

STAR Vote – A Change of Plans

Executive Summary

Believing there was not enough security built into most voting systems, Travis County Clerk Dana DeBeauvoir collaborated with a group of experts in computer science, cryptography and computer security, statistics, and human factor engineering to build a better voting system, and from here the design for STAR-Vote was born. This collaboration brought together different opinions and ideas in search of common ground and scientifically grounded solutions to resolve concerns about electronic voting. STAR Vote (Secure, Transparent, Auditable, Reliable) was designed to offer the speed and accuracy of electronic voting and its advantages for voters with disabilities, combined with a paper list of choices (Paper-LOC) for recount purposes.

In collaboration with the experts above as well as the County Clerk's Election Study Group, Travis County officials developed a list of system requirements and architecture. This led to a Request for Proposals (RFP) seeking entities to build STAR-Vote for use as Travis County's next voting system. The RFP was issued in late 2016 and proposals were submitted by prospective vendors earlier this year.

The proposals received in response to the STAR-Vote RFP were not sufficient to build a complete voting system. Because of this, we are currently unable to pursue building STAR Vote. However, Travis County still needs a new voting system, and there are two points in selecting Travis County's next voting system that are non-negotiable:

- 1.) We must have a voter-verified, paper list of choices (Paper-LOC) for audit and recount purposes, and
- 2.) We must have better security, to include robust support for 3rd party verification of results and better post-election audits.

Though we are unable to advance STAR-Vote at this time, this system is a model from which Travis County and those interested in elections would substantially benefit. At the same time, the investment made by Travis County since 2012 has produced benefits. In studying election security while developing the STAR-Vote requirements, we identified several security features that we could incorporate into our current voting process in tandem with the eSlate system currently in use in Travis County. We look forward to further leveraging the lessons learned into a new election system for Travis County that is state-of-the-art, secure, and accessible.

We are prepared to move forward immediately to continue the process of acquiring a new voting system for Travis County, using a more traditional vendor-based model. In October, we will be releasing a new RFP, using some of the lessons that have been learned from STAR-Vote, and including requirements for enhanced security features and a voter-verified Paper-LOC. All factors will be taken into consideration to acquire and implement the best voting system for Travis County voters.

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STAR-Vote and Travis County's Investment in Secure Elections

Since 2005, the Travis County Clerk has been studying how to improve the security and efficiency of electronic voting systems and making incremental changes to our existing processes in order to anticipate and effectively confront emerging threats.

From 2012 to the present, Travis County and the County Clerk have invested over \$330,000 in time and resources examining election computer security and the relative strengths and weaknesses of various voting systems, and designing the specifications that should be included in Travis County's next voting system. We identified features rooted in proven scientific principles that were important to include alongside usability elements in the requirements for the County's future voting system. To help in this effort, the Clerk assembled a team of computer science experts, academics with a focus on cryptography, statistics, and computer science, and knowledgeable election administrators to help design a new voting system that would be an improvement over the systems legally available for states to purchase. These individuals worked to design an electronic voting system robust enough to survive software attacks, easy enough for any voter to use, and capable of proving via an independent third party that all ballots were counted as intended and as cast. STAR-Vote is the design conceived by this team.

The implementation of a new voting system, particularly one as highly complex as STAR-Vote, would take time. It is true that the goal of our investment was to create STAR-Vote as the next election system in Travis County. However, the Clerk was able to identify a second, present-day, benefit. By engaging in an in-depth examination of election security measures, we identified practices that we have implemented to improve the security and functionality of our current voting process. These include new testing and auditing procedures for our current e-Slate voting system. During these years, we have enjoyed the protections gained from our study of election computer security.

Our RFP resulted in a number of responses, however no combination of responses allowed us to build a voting system that meets Travis County's needs. The proposals left Travis County without any design for the basic part of the software that handles ballot definition, by-mail balloting, and the tally of results among other related tasks. That doesn't mean our community has to give up on the demands we have made for improved voting systems. The information gained through the requirements gathering and RFP development process will be invaluable as we move forward to acquire Travis County's next voting system in a more traditional manner.

A Recap--What is STAR-Vote & what did it offer?

Travis County's idea for its next voting system was—STAR-Vote (Secure, Transparent, Auditable, Reliable). The Travis County Clerk has spent 12 years developing a concept for a better voting system that provides the best of both worlds—the speed and accuracy of electronic voting with the proof and auditability of a paper list of choices (Paper-LOC).

In STAR Vote we asked for:

1. Open Source software in part to reduce high cost licensing fees charged to counties for the use of proprietary voting systems. We wanted a GPL type of license managed by a STAR Vote Foundation to handle normal business issues regarding product certification, version control, software upgrades, implementation, financial and contract management, and other operating matters of a non-profit, election software company.
2. A reliable voter-verified paper list of choices (Paper-LOC). This voter-verified paper trail would match the electronic ballot copy and be preserved at the polls in the ballot box for recount and other verification purposes. In this way, our voters get the best of both worlds. We get the speed and accuracy of electronic voting with a paper back-up that defeats hacking and other attempts to misrepresent the correct vote tally. Our voters with disabilities, which includes a growing number of us, get all the benefits of ADA accessible screens and tools which is also the only way to comply with the Americans with Disabilities Act. Electronic voting interfaces also make it possible for us to enjoy Early Voting and Vote Center conveniences not available in a paper-only environment.
3. An improved security protocol that includes encryption in the base level of the software for the purpose of supporting the ability of third parties (such as NAACP, Democratic or Republican Party, League of Women Voters, etc.) to conduct independent verification of the vote totals. No official recount is needed for this kind of post-election audit.
4. A Take-Home receipt for the voter that does not reveal a voter's selection. Rather it uses a hash code to let the voter, after election night, match their receipt to a database of counted ballots to assure the two codes match and establishing that the ballot was actually counted. The receipt is also useful for other post-election audits.

STAR Vote was a special case of expertise, ingenuity, and passion coming together in a sector that normally does not practice venture capital investment or product development. We now see that the people who served on the County Clerk Study Group, the STAR Vote Design Team, and the Travis County Commissioners Court were ahead of their time. They recognized the financial reward of opting out of the private-sector, licensing-fee world that is today's voting system market. Travis County started the fundraising with \$4 million. We sought development support from foundations, Congress, the White House, think tanks, universities, and private businesses.

We in Travis County, while ahead of our time, are not alone. In June 2017, the Conference of Urban Counties called its second meeting on cost-sharing and security ideas for voting systems to be used across Texas. Several counties present said they could no longer sustain the typical purchasing price as well as the expense of the annual licensing fees charged for proprietary software by the vendors. Many counties

said that they really wanted a paper trail to satisfy themselves and their voters that the election results were correct. They also recognized that doing away with electronic voting altogether would limit voting programs, be unpopular with voters, and fail to meet ADA requirements.

Why can't we have STAR Vote?

In a nutshell, we have run into too many obstacles. There has not been enough funding, time, or support to bring STAR Vote into the phase of being a start-up, through development and the legally-required certification process and then into use. In addition, our current voting system, e-Slate, is aging, as are so many systems throughout the U. S. The recent RFP we issued did not result in a proposal for a complete system design that Travis County could use to build and certify STAR-Vote. The proposals left Travis County without any design for the basic part of the software that handles ballot definition, by-mail balloting, and the tally of results among other related tasks. Given this omission, Travis County would now have to take on the prospect of writing every line of code for the entire system from scratch. We would be called upon to re-invent basic software that has been in the marketplace for 30 years in addition to the challenges we already had accepted in writing new homomorphic encryption programming.

In seeking to influence improvements in the marketplace, the risks kept accumulating and the time available to solve these problems kept shrinking. We have, in fact run out of time to pursue STAR-Vote any longer. Travis County, and the cities and schools it serves, needs to move toward a more immediately-deliverable voting system.

We Need to See the Bigger Picture

The County Clerk's Office has made a lot of progress in educating other stakeholders about the need for better security in electronic voting systems. However, our ultimate lack of progress in building the STAR-Vote system is related to a national failure to address an aging inventory of electronic voting equipment. Congress has not addressed the status of our American voting equipment, Russian hacking, and other security issues. Some people have suggested a return to paper ballot elections which fails to address the key issue: more stable funding of and better security for elections infrastructure. If there is a silver lining in the cloud of the 2016 general election, it is that there is now heightened interest in protecting voting systems and voter registration systems from various kinds of attacks. Much like the elections of 2000 and 2004, the 2016 election can be an opportunity to improve election equipment and security methods in order to give voters an accurate and just method to select leaders at all levels of their democracy.

Going Forward – Travis County Voters Want Security Improvements

Although we are no longer able to pursue the building of STAR Vote at this time, some of its improvements can be included in Travis County's next voting system.

There are two points in selecting Travis County's next voting system that are non-negotiable:

- 1.) We must have a voter-verified, paper list of choices (Paper-LOC) for recount purposes, and
- 2.) We must have better security, to include robust support for 3rd party verification of results and better post-election audits.

We will seek as many of the features of STAR-Vote as possible in currently-certified voting systems. We may need customization. We are prepared to enter into negotiations with a vendor to achieve these improvements keeping in mind that such additions may mean more expense or additional time needed to re-certify part of their voting system. All factors will be taken into consideration to implement the best voting system for Travis County voters.

Some of the improvements sought in STAR-Vote were to the elections system business model. Those are among the most problematic. Specifically, using an Open Source software solution is a significant obstacle in the current marketplace because open-source is seen as a low-revenue business model. For now, we will have to give up on the idea of Open Source software and its concomitant cost savings.

Most importantly, with a known vendor and an already certified voting system, Travis County will not have to be responsible for taking a voting system from the experimental stage through to full and stable implementation. Current proprietary systems will cost more to purchase, and for long-term maintenance, but in a traditional approach there is less risk that we would have a delay, or worse, a failure in development and implementation. STAR Vote did carry both the benefits and risks of inventing our own voting system.

Next Steps and Timeframe

On September 26, 2017, the Travis County Commissioners Court rejected all proposals submitted under the current Request for Proposal (RFP) for the STAR Vote voting system. In October of 2017, we will issue another RFP for a voting system for Travis County with certain specifications for a Paper-LOC and additional security features. This will be a more traditional RFP process that will engage the established election system vendor community. The County Clerk Elections Study Group, the STAR-Vote Design Team, Travis County Purchasing Agent, and others will work to analyze the responses to the latest RFP and negotiate the best voting system package for Travis County.

It will take 2-4 years, even without developing the forward-thinking STAR Vote, to see Travis County's next voting system put into place. We must allow for sufficient training of staff and election judges, and we must step carefully in showing all our voters how to use a new method for voting. Our current eSlate voting system is functioning and robust, and we have taken important steps to ensure its security, but our new voting method must be in place before we start to see degradation in our current voting system. We must bring all that we have learned over the past years to implement a carefully-constructed, secure voting system, and time is of the essence.