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Problem. Solved.

ACCESSIBLE VOTING
Making Voting Accessible for Disabled Veterans

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Impact of Military Disability on Voting Process

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U.S. Military Casualties – Wounded In Action*

- Global War on Terror
  - Operation Enduring Freedom
    - 16,781
  - Operation Iraqi Freedom
    - 31,926
  - Operation New Dawn
    - 301
- Persian Gulf War
  - 467
- Vietnam War
  - 153,303

15.8 Million Veterans voted in the 2008 presidential election

3.4 Million Veterans have a service-connected disability

*Source: https://www.dmdc.osd.mil/dcas/pages/casualties_oef.xhtml accessed online 17 Jul 2012

Specific Aims

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- Understand current limitations experienced by veteran voters as a result of their injuries and the barriers those voters encounter in the voting process
- Evaluate available and potential technological solutions (focused on service-related injuries) to provide recommendations for implementation
- Assess range of service members injuries and how they differ from those typically found in the general population

GOAL: Identify potential technological solutions to facilitate voting among injured service members

Goals and Objectives

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Accessible Voting Research and Development for Wounded Warriors/Veterans

- Improving voting accessibility enables
  - ✓ Veterans to exercise their fundamental right to vote
  - ✓ Veterans to engage in civic participation on par with other citizens

Provide equitable opportunities to fully participate in the democratic process

Population At Risk

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Active duty & "transitioning" military personnel

- Recently injured
- In-transit through echelons of medical care
- Those undergoing treatment and/or rehabilitation

Veterans

- Those undergoing long term care
- Recovering or recovered from injuries
- Living with chronic impairment

Populations are similar but experience different policies and support infrastructures

The Evolution of Warfare and Shifting Patterns of Injury

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Characteristic Threats:

- Evolution of the Improvised Explosive Device
  - IEDs capable of defeating advance personal body armor (e.g., Kevlar) and vehicle platforms
- Variability of threats from Operation Iraqi Freedom to Operation Enduring Freedom to Operation New Dawn
  - Anti-armor IED . . . To the EFP . . . To the HME Anti-personnel/platform IED

By the Numbers

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Voting Accessibility for the Physically Impaired Service Member/Veteran:

¥Distribution of Injuries (Sep 2010)	
PTSD	88,719
TBI	178,876
Amputation	1,621

- Sample Statistical Data (WIA)
  - OIF/OEF/OND
  - 21% of the nearly 500,000 veterans treated by the VHA between 2004 and 2009 had PTSD; 7% had TBI
- Impact of Warrior Disability on Voting
  - Second and third order effects include
    - Depression
    - Anxiety
    - Impaired social relationships
    - Reduced desire to engage in leisure activities
    - Disenfranchisement, alcoholism, homelessness, etc.

¥Source: Congressional Research Service, "U.S. Military Casualty Statistics: Operation New Dawn, Operation Iraqi Freedom, and Operation Enduring Freedom", September 28, 2010

The Evolution of Warfare and Shifting Patterns of Injury

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Primary Injuries of Interest:

- Vision/Hearing Loss
- Amputation
- Poly-trauma
- mTBI/TBI
- PTSD

Over 49,000 service members been wounded in action in Iraq & Afghanistan

Determining Needs of the Recently Injured

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Our Patient Interviews

- Collected data at multiple centers treating wounded service members:
  - Brooke Army Medical Center (BAMC), San Antonio, TX
  - Carl R. Darnall Army Medical Center, Fort Hood, TX
  - National Navy Medical Center (NNMC), Bethesda, MD
  - Walter Reed Army Medical Center (WRAMC), Washington, D.C.
  - Womack Army Medical Center, Fort Bragg, Fayetteville, NC
  - Naval Hospital Camp Lejeune, Jacksonville, NC
  - Shepherd Center, Atlanta, GA
- n=104 OIF/OEF injured service members
- Worked with Federal Assistance Voting Program (FVAP)

The Evolution of Warfare and Shifting Patterns of Injury

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Impact of Physical, Cognitive, & Psychosocial Sequelae:

- Physical limitations (including sensory impairment):
  - Challenges in *transportation* to/from polling place, *completing the ballot . . .*
- Cognitive limitations may include:
  - Impaired *executive functions*, *slowed speech* production/understanding, increased *confusion*, and lowered ability to maintain *attention . . .*
- Common psychosocial health problems following TBI:
  - *Depression*, *anxiety*, decreased social contact, *lack of motivation*, *irritability*, *aggression*, and *lethargy . . .*
  - Characteristics of TBI are also often comorbid with PTSD

Impact of Impairments on Voting

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The following themes emerged from our needs assessment:

- Reliance on technology (e.g., PDAs, prosthetics, wheelchairs)
- Avoidance of social situations and crowds
- Sensitivity to overstimulation (light, ambient noise)
- Loss of motivation
- Difficulty with memory and concentration
- Limitations in endurance (fatigue, pain)
- Hearing impairments (hearing loss and tinnitus)

Design, Accessibility, and Policy Considerations

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Design and accessibility should *INFORM* and *INFLUENCE* voting policy

- Streamline process for obtaining absentee ballots
- Provide regular reminders leading up to elections
  - Using a variety of accessible means
- Provide ballot data in an electronic format
  - Independent of presentation style (options to display info in a variety of ways based on individual needs)

Technology experts and policy makers must to work together to create a synergistic solution

Design, Accessibility, and Policy Considerations

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Obtaining a ballot

- Service members may receive long term care outside of their home district
- Methods for obtaining a ballot may be inaccessible

Marking a ballot

- Marking a ballot requires handling and physically marking paper ballots
- May have difficulty comprehending ballot marking instructions

The solution requires both technological and policy interventions

Design, Accessibility, and Policy Considerations

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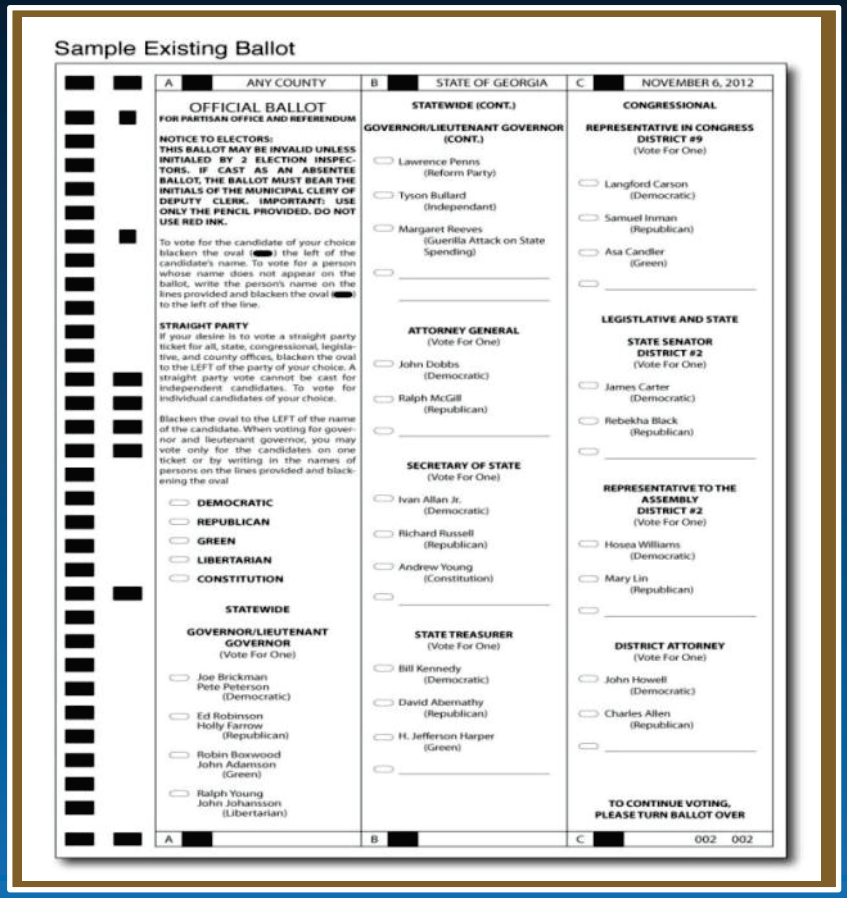
Ballot Design

- Candidates listed on multiple columns or pages
- Small text difficult for users with low vision
- Complexity may be an issue for those with cognitive impairments
- May have difficulty maintaining focus and keeping track of progress


Sample Existing Ballot

A ANY COUNTY

OFFICIAL BALLOT
FOR PARTISAN OFFICE AND REFERENDUM

NOTICE TO ELECTORS:
THIS BALLOT MAY BE INVALID UNLESS INITIALED BY 2 ELECTION INSPECTORS. IF CAST AS AN ABSENTEE BALLOT, THE BALLOT MUST BEAR THE INITIALS OF THE MUNICIPAL CLERY OF DEPUTY CLERK. IMPORTANT: USE ONLY THE PENCIL PROVIDED. DO NOT USE RED INK.

To vote for the candidate of your choice blacken the oval ( ) the left of the candidate's name. To vote for a person whose name does not appear on the ballot, write the person's name on the lines provided and blacken the oval ( ) to the left of the line.

STRAIGHT PARTY
If your desire is to vote a straight party ticket for all, state, congressional, legislative, and county offices, blacken the oval to the LEFT of the party of your choice. A straight party vote cannot be cast for independent candidates. To vote for individual candidates of your choice.

Blacken the oval to the LEFT of the name of the candidate. When voting for governor and lieutenant governor, you may vote only for the candidates on one ticket or by writing in the names of persons on the lines provided and blackening the oval

- DEMOCRATIC
- REPUBLICAN
- GREEN
- LIBERTARIAN
- CONSTITUTION

STATEWIDE

GOVERNOR/LIEUTENANT GOVERNOR
(Vote For One)

- Joe Brickman / Pete Peterson (Democratic)
- Ed Robinson / Holly Farrow (Republican)
- Robin Boxwood / John Adamson (Green)
- Ralph Young / John Johansson (Libertarian)

B STATE OF GEORGIA

STATEWIDE (CONT.)

GOVERNOR/LIEUTENANT GOVERNOR (CONT.)

- Lawrence Penns (Reform Party)
- Tyson Bullard (Independant)
- Margaret Reeves (Guerilla Attack on State Spending)

ATTORNEY GENERAL
(Vote For One)

- John Dobbs (Democratic)
- Ralph McGill (Republican)

SECRETARY OF STATE
(Vote For One)

- Ivan Allan Jr. (Democratic)
- Richard Russell (Republican)
- Andrew Young (Constitution)

STATE TREASURER
(Vote For One)

- Bill Kennedy (Democratic)
- David Abernathy (Republican)
- H. Jefferson Harper (Green)

C NOVEMBER 6, 2012

CONGRESSIONAL

REPRESENTATIVE IN CONGRESS DISTRICT #9
(Vote For One)

- Langford Carson (Democratic)
- Samuel Inman (Republican)
- Asa Candler (Green)

LEGISLATIVE AND STATE

STATE SENATOR DISTRICT #2
(Vote For One)

- James Carter (Democratic)
- Rebekha Black (Republican)

REPRESENTATIVE TO THE ASSEMBLY DISTRICT #2
(Vote For One)

- Hosea Williams (Democratic)
- Mary Lin (Republican)

DISTRICT ATTORNEY
(Vote For One)

- John Howell (Democratic)
- Charles Allen (Republican)

TO CONTINUE VOTING, PLEASE TURN BALLOT OVER

A B C 002 002

Paper ballots are inaccessible to many with war injuries

Recommended Accessible Absentee Voting Process

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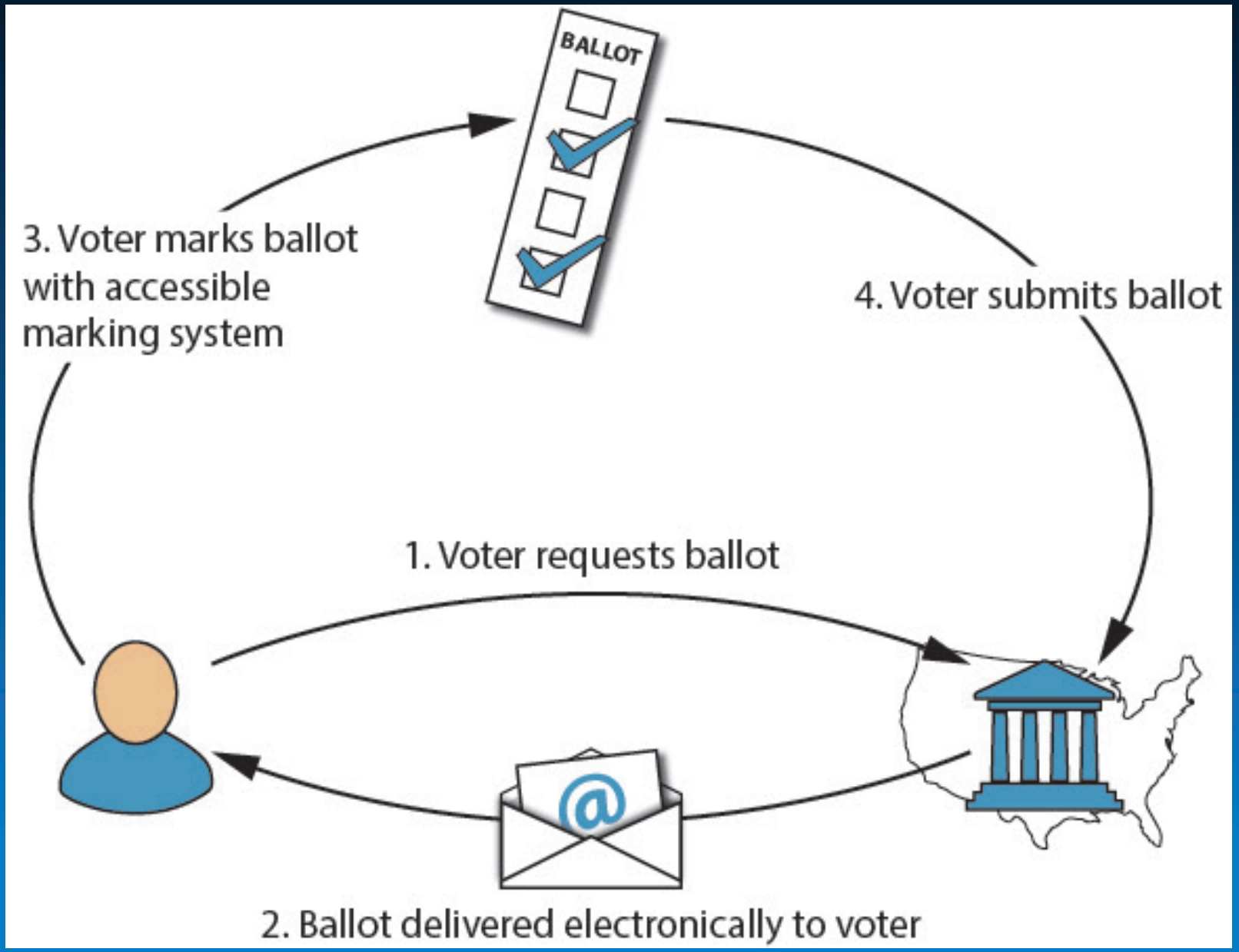

Voting Test Bed

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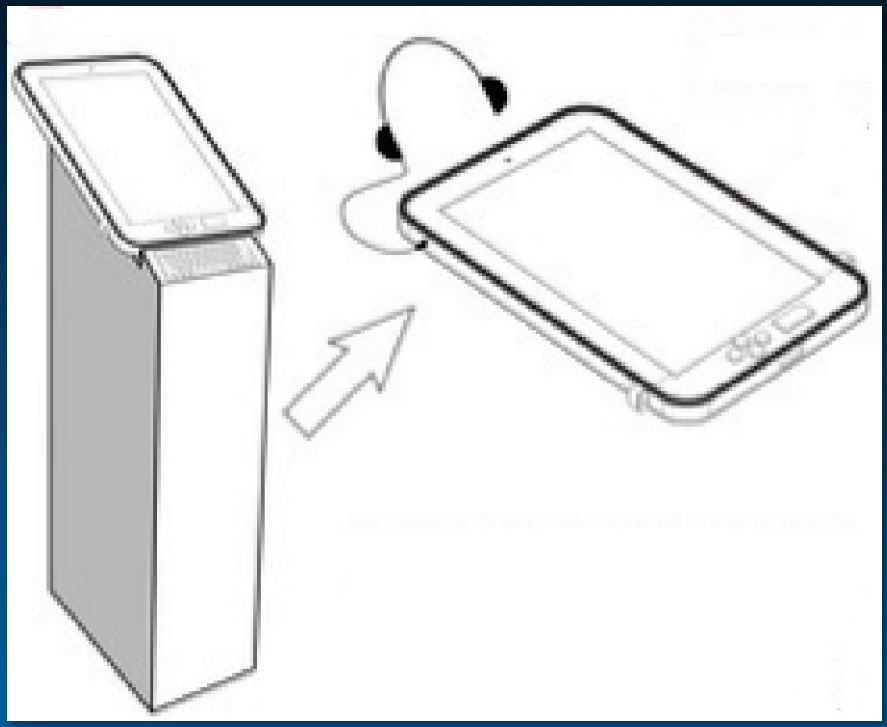
Purpose of Voting Test Bed

- Investigate new technologies as a method to vote (an alternative to absentee voting)
- Development of an electronic marking tool / kiosk



Current Work in Test Bed

- Voting web application for absentee voting
- Investigate innovative methods for displaying and marking ballots in accessible formats to enable private and independent voting

Initial Voting Test Bed Study

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Information Density

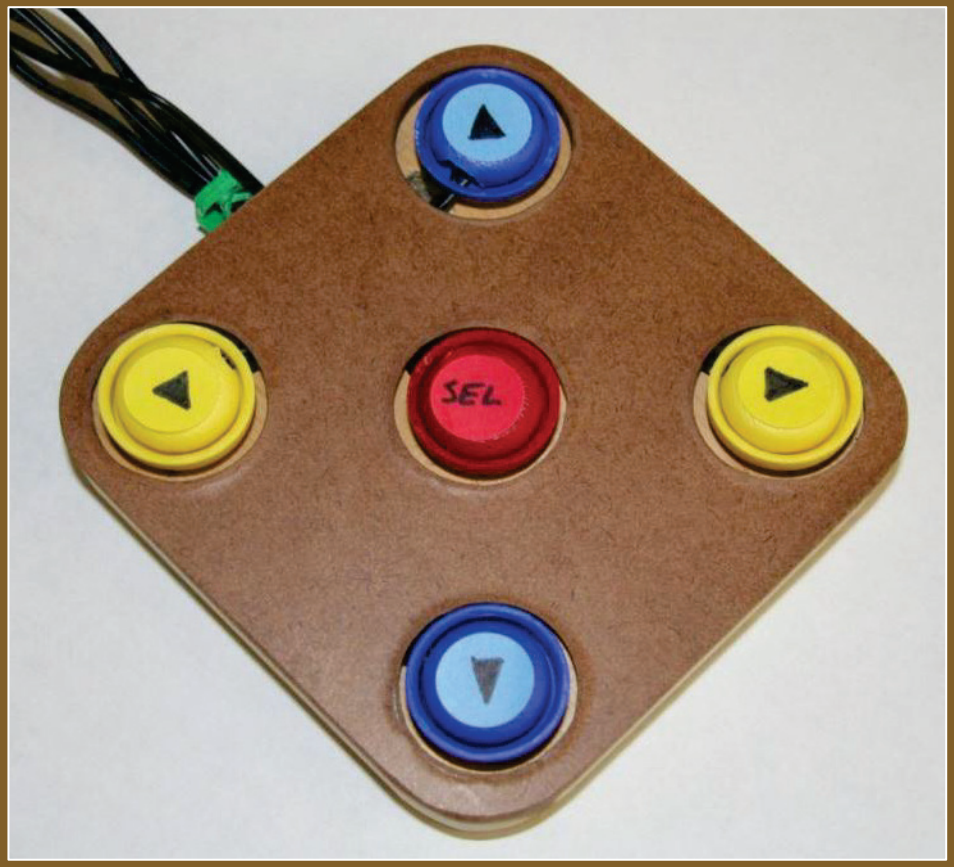
- Present information to maximize comprehension and minimize confusion
- Efficient use of screen space
  - PAGING
  - SCROLLING
  - COLUMNS

Input Devices

- Provide controls that maximize ease of use and minimize user errors
  - 2-BUTTON CONTROLLER
  - 5-BUTTON CONTROLLER
  - MOUSE

2 Main Variables

Input Devices



- Up Arrow: Shift + Tab
- Down Arrow: Tab
- Left Arrow: Page Backward
- Right Arrow: Page Forward
- SEL: Select

Five-Button Controller

Mouse Only

Left Button: Tab
Right Button (SEL): Select

Two-Button Controller

Heat Map for Eye Tracking Data

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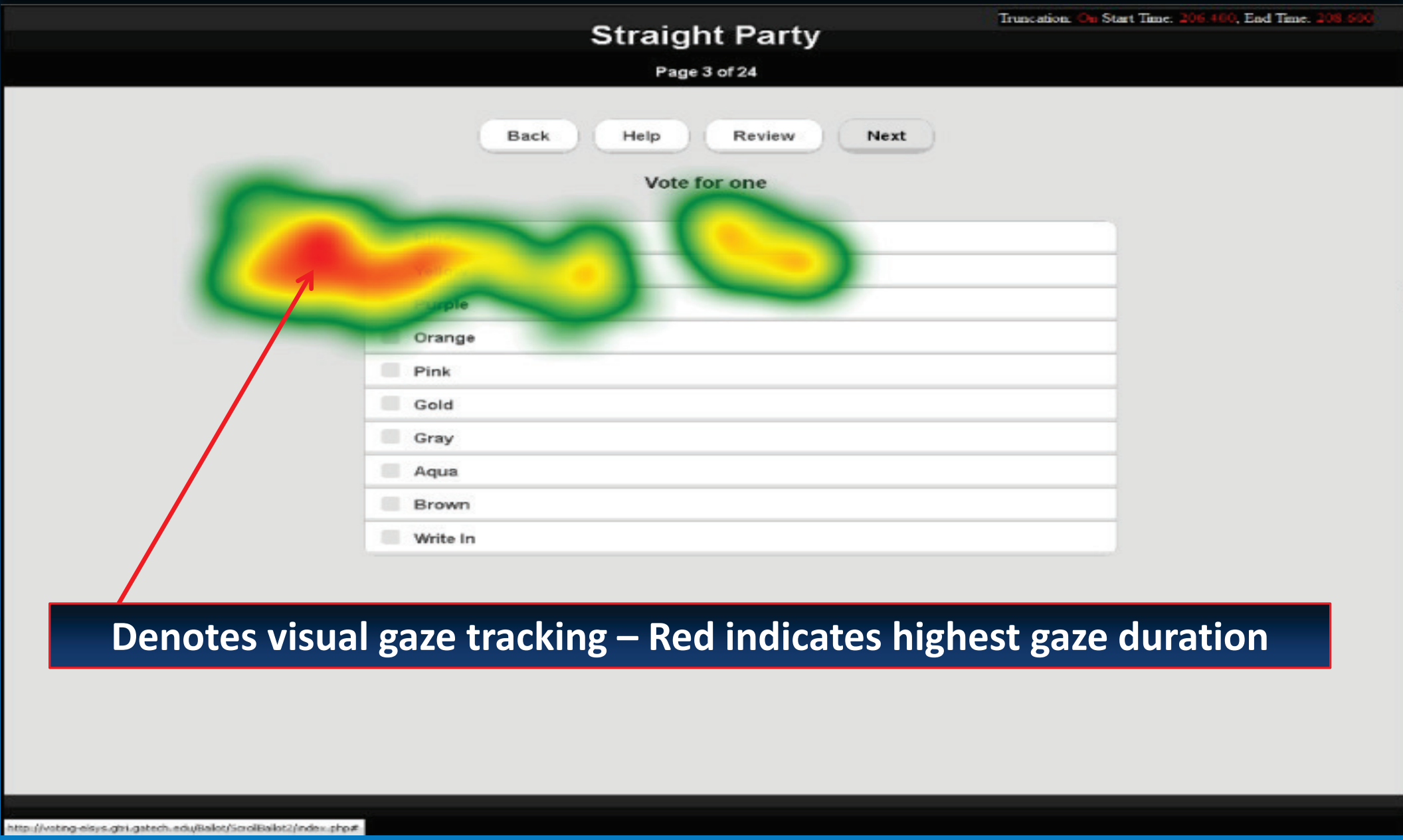

Denotes visual gaze tracking – Red indicates highest gaze duration

Summary of Results

- ***The needs of recently wounded service members and veterans are similar***
- ***Technology solutions will be ineffective without corresponding policy solutions***
- ***Newly injured service members have little to no experience with assistive technologies***
  - *Current accessibility solutions might not be optimal*
- ***Ballot design issues are at least as important as ballot delivery and marking issues***
  - *Characteristic injuries impact memory and attention*
  - *Complexity is a barrier for many*
- ***Need for further research to address needs of those with cumulative mTBI / TBI / PTSD injuries***

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