Matrix Correspondence of TGDC Resolutions to NIST Work Product: A Report to the TGDC

November 2006

Acronyms and Terms Used in This Report

The following acronyms and terms are used in this report and accompanying matrix. Some of these terms are also defined in the draft VVSG 2007 glossary, located at
http://vote.nist.gov/TGDC/VVSG2007-glossary-20061011.doc.

- **ANSI**– American National Standards Institute
- **EAC** – United States Election Assistance Commission
- **EBM** – Electronic Ballot Marking device, e.g., the ES&S AutoMARK
- **CRT** – Core Requirements and Testing subcommittee of the TGDC
- **DRE** – Direct Record Electronic voting systems
- **HAVA** – Help America Vote Act
- **HFP** – Human Factors and Privacy subcommittee of the TGDC
- **IDV/IV** – Independent Dual Verification, shortened to Independent Verification
- **ITAA** – Information technology Association of America
- **MTBF** – Mean Time Between Failure
- **NASED**– National Association of Sate Election Directors
- **NIST** – National Institute of Standards and Technology
- **NSRL** – National Software reference Library
- **Op Scan** – voting systems in which a voter completes a paper ballot, either by hand or via an EBM, and then the ballot is scanned by an optical scanner
- **OEVT** – Open Ended Vulnerability Testing
- **SI** – Software Independence or Independent
- **STS** - Security and Transparency Subcommittee of the TGDC
- **TGDC** - Technical Guidelines Development Committee
- **DRE-VVPAT** – A DRE with Voter Verified Paper Audit Trail voting system
- **VVPR** – Voter Verified Paper Records
- **VVSG** – Voluntary Voting Systems Guidelines

1. Introduction

The Help America Vote Act of 2002 mandated the creation and make up of a fifteen person technical committee, chaired by the Director of NIST to recommend voluntary voting system guidelines to the Executive Director of the U.S. Election Assistance Commission. The Technical Guidelines Development Committee began its work in July 2004. At the first meeting of the TGDC and continuing for its five succeeding public plenary sessions, the Committee, operating as a Federal Advisory Committee, debated and adopted forty five resolutions to guide the

technical work product of NIST staff. At the March 2006 TGDC plenary session, the TGDC unanimously adopted a forty sixth resolution:

Resolution #01-06,   **Offered by: Mr. Craft**   **March 29, 2006**

NIST shall prepare a brief report that tracks the resolutions passed by the TGDC with the progress of standards development and specific work products of NIST. After the initial publication, reports will be provided to the TGDC prior to each public meeting and will be included as an appendix to all NIST and TGDC work products sent to the Election Assistance Commission.

The initial report was e-mailed to TGDC members in June 2006. The report included a brief overview and accompanying matrix that tied specific NIST tasks to corresponding resolutions passed by the TGDC over the two preceding years. From June 2006 through November 2006, NIST staff updated the matrix to reflect progress on particular tasks. The current document fulfills the progress report due to the TGDC in advance of the December 2006 plenary session.

2. Overview

NIST staff began tracking HAVA work product activities to their corresponding resolutions in January 2005. The TGDC received a high level matrix presentation at the March 2005 plenary session. The matrix dealt specifically with the tasks required to complete the initial recommendations for voluntary voting system guidelines due to the EAC in may 2005. The current matrix includes the disposition of tasks relative to both the 2005 VVSG and the 2007 VVSG due to the EAC in July 2007.

Approximately 25% of the resolutions are defined as structural. They apply to all three working subcommittees: HFP, STS, and CRT. In addition, these resolutions, while on-going, simply provide a framework for the output of both the TGDC and NIST. As such, the structural resolutions will require little if any updating over the course of the development of guidelines by the TGDC.

The remaining 75% of the resolutions in the matrix are tied to specific subcommittees, task status and priority issues. The final three "preliminary report" resolutions were presented, debated and approved at the March 2006 TGDC plenary session. The Committee will review and debate updated 'preliminary reports' at the December 2006 TGDC meeting.

2. Resolution-Task Matrix

The succeeding pages present a matrix of the current status of NIST work on tasks assigned by the TGDC. NIST staff will continue to update the matrix periodically and provide updates to the TGDC as necessary and before each plenary meeting of the TGDC. In addition, this and all other versions of the matrix are made available to the EAC as the status of work product is updated. Finally, the matrix will be included as an appendix in all formal reports to the EAC by the TGDC to comply with the intent of Resolution #01-06.

Number	TGDC Resolution	Subcommittee	Disposition VVSG 2005	Disposition VVSG 2007	Task Status/NIST Lead	Priority issues
01-06	Create a tracking matrix of resolutions passed by the TGDC correlated with specific work products of NIST	Structural Resolution (All)	Initial High Level Matrix completed in January 2005 and presented at 3/05 TGDC Meeting. See: http://vote.nist.gov/Priority-Strategy%20TGDC%20Resolutions2.doc	Matrix to be completed and maintained with updated status on web site. TGDC to receive report before plenary.	**Ongoing**/Eustis	Complete VVSG 2007 due to EAC in July 2007
01-04	Create 3 three working sub committees:Security &Transparency; Human Factors & Privacy; Core Requirements and Testing	Structural Resolution (All)	Subcommittees met via telcon and reviewed NIST preliminary documents and VVSG drafts. See:http://vote.nist.gov/subcomm_xscripts2004.htm	Subcommittees meet bi-weekly. Calendar available for updates at: http://vote.nist.gov/TGDC/telecons.html	**Ongoing**/ Eustis, Laskowski, Hastings, Goldfine	Action Items and priorities are noted in telcon meeting minutes. See: http://vote.nist.gov/TGDC/telecons.html
02-04	Chair surveys TGDC and appoints Subcommittee Chairs	Structural Resolution (All)	Subcommittee chairs appointed. All TGDC members assigned to desired subcommittees. See: http://vote.nist.gov/subcomm_work.htm	No change in procedure for VVSG 2007	**Completed**/Bement,Semerjian, Jeffrey	Four open seats onTGDC filled officially11/06. P. Miller represents NASED, Mason, Pearcer represent U.S. Access Board. Wagner represents ANSI.
03-04	Resolutions adopted by TGDC shall be referred to NIST for technical assistance and editing. TGDC will conduct final review.	Structural Resolution (All)	NIST referred draft VVSG requirements for final review to TGDC at 4/05 plenary session.See: http://www.vote.nist.gov/VVSG1/VersionOne.htm	Process of TGDC review continues for VVSG 2007. All draft documents are available for review on TGDC internal web page: http://vote.nist.gov/TGDC/vvsg07.html	**Ongoing**/Bement/ Semerjian/ Jeffrey	Priority issues for VVSG 2007 to be debated at December 2006 TGDC plenary session
04-04	Adopted resolutions and explanatory materials comprise first set of recommendations	Structural Resolution (All)	First set of recommendations submitted to EAC on 5/9/05. See:http://vote.nist.gov/TGDC/memo.pdf	No change in procedure for VVSG 2007	**Completed**/ Bement,Semerjian, Jeffrey	Initial DocumentStrategy for HAVA Priorities at: http://vote.nist.gov/TGDC/Priority-Strategy%20TGDC%20Resolutions.doc
05-04	Recommend to EAC that certified software be sent to NSRL	Structural Resolution (All)	Software has been submitted to NSRL and is publicly posted at: http://www.nsrl.nist.gov/vote.html	NSRL remains open to vendor software submissions and will work with EAC to issue NSRL usage explanation to election officials	**Ongoing**/Guttman	ITAA members willing to work with NIST/EAC on explanatory language
01-05	Work product Instructions to NIST staff re: development of initial VVSG requirements	Structural Resolution (All)	All work product to be considered by TGDC delivered to members NLT 5 working days before plenary meetings. See:http://vote.nist.gov/MeetingMaterials-032906.html	No change in procedure for VVSG 2007	**Completed**/Eustis	Work product posted for review by TGDC in advance of December 2006 plenary. See: http://vote.nist.gov/TGDC/TGDCmeeting120406.htm
02-05	Accessible Voting Systems	Human Factors	Covered partially in VVSG2005:Section 3, pp 45-64	All relevant existing accessibility requirements to be incorporated.See: http://vote.nist.gov/20050929prelimHF.doc	**Ongoing**/Laskowski	U.S. Access Board consulted on specific issues of concern
03-05	Human Factors and Privacy of Voting Systems at the Polling Place	Human Factors(Lead) & Security	Covered partially in VVSG2005:Section 3, pp 45-64	Working with Security Subcommittee on overlap in "privacy" issues. See: http://vote.nist.gov/032906User-BasedConfTesting3-10-06.doc	**Ongoing**/Laskowski	VVPAT concerns to be discussed at the December 2006 Plenary Session
04-05	Human Factors and Privacy Requirements for Capturing Indication of a Voter's Choice	Human Factors	Covered partially in VVSG2005:Section 3, pp 45-64	Working with Security Subcommittee on overlap in "privacy" issues. See: http://vote.nist.gov/032906User-BasedConfTesting3-10-06.doc	**Ongoing**/Laskowski	Draft VVSG 2007 HF Standards to be reviewed at December 2006 TGDC meeting
05-05	Human Performance-Based Standards and Usability Testing	Human Factors	Covered partially in VVSG2005:Section 3, pp 45-64	Overview of proposed metrics completed. See: http://vote.nist.gov/032906performance-metrics3-10-06.doc	**Ongoing**/Laskowski	Ongoing HFP Research to be reviewed at December 2006 TGDC meeting

Number	TGDC Resolution	Subcommittee	Disposition VVSG 2005	Disposition VVSG 2007	Task Status/NIST Lead	Priority issues
06-05	Accommodating a Wide Range of Human Abilities	Human Factors	Covered partially in VVSG2005:Section 3, pp 45-64	Usability policy issues to be referred to EAC.See http://vote.nist.gov/AlternativeLanguageIssues.pdf, http://vote.nist.gov/TGDC/hfp/choice-n-warning.htm, & http://vote.nist.gov/TimingIssuesforUsability.pdf	Ongoing/Laskowski	HFP Preliminary Reports to be discussed at December 2006 TGDC. See:http://vote.nist.gov/TGDC/TGDCmeeting120406.htm
07-05	*Withdrawn*					
08-05	Guidance for Instructions, Ballot Design, and Error Messages	Human Factors	Issues initially addressed in HFP Report to Congress Section 6.6.See: http://www.vote.nist.gov/Final%20Human%20Factors%20Report%20%205-04.pdf	To be addressed in VVSG2007 HFP section. Initial guidelines under review at: http://www.vote.nist.gov/TGDC/hfp/Plain%20Language%20Report.pdf	Ongoing/Laskowski	Plain Language research to be briefed at December 2006 TGDC
09-05	General Voting System Human Factors and Privacy Considerations	Human Factors	Covered partially in VVSG2005:Section 3, pp 45-64	Working with Security Subcommittee on overlap in "privacy" issues. See: http://vote.nist.gov/032906User-BasedConfTesting3-10-06.doc	Ongoing/Laskowski	Preliminary HF Research in this area to be briefed at December 2006 TGDC meeting
10-05	Usability of Standard	All	Similar structure to 2002 VSS with additions of conformance clause, usability and additional security requirements . See VVSG 2005 Section 1.6.3 page 13	Addressed in VVSG2007 structure, layout, language. See: http://vote.nist.gov/TGDC/format_rules.html and http://vote.nist.gov/TGDC/VVSG2-20060605-dwf.pdf	Ongoing/Wack	Proposed structure of VVSG 2007 to be discussed at December 2006 VVSG
11-05	Availability of Voting Machines for Validating Benchmarks and Conformance Test Protocols	Human Factors	NIST now has voting system lab; vendors replying to Federal Register notice.See: http://vote.nist.gov/AccredLAbnotice.pdf	NIST conducting initial benchmark research with voting equipment	Ongoing/ Laskowski, Eustis	Preliminary HF Research in this area to be briefed at December 2006 TGDC meeting
12-05	Voter Verifiability I	Security	Addressed with VVPAT in VVSG2005. See Sections 7.8 and 7.9 pages 134, 137.	Addressed more fully in VVSG2007with IDV requirements.	Ongoing/Wack, Peralta	STS Preliminary reports to be discussed at December 2006 TGDC meeting
13-05	*Not Adopted*					
14-05	Commercial Off-The-Shelf Software ("COTS Software")	Security (lead) & Core Requirements	COTs software exclusion in VVSG 2005 I Section 5.2.3, p 94 Also I.5.1.1, I.7.1, II.4.2.1, II.4.6.1, and II.5.2	Addressed in VVSG2007 with voting system architectural & testing requirements. See:http://vote.nist.gov/TGDC/crt/DWF-WorkingDraft-20060425/DWF-WorkingDraft-20060425.html	Ongoing/Flater, Hastings	See COTS issue paper: http://vote.nist.gov/TGDC/crt/COTS-20061016/COTS-20061016.pdf. Issues to be discussed further at December 2006 TGDC meeting
15-05	Software Distribution	Security	Covered partially in VVSG2005. See Section 7.4.4 p 119. Also see http://vote.nist.gov/TGDC/Software%20Distribution-02252005.doc	Addressed more fully in VVSG2007.See: http://vote.nist.gov/20050929hastings.pdf	Ongoing/Hastings	STS Preliminary reports to be discussed at December 2006 TGDC meeting. See:http://vote.nist.gov/TGDC/TGDCmeeting120406.htm
16-05	Setup Validation	Security	Covered partially in VVSG2005. See Section 7.4.3 p 119 and Section 7.4.6 p 123	Addressed more fully VVSG2007. See: http://vote.nist.gov/20050929hastings.pdf	Ongoing/Hastings	STS Preliminary reports to be discussed at December 2006 TGDC meeting
17-05	Testing (for security)	Security	See VVSG 2005 (Volume 2) , Sections 4 and 5	Test cases and requirements for open-ended testing to be addressed in VVSG2007. See:http://vote.nist.gov/TGDC/sts/OEVT%20workingdraft%20v3.doc	Ongoing/Hastings	STS Preliminary reports to be discussed at December 2006 TGDC meeting
18-05	Documentation (for security)	Security	See VVSG 2005, Sections 4.1.7, 4.1.8 and 5.4.	To be addressed in requirements for technical data package and voting equipment user documentation. See:http://vote.nist.gov/TGDC/crt/DWF-WorkingDraft-20060425/VolumeIV-20060425.pdf	Ongoing/Hastings	STS Preliminary reports to be discussed at December 2006 TGDC meeting

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19-05	*Withdrawn*					
20-05	*Withdrawn*					
21-05	Multiple Representations of Ballots	Security	Covered partially in VVSG2005 in VVPAT and IDV. See: Sections 7.8 and 7.9 pages 134, 137.	Addressed more fully in VVSG2007 in IDV requirements. See: http://vote.nist.gov/TGDC/sts/VVPAT_Expansion-20060208-jpw.pdf	**Ongoing/**Hastings, Wack, Peralta	STS Preliminary reports to be discussed at December 2006 TGDC meeting
22-05	Federal Standards	Security	Covered partially in VVSG2005 in use of USG crypto programs and existing industry standards. See VVSG 2005 Appendix B	Addressed more fully in VVSG2007 with inclusion of relevant material or citations to USG and other standards, e.g., FIPS 140, ANSI/RBAC, NIST E-authentication.See: http://vote.nist.gov/TGDC/sts/OEVT%20workingdraft%20v3.doc	**Ongoing/**Hastings	STS Preliminary reports to be discussed at December 2006 TGDC meeting
23-05	Common Ballot Format Specifications	Security	Addressed initially in VVSG2005 in VVPAT, See: Section 7.9 page 137 -141	Addressed more fully in VVSG2007 with interoperability requirements for election data. See: http://vote.nist.gov/TGDC/crt/DWF-WorkingDraft-20060425/DWF-WorkingDraft-20060425.html#ProductStandard	**Ongoing/**Hastings, Flater	The interoperability section is not as strict as the resolution calls for, since it allows the use of a documented database schema in lieu of a standard export format.
24-05	Conformance Clause	Core Requirements	Present in VVSG2005, See Section 1.6	Re-written for VVSG2007. See http://vote.nist.gov/TGDC/crt/DWF-WorkingDraft-20060425/DWF-WorkingDraft-20060425.html#ConformanceClause	**Ongoing**/ Flater	
25-05	Precise and Testable Requirements	Structural Resolution (All)	Initially covered in VVSG 2005, Section 1.6.3. Also analysis of VSS 2202 at- http://vote.nist.gov/TGDC/Disposition%20of%20Requirements%20from%202002%20VSS%20Vol%20I.doc & http://vote.nist.gov/TGDC/Table%202%20%20Disposition%20of%20Requirements%20from%20the%202002%20VSS%20Vol%20II.doc	To be addressed in VVSG2007 through reorganization of standard, rewrite of requirements and revision of test methods.	**Ongoing /**Goldfine	CRT Preliminary Reports to be discussed at December 2006 TGDC Meeting. See:http://vote.nist.gov/TGDC/TGDCmeeting120406.htm
26-05	Uniform Testing Methods and Procedures	Core Requirements	VVSG 2005 Test Methods in Volume II Sections 3-7	Revised test methods in VVSG2007, with bulk of test protocol development work beginning in 2007.	**Ongoing**/Flater, Rosenthal	
27-05	Non-Conformant Voting Systems	Core Requirements	Analysis of VSS 2002 done. See: http://vote.nist.gov/TGDC/Analysis%20of%20the%202002%20VSS%20Final%20Draft.doc	Moot; text in question deleted and sections rewritten in VVSG2007	**Completed/**Goldfine, Flater	
28-05	Publicly Available Qualification Data	Core Requirements	No publicly available data package defined in VVSG 2005	To be addressed in VVSG2007 and in NVLAP work in setting up VSTLs. See: http://vote.nist.gov/TGDC/crt/DWF-WorkingDraft-20060425/VolumeIV-20060425.pdf	**Ongoing**/ Flater	CRT Preliminary Reports to be discussed at December 2006 TGDC Meeting
29-05	Ensuring Correctness of Software Code	Core Requirements	Initially in VVSG 2005 Vol 1-Software Integrity Section 5.2.2 and Vol2 Secion 5Software testing	Addressed in VVSG2007 by revised coding standards, TDP requirements and logic verification test method. See: http://vote.nist.gov/TGDC/crt/DWF-WorkingDraft-20060425/DWF-WorkingDraft-20060425.html	**Ongoing**/ Flater	CRT Preliminary Reports to be discussed at December 2006 TGDC Meeting

Number	TGDC Resolution	Subcommittee	Disposition VVSG 2005	Disposition VVSG 2007	**Task Status**/NIST Lead	Priority issues
30-05	Quality Management Standards	Core Requirements	Initially in VVSG 2005 Vol 1 Section 8 & Volume 2 Section 7	To be addressed in VVSG2007. See: http://vote.nist.gov/TGDC/crt/AG-WorkingDraft-20060317/AG-WorkingDraft-20060317.pdf	**Ongoing/**Goldfine	White Papers developed for discussion at December 2006 TGDC Meeting
31-05	Maintenance of the VSS	Core Requirements	Issues paper has been produced and circulated to TGDC. See: http://vote.nist.gov/TGDC/Maintenance%20of%20the%20VVSG%20Draft%203.doc	Issues Paper applies. Relevant HAVA policy issues to be referred to EAC	**Ongoing/**Goldfine	
32-05	Sharing Information and De-qualification of Voting Systems	Core Requirements	Complete; issues paper has been produced; See: http://vote.nist.gov/TGDC/sharing_cert_info20050606.doc	Issues Paper applies. Relevant HAVA policy issues to be referred to EAC	**Ongoing/**Goldfine	
33-05	Glossary and Voting Model	Core Requirements	Addressed in VVSG2005 Appendix A	To be updated in VVSG 2007 as needed	**Ongoing/** Flater, Rosenthal	
34-05	Assessment Papers on Recommendations for Future work	Core Requirements	Addressed in initial issues papers See: http://vote.nist.gov/TGDC/assess-gap.doc	Contract research in process	**Ongoing/** Guttman, Laskowski, Goldfine	Progress on research to be updated at December 2006 TGDC meeting
35-05	Wireless	Security	Covered initially in VVSG2005. See Volume 1 Section 6	Wireless and communications security concerns to be absorbed into more general security requirements. Draft EMC requirements at: http://vote.nist.gov/TGDC/crt/environmental-electrical-rf.doc- Open for further refinement	**Ongoing/**Hastings, Goldfine	STS Preliminary reports to be discussed at December 2006 TGDC meeting
36-05	Consensus Standards	Structural Resolution (All)	Consensus Standards referenced in VVSG 2005. See Volume 1 Appendix B	Consensus Standards in VVSG 2007. See: http://vote.nist.gov/TGDC/crt/AG-WorkingDraft-20060317/AG-WorkingDraft-20060317.html	**Ongoing/** Goldfine, Flater	
37-05	Work Product Instructions to Chair and Staff of (NIST)	Structural Resolution (All)	Instructions followed in completion of initial recommendations. See: http://vote.nist.gov/TGDC/memo.pdf	Process will continue for VVSG 2007	**Ongoing/** Eustis	
38-05	Procedural Resolution Regarding "Grandfathering"	Structural Resolution (All)	Policy Issue for EAC	Policy issue for EAC	**No NIST Action**	
39-05	Voter Verified Paper Audit Trail Assignment	Security	VVPAT requirements in 2005 VVSG Section 7.9	Proposed expansion of VVPAT requirements. See: http://vote.nist.gov/TGDC/sts/vvpat-update-20060317.pdf	**Ongoing/** Wack	STS Preliminary reports to be discussed at December 2006 TGDC meeting
40-05	EAC Consideration of Initial Recommendations	Structural Resolution (All)	Initial TGDC Recommendations delivered May 2005. EAC hosted a public comments page	NIST reviewed and commented on public comments at request of EAC. Deferred comments to be considered for VVSG 2007. See: http://vote.nist.gov/TGDC/CommentsCarriedOver.doc	**Completed/**Hastings, Goldfine,Laskowski	
03/06 Plenary	Preliminary Reports: Human Factors & Privacy for next VVSG iterations	HFP		Adopted by Unanimous Consent.See- http://vote.nist.gov/032906hfp.pdf	**Completed/**Laskowski	Responds to TGDC Resolutions 2-05, 3-05, 4-05, 5-05, 6-05, 8-05, 9-05, 10-05, and 11-05
03/06 Plenary	Preliminary Reports: Security & Transparency for next VVSg iterations	STS		Adopted by Unanimous Consent.See- http://vote.nist.gov/032906Hastings.pdf, http://vote.nist.gov/032906oevt.pdf , http://vote.nist.gov/032906VVPAT-jpw.pdf	**Completed/**Hastings, Wack	Responds to TGDC Resolutions 12-05, 14-05, 15-05, 16-05, 17-05, 18-05, 21-05, 22-05, 23-05, 35-05, and 39-05

| 03/06 Plenary | Preliminary Reports: Core Requirements & Testing for next VVSG iterations | CRT | | Adopted by Unanimous Consent. See: http://vote.nist.gov/032906CRT-DWF.pdf ,and http://vote.nist.gov/032906CRT-AHG.pdf | **Completed/**Flater, Goldfine | Responds to TGDC Resolutions 24-05, 25-05, 27-05, 29-05, 31-05, and 32-05 |