



## Proposal for Digital Spaces Support

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# Technical Approach

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SERVE Advisory Group will maintain and extend web services operated by the VA's Office of Emergency Management (OEM), including internal SharePoint sites, Teams workspaces, and public-facing web services. An initial content and permissions audit will be conducted to assess functionality and access controls, and GANTT charts and emails will be provided weekly updating the OEM on our progress.

## 1. Assessment and Ideation

### 1.1 Initial Auditing

The OEM SharePoint, Teams, and web site will be manually and automatically smoke tested according to any applicable automated processes and documented user flows. The integrity of the automated testing harness and any existing analytics instrumentation will be compiled in the Instrumentation Assessment Report, while the first impressions of preliminary user experience (UX) investigation will be compiled in a UX Assessment Report. Additionally, SERVE will collate data from third-party analysis tools and conduct correlative keyword presence and density analysis between site content and Google Trends. Results of these analyses will be summarized in an SEO Assessment Report. Following this audit of existing web services and integration of instrumentation code, further action plans can be developed to remediate key obstacles to user conversion metrics such as offsite navigation, key content, contact forms, or other site functionality.

**Deliverables:** UX Assessment Report, SEO Assessment Report, Instrumentation Assessment Report

### 1.2 Analytics Integration

SERVE will develop an internal, Representational State Transfer (RESTful) Analytics Application Programming Interface (Analytics API) that will record anonymized, session-based interaction metrics such as page views, clicks, form submissions, and errors collected via the Analytics API for continuous aggregation and analysis, to be deployed on the OEM's existing ColdFusion web servers. A database will be required to store and aggregate this data: SERVE will defer to OEM approval of a Database Instrumentation Proposal for extension and administration of preexisting database infrastructure, but reserves the right to provision and maintain its own compliant Analytics Database internal to OEM-designated workspaces contingent on rejection of the proposal—with either the applicable functions of the preexisting, extended database or the functions of the newly-provisioned database referred to hereafter as the Analytics Database. Data visualizations such as funnel diagrams, user stories, and navigation heat-maps may be presented with key insights to the OEM, aiding in ideation and prioritization of development efforts, layouts, and user interface components.

**Deliverables:** Database Instrumentation Proposal, Analytics Database, Analytics API

## 2. Implementation

### 2.1 Site Modernization

SERVE will implement Schema Markup and a Site Map to ensure rich and proper indexing by popular search engines based on the findings of the SEO Assessment Report. On the front end, to eliminate visual noise and emphasize content, we will perform a comprehensive Design Overhaul. Tailwind CSS will be integrated to remove cruft, legacy stylesheets will be overhauled, and future wireframes will be tentatively based on componentry from IBM's Carbon Design System for its minimalism, accessibility compliance, and powerful real-time data visualization capabilities. If adopted, the design system—and in particular Carbon Charts—would be integrated with a build pipeline for automated, continuous site recompilation and redeployment, allowing for client-side integration of live dashboards. These data visualizations will be incorporated into existing web pages through the implementation of a real-time-capable Metrics API, available either RESTfully or via WebSockets.

**Deliverables:** Schema Markup, Site Map, Design Overhaul, Metrics API

### 2.2 Streamline Intra-Site Navigation

Based upon preliminary analysis of interactive session data aggregated from the Analytics DB, SERVE will undertake the design and revision of user flows. Revision will be done in-place, if possible, to prevent loss of functionality. Analytics data will provide the instrumental basis for these revisions. Session-based case studies or aggregate data may be used to identify salient, but inconveniently presented endpoints within the organization of the website, with an eye specifically toward longer sessions that terminated at deeply nested pages within the site map hierarchy: Cases where end users ostensibly eventually found the information that they needed to, information foraging took longer than desired or expected. Data prompting specific user flow revisions will be summarized in an Intrasession Navigation Report which can be cited in proposed User Flows to address specific pain points. The resulting User Flows will be mocked up in Figma, Microsoft Visio, or by revision of existing wireframes using applicable legacy wireframing or diagramming software.

**Deliverables:** Intrasession Navigation Report, User Flows

### 2.3 Streamline Intra-Page Navigation

Upon implementation of release-candidate modifications in the user flow, SERVE will additionally use Navigation Visualizations of interactive session data to gain further insights about intra-page, component-level interactions: e.g., heat maps might be used to assess which page elements users thought were clickable and which content appeared most superficially compelling in session replays. Modifications to individual page layouts will be proposed on this basis, and page-load times. The resulting design prescriptions and insights will be summarized in the Intra-Page Navigation Report.

**Deliverables:** Navigation Visualizations, Intra-Page Navigation Report

### 2.4 Automated Data Entry

Auditing of preexisting data entry processes will be conducted to discern opportunities Content Integration via of extraction, transformation, and loading (ETL) to support the monitoring of operational data sources, eliminating boilerplate and repetitive effort from compiling periodical reports and documents for static site redistribution, with the resulting statically generated assets ultimately destined for on-site redistribution via web servers and load-balancing infrastructure already present within the preexisting OEM network topology.

**Deliverables:** Content Integrations, Metrics API

## **3. Stabilization**

### **3.1 Testing and Deployment Procedures**

Smoke testing will be conducted manually and may additionally include automated unit and integration testing, including bespoke scans for inaccessible off-site hyperlinks. A comprehensive cross-browser compatibility, accessibility, and integration testing suite across front-end, back-end, and database systems may be orchestrated using GitHub Actions. Oversight from the OEM for the American Disabilities Act (ADA) Section 508 will be supplemented using this automated tooling, including provisioning of a GitHub Action for Deque Systems' aXe, while unit test cases for layouts and web form input validation, sanitization, and rejection may be mocked using Cypress. The automated testing harness will be supplemented by final acceptance testing, and an additional after-action A/B test may be conducted to confirm and document the intended impacts of release candidates on the end user.

### **3.2 Long-Term Support**

Following each release candidate deployment, a report will be compiled summarizing the instrumental impact of all changes conducted during the work. Ongoing long-term support for database systems, analytics, and further extensions will be provided. Our data-driven approach will add additional oversight to screen for regressions in functionality or ease of use, ensuring that each update supports the intended outcomes given a representative sample of end users and conversion metrics associated with the modifications.