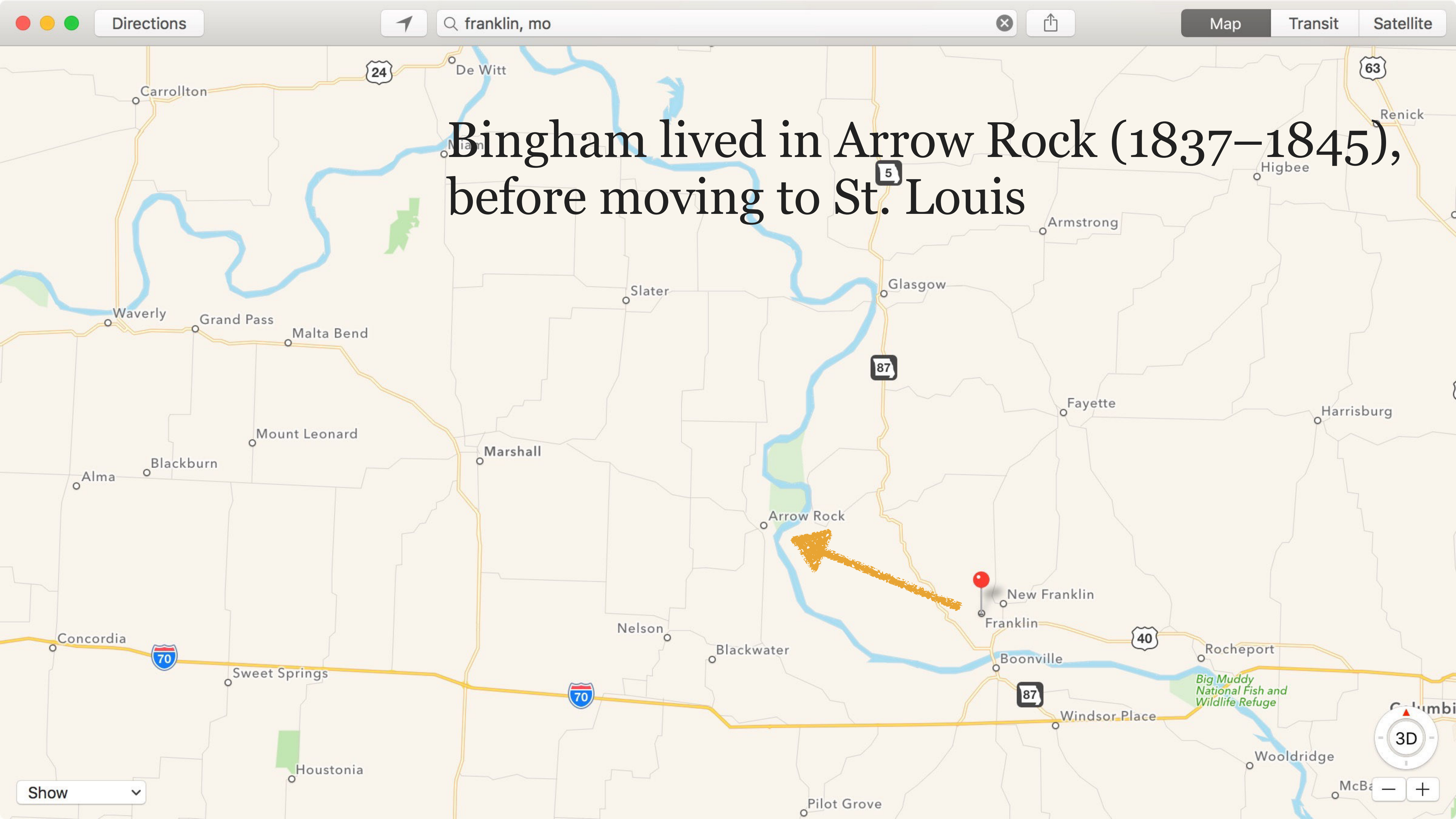
Show



3D

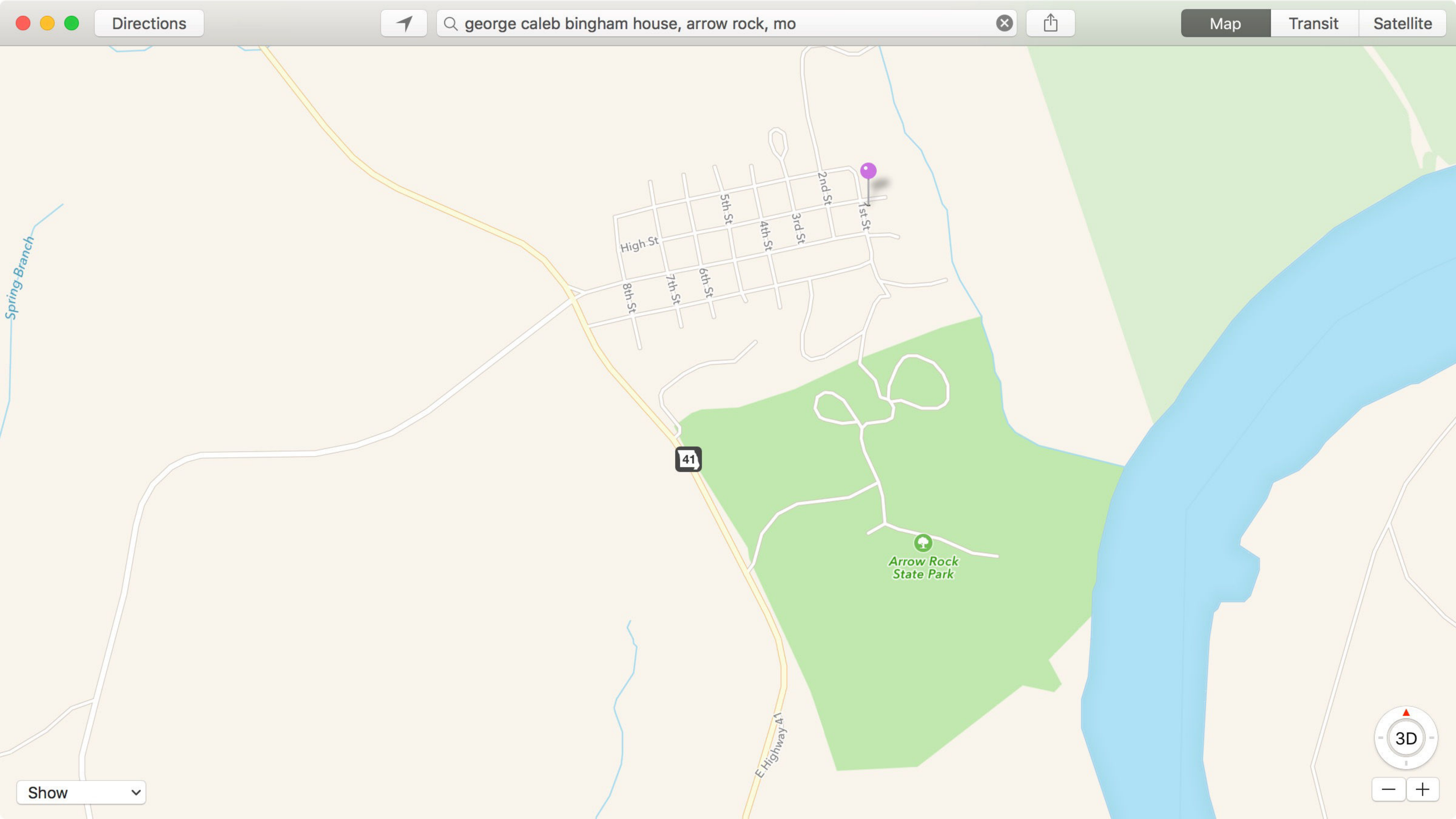






Bingham lived in Arrow Rock (1837–1845),  
before moving to St. Louis





Directions



george caleb bingham house, arrow rock, mo



Map

Transit

Satellite

41

Arrow Rock  
State Park

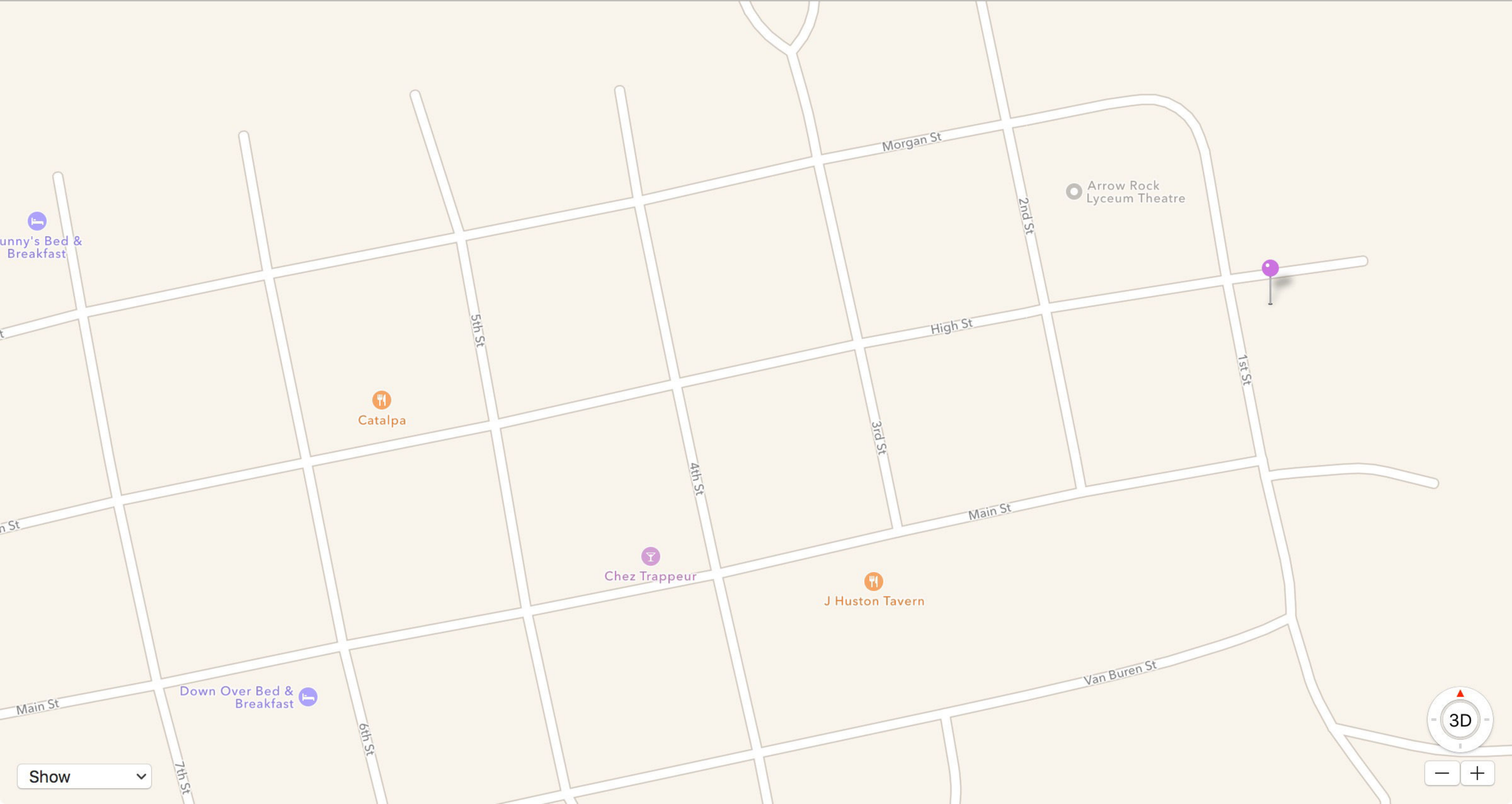
Show

3D

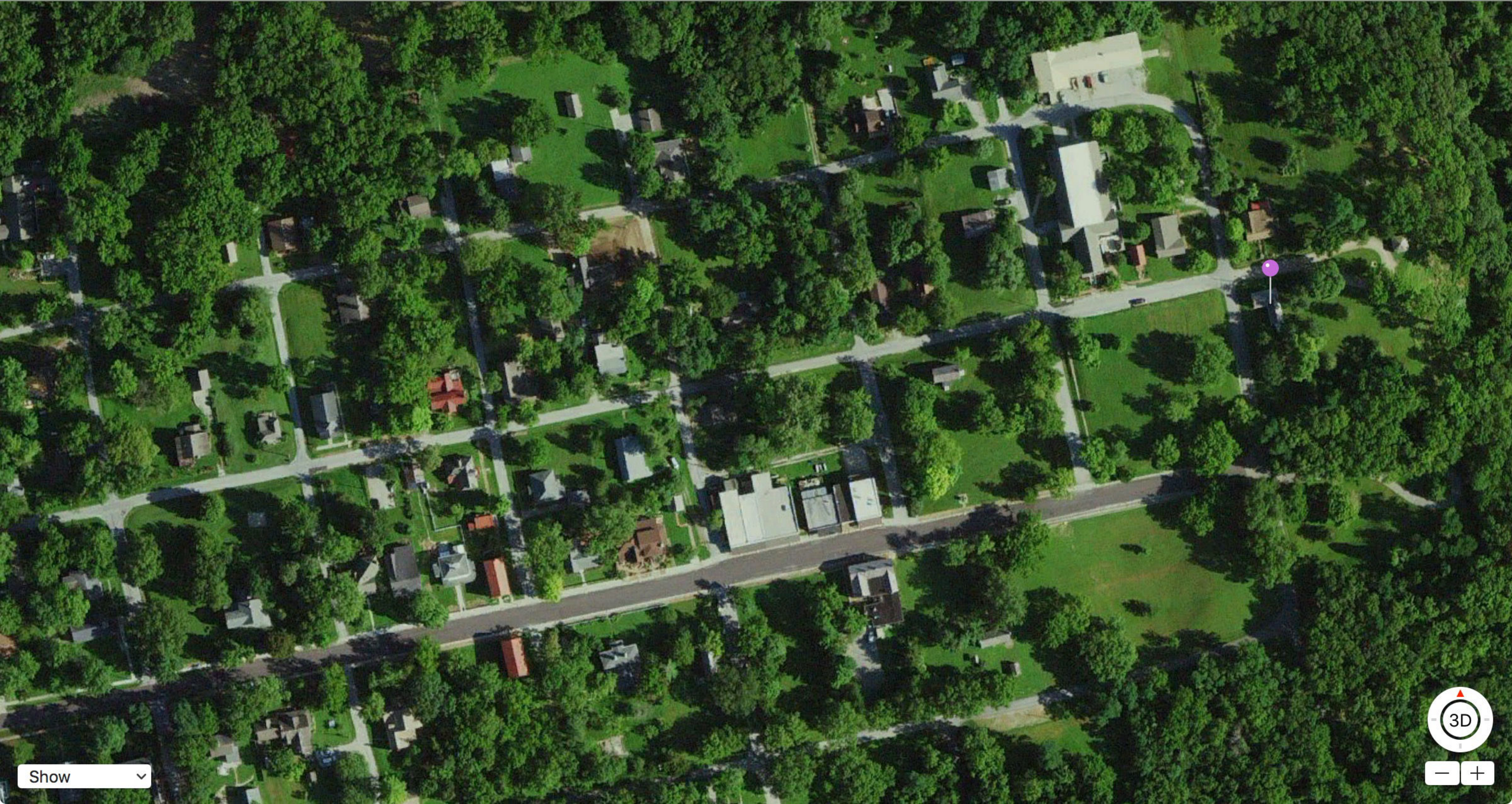
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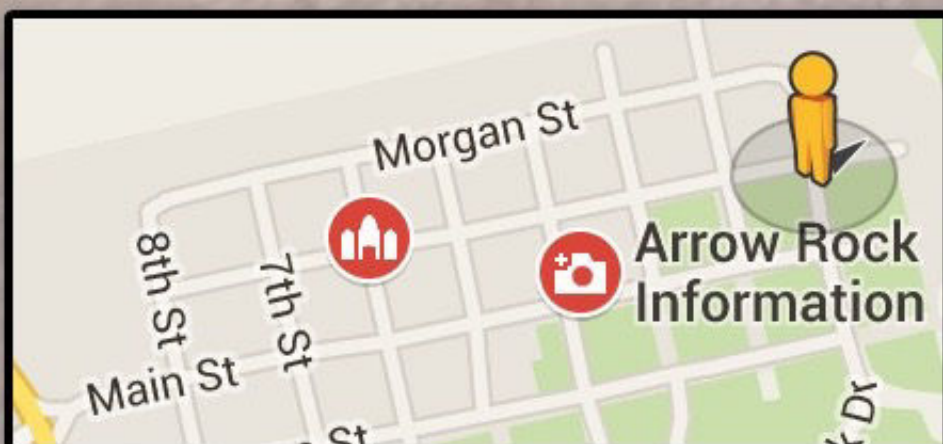




1st St  
Arrow Rock, Missouri

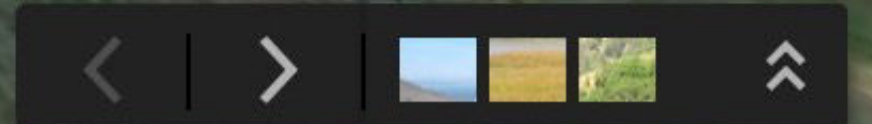
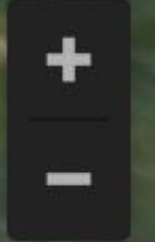


Street View - Jul 2013



Back to Map

Google





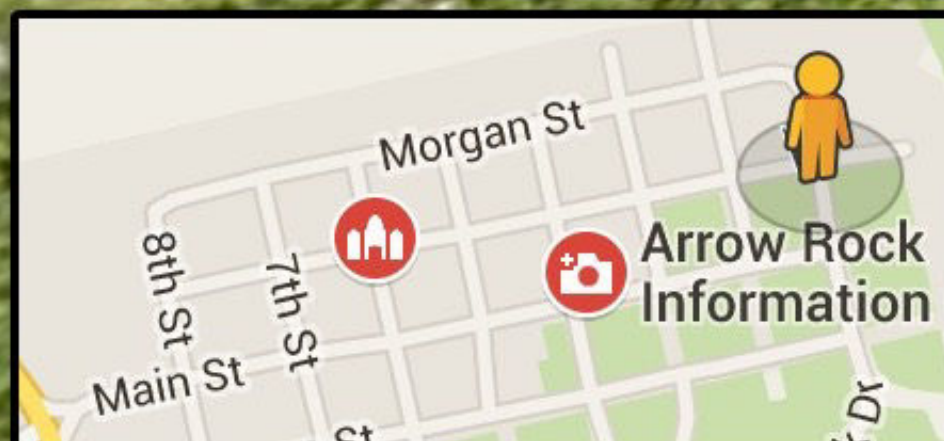
1st St  
Arrow Rock, Missouri



Street View - Jul 2013

Lyceum Theatre

Bingham House



Back to Map

Google



Image capture: Jul 2013 © 2016 Google Terms Privacy Report a problem





George Caleb Bingham's  
*The County Election*  
(1852) shows Election Day  
in 1850 on the main street  
of a town in Saline County,  
Missouri





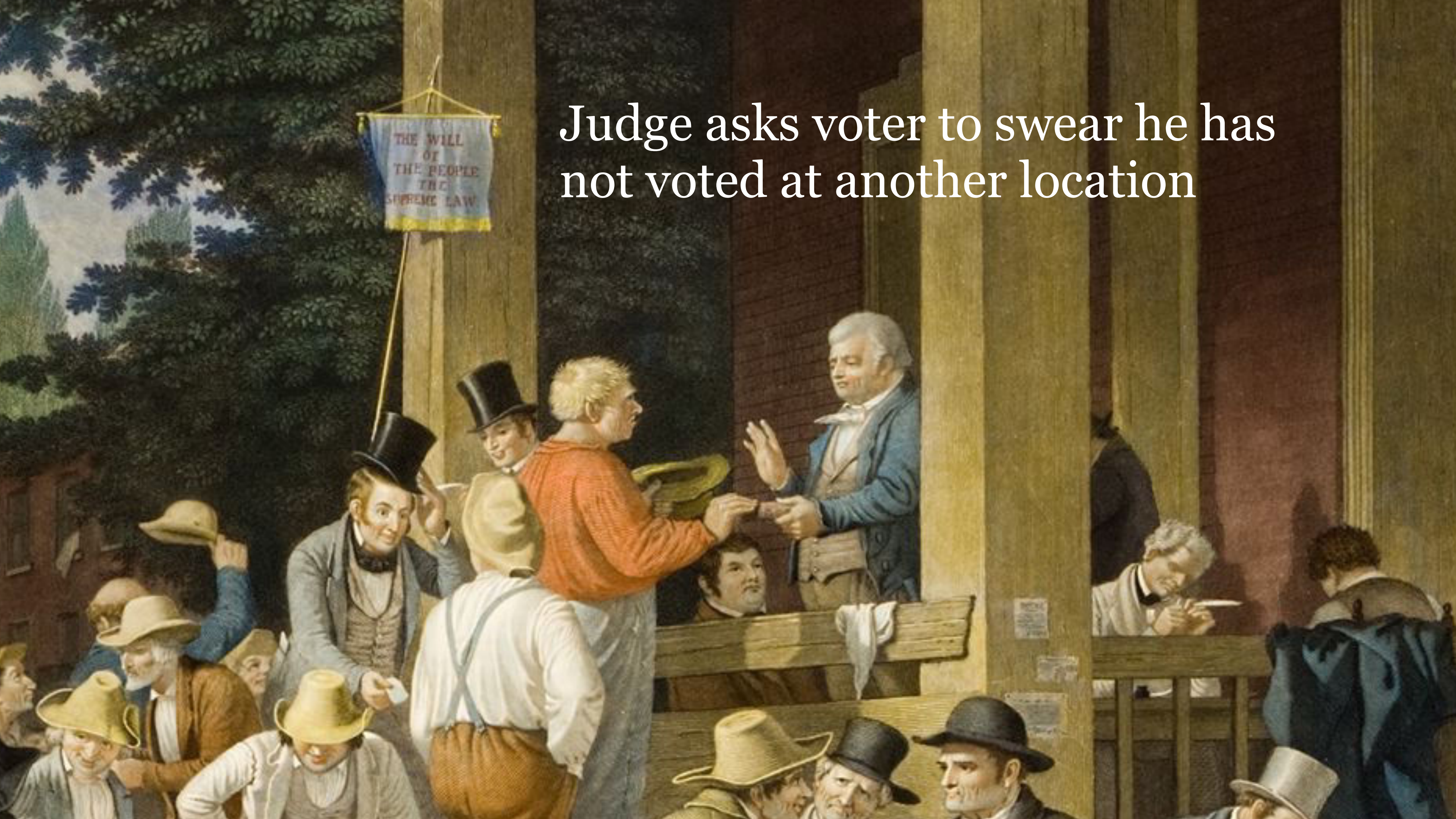


Candidate Erasmus Sappington freely hands  
out card to potential voter right before he votes





Judge asks voter to swear he has  
not voted at another location







Election official waits  
for voter to cast his  
ballot—aloud



Potential voter drinks hard cider  
while a friend support an already-  
drunk man & brings him to vote





No women or people of color,  
except for man pouring alcohol









Systems



5 kinds in use

- » Paper ballots
- » Lever machines
- » Punch cards
- » Optical scan
- » DRE (*Direct Recording Electronic*)



DISTRICT OF COLUMBIA

# OFFICIAL BALLOT

PRESIDENTIAL ELECTION—NOVEMBER 3, 1964

Place a mark in the box beside the names of the  
candidates for whom you wish to vote.



Republican

☐

BARRY GOLDWATER, President, and  
WILLIAM E. MILLER, Vice-President



Democratic

☐

LYNDON B. JOHNSON, President, and  
HUBERT H. HUMPHREY, Vice-President

Fold Here  
before leaving voting booth.



**VOTE ALL BALLOTS**

**AMENDMENT & RETENTION**

**BALLOTS →**

**REGULAR CANDIDATE**

**BALLOT ↓**

**AUTOMATIC VOTING MACHINE CORP.**  
**JAMESTOWN, N. Y.**  
**INSTRUCTION MODEL**  
NO. 29850

2 YES	2 NO	4 FOR	4 AGAINST	5 YES	5 NO
BOARD OF EDUCATION BOND ISSUE		Question 1		Question 2	
Shall bonds be issued by the Board of Education of the City of Chicago for the purpose of erecting, purchasing, or otherwise acquiring buildings suitable for school houses, erecting temporary school structures, erecting additions to, repairing, rehabilitating and modernizing.		Shall plan C for increasing City water supply be approved?		Shall a speed limit of 30 miles per hour be approved?	

**REPUBLICAN**

**DEMOCRATIC**

1 PRESIDENT AND VICE-PRESIDENT OF THE UNITED STATES (Vote for One)	2 UNITED STATES SENATOR (Vote for One)	3	4	5	6 REPRESENTATIVE IN CONGRESS 30th Cong. Dist. (Vote for One)	7 STATE SENATOR 50th Leg. Dist. (Vote for One)	9	10
<b>A</b> 30-50 1 A Henry W. Candidate Edward X. Candidate	2 A Robert J. Candidate	3 A Walter X. Candidate	4 A Jerome A. Candidate	5 A Pamela P. Candidate	6 A Harold A. Candidate	7 A Lorenzo D. Candidate	9 A 1 VOTE	10 A 1½ VOTES Philip D. Candidate
<b>B</b> 30-50 1 B John C. Candidate Wayne W. Candidate	2 B Alex P. Candidate	3 B Hazel V. Candidate	4 B Ned S. Candidate	5 B Nathaniel S. Candidate	6 B Wendy G. Candidate	7 B Hiram Q. Candidate	9 B 1 VOTE	10 B 1½ VOTES Vernon D. Candidate



1  
OFFICIAL BALLOT, GENERAL ELECTION  
PALM BEACH COUNTY, FLORIDA  
NOVEMBER 7, 2000

OFFICIAL BALLOT, GENERAL ELECTION  
PALM BEACH COUNTY, FLORIDA  
NOVEMBER 7, 2000

ELECTORS  
FOR PRESIDENT  
AND  
VICE PRESIDENT

(A vote for the candidates will  
actually be a vote for their electors.)

(Vote for Group)

(REPUBLICAN)  
GEORGE W. BUSH - PRESIDENT  
DICK CHENEY - VICE PRESIDENT

3 ➡

(DEMOCRATIC)  
AL GORE - PRESIDENT  
JOE LIEBERMAN - VICE PRESIDENT

5 ➡

(LIBERTARIAN)  
HARRY BROWNE - PRESIDENT  
ART OLIVIER - VICE PRESIDENT

7 ➡

(GREEN)  
RALPH NADER - PRESIDENT  
WINONA LaDUKE - VICE PRESIDENT

9 ➡

(SOCIALIST WORKERS)  
JAMES HARRIS - PRESIDENT  
MARGARET TROWE - VICE PRESIDENT

11 ➡

(NATURAL LAW)  
JOHN HAGELIN - PRESIDENT  
NAT GOLDHABER - VICE PRESIDENT

13 ➡

(REFORM)  
PAT BUCHANAN - PRESIDENT  
EZOLA FOSTER - VICE PRESIDENT

➡ 4

(SOCIALIST)  
DAVID McREYNOLDS - PRESIDENT  
MARY CAL HOLLIS - VICE PRESIDENT

➡ 6

(CONSTITUTION)  
HOWARD PHILLIPS - PRESIDENT  
J. CURTIS FRAZIER - VICE PRESIDENT

➡ 8

(WORKERS WORLD)  
MONICA MOOREHEAD - PRESIDENT  
GLORIA La RIVA - VICE PRESIDENT

➡ 10

WRITE-IN CANDIDATE

To vote for a write-in candidate, follow the  
directions on the long stub of your ballot card.







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(Vote for ONE)  
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**COMMISSIONERS FOR NATIONAL PASTIMES**  
(Vote for TWO)

JIM THORPE  
PEGGY FLEMING  
**COMMISSIONER OF AMERICAN LITERATURE**  
(Vote for ONE)

(No Vote Cast)  
**MINISTER OF TRANSPORTATION**  
(Vote for ONE)

ORVILLE WRIGHT  
**POET LAUREATE**  
(Vote for ONE)

ROBERT FROST  
**MINISTER OF COMIC RELIEF**  
(Vote for ONE)

LILY TOMLIN  
**Minister of Art**  
(Vote for One)

Andrew Warh

**Reject Ballot**

**Print Next Page**

Ballot Paper  
1. Ballot Paper  
2. Ballot Paper  
3. Ballot Paper  
4. Ballot Paper  
5. Ballot Paper  
6. Ballot Paper  
7. Ballot Paper  
8. Ballot Paper  
9. Ballot Paper  
10. Ballot Paper



“Simply put, many computer scientists doubt that paperless DREs [Direct Recording Electronics] can be made reliable and secure, and they expect that any failures of such systems would likely go undetected.”

—Ariel J. Feldman, J. Alex Halderman, & Edward W. Felten, Princeton University



Companies



■ # of jurisdictions as of 2010

1800

1350

900

450

0

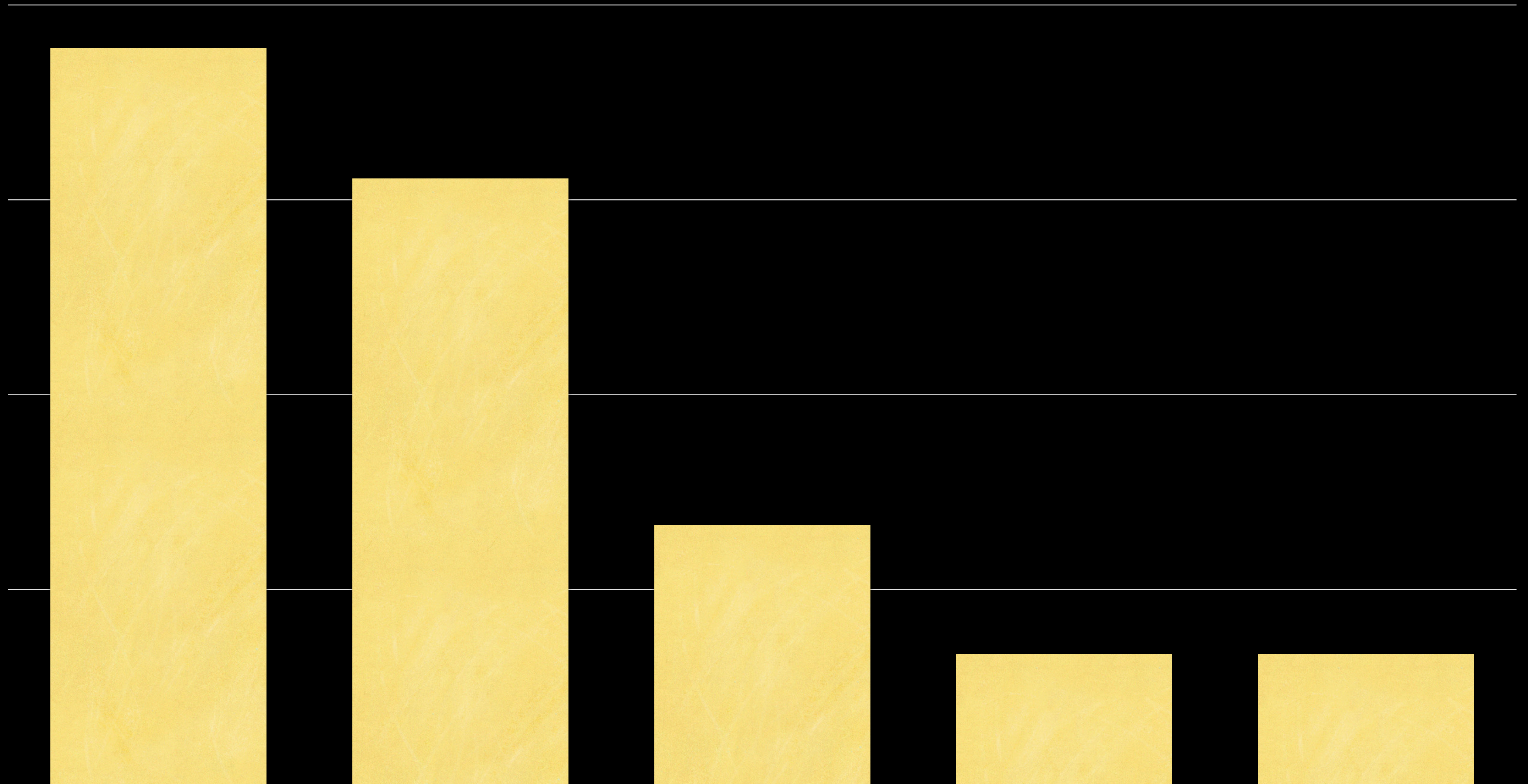
ES&S

Premier

Dominion

Sequoia

Hart





■ # of jurisdictions as of August 2010

3000

2250

1500

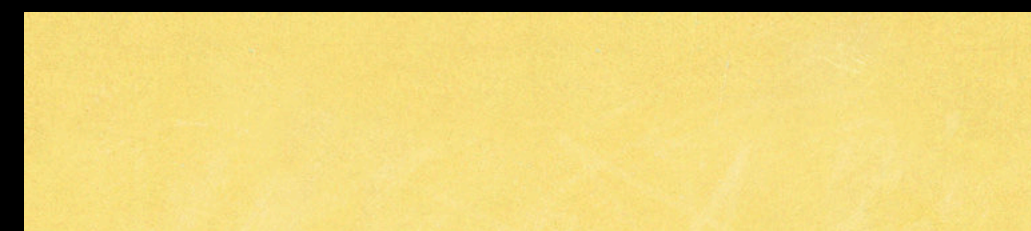
750

0

ES&S

Dominion

Hart





Global Election Systems, Inc. (GES)



Bought by Diebold (2002 • \$24.7 million)



Changes name to Premier Election Solutions (2007)



Bought by ES&S (September 2009 • \$5 million)



Bought by Dominion Voting Systems (May 2010 • \$?)



2012

Hart Intercivic is in:

- » all 234 counties of Texas
- » entire states of Hawaii & Oklahoma
- » half of Washington & Colorado
- » certain counties in Ohio



2014

ES&S is in 4,500 localities with 60+% market share

260,000+ voting systems

75,000+ elections



# Examples



Volusia County, FL  
2000  
Diebold

Al Gore gets –16,022 votes



San Bernardino County, CA  
2001

Programming error causes computers to look for votes  
in the wrong place on a ballot in 33 local elections

No votes registered for those ballots

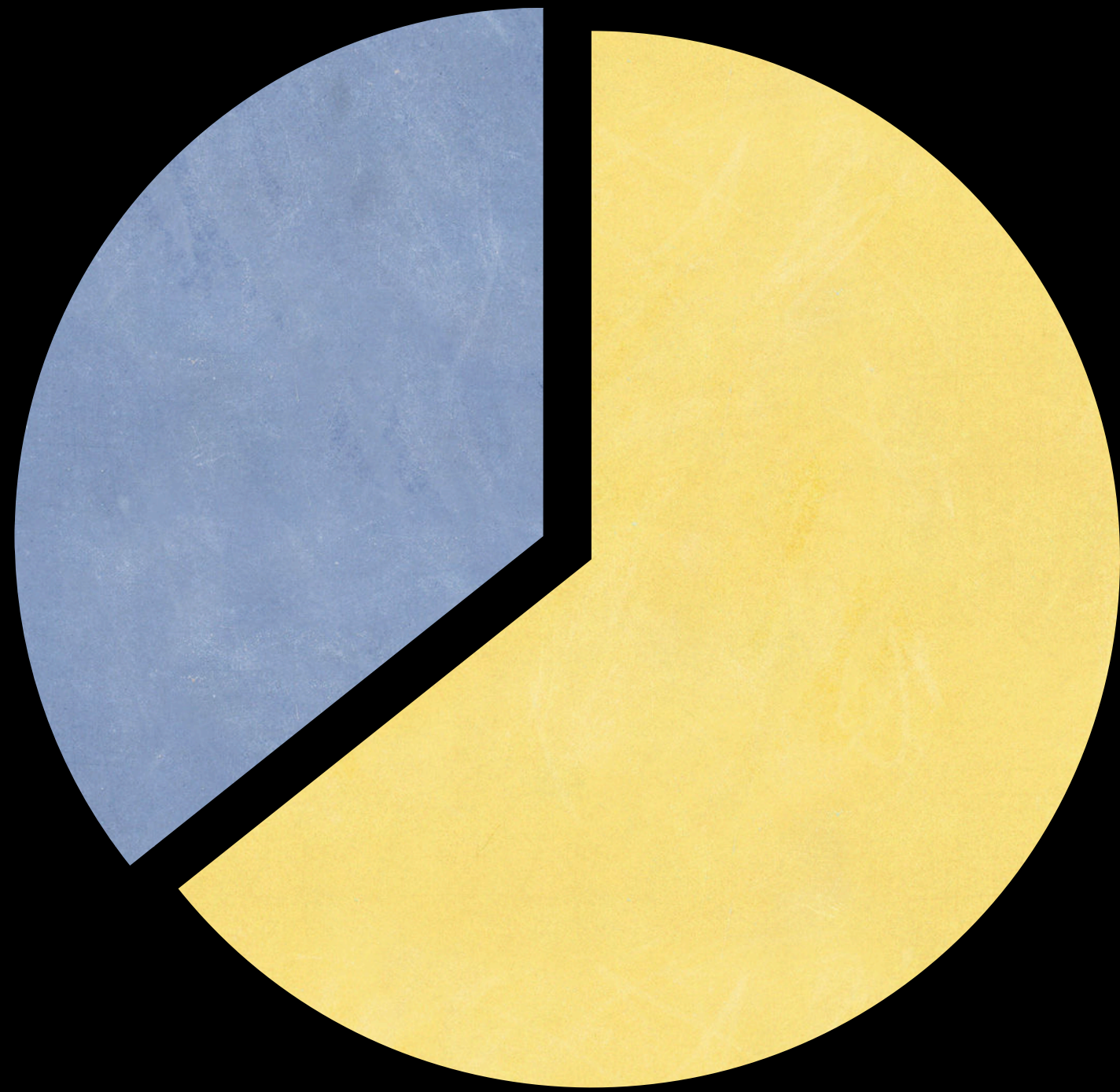




Boone County, IA  
2003

140,000 votes counted on machines

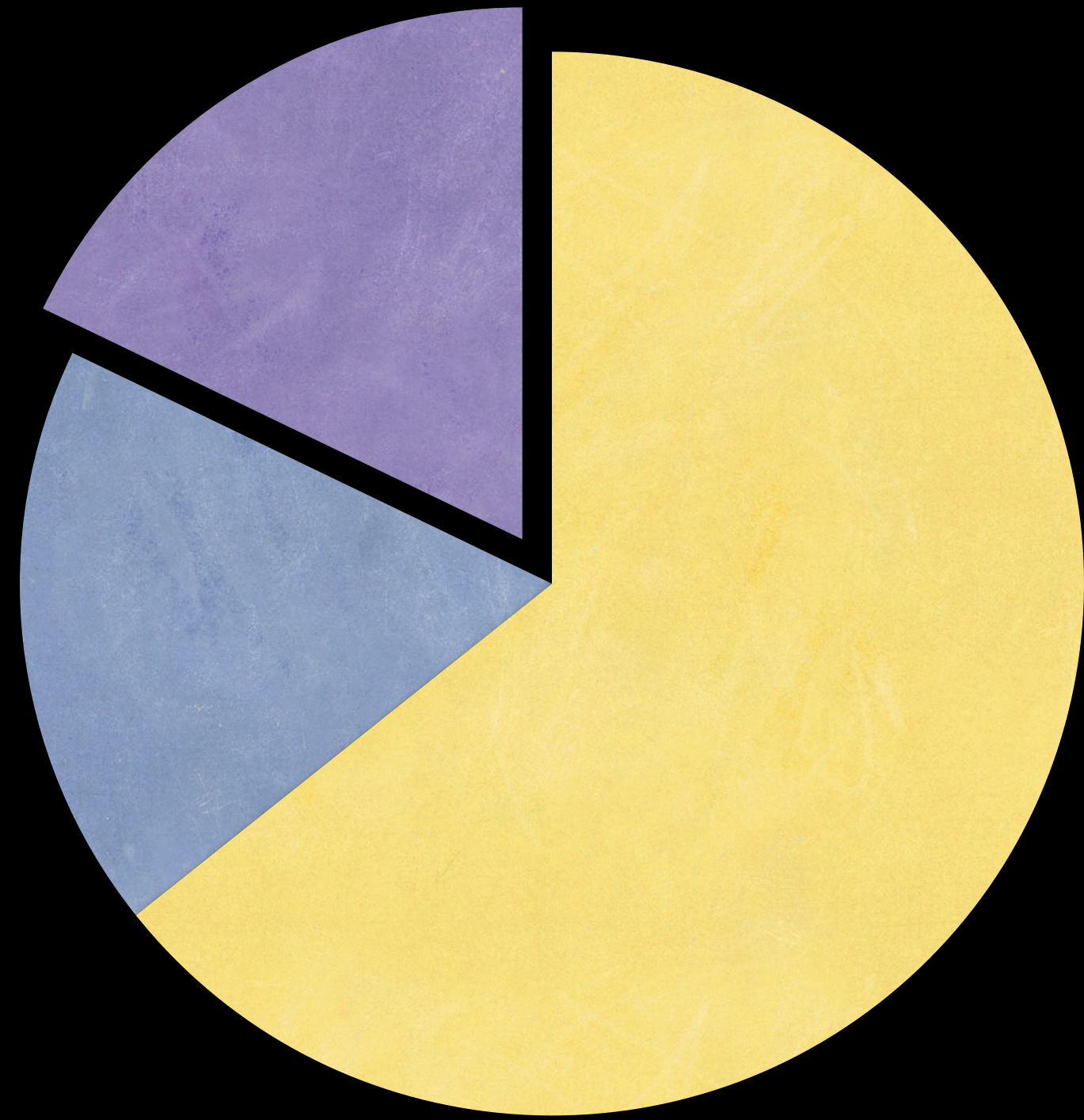




Boone County, IA  
2003

50,000 people live there





Boone County, IA  
2003

25,000 eligible to vote



Palm Beach County, FL  
2004

Audits of voting machine logs reveal more than  
100,000 errors

- » Timestamps of 2010
- » Cards stuck or misread
- » Powering down (128 times!)
- » “Unknown event” messages
- » & many others



Sarasota County, Florida  
2006  
ES&S

18,000 ballots showed no vote cast for the 13th  
Congressional District

Undervote rate was 5 times normal

100s of voters complained that day

Race lost by 400 votes



Jacksonville, FL  
2008

“We’re having problems with the poll machines,” a voter in Jacksonville, Florida, told the CNN Voter Hotline. “They’re not aligned correctly, so you’re not sure about which candidate you’re voting for...”

“... machines at several locations refused to record the ballots.”



Jackson County, West Virginia

2008

ES&S

“I went in there and pushed the Democrat ticket, and it jumped to the Republican ticket for president of the United States,’ said Calvin Thomas, an 81-year-old West Virginian. ... The same thing happened to his daughter, Micki Clendenin, when she cast her ballot.”



TOUCH SCREEN VOTE FLIPPING  
Jackson County, West Virginia  
October 23rd, 2008



Jackson County, West Virginia  
2008  
ES&S



TOUCH SCREEN VOTE FLIPPING  
Jackson County, West Virginia  
October 23rd, 2008



Jackson County, West Virginia  
2008  
ES&S



Decatur County, TN

2008

ES&S

3 voters complain they voted for McCain & a vote for Obama was registered

“Voters who are too tall don’t have a good view of the ballot and might think they’re touching the center of the box when they’re not.”



Mineral Wells, TX

2008

ES&S

Voters report machines switch straight-party vote from  
Democratic to Republican

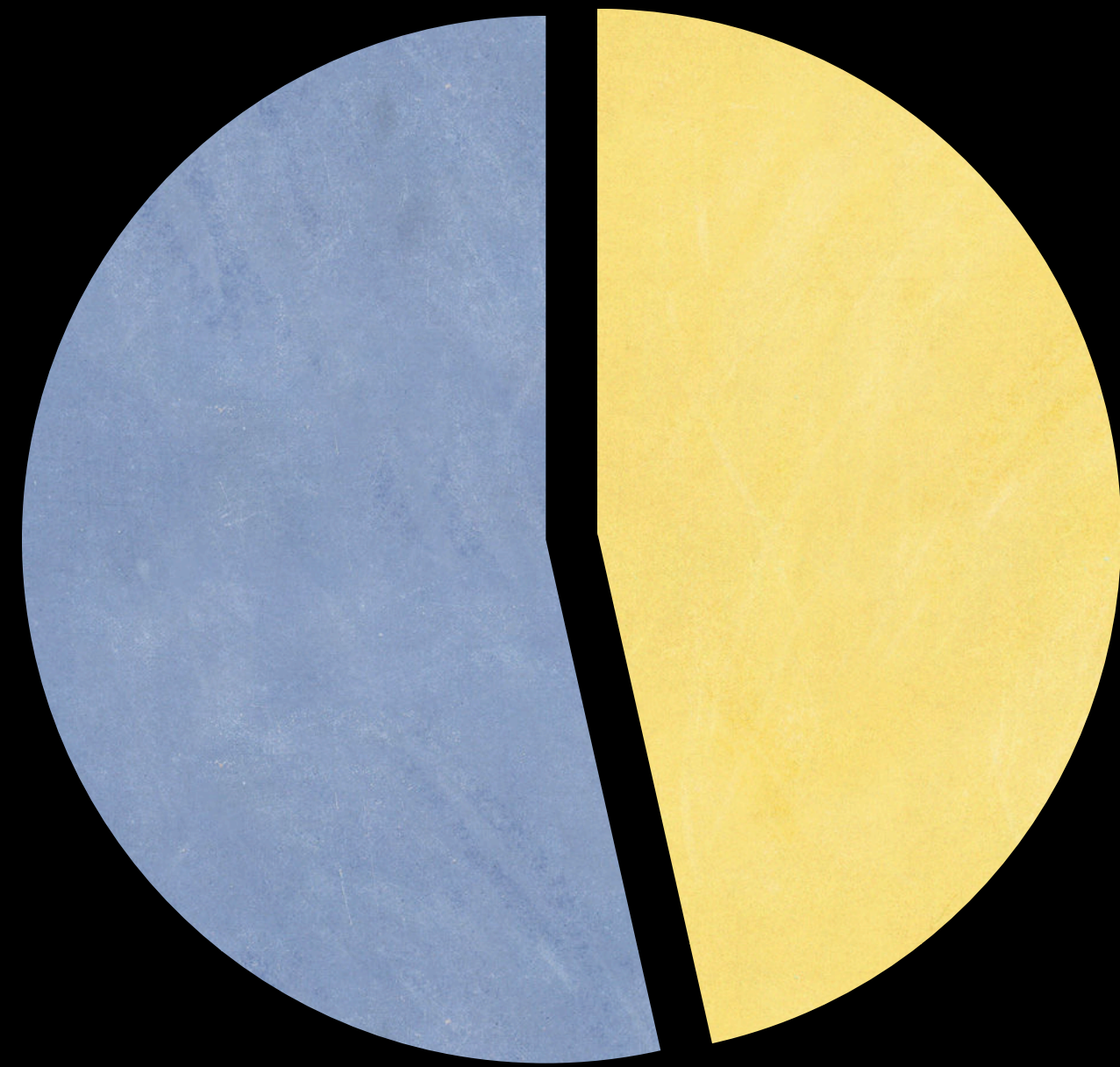




Rapid City, South Dakota  
June 2009  
ES&S

10,488 votes counted





Rapid City, South Dakota  
June 2009  
ES&S

Of those, 4,875 were phantom votes



2012

Virginia, Florida, Pennsylvania, Colorado, & other states used DRE machines that lacked any paper backup for later recount



New York, NY  
2012

1% of all votes in 13th Congressional District were never counted

Charles Rangel wins by a 2% margin

*New York Daily News*: “It defies logic that 514 people went to the polls in this hotly-contested race and voted for no one.”



Greensboro, North Carolina

2012

ES&S

A voter tries to vote for Romney, but the machine  
chooses Obama 3 times

Other voters report similar problems



St. Louis  
2012

Voter votes for Obama but a vote for Romney is cast



you may Split your ballot by selecting  
your choice below and voting for individual  
candidates in any other party.

<input type="checkbox"/>	REPUBLICAN
<input type="checkbox"/>	DEMOCRATIC
<input type="checkbox"/>	GREEN
<input type="checkbox"/>	LIBERTARIAN

**PRESIDENTIAL ELECTORS**  
Vote for the candidates of one Party for the President  
and Vice-President or insert the names of candidates.

<input type="checkbox"/>	MITT ROMNEY, President PAUL RYAN, Vice-President REPUBLICAN
<input type="checkbox"/>	BARACK OBAMA, President JOE BIDEN, Vice-President DEMOCRATIC
<input type="checkbox"/>	JILL STEIN, President CHERI HONKALA, Vice-President GREEN
<input type="checkbox"/>	GARY JOHNSON, President JAMES P GRAY, Vice-President LIBERTARIAN
<input type="checkbox"/>	Write-in

01 / 02

Perry County, Pennsylvania  
2112  
ES&S



you may Split your ballot by selecting  
your choice below and voting for individual  
candidates in any other party.

<input type="checkbox"/>	REPUBLICAN
<input type="checkbox"/>	DEMOCRATIC
<input type="checkbox"/>	GREEN
<input type="checkbox"/>	LIBERTARIAN

**PRESIDENTIAL ELECTORS**  
Vote for the candidates of one Party for the President  
and Vice-President or insert the names of candidates.

<input type="checkbox"/>	MITT ROMNEY, President PAUL RYAN, Vice-President REPUBLICAN
<input type="checkbox"/>	BARACK OBAMA, President JOE BIDEN, Vice-President DEMOCRATIC
<input type="checkbox"/>	JILL STEIN, President CHERI HONKALA, Vice-President GREEN
<input type="checkbox"/>	GARY JOHNSON, President JAMES P GRAY, Vice-President LIBERTARIAN
<input type="checkbox"/>	Write-in

01 / 02

Perry County, Pennsylvania  
2112  
ES&S



Diebold



Global Election Systems, Inc. (GES)



Bought by Diebold (2002 • \$24.7 million)



Changes name to Premier Election Solutions (2007)



Bought by ES&S (September 2009 • \$5 million)



Bought by Dominion Voting Systems (May 2010 • \$?)



# Alterations Without Notifications



Georgia, 2002

Diebold changes machines' software 8 times without the state examining it

6 electoral upsets, including the incumbent senator, ahead in the polls, who loses by 11 points

After the election, Diebold overwrites the flash memory on all machines' cards



Alameda County, CA  
November 2003

Diebold alters software on machines prior to the elections without submitting software for testing or notifying the state about the updates



From  
the Horse's Mouth



March 2003

Someone breaks into a Diebold website & copies 1000s of messages from an internal discussion board

The messages & source code are provided to journalists & posted on college websites



1: January 18, 2001

“I need some answers! Our department is being audited by the County. I have been waiting for someone to give me an explanation as to why Precinct 216 gave Al Gore a minus 16022 when it was uploaded. ... I would appreciate an explanation on why the memory cards start giving check sum messages. We had this happen in several precincts...”



2: October 5, 2001

“Over [the past three years] I have become increasingly concerned about the apparent lack of concern over the practice of writing contracts to provide products and services which do not exist and then attempting to build these items on an unreasonable timetable with no written plan, little to no time for testing, and minimal resources. ... It also seems to be an accepted practice to exaggerate our progress and functionality to our customers and ourselves”



3: March 19, 1999

“For a demonstration [for El Paso County, Colorado] I suggest you fake it. Progam [sic] them both so they look the same, and then just do the upload fro [sic] the AV. That is what we did in the last AT/AV [AccuTouch/AccuVote] demo.”



4: October 18, 2001

“Right now you can open GEMS’ .mdb file with MS-Access, and alter its contents. That includes the audit log. This isn’t anything new. ... Now, where the perception comes in is that its right now very \*easy\* to change the contents. Double click the .mdb file. ... It is possible to put a secret password on the .mdb file to prevent Metamor [a consulting company] from opening it with Access. Being able to end-run the database has admittedly got people out of a bind though. ... Jane (I think it was Jane) did some fancy footwork on the .mdb file in Gaston recently. I know our dealers do it. King County is famous for it. That’s why we’ve never put a password on the file before.”



# Expert Analysis



Avi Rubin of Johns Hopkins University analyzes the stolen Diebold source code

His findings?



It would be easy for a Diebold insider to alter the system to affect votes



Since the code is “closed”, it could be changed without detection



All voting machines use the same hard-coded password



All voting machines use the same hard-coded password

1111



Without a paper trail, there is no way to audit the system, & no way to reconstruct a disputed election



“Our analysis shows that this voting system is far below even the most minimal security standards applicable in other contexts. We highlight several issues including unauthorized privilege escalation, incorrect use of cryptography, vulnerabilities to network threats, and poor software development processes.”



# Audit Logs



March 17, 2009

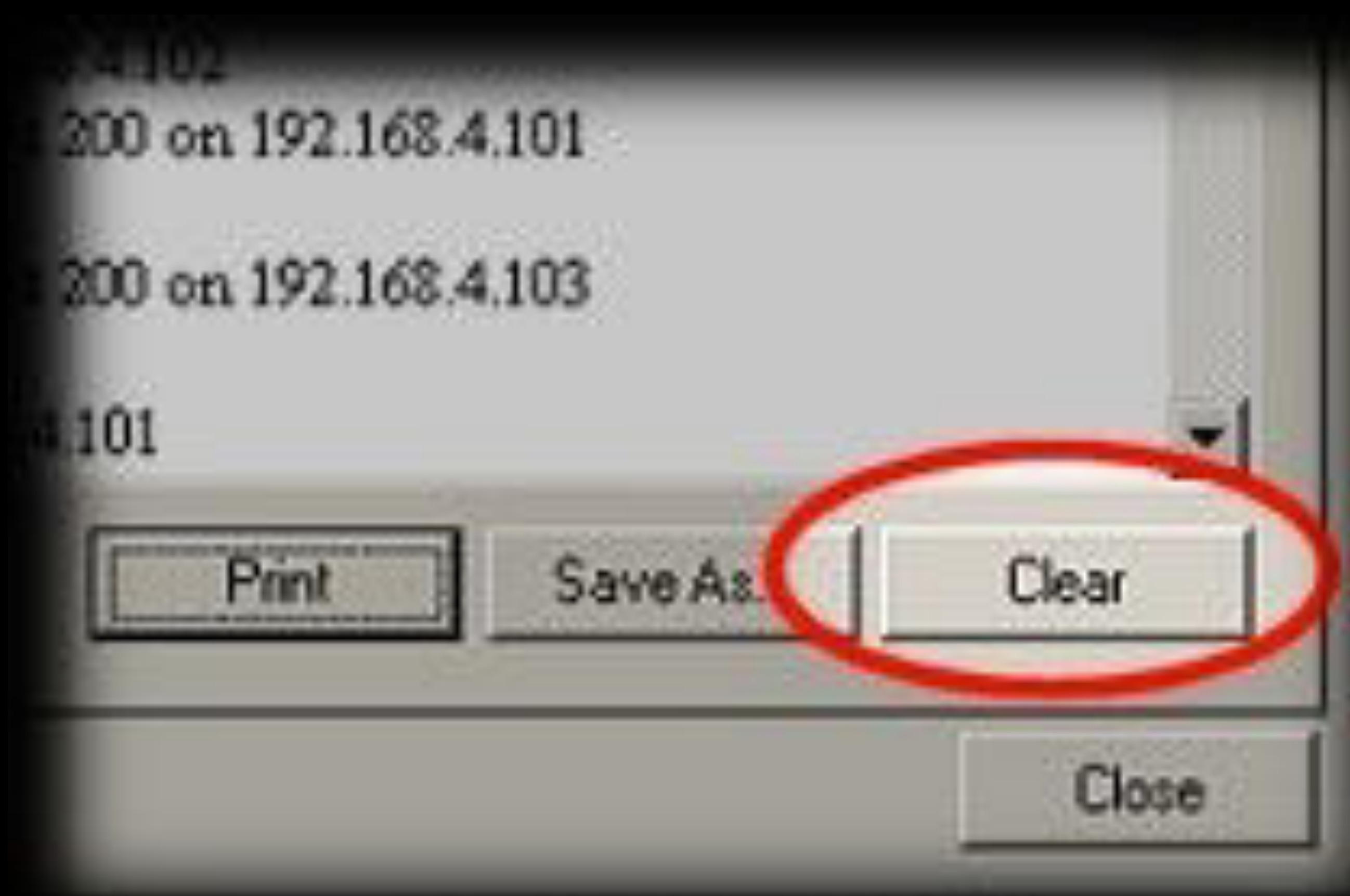
Justin Bales, Premier's Western Region manager, at a California state public hearing, admits the following about machines used in 34 states:



Audit log system does not record ballot deletions, even on election days

Flaws have been present over a decade





Clear button deletes the audit log without asking for confirmation from the user



Bales of Premier: “It was just not in the initial program, but now we’re taking a serious look at that.”

California Secretary of State on Diebold’s audit logs:  
“Useless”



Keys



Ed Felten, Princeton: “The access panel door on a Diebold AccuVote-TS voting machine — the door that protects the memory card that stores the votes, and is the main barrier to the injection of a virus — can be opened with a standard key that is widely available on the Internet.”



AccuVote-OS  
AccuVote-TS  
AccuVote-TSX  
Documentation & Help Cards  
Election Extras  
Electrical Accessories  
ExpressPoll 2000/4000  
Networking & Printer Supplies  
Office Furniture & Storage  
Office Supplies  
Polling Station Supplies  
Signs  
Transfer & Transport Cases  
DMS-Net/Voter Registration  
Voting Booths & Ballot Boxes

## ACCUVOTE-TS

The votes are in and Diebold supplies take the lead for accuracy and simplicity of use with this dependable touch-screen technology. //



### Replacement Access Keys

- 2 keys that allow easy service access to the Tally Printer and replacement battery compartment

GS-567311-1000 \$5.90 USD per set  
\$6.90 CAD per set

Enter a quantity

[add to your order >](#)

ORDER BY PHONE 800.769.3246

### IS DIEBOLD THE DUMBEST COMPANY IN THE HISTORY OF AMERICA?

Screenshot from Diebold's online web store featuring a photo of the key used to open every one of their "secure", yet incredible hackable, electronic voting machines. Working copies were made from only the photo above and used to open a Diebold AccuVote TS system.

**The BRAD BLOG | BradBlog.com**



# Problems



Expensive



DREs cost \$3,000–\$12,000

Most precincts need at least 5–10 DREs

Optical scanners cost \$4,000–\$10,000

Most precincts need 1 optical scanner



North Carolina study

Finding: 1 optical scanner does the work of 20 DREs



2008 cost analysis of Maryland's voting system

Finding: shifting from DREs to optical scanners  
reduces equipment costs by 80%



# Calibration



EXAMINING TOUCHSCREEN  
VOTE FLIPPING  
Jackson County, West Virginia  
Oct. 23, 2008



Jackson County, WV  
Clerk Jeff Waybright  
2008  
ES&S



EXAMINING TOUCHSCREEN  
VOTE FLIPPING  
Jackson County, West Virginia  
Oct. 23, 2008



Jackson County, WV  
Clerk Jeff Waybright  
2008  
ES&S



# Hackability



## From Security Analysis of the Diebold AccuVote-TS Voting Machine:

“Anyone who has physical access to a voting machine, or to a memory card that will later be inserted into a machine, can install ... malicious software using a simple method that takes as little as one minute. In practice, poll workers and others often have unsupervised access to the machines.”



Dan S. Wallach, Associate Prof. of Computer Science,  
Rice University

“What we learned from the California Top-to-Bottom Review and the Ohio EVEREST study was that, indeed, these systems are unquestionably and unconscionably insecure.”



When machine boots, it checks to see if `fboot.nb0` is on removable memory card

If it is, the machine replaces bootloader code on its on-board flash memory with new `fboot.nb0`



When machine boots, it checks to see if `explorer.glb` is on removable memory card

If it is, the machine runs `explorer.glb` without any authentication



Operating system used by Diebold voting machines?



Operating system used by Diebold voting machines?

Windows CE 3.0



Uniformity



Hundreds of thousands of copies of the same machines  
are in use across the USA

One problems means that elections across the country  
would be affected



# Infrastructure



What if the electricity fails?



# The Biggest Problem







# Solutions



# Better Security Procedures



In the Netherlands, after a voting foundation demonstrated security holes, the Dutch government ordered:

- » all software replaced
- » all hardware checked
- » unflashable firmware installed
- » iron seals placed on machines

Machines were checked randomly on election day



Paper ballots must always be available, enough for everyone to use if necessary



Voter-verified paper trails

Independent security reviews of hardware & software



Open Source

What's *open source*?



Secrecy does not mean security

Dan S. Wallach, Associate Prof. of Computer Science,  
Rice University

“Disclosing the source code only results in a complete forfeiture of the software’s security if there was never any security there in the first place. ... If the product is well-engineered, then disclosing the software will cause no additional security problems. If the product is poorly-engineered, then the lack of disclosure only serves the purpose of delaying the inevitable.”



Learn

Touch **Print Next Page** to print and verify the next page.  
OR

Touch **Reject Ballot** if you need to go back and make changes.

**NOTE:** you may reject your printed ballot a maximum of three times, after which you will no longer be allowed to make further changes and your vote will be cast.  
Please contact a pollworker if you are experiencing any problems.

**PRESIDENT**

(Vote for ONE)

THOMAS JEFFERSON

COMMISSIONERS FOR NATIONAL PASTIMES  
(Vote for TWO)

JIM THORPE

PEGGY FLEMING

COMMISSIONER OF AMERICAN LITERATURE  
(Vote for ONE)

(No Vote Cast)

MINISTER OF TRANSPORTATION  
(Vote for ONE)

ORVILLE WRIGHT

POET LAUREATE  
(Vote for ONE)

ROBERT FROST

MINISTER OF COMIC RELIEF  
(Vote for ONE)

LILY TOMLIN

Minister of Art  
(Vote for One)

Andrew Warh

**Reject Ballot**

**Print Next Page**

Ballot Information  
Election  
Ballot Number  
Ballot Type  
Ballot Status  
Ballot Date  
Ballot Time  
Ballot Location  
Ballot Machine  
Ballot Model  
Ballot Version  
Ballot Serial  
Ballot ID



**DO NOT USE**

Touch **Print Next Page** to print and verify the next page.  
OR  
Touch **Reject Ballot** if you need to go back and make changes.

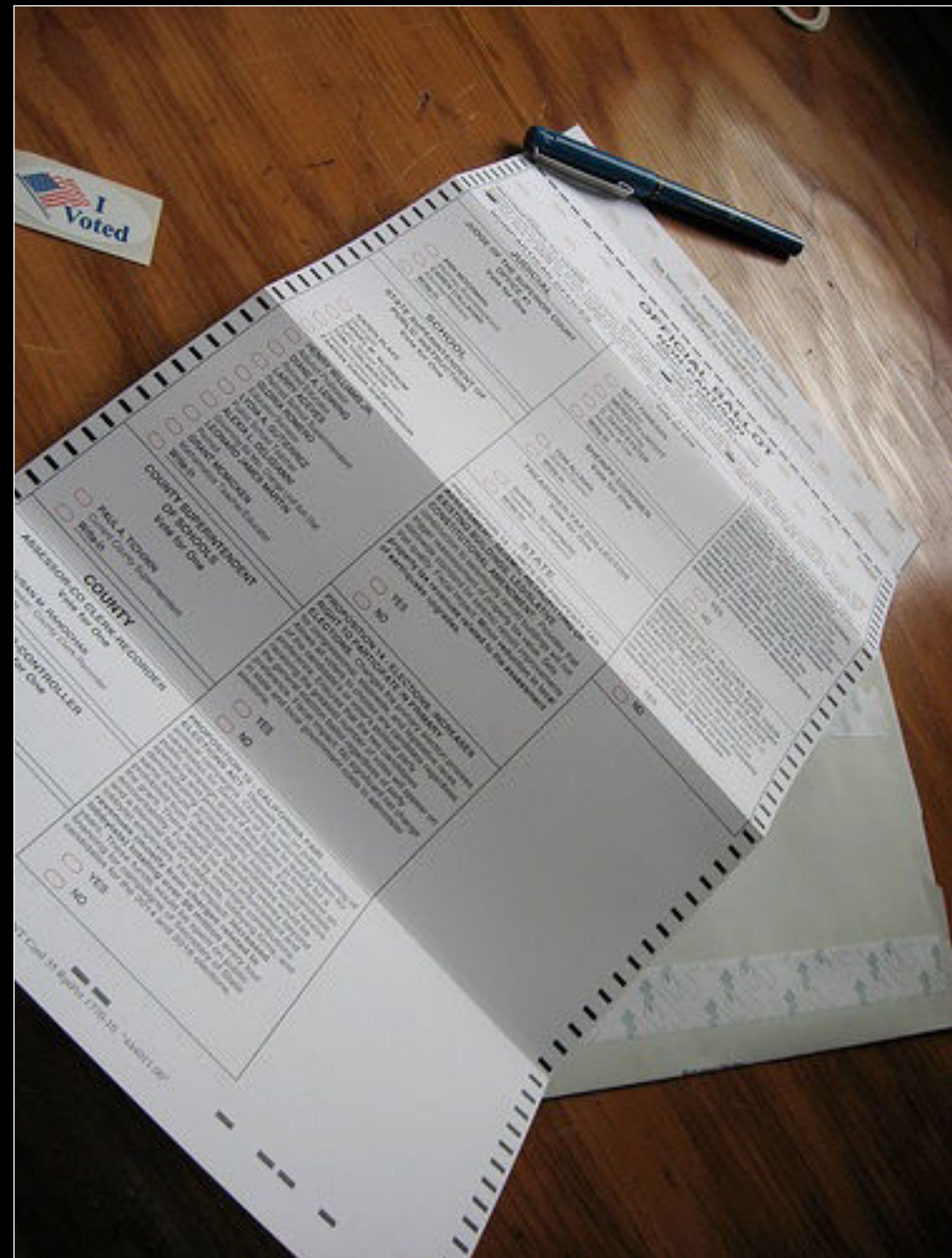
**DTE:** you may reject your printed ballot a maximum of three times, after which you will no longer be allowed to make further changes and your vote will be cast.  
Please contact a pollworker if you are experiencing any problems.

PRESIDENT (Vote for ONE)	
THOMAS JEFFERSON	
COMMISSIONERS FOR NATIONAL PASTIMES (Vote for TWO)	
JIM THORPE	
PEGGY FLEMING	TERATU
COMMISSIONER OF AN	(Vote
(S)	
INGS OR OFFI	ON
(Vote)	
ORVILLE	NET LAUR
(Vote for ONE)	
ROBERT FRODO	MASTER OF COMIC RELIEF (Vote for ONE)
LILY TOMLIN	Minister of Art (Vote for One)
Andrew Wuth	

**Reject Ballot** **Print Next Page**

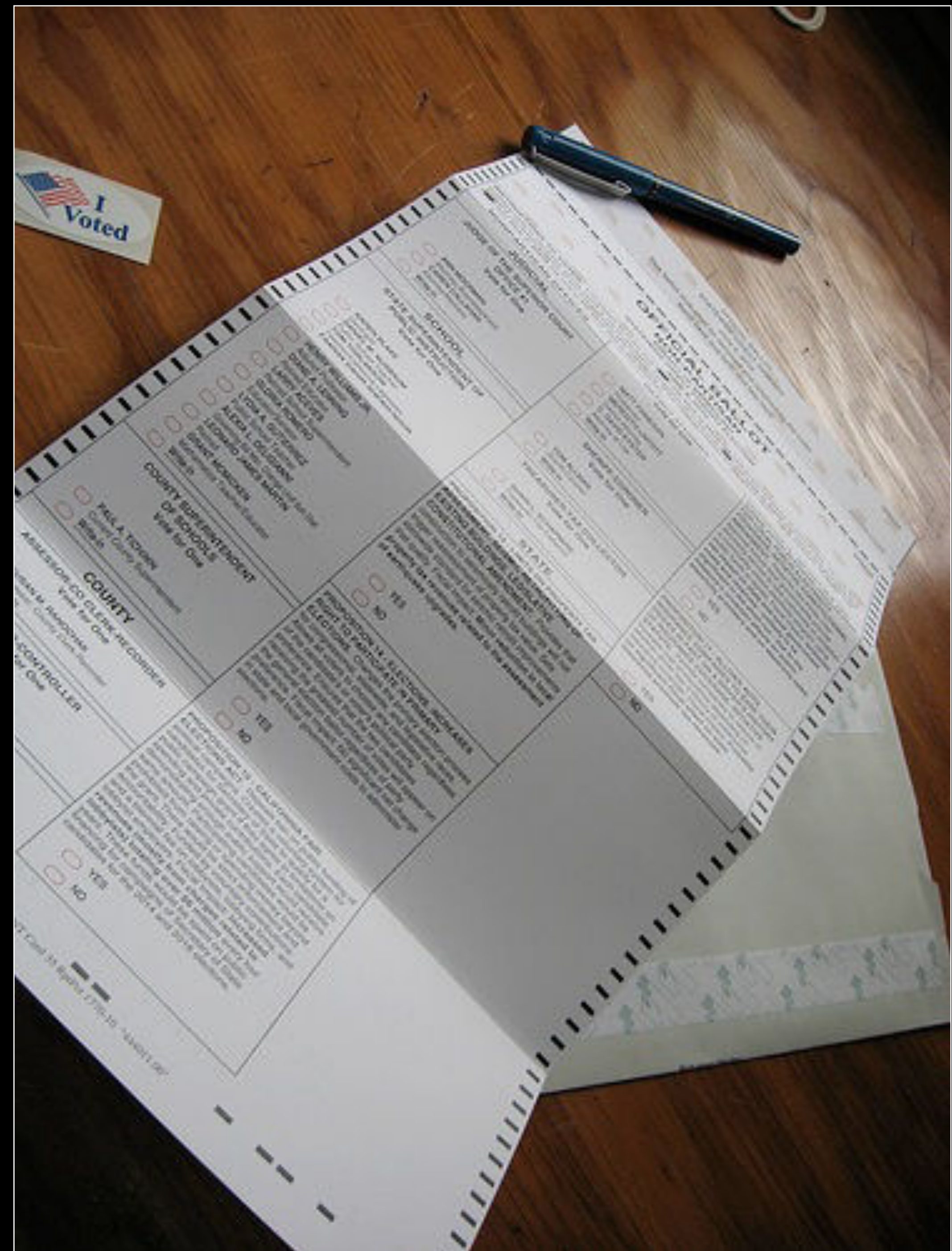
Instructions for Ballot  
1. Touch **Print Next Page**  
2. Verify your vote  
3. Touch **Print Next Page**  
4. Touch **Reject Ballot**  
5. Touch **Print Next Page**  
6. Touch **Reject Ballot**  
7. Touch **Print Next Page**  
8. Touch **Reject Ballot**  
9. Touch **Print Next Page**  
10. Touch **Reject Ballot**







“I’d like the paper  
ballot, please.”



Google *vote* & any of these:

Bruce Schneier

Edward Felten

Avi Rubin



buffering...

buffering...



Thank you!

[scott@granneman.com](mailto:scott@granneman.com)

[www.granneman.com](http://www.granneman.com)

[ChainsawOnATireSwing.com](http://ChainsawOnATireSwing.com)

[@scottgranneman](#)

# This is Democracy?

## Problems with Electronic Voting Machines

R. Scott Granneman

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# Changelog

**2016-05-16 1.1:** Added large section on George Caleb Bingham's *The County Election*

**2014-04-10 1.0:** Moved slides to new format & redid everything

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