Stage 2 Alternatives Analysis

California Department of Technology, SIMM 19B.2 (Ver. 3.0.8, 02/28/2022)

2.1 General Information

1. **Agency or State Entity Name:** 3980 - Environmental Health Hazard Assessment, Office of

   If Agency/State entity is not in the list, enter here with the organization code.

   Click or tap here to enter text.

2. **Proposal Name:** Statewide Extreme Heat Ranking System mobile application (Heat Ranking System App)

3. **Department of Technology Project Number (0000-000):** 3980-004

4. **S2AA Version Number:** Version 1

5. **CDT Billing Case Number:** BY

   Don't have a Case Number? Click here to get one.

2.2 Submittal Information

1. **Contact Information**

   Contact Name: Steve Fong

   Contact Email: steve.fong@oehha.ca.gov

   Contact Phone: 916-324-6449

2. **Submission Type: New Submission**

   If Withdraw, select Reason: Choose an item.

   If Other, specify reason here: Click or tap here to enter text.

   Sections Changed if an update or resubmission: (List all the sections that changed.)

   Not Applicable

   Summary of Changes: (Summarize updates made.)

   Not Applicable

3. **Attach Project Approval Executive Transmittal to your email submission.**

4. **Attach Procurement Assessment Form to your email submission.**

5. **Conditions from Stage 1 Approval** (Enter any conditions from the Stage 1 Business Analysis approval letter issued by CDT or your AIO):

2.3 Baseline Processes and Systems

1. **Current Business Environment (Describe the current business environment of which the effort will be understood and assessed in 500 words)**

   Assembly Bill 2238 requires CalEPA to develop a statewide extreme heat ranking system as local applications accessible via desktop and mobile devices. This project, delegated to the Office of Environmental Health Hazard Assessment (OEHHA), aims to be a nationwide maiden blueprint designed to communicate critical, time-sensitive information through data analytics and data visualization tools to California residents on extreme heat events and identify resources for heat adaptation. The successful creation of this ranking system cements California's leadership in mitigating and adapting to climate change.

   OEHHA proposes to revolutionize this process by acquiring a new system that would meet federal and state-mandated requirements, consolidate information into a central database/repository, interface to other systems and automate manual processes across the business unit. This project would encompass enhanced data collection methods including workflow capability, electronic document management/storage, automated upload of manual data, feedback by external users via email or online reporting, and support for additional interfaces to other systems for both OEHHA and CalEPA.

   Tip: Current Environment costs will be asked for in the Financial Analysis Worksheet to be completed in Section 2.12.

   Attach relevant documentation to email submission (i.e., business process, workflow, problem analysis, user/stakeholder list, research findings). If these types of documents are not available, please indicate "Not Available," and explain the reason below:

   Not available reason: As a brand-new project, no current business processes exist. As the project progresses, new business processes and workflows are anticipated to be created.

2. **Technical Context (Describe the technical environment of which the effort will be understood and assessed in 500 words)**

   OEHHA does not have a system of its own for data collection and will rely on various public data sources such as the ones listed below to provide meaningful data:

   National Centers for Environmental Information (NOAA)
   National Weather Service
   California Department of Public Health
   Department of Health Care Access and Information

The joint use of the overlay by NOAA projected heat events and California Department of Public Health Climate Change and Health Vulnerability indicators, data and narratives to assess exposures, social vulnerability and adaptive capacity are critical for policymakers to prioritize where to focus deeper analysis and plan for public health actions to increase resilience.

OEHHA plans to rely on a series of algorithms created by the Scientific team to generate data which would be uploaded to the data warehouse managed by the solutions provider. There would be a script generated by the solutions provider to enable automatic data upload, data cleansing before data enters the system, and automated workflow that can be customized and changed as business needs change. It will be accessible by OEHHA's program staff on desktop and mobile devices platforms.

This project will greatly improve the productivity of OEHHA staff through providing a means for faster data collection in the office, out in the field, online, and with other integrated systems. It will also help OEHHA increase its performance with more reliable and current data, reinforce decision-making, and real-time dashboards of key performance indicators for the Scientific Branch. The need for OEHHA to have a new system which combines the federal and state mandated requirements in a central database/repository is great and it also help address the automation needs for OEHHA and more flexibility when integrating with other systems such as Google APIs.

Attach relevant documentation to email submission (i.e., logical system environment diagrams, system interactions, business rules, application flows, stakeholder information, data flow charts). If these types of documents are not available, please indicate "Not Available," and explain the reason below:

Not available reason: The exact data sources and data sets, business rules, application flows and data flow charts have yet to be determined as this is a maiden project

3. **Data Management (Enter the information to indicate the data owner and custodian of the current system, if applicable.)**

Data Owner Name: None. System does not currently exist

Data Owner Title: None. System does not currently exist

Data Owner Business Program area: None. System does not currently exist

Data Custodian Name: None. System does not currently exist

Data Custodian Title: None. System does not currently exist

Data Custodian Technical area: None. System does not currently exist

Security - Data Classification and Categorization No

Security - Privacy Threshold & Impact Assessment. No

4. **Existing Data Governance and Data**

a) Do you have existing data that must be migrated to your new solution?

Answer (Unknown, Yes, No): No

If data migration is required, please rate the quality of the data.

Select data quality rating: Not Applicable

b) Does the Agency/state entity have an established data governance body with well-defined roles and responsibilities to support data governance activities?

Answer (Unknown, Yes, No): No

If Yes, include the data governance organization chart as an attachment to your email submission.

c) Does the Agency/state entity have data governance policies (data policies, data standards, etc.) formally defined, documented, and implemented?

Answer (Unknown, Yes, No): No

If Yes, include the data governance policies as an attachment to your email submission.

d) Does the Agency/state entity have data security policies, standards, controls, and procedures formally defined, documented, and implemented?

Answer (Unknown, Yes, No): No

If Yes, attach the existing documented security policies, standards, and controls used to your email submission.

e) Does the Agency/state entity have user accessibility policies, standards, controls, and procedures formally defined, documented, and implemented?

Answer (Unknown, Yes, No): No

If Yes, attach the existing documented policies, accessibility governance plan, and standards used to the email submission.

5. Security Categorization Impact Table

Consult the SIMM 5305-A Information Security Program Management Standard - Security Categorization Impact Table.

Attach a table (in PDF) that categorizes and classifies the agency/state entity's information assets related to this effort (e.g., paper and electronic records, automated files, databases requiring appropriate protection from unauthorized use, access, disclosure, modification, loss, or deletion). Each information asset for which the agency/state entity has ownership responsibility shall be inventoried and identified.

6. **Security Categorization Impact Table Summary**

   Consult the SIMM 5305-A Information Security Program Management Standard - Security Categorization Impact Table to provide potential impact levels of the following areas:

   Confidentiality: Choose an item.

   Integrity: Choose an item.

   Availability: Choose an item.

7. **Technical Complexity Score:** Click or tap here to enter text.

   (Attach a SIMM Section 45 Appendix C with Business and Technical Complexity sections completed to the email submission.)

2.4 Requirements and Outcomes

At this time in the project planning process, requirements and outcomes should be documented and indicative of how the Agency/State Entity envisions the final solution. This shall be accomplished either in the form of mid-level requirements (predictive methodology)/business capabilities or representative epics and user stories (adaptive methodology) that will become part of the product backlog. The requirements or representative epics and user stories must tie back to the Objectives detailed in the Stage 1 Business Analysis. Regardless of which tool/method is used, an understanding of the following, at a minimum, must be clearly articulated:

- Functional requirements
- Expected user experience(s)
- Expected system outcome
- Expected business operations (e.g., How do you envision operations in the future?)
- Alignment to the project's objectives identified in Stage 1
- Product ownership (e.g., Who owns these requirements?); and
- Verification of need(s) fulfillment (e.g., How will success be measured?)

Tip: If providing requirements, the recommended range of requirements is between 50 and 100.

Attach Requirements and/or Outcomes narratives, mid-level requirements, and/or epics/user stories to submission email.

2.5 Assumptions and Constraints

Relevant assumptions and constraints help define boundaries and opportunities to shape the scope and complexity of the project.

Assumption #1: Executive sponsorship will continue through project completion.

Description/Potential Impact: Constant support from executive sponsors will ensure resources are continuously available for the project.

Assumption #2: CalEPA will review and approve the product and vendor selections.

Description/Potential Impact: Control agency support is necessary to start the project and will ensure external influences will not impact the successful completion of the project.

Assumption #3: Issues will be resolved, and risks mitigated on a timely basis.

Description/Potential Impact: Issues and risks that are not addressed on a timely basis could impact the project scope, budget, and/or schedule.

Assumption #4: Technology is available to meet the business needs and security compliance.

Description/Potential Impact: Selected vendor's technology can fulfill both the business requirements as well as the create new workflows. Selected vendor's technology will be satisfy Enterprise IT Security and IT compliance in areas such as cybersecurity, privacy, data sharing, data warehouses, governance, risk management and visualization tools for reporting.

Assumption #5: Effective Data Science Algorithms

Description/Potential Impact: Quality data will improve the effectiveness of data science algorithms, ensuring insights gained are accurate and actionable. Frequent data profiling and the identification of a data steward will lead to increased precision in algorithmic output.

Assumption #6: OEHHA will own its data and the system developed for it.

Description/Potential Impact: The intent of OEHHA is to modernize in a way that makes it easier and simpler to access data and maintain content management.

Assumption #7: OEHHA's dedicated staff will remain in their current roles.

Description/Potential Impact: When new staff join the project or if project staff change roles, retire, or otherwise leave the project, it is critical to ensure adequate staff training and knowledge transfer.

Assumption #8: Solution Provider and State staff will perform their assignments related to the project in a competent and timely manner.

Description/Potential Impact: Delays by any of the project partners could adversely impact the project schedule.

Assumption #9: The functional and non-functional requirements will not change significantly during project development

Description/Potential Impact: Potential vendors may not be able to meet the defined project objectives within the time constraints and/or within budget limitations.

Constraint:

- OEHHA must be able to identify, access and maintain the data sets in the solution.

Description/Potential Impact: Without access and the ability to collaborate, modify, maintain, and train machine learning, data sets will severely hamper the full implementation of the solution to the fullest.

TIP: Copy and paste to add Assumptions/Constraints with Descriptions/Impacts as needed.

2.6 Dependencies

Dependencies are elements or relationships in a project reliant on something else occurring before the function, service, interface, task, or action can begin or continue.

Dependency Element: Development Tools

Dependency Description: Develop a standard for the development methods and tools that the solution provider will use during the project. This will ensure that the technology transition is consistent with OEHHA staff knowledge and skills for ongoing system maintenance and operations, once the project is completed.

Dependency Element: Testing Strategy

Dependency Description: The testing strategy will serve as a guide for verifying how the major aspects of the solution shall be developed

Dependency Element: Preparing Environments

Dependency Description: Environments for the development, integration testing (IT), system testing (ST), user acceptance testing (UAT), and training will need to be set up and configured. Development and IT environments would need to be available before the vendor can start the analysis and design phases of the project. ST and UAT environments will be established before testing can begin. Additionally, the training environment will need to be established to allow curriculum development in order to train the users

Dependency Element: Business and Systems Requirements

Dependency Description: The tracing of OEHHA detailed requirements and use cases will be essential in testing, troubleshooting, and building the solution. Traceability from business requirements to system requirements to code and from business requirements to use cases and test cases will ensure that minimal errors are introduced into the OEHHA production environment.

Dependency Element: Software Development Life Cycle (SDLC)

Dependency Description: OEHHA plans to adopt a hybrid waterfall/Agile Software Development framework. The project will be dependent on the specific framework that OEHHA chooses during the solicitation phase and implementation.

Dependency Element: Technology Platform

Dependency Description: The project is dependent on the below listed technology platforms used to revolutionize both the browser and mobile applications. The following technology platforms may be considered for the solution:

- Analytics
- API Platforms
- Application Platforms
- Business Intelligence
- Computing Platforms
- Content and Document Management Systems
- Database Platforms
- Mobile Platforms
- Operating Systems
- Security
- Storage Platforms
- Web Platforms
- Public Data Sources
- Heat Equity Mapper
- Data Warehousing Platforms

Dependency Element: Proof of Concept Demonstrations

Dependency Description: OEHHA plans to conduct demonstrations for proof of technology to ensure that the project is progressing in the right direction.
Need further discussion with OSTP and OEHHA Procurement in Stage 3.

TIP: Copy and paste to add Dependency Elements and Descriptions as needed.

2.7 Market Research

Market Research (CDT Market Research Guidelines) determines whether products or services available in the marketplace can meet the business needs identified in this proposal. Market Research can also determine whether commercial practices regarding customizing/modifying products or tailoring services are available, or even necessary, to meet the business needs and objectives of the business.

Before undertaking a Market Research approach. Contact your PAO Manager to schedule a collaborative review to review planning to date and discuss the procurement approach.

1. **Project Management Methodology:** Hybrid

2. **Procurement approach recommended:** Challenge-based Procurement

3. **Market Research Approach**

Provide a concise narrative description of the approach used to perform market research.

OEHHA used two methods to perform market research.

1) Internet research

OEHHA conducted extensive research on the internet to identify potential solution approaches to meet its technical requirements. Techniques included reviewing Gartner's Magic Quadrant methodologies, Gartner's Critical Capabilities research notes and Gartner's Peer Insights publication. Magic Quadrant "Analytics and Business Intelligence Platforms" was published in April 2023 while "Business Analytics Services Worldwide" Critical Capabilities was published in February 2021. Peer Insights' publication contained feedback from verified technology executives associated with Government Open Technology Platforms current as of April 2023. Other factors for solutions provider shortlist included prior experience working information technology climate projects with State agencies or private entities, prior experience working with multi-layer and data visualization tools in a GIS environment, solutions based on cloud architecture and robust security policies.

Summary of Findings from Internet Market Research

A key finding from the market research performed by OEHHA is that because this is an inaugural project, there is no known existing solution. Hence, OEHHA was unable to initiate interviews with industry peers or assemble focus groups. The preferred solution may need to be implemented in a phased approach—generally two and up to three phases. OEHHA plans to incorporate what it learned from market research in the project planning, detailed requirements development, solution configuration, and procurement strategy for CalEPA/OEHHA/OSTP as well as focused on ease of use and solution architecture as key solution elements, as well as cost.

2) Request for Information

OEHHA's Contracts & Business Services

4. **Market Research Artifacts**

Market Research Artifacts can include internet research, collaboration with other governmental entities, or other documentation.

Attach Market Research artifacts to the email submission.

2.8 Viable Alternative Solutions

The CDT expects Agencies/state entities to conduct a thorough analysis of all feasible alternatives that will meet the proposal's objectives and requirements. Agencies/state entities should provide at minimum the three (3) most viable solutions, one (1) of which could be leveraging and/or enhancing the existing solution (if applicable).

1. **Viable Alternative Solution #1**

   Name: Cloud Based Custom Development with SaaS/PaaS Solution Provider (Preferred Solution)

   Description: This alternative will allow all the technical and non-technical requirements due to the custom development aspect for the mobile application solution. Combined with the ability to leverage SaaS/PaaS in order to host the data and utilize ESRI APIs to drive the content for the mobile application.

   Why is this a viable solution? Please explain:

   A cloud-based custom development approach using SaaS/PaaS provides a scalable, efficient, and collaborative framework for developing and deploying the solution. This solution leverages cloud services for hosting, processing, and delivering real-time heat rankings, while offering flexibility for customizations to meet unique business and operational needs. A cloud-based custom development solution utilizing SaaS and PaaS offers significant advantages for a heat ranking system, including scalability, cost efficiency, and fast deployment. While there are some trade-offs, such as dependency on internet connectivity and potential vendor lock-in, the benefits far outweigh the disadvantages for most use cases. This approach is ideal for organizations looking for a modern, agile, and collaborative platform to deliver real-time, data-driven heat ranking insights. The comparatively low maintenance cost was one of the primary factors that help determine this solution as viable alternative solution #1.

   Advantages

   1. Scalability and Flexibility
      - Easily adapts to growing user bases and new features.
      - Elastic computing ensures performance during high-demand periods.
   2. Cost Efficiency
      - Pay-as-you-go pricing reduces upfront costs compared to on-premise solutions.
      - Lower maintenance and operational expenses due to managed cloud infrastructure.
   3. Faster Deployment
      - PaaS platforms provide pre-built tools and services, reducing development time.
      - SaaS eliminates the need for infrastructure setup, enabling quicker go-to-market.

4. High Availability and Resilience
    - Redundant cloud infrastructure ensures high uptime.
    - Built-in disaster recovery mechanisms.
5. Global Accessibility
    - Accessible from anywhere with an internet connection, supporting remote teams and users.
    - Cross-region data centers ensure low latency for global users.
6. Seamless Integration
    - Pre-existing APIs and SDKs enable smooth integration with third-party tools.
7. Enhanced Collaboration
    - Multi-user access with role-based controls fosters team collaboration.

Disadvantages

1. Dependency on Internet Connectivity
    - Limited functionality in areas with poor or no internet access.
    - May impact responsiveness during network outages.
2. Vendor Lock-In
    - PaaS/SaaS reliance on specific cloud providers may create challenges in switching vendors.
    - Custom-built features may not easily migrate to another platform.
3. Data Privacy Concerns
    - Storing sensitive data in the cloud requires stringent compliance and monitoring.
    - Users must trust the cloud provider's security protocols.
4. Limited Customization in SaaS
    - SaaS solutions might not allow full customization for unique business needs.
    - PaaS offers more flexibility but requires additional development expertise.
5. Recurring Costs
    - Long-term subscription fees may exceed the cost of on-premise solutions.
    - Costs can rise with increased data storage, processing, or user demand.

Approach

Increase staff – new or existing capabilities: Yes

Modify the existing business process or create a new business process: Yes

Reduce the services or level of services provided: No

Utilize new or increased contracted services: Yes

Enhance the existing IT system: No Note: Not applicable; no DIR IT system exists Choose Yes or No.

Modify Statute/Policy/Regulations: No

Please Specify: Click or tap here to enter text.

Create a new IT system: Yes

Other: No Specify: Click or tap here to enter text.

Architecture Information

Business Function(s)/Process(es):

1. **Real-Time Heat Rankings**
   - Continuous monitoring and analysis of temperature data from multiple sources (weather APIs, IoT sensors, and satellite imagery).
   - Real-time updates of heat rankings across defined regions, time periods, and demographic factors.
2. **Interactive Dashboards and Visualizations**
   - User-friendly dashboards for comparing heat trends across locations, demographics, and timeframes.
   - Heat maps with overlays for geographic insights.
3. **Advanced Filtering and Analysis**
   - Filters for time periods, temperature thresholds, and geographic regions.
   - Analysis of historical trends and predictive modeling.
4. **Demographic Insights**
   - Reporting on heat impact by age groups, vulnerable populations, and socioeconomic data.
5. **Scalability and Elasticity**
   - Automatic scaling to handle high data influx during peak seasons, such as heatwaves.

- Support for multi-tenancy, enabling multiple agencies or organizations to use the system.

6. **Customizable Alerts and Notifications**
   - Heat alerts for critical thresholds via SMS, email, or push notifications.
   - Configurable alert settings for different user roles (e.g., emergency services, city planners).
7. **Secure Data Management**
   - Compliance with GDPR, HIPAA, or other applicable standards for sensitive data.
   - Encrypted data storage and secure access protocols.
8. **Integration Capabilities**
   - APIs for integration with existing systems like GIS tools, emergency response systems, and healthcare platforms.
   - Support for third-party SaaS tools for enhanced functionality.
9. **Accessibility and Multi-Device Support**
   - Web and mobile-friendly interfaces for users in the field or on the go.
10. **Reporting and Data Export**
    - Customizable reports for stakeholders.
    - Export options for data in formats like CSV, PDF, or JSON.

TIP: Copy and paste or click the + button in the lower right corner to add business processes with the same application, system, or component; COTS/Cloud Technology or custom solution; runtime environment; system interfaces, data center location; and security.

Conceptual Architecture

Attach a copy of the conceptual architecture to your email submission.

COTS/SaaS/Cloud Technology or Custom: COTS/SaaS/Cloud Technology

Name/Primary Technology: AWS, ArcGIS, .NET SDK for Mobile Application, Lambda with some custom processes.

TIP: Copy and paste or click the + button in the lower right corner to add system software information if the application, system, or component uses additional system software.

Explain Existing System Interfaces: This is a new system

Explain New System Interfaces: The new system will integrate will several public data sources (e.g. NOAA, NWS, OES, HCAI)

Data Center Location of the To-be Solution: Commercial data center

If Other, specify: Click or tap here to enter text.

Security

Access

Public: Yes

Internal State Staff: Yes

External State Staff: Yes

Other: Choose Yes or No. Specify: Click or tap here to enter text.

Type of Information (Select Yes or No for each to identify the type of information that requires protection. See the SAM Section 5305.5 for more information.)

Personal: No

Health: No

Tax: No

Financial: No

Legal: No

Confidential: No

Other: Yes Specify: Publicly curated data

Protective Measures (Select Yes or No to identify the protective measures used to protect information.)

Technical Security: Yes

Physical Security: Yes

Backup and Recovery: Yes

Identity Authorization and Authentication: Yes

Other, specify: Click or tap here to enter text.

Total Viable Alternative #1 Solution Cost (copy from FAW – Executive Cost Summary tab, cells E7 through E11):

Planning Costs: $5,498,659

One-Time (Project) Costs: $4,711,179

Total Future Ops. IT Staff OE&E Costs: $376,241

Total Proposed Cost: $10,586,079

Annual Future Ops. Costs (M&O): $241,241

2. **Viable Alternative Solution #2**

Name: SaaS/PaaS

Description: Locate a SaaS/PaaS solution provider which offer pre-built modules and features to address a number of OEHHA's objectives, including a technology stack native mobile application, flexibility for product customization, modern interface capabilities, easy-to-set-up workflow, and streamlined publishing. Available PaaS also provide pre-built client-facing services, with customizable workflow, alerts, and client-specific business rules, and state-of-the-art communication features (mobile notifications).

Why is this a viable solution? Please explain:

A viable SaaS/PaaS solution would provide a cloud-based platform offering pre-built modules and features to monitor, analyze, and manage heat-related risks. The system is designed to deliver a unified view of customer data, leverage business intelligence (BI) and data mining capabilities and facilitate seamless integration across modules. With modern interface designs, the platform ensures flexibility for product customization, quick setup of workflows, and streamlined reporting. The SaaS/PaaS approach ensures scalability, ease of use, and robust data-driven insights without requiring extensive infrastructure setup. This SaaS/PaaS solution balances ease of use and advanced capabilities, making it ideal for organizations looking to implement a heat ranking system with minimal setup while leveraging cutting-edge analytics and integration. However, careful planning around cost, security, and vendor selection is crucial to ensure a successful deployment. This solution targets organizations such as government agencies, urban planners, healthcare providers, and emergency response teams that need to manage heat risk effectively.

Advantages

- Quick Deployment
    - Pre-built modules reduce development time, allowing for faster implementation.
    - Users can focus on customization rather than building core features from scratch.
- Cost Efficiency
    - SaaS/PaaS pricing models (subscription-based or usage-based) reduce upfront costs.
    - Eliminates the need for expensive infrastructure and maintenance.
- Scalability

    - Cloud-based infrastructure supports scaling based on user demand and data volume.
    - Suitable for small teams as well as large organizations with extensive datasets.
- Built-in Security
    - Providers offer robust security measures, including encryption, role-based access control, and compliance with data protection standards.
- Cross-Platform Access
    - Ensures seamless user experience across web and mobile platforms.
    - Accessibility anytime, anywhere, with minimal hardware requirements.
- Continuous Updates
    - Regular updates and improvements from the provider ensure the system remains modern and efficient.
- Ease of Use
    - User-friendly interfaces and workflow automation reduce the learning curve for staff.
- Seamless Integration
    - Integration with third-party tools and APIs ensures interoperability with existing systems.
- Real-Time Insights
    - Continuous data collection and processing for up-to-date heat rankings and notifications.
- Customizability
    - Tailored features allow users to adapt the system to unique requirements, such as regional or industry-specific needs.
- Accessible Anywhere
    - Cloud-based access ensures usability across multiple locations and devices.

Disadvantages

- Limited Customization
    - Pre-built modules may not fully address niche or highly specialized requirements.
    - Customizations beyond standard configurations can increase costs or require additional development.
- Vendor Lock-in
    - Dependence on a specific SaaS/PaaS provider may limit flexibility in transitioning to other platforms or solutions.

    - Changing providers could lead to data migration challenges and additional expenses.
- Recurring Costs
    - Subscription or usage-based pricing may result in higher long-term costs compared to self-hosted solutions.
    - Pricing fluctuations could impact budget predictability.
- Data Privacy Concerns
    - Sensitive data stored on third-party servers might raise privacy or regulatory concerns.
    - Users must rely on the provider's commitment to compliance and data protection.
- Dependency on Internet Connectivity
    - Requires stable internet access for optimal performance, which may limit usability in remote or underserved regions.
    - Offline functionality, while available, may be limited.
- Performance Variability
    - Performance may depend on the provider's server infrastructure and the number of concurrent users.
- Limited Offline Capabilities:
    - Functionality relies on a stable internet connection, which could be an issue in remote areas.
- Vendor Lock-In:
    - Dependence on a specific platform can create challenges if switching vendors or platforms becomes necessary.
- Integration Complexity:
    - While integration is a feature, connecting to legacy systems or bespoke databases might still require significant effort.

Approach

Increase staff – new or existing capabilities: Yes

Modify the existing business process or create a new business process: Yes

Reduce the services or level of services provided: No

Utilize new or increased contracted services: Yes

Enhance the existing IT system: Yes

Modify Statute/Policy/Regulations: No

Please Specify: Click or tap here to enter text.

Create a new IT system: Yes

Other: Choose Yes or No. Specify: Click or tap here to enter text.

Architecture Information

Business Function(s)/Process(es):

1. **Mapping Module**
   - Offers interactive GIS-based tools for visualizing heat rankings across geographic regions.
   - Supports overlays for demographic data, temperature thresholds, and regional heat maps.
   - Provides real-time updates and multi-region comparison capabilities.
2. **Data Repository**
   - Cloud-based storage for managing large volumes of historical and real-time temperature data.
   - Integrated APIs for seamless data ingestion from external weather services and IoT devices.
   - Ensures data security and compliance with industry standards (e.g., GDPR, CCPA).
3. **Mobile Application Integration**
   - Pre-built templates for cross-platform mobile apps.
   - Features push notifications, heat alerts, and user-specific filtering options.
   - Optimized for offline functionality and lightweight data usage.
4. **Customization Options**
   - Drag-and-drop tools for customizing dashboards, reports, and user interfaces.
   - Configurable filters and thresholds tailored to specific user needs.
5. **Scalability and Performance**
   - Cloud-native architecture ensures on-demand scalability.
   - Real-time analytics engine for processing large datasets with minimal latency

Click or tap here to enter text.

TIP: Copy and paste or click the + button in the lower right corner to add business processes with the same application, system, or component; COTS/Cloud Technology or custom solution; runtime environment; system interfaces, data center location; and security.

Conceptual Architecture

Attach a copy of the conceptual architecture to your email submission.

The conceptual architecture is attached.

COTS/SaaS/Cloud Technology or Custom: COTS/SaaS/Cloud Technology

Name/Primary Technology: AWS, ArcGIS, Lambda with some custom processes.

TIP: Copy and paste or click the + button in the lower right corner to add system software information if the application, system, or component uses additional system software.

Explain Existing System Interfaces: This is a new system.

Explain New System Interfaces: The new system will integrate will several public data sources (e.g. NOAA, NWS, OES, HCAI)

Data Center Location of the To-be Solution: Commercial data center

If Other, specify: Click or tap here to enter text.

Security

Access:

Public: Yes

Internal State Staff: Yes

External State Staff: Yes

Other: Yes Specify: Publicly curated data

Type of Information (Select Yes or No for each to identify the type of information that requires protection. See the SAM Section 5305.5 for more information.)

Personal: No

Health: No

Tax: No

Financial: No

Legal: No

Confidential: No

Other: Choose Yes or No. Specify: Click or tap here to enter text.

Protective Measures (Select Yes or No to identify the protective measures used to protect information.)

Technical Security: Yes

Physical Security: Yes

Backup and Recovery: Yes

Identity Authorization and Authentication: Yes

Other, specify: Click or tap here to enter text.

Total Viable Alternative #2 Solution Cost (copy from FAW – Summary tab, cell AL33):

Total Proposed Cost: $10,961,079

3. **Viable Alternative Solution #3**

Name: Proprietary COTS/MOTS Solution

Description: The third viable alternative solution is a proprietary COTS/MOTS solution hosted as a cloud-based Software as a Service (SaaS) solution. Since OEHHA is open to creative solutions proposed by bidders, the details about this solution's specific technology platform, toolset, processing, and capabilities will be based on the winning bidder's proposal.

Why is this a viable solution? Please explain:

A proprietary heat ranking system is a custom-built software solution designed to analyze, rank, and display heat-related data. This system uses advanced algorithms, real-time weather data, and user-defined parameters to provide actionable insights on heat risks across geographic locations, time periods, and demographic groups. The proprietary nature ensures unique features tailored to the organization's needs, including data security and custom branding. This proprietary heat ranking system represents a robust and scalable solution for organizations prioritizing data security, customization, and advanced analytics. While the higher cost and dependency on the vendor are notable challenges, the benefits in terms of functionality and organizational alignment often outweigh these drawbacks, particularly for large-scale or mission-critical applications.

Advantage:

- Quick development and deployment of the solution.
- Customization
    - Tailored to specific needs, including user interface, reporting formats, and ranking parameters.
- Data Ownership
    - Full control over data and analytics without reliance on third-party platforms.
- Enhanced Security
    - Proprietary systems are less prone to generic vulnerabilities and offer better protection against data breaches.
- Scalability

    - Designed to grow with the organization's needs, accommodating new regions, demographics, or data types.
- Competitive Edge
    - Unique features can offer advantages over generic or open-source solutions.
- Branding
    - Custom design and branding reinforce organizational identity.

Disadvantages

- Unable to fulfill all technical and non-technical requirements.
    - One requirement would be having the ability to have multiple languages within the same mobile application. Locked into a specific technology stack.
    - Unable to self-maintain and operate the solution after the contract ends.
    - High entry cost and scope reduced.
- High Initial Cost
    - Proprietary solutions require significant upfront investment for design, development, and implementation.
- Long Development Time
    - Customization and testing can delay deployment compared to off-the-shelf solutions.
- Maintenance and Updates
    - Ongoing costs for system maintenance, updates, and scaling.
- Vendor Dependency
    - Organizations may depend heavily on the vendor for updates, troubleshooting, and enhancements.
- Training Requirements
    - Custom systems often require user training to ensure effective utilization.
- Limited Community Support
    - Unlike open-source solutions, proprietary systems lack a broad community for troubleshooting and knowledge sharing.

Approach

Increase staff – new or existing capabilities: Yes

Modify the existing business process or create a new business process: Yes

Reduce the services or level of services provided: No

Utilize new or increased contracted services: Yes

Enhance the existing IT system: Yes

Modify Statute/Policy/Regulations: No

Please Specify: Click or tap here to enter text.

Create a new IT system: Yes

Other: Choose Yes or No. Specify: Click or tap here to enter text.

Architecture Information

Business Function(s)/Process(es):

1. **Real-Time Data Analysis**
    - Integration with live weather data feeds (e.g., meteorological APIs).
    - Continuous updates to heat rankings for immediate risk assessment.

2. **Advanced Ranking Algorithms**
    - Machine learning models to calculate heat rankings based on temperature, humidity, and other environmental factors.
    - Inclusion of weighted parameters, such as demographic vulnerability and historical data.

3. **Custom Filters and Comparisons**
    - Compare heat rankings across time periods, locations, and demographic groups.
    - Filter rankings by temperature thresholds, geographic regions, or specific dates.

4. **Interactive Visualization Tools**
    - Heatmaps with real-time overlays for geographic analysis.
    - Graphs and dashboards for trend analysis and user-friendly summaries.

5. **User and Stakeholder Notifications**
    - Alerts for critical thresholds (e.g., heat advisories, warnings).
    - Configurable email or SMS notifications for users and administrators.

6. **Role-Based Access Control**
    - Different access levels for administrators, analysts, and general users.
    - Secure login and data encryption to protect sensitive information.

7. **Mobile Compatibility**
    - Mobile app support for on-the-go access to heat rankings and alerts.

8. **Export and Reporting**
    - Export data and analysis reports in PDF, Excel, or CSV formats.
    - Automated report generation for periodic assessments.

TIP: Copy and paste or click the + button in the lower right corner to add business processes with the same application, system, or component; COTS/Cloud Technology or custom solution; runtime environment; system interfaces, data center location; and security.

Conceptual Architecture

Attach a copy of the conceptual architecture to your email submission.

COTS/SaaS/Cloud Technology or Custom: Custom

Name/Primary Technology: Proprietary Software Solution

TIP: Copy and paste or click the + button in the lower right corner to add system software information if the application, system, or component uses additional system software.

Explain Existing System Interfaces: This is a new system.

Explain New System Interfaces: The new system will integrate will several public data sources (e.g. NOAA, NWS, OES, HCAI)

Data Center Location of the To-be Solution: Commercial data center

If Other, specify: Click or tap here to enter text.

Security

Access:

Public: Yes

Internal State Staff: Yes

External State Staff: Yes

Other: Yes Specify: Publicly curated data

Type of Information (Select Yes or No for each to identify the type of information that requires protection. See the SAM Section 5305.5 for more information.)

Personal: No

Health: No

Tax: No

Financial: No

Legal: No

Confidential: No

Other: Choose Yes or No. Specify: Click or tap here to enter text.

Protective Measures (Select Yes or No to identify the protective measures used to protect information.)

Technical Security: Yes

Physical Security: Yes

Backup and Recovery: Yes

Identity Authorization and Authentication: Yes

Other, specify: Click or tap here to enter text.

Total Viable Alternative #3 Solution Cost (copy from FAW – Summary tab, cell AL50):

Total Proposed Cost: $11,556,079

2.9 Project Organization

Project planning includes the process of identifying how and when specific labor skill sets are needed to ensure that the proposed project has sufficient staff with the appropriate knowledge and experience by the time the project moves into execution. All staff identified in the following sections should be included in the Financial Analysis Worksheet to be completed in Section 2.12.

1. **Project Organization Chart:**

   Attach the Project Organization Chart to your email submission.

2. **Is the department running this project as a matrixed or projectized organization?**

   Matrixed

In each of the following sections, provide a concise description of the approach to staffing the proposed project including contingencies for business/program, IT, or administrative areas to maintain ongoing operations in conjunction with the proposed project.

1. Administrative

OEHHA will provide the following staff for the administrative needs of the project:

A. Project Manager

The project manager (PM) will have experience with project implementation and will manage the project from initiation to closing. The PM will ensure that the project team completes the project for their designated functions. The PM will facilitate the development of project plans, manage contractor performance of project tasks, and communicate with control agencies. The PM secures acceptance of deliverables from the project sponsor and stakeholders. The PM is responsible for communication, including status reporting, risk management, and escalation of issues that cannot be resolved by the project team.

B. Procurement Team (CDT, CalEPA and OEHHA Contracts, and Programs)

The procurement team will include CDT's Statewide Technology Procurement Division (OSTP), CalEPA and OEHHA Contract experts and management from each affected program.

The procurement team will develop the Procurement Management Plan in accordance with CDT guidelines and will facilitate approval. The procurement team will review the solicitation document(s) and submit the final version(s), as appropriate, based on the procurement vehicle being utilized. The procurement team will facilitate the evaluation of proposals/offers. It will also develop (with CDT OSTP) the evaluation and selection report for each formal procurement and submit it for procurement documentation to support contract(s) award.

C. Contracts Manager (CalEPA and OEHHA Procurement)

The contract manager is responsible for the oversight of the Software Solutions Provider contract, System Integrator contract, Scientific contracts and any other contracts supporting the project. The individual will participate in contractor performance reviews by reviewing and evaluating deficiencies, provide interpretation of project contracts to project team, recommend course of action on contractual issues, participate in procurement and contract meetings, monitor contractor deliverables, and monitor, analyze, and mitigate procurement-related risks and issues.

D. Information Technology Support Team

The IT support team will include experts from Agency that will assist the PM throughout the project to facilitate hardware, software, interfaces, and migration activities. The IT support team will provide system support through the development and implementation of this project to facilitate a successful implementation and transition. In-house current staff will be augmented by additional resources for the project.

2. Business Program

There will be a designated Scientific Manager (SM) who will oversee the contracted Scientific Team and subcontractor Scientific Staff. Within the components of the application, there would be a product owner. (For instance, GIS component will have a product owner skilled in mapping or geo spatial analysis). Product owners will team with the SM during project development and delivery to test and validate system functions. The product owners will act as the key decision

maker on system functionality and will work closely with the SM and solutions provider on a daily basis through the project phase. Additionally, there would be one of more program Subject Matter Experts (SME) earmarked within each component. These SMEs will work with the selected solution provider and the SM to implement the solution. Program SMEs will be committed to the project and will also serve as the system's user acceptance testers and execute testing at the direction of the SM and product owner. Staff experts will also perform data validation activities. For this project to be successful, it is required that staff prioritize it and dedicate the time necessary to ensure its completion.

3. Information Technology

OEHHA will assign support resources to work with the solutions provider and program staff to address issues encountered when accessing the proposed solution through a mobile application accessible via a mobile device. The resources will have experience with OEHHA mobile application, system, and security configurations. The IT resources will be available throughout the project lifecycle to address system implementation and interface issues.

4. Testing

All product owners and SMEs will act as testers. Under guidance of the project manager and informed by the vendor's expertise, the testers will participate in software requirements meetings, as needed, to understand the business and functional requirements that the software must meet. They will perform testing based on the test plan and document any issues in a defect and enhancement tracking tool. Once the issue has been resolved, the testers will retest and declare it fixed or report it again until the requirement has been successfully tested.

5. Data Conversion/Migration

OEHHA currently does not have an established data conversion/migration strategy that includes well-defined roles and responsibilities to support data conversion/migration, and data governance activities. For this project, OEHHA anticipates two major types of data: 1) scientific data (e.g., National Weather Service weather data), and 2) profile data (i.e, non-PII data such as zip code). OEHHA staff, the product owners, and staff experts (technical resources) will participate in data migration activities with the System Integrator on an as needed basis.

6. Training

Training for the recommended solution will be conducted by the solutions provider and included in the procurement contract. The solutions provider and SM will work with the product owners and/or SMEs to train key program staff on how to utilize the software. OEHHA program staff will serve as trainers to supplement the vendor provided training and provide on-site support and business process documentation as necessary to mitigate any business process change issues. OEHHA will use a train-the-trainer approach and have the system integrator provide initial training and knowledge transfer. OEHHA trainers will perform most of the training onsite with business program users.

7. Organizational Change Management

In-house staff will be sufficient for the project's need for Organizational Change Management.

8. Resource Capacity/Skills/Knowledge for Stage 3 Solution Development

This narrative should include the experience level and quantity of procurement, contract management, and budget staff who will be responsible for the Stage 3 Solution Development.

For Stage 3 Solution Development, CalEPA/OEHHA procurement staff have robust experience in dealing with the procurement vehicles identified for this project. Aside from leading the procurement phases of projects with similar scope or dollar value (CERS Next Gen, BECRT), CalEPA/OEHHA has successfully executed the purchase of many items using leveraged procurement agreements, CalEPA/OEHHA in-house procurement, contract management and budget staff with work with CDT and CalEPA's established Project Management Offices to conduct the Stage 3 activities.

2.10 Project Planning

1. Project Management Risk Assessment

Updated Project Management Risk Score: 0.3

Attach Updated PM Risk Assessment to your email submission. SIMM Section 45A

2. Project Charter

Is your project charter approved by the designated Agency/state entity authority and available for the Department of Technology to review? **Choose**: 'Yes,' 'No,' or 'Not Applicable.' If 'No' or 'Not Applicable,' provide the artifact status in the space provided.

Project Charter (Approved): Yes

Status: Latest update was 03/06/2024

Attach a copy of the Project Charter to your email submission.

3. Project Plans

Are the following project management plans or project artifacts approved by the designated Agency/state entity authority and available for the Department of Technology to review? **Choose**: 'Yes,' 'No,' or 'Not Applicable.' If 'No' or 'Not Applicable,' provide the artifact status in the space provided.

Note: For Low to medium complexity and cost projects, discuss with your PAO manager the option of submitting a Master Project Management Plan in place of individual plans.

Scope Management Plan (Approved): Yes

Status: Click or tap here to enter text.

Communication Management Plan (Approved): Yes

Status: Click or tap here to enter text.

Schedule Management Plan (Approved) : Yes

Status: Click or tap here to enter text.

Procurement Management Plan (Approved): Yes

Status: Click or tap here to enter text.

Requirements Management Plan (Approved): Yes

Status: Click or tap here to enter text.

Stakeholder Management Plan (Draft): Yes

Status: Click or tap here to enter text.

Governance Plan (Draft): Yes

Status: Click or tap here to enter text.

Contract Management Plan (Draft): Choose an item.

Status: Click or tap here to enter text.

Resource Management Plan (Draft): Choose an item.

Status: Click or tap here to enter text.

Change Control Management Plan (Draft): Yes

Status: Click or tap here to enter text.

Risk Management Plan (Draft + Risk Log): Yes

Status: Click or tap here to enter text.

Issue and Action Item Management Plan (Draft + Issue Log): Choose an item.

Status: Click or tap here to enter text.

Cost Management Plan (Approved if planning BCP approved): Choose an item.

Status: Click or tap here to enter text.

4. **Project Roadmap (High-Level)**

Attach a high-level Project Roadmap showing remainder of planning phase and transition into execution phase to the email submission.

a) Planning Start Date: 3/1/2023

b) Estimated Planning End Date: 12/31/2025

c) Estimated Project Start Date: 1/2/2026

d) Estimated Project End Date: 6/30/2027

2.11 Data Cleansing, Conversion, and Migration

If in Section 2.3 (above) the answer to the question "Do you have existing data that must be migrated to your new solution?" was marked "Yes," please complete this section.

The California Department of Technology recommends having a Data Consultant start data cleansing, conversion, and migration activities as soon as possible.

Identify the status of each of the following data activities. If "Not Applicable" is chosen, explain why the activity is not applicable or if "Not Started" is chosen, explain when the activity will start and its anticipated duration:

1. **Current Environment Analysis: Not Applicable**

   As this is a new project, a current environment does not exist.

2. **Data Migration Plan: Not Applicable**

   OEHHA currently does not have an established data conversion/migration strategy that includes well-defined roles and responsibilities to support data conversion/migration, and data governance activities. For this project, OEHHA anticipates two major types of data: 1) scientific data (e.g., National Weather Service weather data), and 2) profile data (i.e, non-PII data such as zip code).

3. **Data Profiling: Not Applicable**

   As this is a new project, there is no data to profile.

4. **Data Cleansing and Correction: Not Applicable**

   As this is a new project, there is no data to cleanse and correct.

5. **Data Quality Assessment: Not Applicable**

   As this is a new project, there is no data to assess for quality.

6. **Data Quality Business Rules: Not Applicable**

   As this is a new project, there are no data quality business rules

7. **Data Dictionaries: Not Applicable**

   As this is a new project, the data dictionaries have yet to be defined

8. **Data Conversion/Migration Requirements: Not Applicable**

   As this is a new project, OEHHA anticipates two major types of data: 1) scientific data (e.g., National Weather Service weather data), and 2) profile data (i.e, non-PII data such as zip code).

2.12 Financial Analysis Worksheets

Attach F.2 Financial Analysis Worksheet(s) to the email submission.

End of agency/state entity document.

Please ensure ADA compliance before submitting this document to CDT.

When ready, submit Stage 2 and all attachments in an email to ProjectOversight@state.ca.gov.

Department of Technology Use Only

Original "New Submission" Date: 1/24/2025

Form Received Date: 1/24/2025

Form Accepted Date: 1/24/2025

Form Status: Completed

Form Status Date: 5/14/2025

Form Disposition: Approved

Form Disposition Date: 5/14/2025