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A. GENERAL INFORMATION

1. Date

2025-04-24

2. Department

California High-Speed Rail Authority

3. Organizational Placement (Division/Branch/Office Name)

Information Technology

4. CEA Position Title

Deputy Chief Information Officer

5. Summary of proposed position description and how it relates to the program's mission or purpose.
(2-3 sentences)

Under the general direction of the Chief Information Officer (CIO), the CEA leads the Enterprise Services and Solutions Delivery Divisions of the California High-Speed Rail Authority's (Authority) Information Technology (IT) Office. In this capacity, the CEA is responsible for developing and implementing technology strategy, policy, and standards to support core business operations, as well as establishing the policies and standards to support the implementation of the specialized operational technologies and integrations required for high-speed rail operations.

Major responsibilities include but are not limited to: leading the development and adoption of architectural standards for platform services, solutions development and integration, and digital innovation; identifying opportunities for and ethical use of Generative Artificial Intelligence (GenAI) solutions to streamline business processes; reducing the potential for error in critical operations; improving service delivery; establishing robust geospatial and data visualization capabilities; and overseeing the ongoing operations of the IT infrastructure, client services, application development and support, project portfolio, and the personnel responsible for those operations.

6. Reports to: (Class Title/Level)

Chief Information Officer (CEA C)

7. Relationship with Department Director (*Select one*)

- ☐ Member of department's Executive Management Team, and has frequent contact with director on a wide range of department-wide issues.
- ☒ Not a member of department's Executive Management Team but has frequent contact with the Executive Management Team on policy issues.

(*Explain*):

Interprets Global, Federal, and State technology policies and standards relative to the delivery of high-speed rail systems in order to develop, implement, and support California's high-speed rail technology policies and standards for safe and efficient rail operations. Frequently advises executive management on the adoption and integration of highly specialized technology required for fully integrated, efficient, and safe rail operations.

8. Organizational Level (*Select one*)

- ☐ 1st ☐ 2nd ☒ 3rd ☐ 4th ☐ 5th (mega departments only - 17,001+ allocated positions)

B. SUMMARY OF REQUEST

9. What are the duties and responsibilities of the CEA position? Be specific and provide examples.

The CEA is responsible for establishing and implementing policies and standards for the adoption of highly specialized operational technologies; overseeing the development of the architectural frameworks required for the integration of those technologies with each other and with the information technology that supports key business applications, where applicable; and providing leadership and direction of the operations and personnel of the Enterprise Services and Solutions Delivery Divisions of the IT Office. Key responsibilities include but are not limited to:

Operational Technology:

- Establishes partnerships and facilitates collaboration with rail system providers and engineers outside of the US to gain insight, hear lessons learned, and inform the selection and implementation of specialized rail technologies.
- Formulates policies and develops roadmaps for the introduction of operational technology into the technology portfolio.
- Works with contracted partners, rail engineers, the Information Security Office, and other subject matter experts to review the applications, configurations, and integrations of proposed rail technologies to ensure compliance with approved standards.

Innovation and Integration:

- Establishes policies and strategies governing the adoption and development of Generative Artificial Intelligence (GenAI), ensuring tools and solutions support the Authority's mission and adhere to ethical guidelines.
- Develops policies and standards for a Common Data Environment (CDE), digital engineering solutions, and data sharing and integration.
- Establishes and oversees a geospatial program inclusive of geographic information systems (GIS); geospatial data modeling; integration with real property, asset management, and other key information systems, and the development of multi-layer visualization of capabilities.
- Establishes policy and develops strategic roadmaps to support innovation and optimizations that increase efficiencies, reduce costs and risks, and improve business operations across the Authority.
- Works with Authority executives to establish enterprise-wide governance for the delivery of new systems and solutions, and the standardization, integration, and visualization of data.

Managerial & Administrative:

- Oversees the management, direction, and deliverables of technical staff, contracted personnel, and vendors responsible for the delivery and operations of core IT services and solutions.
- Oversees the acquisition, delivery, and lifecycle of IT assets; including procurement and contract management activities.
- Establishes performance expectations and standards; supports workforce development; and ensures compliance with state personnel laws and standards.

B. SUMMARY OF REQUEST (continued)

10. How critical is the program's mission or purpose to the department's mission as a whole? Include a description of the degree to which the program is critical to the department's mission.

- ☒ Program is directly related to department's primary mission and is critical to achieving the department's goals.
- ☐ Program is indirectly related to department's primary mission.
- ☐ Program plays a supporting role in achieving department's mission (i.e., budget, personnel, other admin functions).

Description: The Authority is responsible for planning, design, building, and operating the first high-speed rail system in the nation. California's high-speed rail will connect the megaregions of the state, contribute to economic development and a cleaner environment, create jobs, and preserve agricultural and protected lands.

As the program advances toward rail operations, the IT Office must broaden its capabilities and services. The CEA will focus on the development of policies, frameworks, architectures, and standards that support the implementation of advanced digital engineering practices (model-based engineering), enabling collaboration between rail system providers (common data environment), and the introduction and integration of specialized operational technology. The innovation and optimization of existing technology operations is necessary to support the advanced requirements associated with the implementation of the tools and technologies required for modern engineering practices.

Further effective enterprise-wide governance, portfolio management, and analytics will ensure strategic alignment and efficient delivery by streamlining and enhancing operations, optimizing resources, and enabling well-informed decision making that is crucial to fulfilling the Authority's mission.

B. SUMMARY OF REQUEST (continued)

11. Describe what has changed that makes this request necessary. Explain how the change justifies the current request. Be specific and provide examples.

The Authority is rapidly advancing toward operations of the high-speed rail system. The IT Office must broaden its capabilities in order to provide the technologies and services required to support advanced, modern engineering standards and practices and the adoption and integration of specialized rail technologies. The CEA will establish the policies and standards that will guide the work that is crucial at this stage of the program.

Advanced architecture designs must be developed to ensure solutions can exchange information required for interoperability. Data flows must overlay the system architecture to further support efficient operations. required for the interoperability, integration, and effective operation of the systems and data.

A robust geospatial program must be developed that will provide a multilayer view of any location along the high-speed rail alignment. Executives, construction managers, asset managers, and more will be able to "click" on a location or asset and see all details of the area including parcel information, utility locations, asset data, and more through an interactive viewer that allow the user to focus on specific elements or components as needed. Existing computer-aided design drawings (CADD) will be converted from 2D to 3D and integrated with geospatial data and asset information using Building Information Modeling (BIM) technology to develop 3D models. Those models and the underlying data are the foundation of digital twins. Digital twins are virtual representations of physical assets, maintained in real-time.

Policies and standards, along with keen oversight of the adoption of ethical GenAI technologies will support operational efficiencies across the organization, potentially reducing cost and facilitating faster delivery of services.

These advancements in the IT Office are designed to ensure enterprise-wide program governance and integration, and support executive decision-making and control of the overall delivery of the rail system.

C. ROLE IN POLICY INFLUENCE

12. Provide 3-5 specific examples of policy areas over which the CEA position will be the principle policy maker. Each example should cite a policy that would have an identifiable impact. Include a description of the statewide impact of the assigned program.

The Authority is a State entity within the California Transportation Agency (CalSTA); however, its mission of delivering the first high-speed rail system in the nation differentiates it from other State entities. While technology supporting the business operations of the Authority is relatively standard; the systems, architecture, integrations, and services required to support rail operations are new to the State and the US. The new CEA will be the principal policy maker for:

1. Operational Technology: Train control systems, track power, signaling systems, environmental and seismic sensors, and more require specialized technology to function and communicate critical information within the rail system and externally, as required. The impact of a breakdown in communication can range from minor, such as a schedule delay, to catastrophic, such as a collision or derailment. The CEA will develop policy and set technical standards designed to ensure the control systems and components are able to exchange critical information that enable the safe and efficient operation of the rail system.

2. Digital Transformation: The CEA will engage with an array of stakeholders and subject matter experts, including civil engineers, track and system operators, station designers, geotechnical engineers, and others to establish a strategic roadmap and policies for digital integration. Development of the roadmap will require the CEA to formulate and implement policies and standards that support advanced visualization of geospatial information and other data, implementation of model-based engineering tools, and the development of a common data environment where all design, construction, and rail system providers can collaborate using digital twins. Digital twins are real-time virtual replicas of physical environments, systems, system components, and other assets that provide an interactive platform to collaborate, create simulations, and monitor their physical counterparts. These capabilities enable better decision making and risk assessment and provide real-time analysis of the structural integrity and performance of an asset, system component, or the system as a whole.

3. Generative Artificial Intelligence (GenAI): The CEA will establish the policies, strategies, and procedures for the adoption of GenAI tools across the Authority's technology portfolio. Policies will align with the Governor's Executive Order N-12-23 which directs state entities to accelerate services via the responsible use of GenAI. The development and/or acquisition of AI tools will accelerate the discovery and standardization of data; provide analysis of financial, risk, and other information; and much more. Leveraging AI technologies will create efficiencies, increase accuracy, inform decision-making, and ultimately enable streamlined operations and delivery of the rail system.

General technology Policy Development: The CEA will establish the technology policy, strategy, implementation, and operations of the systems, tools, and services that support these advanced capabilities that are core to the Authority's mission.

Impact: These initiatives will enable the safe and efficient operations of the first high-speed rail system in the nation; improve decision-making across the organization and oversight authorities, such as the legislature, by providing accurate and reliable data to support mandatory and ad hoc reporting; and support technological innovations that will streamline business processes and enable real-time visualization of rail operating systems and components.

C. ROLE IN POLICY INFLUENCE (continued)

13. What is the CEA position's scope and nature of decision-making authority?

The CEA will have a broad range of responsibilities, including the development and implementation of the policies and standards associated with Gen AI, digital engineering, geospatial and data visualization, and operational technology; compliance with these policies and standards; oversight of the development of solution and data architectures; and digital and data integration. The CEA will provide strategic direction of the development and implementation of advanced technologies and the innovations required to support a fully integrated organization.

The CEA's authority encompasses the full range of activities associated with the delivery of the systems and solutions required for Authority operations, the infrastructure that supports those solutions, and the customer support of business applications and end user devices.

The CEA is a technical expert and will play a crucial role in strategic planning, developing technology roadmaps, and managing technical staff and resources.

While the position reports to the CIO, the decisions made by the CEA are critical to the Authority's mission and can impact funding opportunities, stakeholder and public perception, litigation, and public safety.

14. Will the CEA position be developing and implementing new policy, or interpreting and implementing existing policy? How?

The new CEA will review and become well-informed on Federal and State policies and technology standards in place for high-speed railway systems across Europe, Asia, and other parts of the world. Interpretation of existing policies and global standards will inform the development and implementation of new policies and standards for the innovations and advancements required for the delivery of the California high-speed rail system.