Disability Rights California
California's protection & advocacy system

VOTING RIGHTS UNIT
1330 Broadway, Ste. 500
Oakland, CA 94612
Tel: (510) 267-1200
TTY: (800) 719-5798
Toll Free: (800) 776-5746
Fax: (510) 267-1201
www.disabilityrightsca.org

March 21, 2016

VIA E-MAIL AND U.S. MAIL

Christopher J. Jerdonek
President, San Francisco Elections Commission
1 Dr. Carlton B. Goodlett Place, Room 48
San Francisco, California 94102

Jeff Cretan
Legislative Aide to Supervisor Scott Wiener
City Hall
1 Dr. Carlton B. Goodlett Place, Room 244
San Francisco, California 94102

RE: Accessible Features of a New Voting System

Dear Mr. Jerdonek and Mr. Cretan:

Thank you for taking the time to meet with us regarding San Francisco's prospects in acquiring a new voting system. Pursuant to our conversation in January, we have developed a working definition of "accessible" as well as some features of an accessible voting system.

Definition of "Accessible"

"Accessible" refers to direct access without assistance. "Accessible" incorporates the design of products, devices, services or environments for

persons with disabilities. Accessible also refers to ease of approach, reach, enter, speak with or use.[1]

Voting systems generally meet HAVA accessibility requirements to the extent they are required to do so. The requirements, however, are based on particular disability groups such as blind and low vision, manual dexterity, intellectual and developmental disabilities as well as other groups and do not take into account combinations of disability. This results in requirements that may work well for people who are blind but not for people who are blind with limited dexterity or limited tactile sensitivity. As might be expected, stand-alone systems designed after implementation of Voluntary Voting System Guidelines (VVSG 1.0) have a much greater compliance than those designed prior to VVSG 1.0.

Desirable Features of an Accessible Voting System[2]

In addition to an audio component and touchscreen, we believe that an accessible voting system should be self-explanatory and have additional accessible features, including, but not limited to, the following:

- Sip and puff - The mouth-controlled input provide users who cannot move their arms with a simple and effective way to use their breath to control a device, such as their power wheelchair or computer.

- Keyboard for write-in votes – Many people with disabilities are unable to type in names of write-in candidates using the touchscreen either because they can hit one large button to cast their ballot by using a big part of their hand or even face to choose a candidate on the ballot, but cannot type on a touchscreen keypad. A manual keyboard should be readily available.

- Voice activated – Voice input for voters who have difficulty using their hands.

---

[1] *See* https://en.wikipedia.org/wiki/Accessibility

[2] The information below, as well as additional information, may be found in the Research Alliance for Accessible Voting (RAAV) Abstract, "Guide to Disabilities and Voting Systems and Access Features: Developed by the Association of Assistive Technology Act Program as a partner of the RAAV Project. http://www.ataporg.org/docs/RAAV%206.27.13%20publish.pdf

- Synchronized audio and visual - When synchronized speech and audio are engaged, a voice reads each word as it is displayed. Adjustments to change the volume and tempo should be available to assist voters with intellectual and developmental disabilities, voters with learning disabilities, voter who had traumatic brain injuries and voters who had a stroke.

- Joystick – Some voters with disabilities may need to use a joystick to navigate the touchscreen component if they cannot operate the touchscreen because they are unable to raise their hand or cannot accurately hit their selection due to fine motor control limitations or involuntary movements.

- Tecla switch compatibilty- The Tecla Switch is a wireless device that lets a person with limited to no hand movement control electrontic devices, such as a smartphone, tablet or computer (PC & Laptop), and the driving controls of their power wheelchair using their external switches.[3]

- Tactile buttons - An access feature provided as an alternative to touch screen input. It provides keys/controls that can be felt in contrast to a touchscreen, which provides no mechanism to "feel" the difference between selections.

- Electronic Ballot Delivery – An electronic ballot in accessible format that is either e-mailed to a voter with a disability or downloadable from a secure website that a voter can read and mark using their familiar assistive device (e.g., screen reading software, mouse keys, etc.), print it and mail it back to the county elections officials. Electronic ballot delivery would allow voters with disabilities to vote by mail privately and independently the same as voters without disabilities.

---

[3] *See* http://gettecla.com.

Tablets Generally Do Not Comply with the VVSG Requirements and are Not Currently Expected to Do So Even Though They are Being Increasingly Used as Part of the Voting Process.[4]

Tablets are not accessible to many people with disabilities. Several disabilities (for example Cerebral Palsy, Multiple Sclerosis, Parkinson's Syndrome, Paralysis) cause motor control and dexterity limitations such as poor coordination or involuntary movements.

Any of these disabilities can seriously impair a person's ability to accurately touch a small area on a voting system touch screen or accurately activate a key on a keypad. They may also impact the pressure needed to touch or activate a control. These individuals may need keys needing less pressure than most people or they may be prone to using too much pressure and activate a repeat function on the key or selection spot.

These individuals may frequently use adaptive keyboards with a layout of keys that match their range of motion; they may use a head-mouse, mouth-stick, or head-pointer, voice-recognition software, an eye-gaze system, or any one of a number of other assistive technologies to efficiently use a computer. They may need longer response times and adjustments in key repeat, requirements for simultaneous key use, etc.

The VVSG requires that controls should be operable with one hand, without excessive force, and must not require tight grasping, pinching, or twisting of the wrist. VVSG 1.1 Section 3.2.6.c. The combined impact of these requirements is that controls must be easily operated but not easily activated by accident. VVSG 1.1 Section 3.3.4.b. This benefits all voters but particularly benefits those who lack fine motor control.

Tablets generally do not include safeguards to prevent key repeat or other forms of accidental key activation. This means, for example, that individuals who lack hand coordination can easily enter extra characters when entering

[4] The information below, as well as additional information, may be found in a working paper called "Accessible Voting Technology: Analysis and Recommendations" by Deb Cook and Mark Harriss from the University of Washington for the Information Technology and Innovation Foundation, Accessible Voting Technology Initiative (December 2012) < http://elections.itif.org/reports/AVTI-004-Cook-Harniss-2012.pdf>

a write-in choice. Operating systems on tablets generally include an option to disable key repeat, but it is not easily accessed, is probably not known to most voters, and may not be enabled at a polling place.

Voter Input at All Stages

Having voter input at all critical stages of the development and the procurement process, either by focus groups, surveys or a task force would be an ideal way to make sure San Francisco's next voting system is accessible and usable by all San Francisco voters, especially those with disabilities.

We appreciate the opportunity to continue the conversation and contribute to the process to meet our joint goal of ensuring all people desiring to vote can do so privately and independently. Again, thank you for your time and consideration.

Sincerely,

Fred Nisen
Supervising Attorney for Voting Rights

Cc: John Arntz, Director, Department of Elections
Carla Johnson, Director, Mayor's Office on Disability

FREE & FAIR

Free & Fair
421 SW 6th Avenue | Suite 300 | Portland, OR 97204
T +1 503 808-3247 | F +1 503 350-0833
www.freeandfair.us

21 March 2016

Rules Committee
City Hall
1 Dr. Carlton B. Goodlett Place
San Francisco, CA 94102

Dear Rules Committee Members:

Free & Fair is a public benefit corporation in Portland, OR. Free & Fair is developing open source elections systems for public good. We are a spin-out of a company called Galois, and our R&D and elections legacy goes back around fifteen years. This joint history intertwines Galois's history as a company with my history as a scientist-activist-academic.

Galois has a 16 year history in solving the world's most difficult computer science problems, primarily in the area of secure high assurance systems for the federal government. High-assurance systems are computing systems that simply cannot fail, because the consequence of failure is enormous. Galois views elections technology as exactly this kind of system.

My 16 year history in elections starts with my observing the disaster that was Florida in the 2000 Presidential election, and continues into my career as a Professor of Computer Science at several top universities in three European countries. During those years, elections was a constant case study for my R&D in topics like applied formal methods and rigorous engineering.

My team, and many others in the elections R&D community, view our democracy as a critical system. Elections are the keystone of that system. Thus, we must put our skills to good use.

As scientist-activists, my team has sometimes acted as white hat hackers, and were hired by governments to show that existing elections systems are insecure and terribly built. As constructive researchers and engineers who like to solve problems, we have created open source high assurance election systems that have been used in binding elections, such as in the EU in 2003. Finally, as a public employee, I have provided expert advice to several governments and non-profit corporations on matters relating to elections correctness, security, and trustworthiness. Consequently, I hold deep concerns about the evolving digital elections infrastructure worldwide.

As such, we have created Free & Fair with the explicit intent to help jurisdictions like yours improve their elections infrastructure with judicious and appropriate use of open source, high assurance technology. We look forward to offering to assist San Francisco in your noble mission, which is wholly in alignment with our own.

Best,

Joe Kiniry, CEO and Chief Scientist, *Free & Fair*
Copy: Director John Arntz, San Francisco Elections Commission