Building a more inclusive and sustainable California:

Maximizing the federal infrastructure funding opportunity

Summary of stakeholder feedback and recommendations

May 2023

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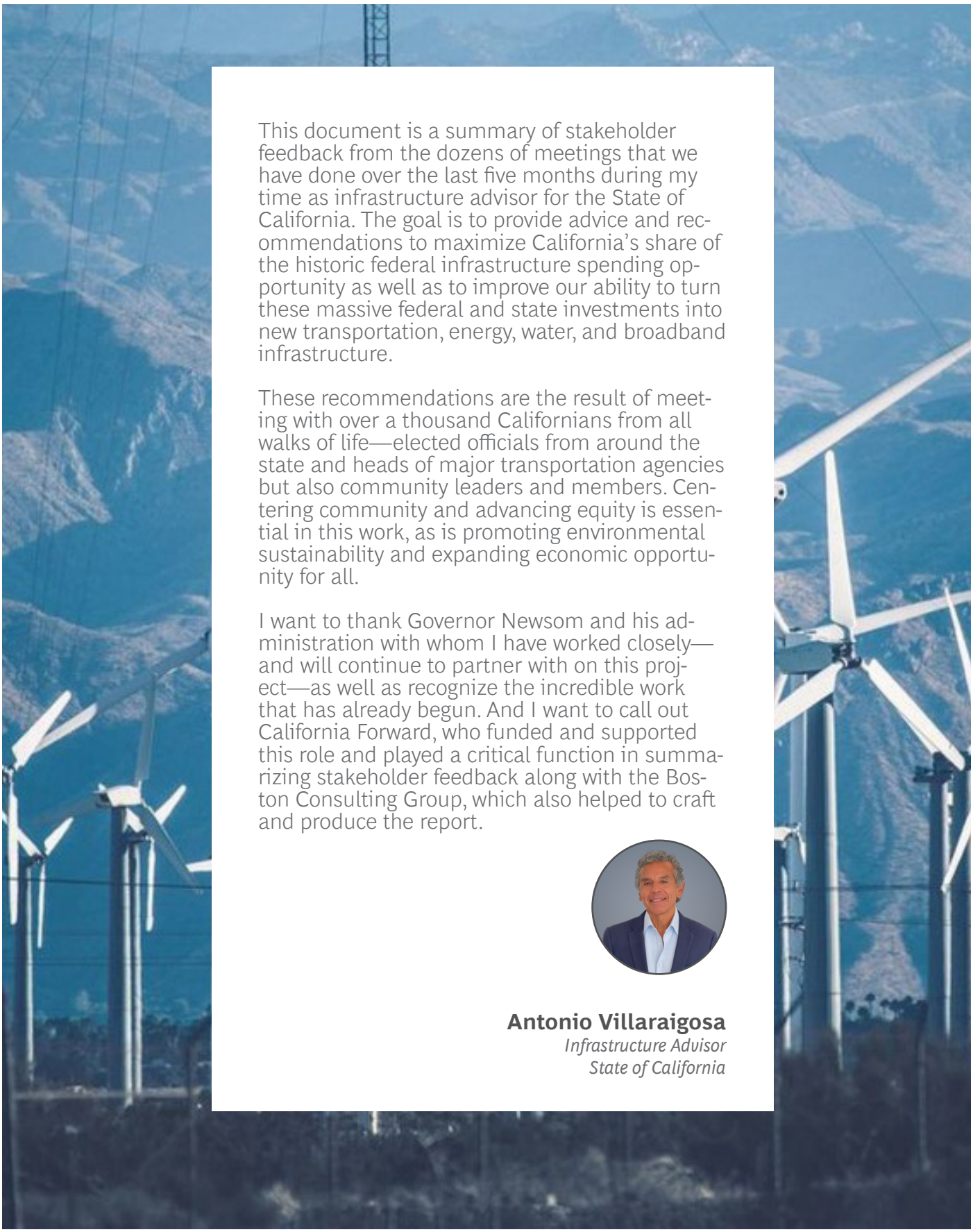
Open letter to California leaders and stakeholders



This document is a summary of stakeholder feedback from the dozens of meetings that we have done over the last five months during my time as infrastructure advisor for the State of California. The goal is to provide advice and recommendations to maximize California's share of the historic federal infrastructure spending opportunity as well as to improve our ability to turn these massive federal and state investments into new transportation, energy, water, and broadband infrastructure.

These recommendations are the result of meeting with over a thousand Californians from all walks of life—elected officials from around the state and heads of major transportation agencies but also community leaders and members. Centering community and advancing equity is essential in this work, as is promoting environmental sustainability and expanding economic opportunity for all.

I want to thank Governor Newsom and his administration with whom I have worked closely—and will continue to partner with on this project—as well as recognize the incredible work that has already begun. And I want to call out California Forward, who funded and supported this role and played a critical function in summarizing stakeholder feedback along with the Boston Consulting Group, which also helped to craft and produce the report.

Antonio Villaraigosa
Infrastructure Advisor
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Acknowledgments

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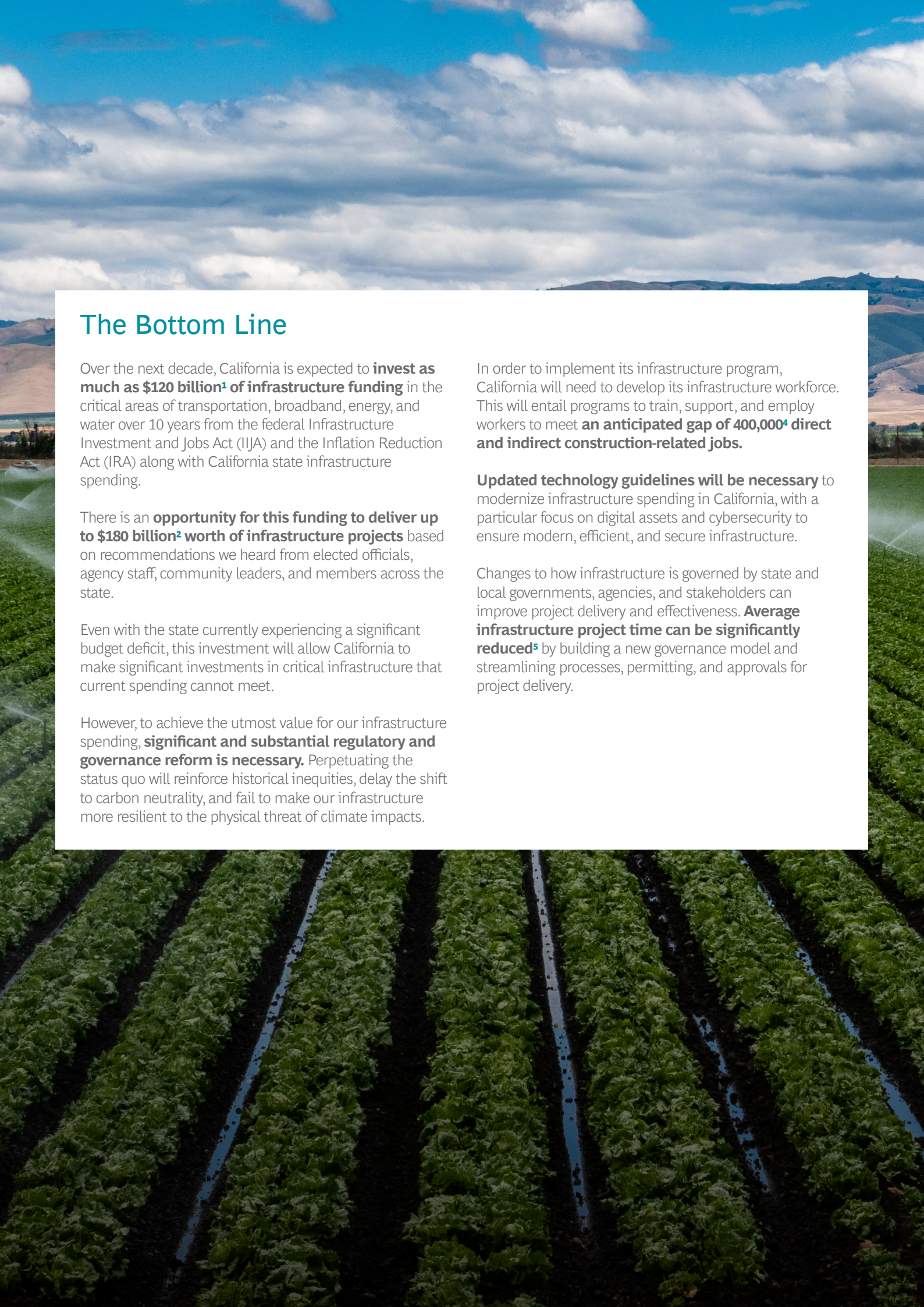
Thank you also to the California Stewardship Network and California Forward Leadership Council for their insights.

Finally, special thanks to the many participants who attended meetings and workshops and shared their perspective on their community's infrastructure needs and opportunities. The analysis and potential actions described herein can only succeed through partnership with the community members, organizations, public agency staff, elected officials, and other key actors who collectively help shape, plan, fund, design, build, and ultimately use the infrastructure of California.



The Bottom Line

Over the next decade, California is expected to **invest as much as $120 billion[1] of infrastructure funding** in the critical areas of transportation, broadband, energy, and water over 10 years from the federal Infrastructure Investment and Jobs Act (IIJA) and the Inflation Reduction Act (IRA) along with California state infrastructure spending.

There is an **opportunity for this funding to deliver up to $180 billion[2] worth of infrastructure projects** based on recommendations we heard from elected officials, agency staff, community leaders, and members across the state.

Even with the state currently experiencing a significant budget deficit, this investment will allow California to make significant investments in critical infrastructure that current spending cannot meet.

However, to achieve the utmost value for our infrastructure spending, **significant and substantial regulatory and governance reform is necessary.** Perpetuating the status quo will reinforce historical inequities, delay the shift to carbon neutrality, and fail to make our infrastructure more resilient to the physical threat of climate impacts.

In order to implement its infrastructure program, California will need to develop its infrastructure workforce. This will entail programs to train, support, and employ workers to meet **an anticipated gap of 400,000[4] direct and indirect construction-related jobs.**

Updated technology guidelines will be necessary to modernize infrastructure spending in California, with a particular focus on digital assets and cybersecurity to ensure modern, efficient, and secure infrastructure.

Changes to how infrastructure is governed by state and local governments, agencies, and stakeholders can improve project delivery and effectiveness. **Average infrastructure project time can be significantly reduced[5]** by building a new governance model and streamlining processes, permitting, and approvals for project delivery.

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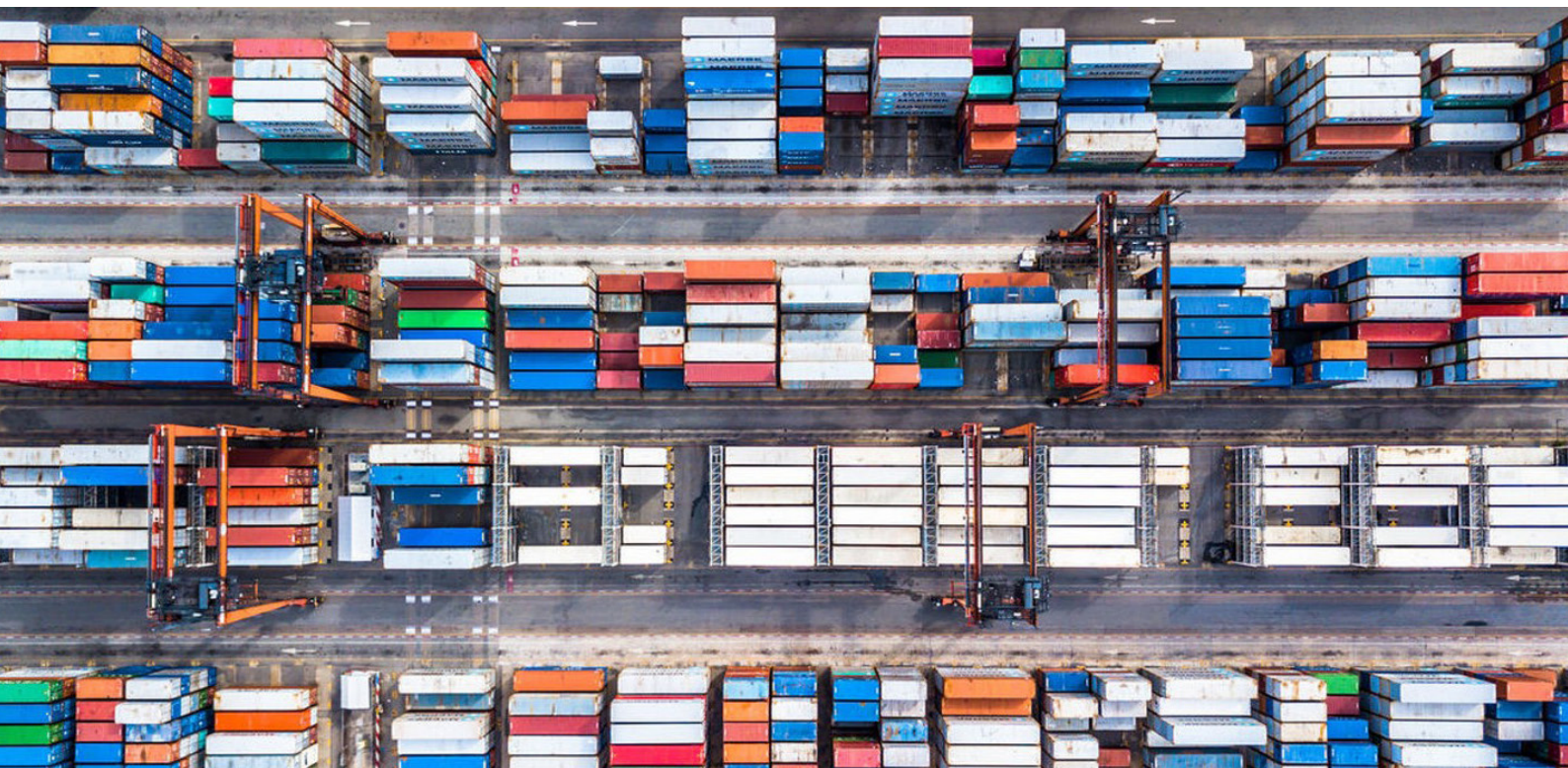
Executive summary

High-functioning infrastructure is a prerequisite for a prosperous and inclusive society that delivers high-quality, middle-class jobs. However, California's infrastructure has not always met the needs of its communities or created equitable access, often dividing them in ways that are still visible today. Furthermore, for decades California has under-invested in infrastructure and faces potentially hundreds of billions of dollars in infrastructure investment need, that current funding cannot meet. Our current infrastructure delivery can be slow and complex, and without a new approach, we may perpetuate historic inequities, delay the shift to carbon neutrality, and fail to make our infrastructure more resilient to the physical threat of climate impacts. Governor Newsom has committed to rebuilding California's clean energy future and addressing these needs.

The State of California has demonstrated its ability on many occasions to deliver infrastructure in a focused, accelerated manner after significant disasters like the Paradise fire & Dixie fires – with focused resources and streamlined delivery, and projects like the Oroville spillway rebuild. The state with strong leadership from the Governor and his administration, has already made significant progress reducing the broadband approval process 50%+ (from 33 to 16 months) with additional efforts in work to drive that down to 11 months. The focus of this effort is to provide direction to leverage those competencies at a significantly larger scale, ensuring an accelerated deployment of the unprecedented size of the IIJA / IRA infrastructure program.

California is set to invest as much as ~$120 billion[7] of funding in infrastructure over the next 10 years from the federal Infrastructure Investment and Job Act (IIJA) and Inflation Reduction Act (IRA), plus state infrastructure funding. This report summarizes concrete recommendations we heard from elected officials, agency staff, and community leaders and members across the state to maximize and amplify the upcoming federal funds and accelerate project delivery. By acting now, the state could deliver up to $180 billion[8] worth of infrastructure projects and ~400,000[9] direct and indirect construction jobs. Average infrastructure project time can be significantly reduced[10] by building a new governance model and a replicable framework to standardize and coordinate planning, as well as streamlining processes, permitting, and approvals for delivery. Finally, by integrating the principles of equity, climate, and shared prosperity in infrastructure development and delivery, California can shape a more modern, prosperous, resilient, and inclusive economy that centers community voice and priorities. This journey will be one that California will need to take on over the next decade with some actions happening faster than others – but with sustained commitment will build the foundation to continue to propel the state forward..

6. The American Society of Civil Engineers (ASCE) defines critical infrastructure as systems, facilities, and assets so vital that their destruction or incapacitation would have a debilitating impact on national security, the economy, or public health, safety, and welfare.
7. Based on $46 billion from IIJA formula funding, $47 billion from CA state funding, and $28 billion from IIJA & IRA discretionary funding (see Chapter 2.1 for further details).
8. Based on $46 billion from IIJA formula funding, $47 billion from CA state funding, $28 billion from IIJA and IRA discretionary funding
9. Estimated incremental direct/indirect construction workforce demand from IIJA, IRA, and state funding through 2032 (see Chapter 2.1 for further details).
10. Based on taking proposed actions across the lifecycle of infrastructure delivery to streamline and accelerate development (see Chapter 5.3 for further details).



Chapter 1 | Introduction and approach

1.1 Scope of this report

This report sets out with three goals:

1. **Continue to build our approach to infrastructure** to ensure we put equity and inclusion, climate resilience, and shared prosperity as core outcomes.

2. **Continue to organize across California** to ensure we are competitive in accessing discretionary federal funds and bringing in private investment.

3. **Accelerate the planning and delivery of infrastructure** by taking advantage of proven State of California competencies at scale to make sure infrastructure projects are built better, faster, and with greater transparency.

1.2 New federal funding addresses many aspects of America's physical infrastructure

The scope of infrastructure considered in this report broadly aligns with the aspects of physical infrastructure directly impacted by the new federal funding:

- **Transportation:** Rebuild and improve California's transit systems, roads, bridges, rail, ports, and airports.

- **Water:** Expand access to potable water and ensure sufficient water supply for residential, commercial, and agricultural uses.

- **Energy:** Continue to incentivize investment in zero-carbon energy, clean tech, and needed transmission infrastructure.

- **Broadband:** Ensure every Californian has access to high-speed internet.

- **Climate restoration and electrification of vehicles:** Accelerate transition to green modes of transportation and economic engines, including electrification of vehicles

1.3 Meetings and engagements about infrastructure held across California's economic regions

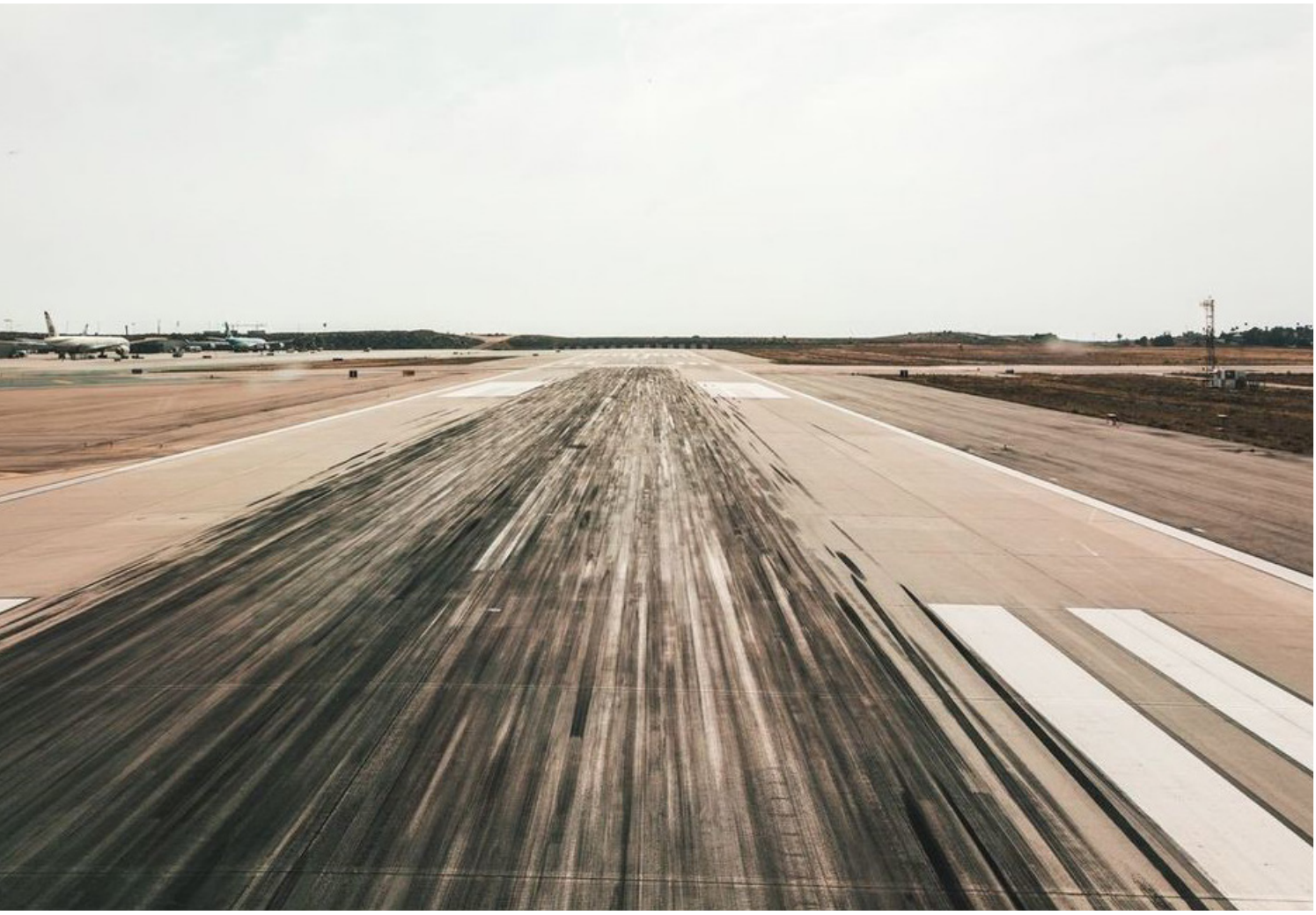
Over the second half of 2022, former Los Angeles mayor and current state Infrastructure Advisor to the Office of the Governor Antonio Villaraigosa engaged with more than 1,000 stakeholders across 50-plus engagement sessions to solicit opinions from a broad set of stakeholders and ensure our recommendations reflect community values. Participants represented elected officials (state senate, assembly, supervisors, council members, mayors), community representatives, labor officials, environmental stakeholders, public agency staff, and business leaders.

Participants provided feedback and recommendations on issues they encounter with infrastructure, examples of best practices that could scale, and suggestions for embedding principles of equity, climate resilience, and shared econo-mic prosperity in infrastructure delivery. In this report, we have synthesized community input into a set of concrete ideas, actions, and several long-term recommendations that the state can continue to work towards.

Equity: Incorporate community stakeholders who will be most impacted by a project in decision-making activities such as policy development, investment opportunities, and governance from start to finish and continue to develop in accordance with the Justice40 ambitions. This is vital to building trust and buy-in, demonstrating a commitment to transparency and accountability, and minimizing obstructionism and supporting project expediency and cost savings.

Economy: Ensure that infrastructure projects yield economic opportunities for members from the most impacted communities. This includes securing good-paying, middle-class jobs for these residents through training programs that facilitate access to those jobs. Ensuring that BIPOC entrepreneurs and small-business owners have access to procurement opportunities related to infrastructure projects was important to many who provided feedback as well.

Environment: Leverage these historic infrastructure investments to make communities more resilient to the effects of climate change. We must ensure environmental justice considerations to make sure that all communities benefit from climate-resilient projects and that any negative impacts of these projects are not concentrated in select historically disadvantaged communities.



Chapter 2 | The opportunity of a lifetime to transform California's infrastructure

Key questions: *Why is this strategy needed now? How can we ensure this strategy meets our equity, climate resilience, and economic goals?*

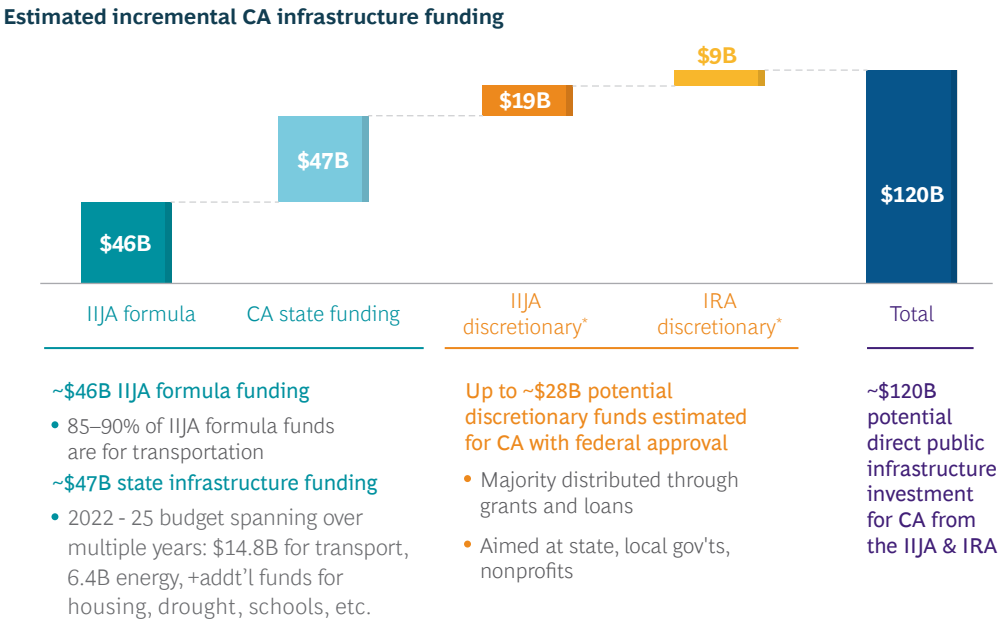
2.1 A generational investment in California's infrastructure

High-functioning infrastructure is a prerequisite for a prosperous and inclusive society that delivers high-quality middle-class jobs. Our infrastructure has historically strengthened communities—but also divided them. For decades we have underinvested in infrastructure and now face major deficiencies in many areas. There is now an unprecedented infrastructure funding opportunity before us, and by taking a new approach, we can build on California's early successes, and we open the possibility to realize the full value of this infrastructure investment. By preparing our state for the shift to carbon neutrality, we can leave behind perpetuating historical inequities sufficiently increase resilience to climate impacts, and build the foundation for new economic engines.

The state of California is set to receive and invest up to $120 billion[11] in infrastructure over the next 10 years from the Infrastructure Investment and Jobs Act (IIJA), Inflation Reduction Act (IRA), and state infrastructure spending, representing an approximately 30% increase[12] in infrastructure capital expenditure over the same period. On top of this, $10 to $20 billion in IRA tax credits are expected to flow to California clean energy projects from the Inflation Reduction Act, which will spur significant private sector investment in clean energy infrastructure (Exhibit 1).

The new infrastructure funding is expected to generate 400,000 direct and indirect construction jobs through 2032, with the majority of capacity needed before 2026 (Exhibit 2). This represents a huge opportunity to create well-paying middle-class jobs for Californians, so it is imperative that labor-, public-, and private-sector actors work together to ensure California meets this workforce demand.

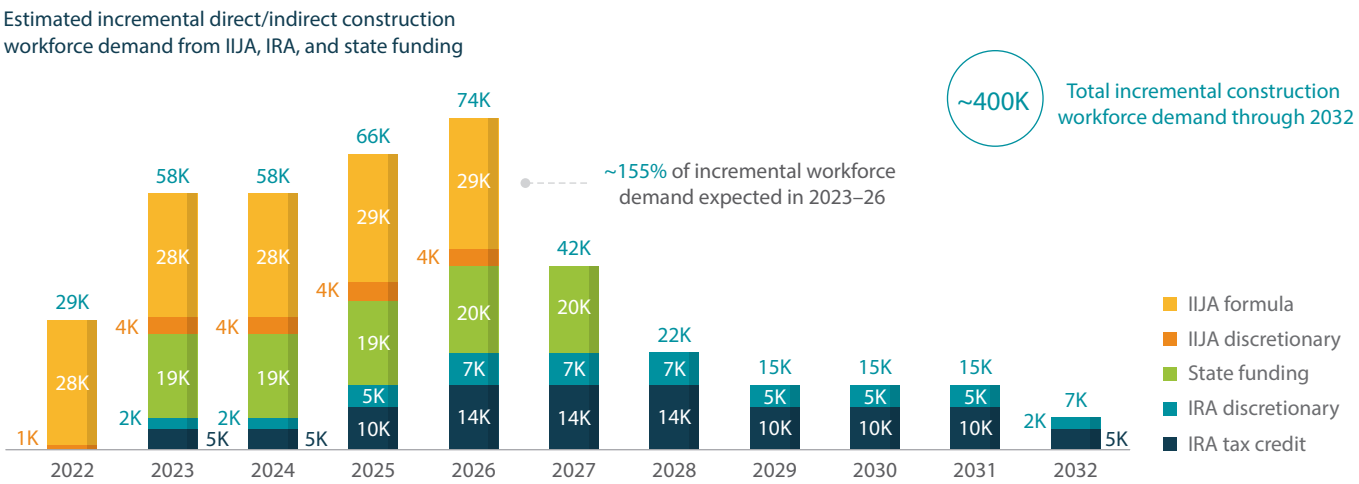
Exhibit 1: Estimated up to $120B of new federal and state infrastructure funding for California over next 10 years



Source: ASCE 2019 CA Infrastructure Report Card; BPC State Matching datasheet; White House IIJA Fact Sheet; White House IRA CA Fact Sheet; BCG Analysis.

*Estimated assuming CA receives funding proportional to formula allocation; IIJA = Infrastructure Investment and Jobs Act; IRA = Inflation Reduction Act

Exhibit 2: New infrastructure funding expected to create demand for ~400K new California jobs



Source: Moody's Analytics, Political Economy Research Institute, White House Fact Sheet, BCG analysis.

Note: Full detail of workforce demand estimate in appendix; estimated based on direct/indirect jobs demand created, does not include induced demand. Used incremental funding for IIJA formula.

2.2 California can be a leader in building infrastructure to meet social, climate, and economic goals

IIJA and IRA funding directly address equity, climate resilience, and shared economic prosperity through dedicated funding programs (e.g., the Broadband Equity, Access, and Deployment Program, funding for climate resilience programs) as well as tax incentives that require prevailing wages, apprenticeships, and investment in low- income communities. The Justice40 initiative within the IIJA made it a goal that 40% of the benefit of certain federal investments flow to disadvantaged communities. California has already begun to demonstrate its commitment to meeting the high standards and ambitions set out in Justice40 initiative, leading the way with work on the CalEnviroScreen tools and methodology which build a foundation to understand the environmental impacts in specific counties, cities and zip codes. This visibility will increasingly allow California and stakeholders at the state, county and city level to continue to mitigate climate impacts on those historically disadvantaged communities.

To continue building on this progress, the state, counties, cities, and agencies will need to demonstrate how funds will flow to disadvantaged communities and be able to undertake quantitative assessments and engagement to understand and tailor projects to local needs.

Principle	How infrastructure can help meet principles
Equity & inclusion	• **Embed equity and address historic inequities.** Maximize investments to historically disinvested communities and continuing to track impacts to ensure meeting the Justice40 Initiative ambitions, and expanding opportunities for BIPOC[14] and SMB contractors. • **Incorporate community voice in an inclusive process with democratic decision-making.** Include impacted communities at the table from the start.
Climate & sustainability	• **Support the state's shift to a carbon-neutral economy.** Look at macro environmental impacts of projects and reduce fossil fuel reliance and greenhouse gas emissions. • **Strengthen climate resilience.** Infrastructure designed for adaptation, located to minimize environmental risks from wildfires, coastal erosion, flooding, etc. • **Be "shovel-worthy, not just shovel-ready."** Prioritize funding for projects that push the needle on sustainability and/or have multiple benefits such as infrastructure for infill housing. • **Measure and track impacts.** Continue to build and develop tools (e.g. CalEnviro-Screen) to understand and mitigate climate impacts on historically underserved communities.
Economic prosperity	• **Strengthen regional economic prosperity.** Use infrastructure to support regional economic goals and planning such as supporting growth of new industries and implementation of CERF[15] regional plans. • **Support career pathways to high-quality jobs building infrastructure.** Example: Scale the education training pipeline. • **Provide Californians with access to high-quality middle-class jobs in all regions.** For example, connect households and businesses to broadband internet to enable job growth and telework.

14. BIPOC = Black, Indigenous, and people of color.

15. CERF = Community Economic Resilience Fund.

Chapter 3 | What we heard: Current state of CA infrastructure and core issues to address

Key questions:

What is the current state of California infrastructure? What macro issues regarding our infrastructure must we address?

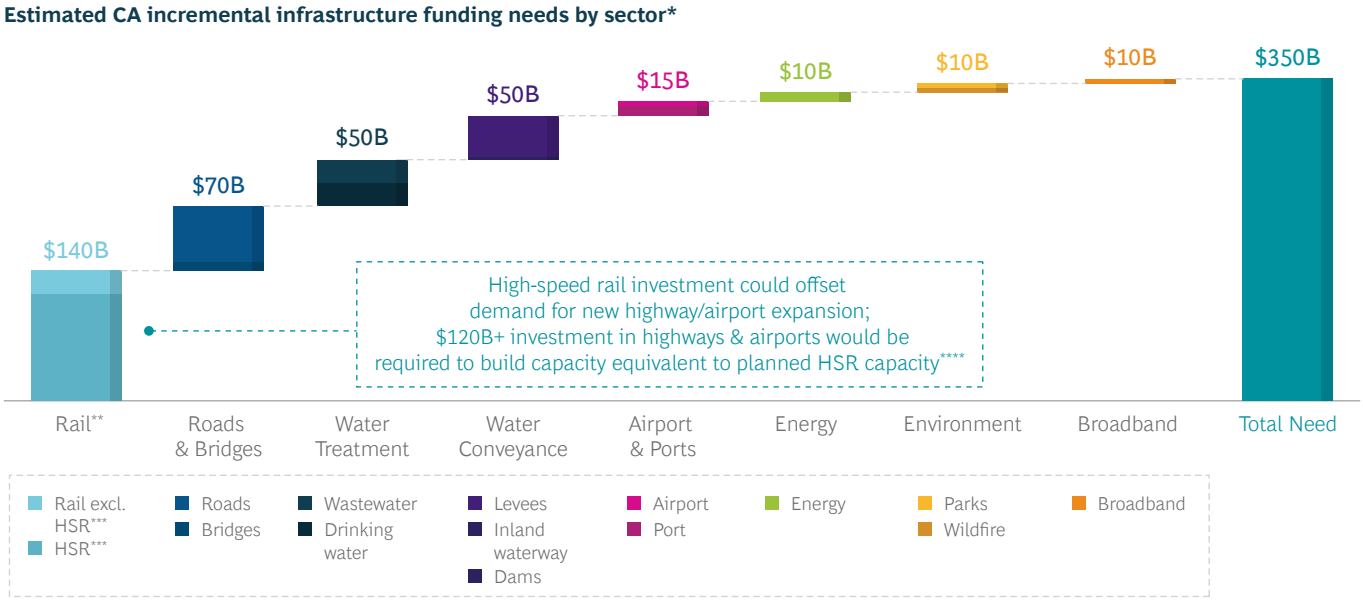
California needs significant, long-term investment in its critical infrastructure over the next decade and beyond. In one estimate, California needs up to $350 billion[17] to meet critical infrastructure needs over the next 10 years. Transportation and water represent more than 90% of the identified funding need, which includes rail (including high-speed rail, $140 billion), roads and bridges ($70 billion), and water treatment and conveyance ($100 billion combined). (Exhibit 3).

17. ASCE 2019 Report Card for California's Infrastructure.

Transportation and water represent more than 90% of the identified funding need, which includes rail (including high-speed rail, $140 billion), roads and bridges ($70 billion), and water treatment and conveyance ($100 billion combined). (Exhibit 3).

Historically, infrastructure in California is pursued independently with limited collaboration across jurisdictions. This has impeded the state from planning an integrated infrastructure portfolio to maximize the impact of infrastructure funding. As California and the Newsom administration make historic future investments in infrastructure – in spite of significant budget deficits this year – there will need to be trade-offs made across categories of infrastructure and across jurisdictions to deliver the best possible project allocation to support the long-term goals and prosperity for all Californians.

Exhibit 3: California infrastructure needs estimated ~$350B across state, county and local funding sources



Source: ASCE 2019 CA Infrastructure Report Card; BPC State Matching datasheet; White House IIJA Fact Sheet; White House IRA CA Fact Sheet; BCG Analysis.

*Estimated assuming CA receives funding proportional to formula allocation; IIJA = Infrastructure Investment and Jobs Act; IRA = Inflation Reduction Act.

**Rail includes transit (transit consists of electrification of bus fleets).

***HSR = High-speed rail.

****CA High-Speed Rail Authority "High-Speed, High-Capacity Transportation," 2022.

3.1 Current California infrastructure delivery is a slow, complex process that increases cost and overruns

Pain points across the infrastructure project life cycle lead to cost and schedule overruns, and ultimately lower the value delivered to Californians. It is vital that stakeholders across the state work together to address these issues (Exhibit 4).

3.2 3.2 New capital investment could potentially create up to ~$25B in additional operating spend in California

California spent around $110 billion[19] in 2021 across mass transit, roads and bridges, water systems, ports and airports, energy, environment, and education facilities, inclusive of federal, state and local taxes, and revenues. This includes approximately $35 billion of capital investment and $75 billion in annual operating expenses per year (Exhibit 5).

Exhibit 4: Current California infrastructure delivery is a slow, complex process that increases cost and overruns

Issues to address across the infrastructure project lifecycle

Plan

Identifying and defining projects to deliver

- Many communities lack expertise to understand needs and identify projects that address needs, leading to suboptimal project selection
- Projects are identified individually and reviewed in siloes, which is both a complex, slow process and creates unbalanced project portfolios that do not meet all needs across a community

Fund

Securing & allocating funding and financing for projects

- Not enough public funding to meet all of California's infrastructure needs
- No coordinated effort to match projects to funding, creating local competition and inefficient funding allocation
- Insufficient local resources to maximize discretionary funds (e.g., technical assistance)
- Lack of authority and expertise to leverage alternative financing (e.g., public-private partnerships)

Review & Approve

Reviewing projects for permits and approvals

- Slow, expensive, process to apply for environmental reviews risks overall project delivery
- Concerns not related to environmental protections use challenge process to prevent development
- Uncoordinated review process across multiple agencies compounding delays

Deliver

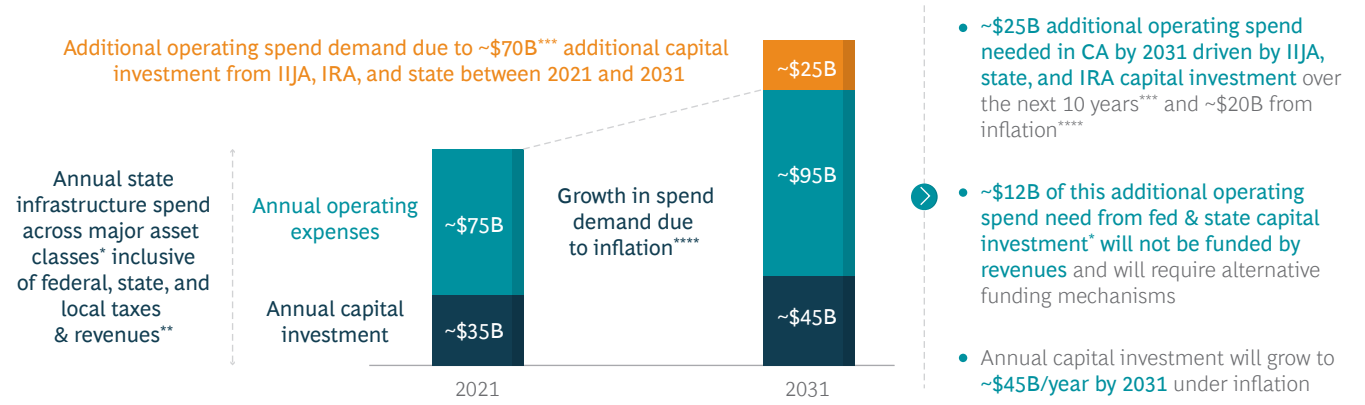
Procuring and delivering projects

- Lack of qualified public and private sector staff and limited technology (e.g., BIM, cybersecurity, data) to deliver complex infrastructure leads to higher risk, costs, and overruns
- Current procurement processes do not always ensure high quality projects and will not meet climate or equity goals
- Operational and maintenance expenses are not planned for in project delivery, leading to future unfunded costs

19. Based on CA State Controller's Office local government financial data for 2021, CA state agencies' annual budget and capital spending reports, and state & local finance reports reported by CA Legislative Analyst's Office.

Exhibit 5: New capital investment could potentially create up to ~$25B in additional operating spend in California

CA infrastructure spend need 2021–31



Source: CA state agencies' annual budget and capital spending reports; state and local finance report by CA Legislative Analyst's Office; Federal Reserve; CA state financial reporting website; BCG analysis.

*Mass transit, roads & bridges, water systems, ports, airports, energy, environment, broadband, and education facilities.

**Revenues make up ~70% of CA infrastructure spend (~90% local revenues); taxes make up 30% of CA infrastructure current spend across federal, state, and local tax receipts.

***~$70B incremental capital investment from IIJA, state, and IRA over 10 years based on net new funds (i.e., not reallocations) and funds that will increase needs for operational expenses (e.g., by expanding capacity vs. rehabilitation).

****Inflation rate estimates (Personal Consumption Expenditures index) from Federal Reserve are 5.4% in 2022, 2.8% in 2023, 2.3% in 2024, and 2% every year after.

Inflation is expected to add some $30 billion[20] to the state infrastructure spend demand. We project that the expanded infrastructure capacity driven by the $70 billion in incremental infrastructure capital investment (not reallocations) from the IIJA, IRA, and state budget could potentially lead to an additional up to $25B in operating expense demand by 2031.

Additionally, transportation faces particularly acute operating cost challenges. As electric vehicle sales and corresponding VMT revenues increase, we project gas and diesel tax revenues to plateau and potentially begin declining. Similarly, the expiration of federal COVID relief operating funds and reduction in ridership revenues will cause a decrease in transit funding - both of these impacts will require transportation and transit to rethink ways to increase its efficiency in managing operating and maintenance costs.

However California has already begun taking steps to mitigate this potential impact changing the way it builds infrastructure - including examples in broadband where operating and maintenance costs are being incorporated in initial capital expenditure outlays. There are significant opportunities in other ares to explore this type of innovative approach to funding O&M needs in transportation and energy that California is already exploring.

These pressures will continue to open up opportunities coupled with new technological advances for California to explore new avenues to continue to optimize operating and maintenance (O&M) spend via innovative approaches. Strategies such as transformative asset management and increased efficiency of maintenance resources can unlock new capabilities for California to achieve a higher return on every dollar of O&M spend and minimize the acceleration of future operating expenditures.

Against this backdrop of escalating funding challenges, California has set a commitment to achieve economy-wide carbon neutrality by 2045. This is only possible through decarbonization of transportation and reductions in driving made possible in part with a viable transit system.

Given this backdrop California will need to expand its future potential options. While it is still a potential problem - with strong leadership and focus on continuing the work of increasing efficiency of infrastructure O&M spend over the next decade - California can and will position itself to solve these potential issues before they become pressing problems.

20. Federal Open Market Committee economic projections, The Federal Reserve (September 2022).

3.3 Infrastructure has historically divided communities along racial and socioeconomic lines

Investment in infrastructure, particularly highways, has created inequitable results for communities across California. In particular, the construction of federal interstate highways, state highways, as well as some county and local roads across California resulted in the destruction and displacement of tens of thousands of homes and businesses. These projects divided existing communities—many working-class communities of color—whose residents now experience higher rates of pollution and other impacts such as asthma and traffic fatalities.

Public agencies are increasingly acknowledging the harm these highway investments and accompanying racist policies created. For example, the California Transportation Commission released the following racial equity statement in 2021:

"New highways [in the mid-twentieth century] were frequently **constructed through predominately Black, Latino, Asian, and low-income neighborhoods** to meet the needs of primarily white suburban commuters, and through tribal lands. Racist policies and decisions also influenced the siting of other types of transportation infrastructure.... The results of racial segregation and disinvestment of transportation funds in communities of color are **still visible in cities today.**

–California Transportation Commission Racial Equity Statement

3.4 Climate change is damaging California's infrastructure today, and investment is required to build resilience

California recognizes climate change is not only an existential threat to the state's future but one with real and tangible impacts today. In recent years, California has been impacted by the most destructive wildfires on record, with significant flooding soon after. The frequency and intensity of these events are forecasted to increase with significant impacts on infrastructure. Climate change impacts will include:

Higher temperatures and extreme heat events. Temperatures across the state are projected to increase by 6.5F by 2100, and the number of extreme-heat days are expected to increase six- to seven-fold.[21] This will lead to increased buckling and rutting of roads under heat waves, require relocation of facilities most at risk from extreme heat, such as schools, and decrease the life expectancy of asphalt by 15–35%.[22]

Flooding due to extreme precipitation. Less frequent but more intense storms, combined with increased rain versus snow, will drive increased flooding in future decades, with runoff projected to increase by some 50%.[23] This will lead to damage to transit, rail, and road infrastructure while exposing some $1.5 billion of electricity assets, $1 billion of roads, and 1,300 miles of levees to flooding damage in the Sacramento-San Joaquin Delta and Suisun Marsh areas alone.[24]

More severe wildfires. Increases in available combustible fuel caused by warmer, drier conditions are increasing wildfire destruction, with 18 of the 20 most destructive wildfires occurring since the year 2000, and it is projected that wildfires that burn more than 25,000 acres will increase 50% by 2100.[25] Around 1 million structures in California are located in areas classified as very high risk from wildfires,[26] while 7,000 centerline miles of state highway are exposed to medium- to very-high wildfire risk areas.[27]

Coastal flooding and erosion. Sea level is projected to rise by 7–10 feet along the coast of California by 2100,[28] leading to damage and destruction of coastal roads, railways, bridges, and other critical infrastructure. Thirty-six California wastewater treatment plants, for example, will be exposed to flooding with a 6-foot sea level rise.

21. Climate Change Impacts Across California: Crosscutting Issues, Legislative Analyst's Office (April 2022).
22. Climate Change Impacts Across California: Transportation, Legislative Analyst's Office (April 2022).
23. See Footnote 17.
24. Delta Adapts: Creating a Climate Resilient Future - Sacramento San Joaquin Delta Climate Change Vulnerability Assessment, Delta Stewardship Council (January 2021).
25. See Footnote 17.
26. See Footnote 17.
27. Caltrans Climate Change Vulnerability Assessment Statewide Summary Report, Caltrans (2021).
28. See Footnote 17.

Chapter 4 | What we heard: proposed actions to meet the opportunity

Key questions: *What did stakeholders raise as core issues and deficiencies in California infrastructure? What strategic actions did stakeholders propose to address these challenges?*

A framework to maximize the federal infrastructure funding opportunity and build a more inclusive and sustainable California

We have identified 11 discrete action areas across the infrastructure project life cycle (plan, fund, review and approve, deliver) as well as the cross-cutting enablers (workforce, technology) and governance structures needed to deliver. This framework embeds the principles of equity and inclusion, climate and sustainability, and economic prosperity into how California delivers infrastructure.

The framework above is intended to provide a comprehensive list of actions to be considered by the State Executive branch and Local governments. We believe the major priorities to focus on are concentrated in four key areas:

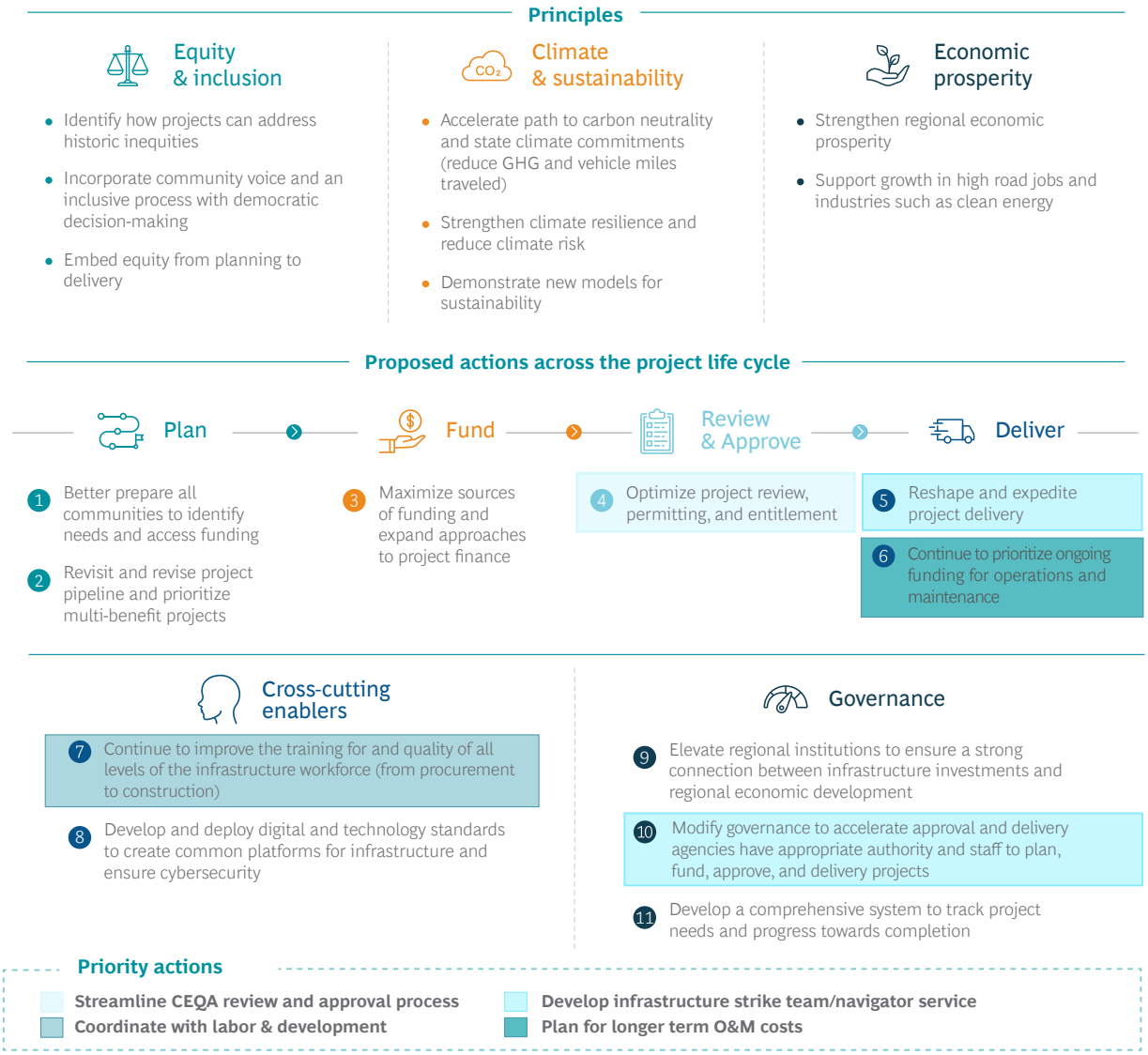
1. Streamlining of CEQA review and approval process including compressing timelines judicial review

2. Developing an infrastructure strike team to guide and coordinate critical infrastructure projects through review, development, and delivery

3. Coordinating with labor and development on key agreements to ensure benefits of the infrastructure program remain in California

4. Planning for the longer term O&M costs through the infrastructure development process including improved efficiency of deployed asset management resources

A framework to maximize the federal infrastructure funding opportunity and build a more inclusive & sustainable California



For each action area, we have synthesized a range of sub-actions that can be utilized to drive progress across the infrastructure delivery life-cycle along a spectrum of timelines across all levels of government.

Given the large lift of recognizing every recommended action, not all actions need to be implemented and/or taken up all at once. Rather these recommendations should be viewed as helping inform and lead the journey California has already embarked upon and will continue to drive over the next decade in delivering a historic amount of infrastructure to serve as the foundation of continued prosperity for all.

4.1 Better prepare all communities to identify needs and access funding

Why this matters

Because of historic inequities such as inequity of resources and inability to identify critical projects and navigate approvals, many communities, agencies, and cities do not fully study or understand their specific infrastructure needs, nor have they been able to scope out potential projects.

As a result, some projects that are shovel-worthy are not shovel-ready and many communities might miss out on potential federal and state funding. In particular, disadvantaged communities often have less expertise around financing infrastructure needs, implementation, and project management to translate ideas into projects. Having such expertise on board can lead to an increase in well-designed local projects, which can deliver solutions and good jobs right away, such as grants for safer streets.

Proposed actions

1A Establish a standardized approach and framework for assessing infrastructure needs, including climate, economic prosperity, and equity considerations.

1B Continue to provide planning support and work with philanthropic partners to grow capacity-building for local governments (e.g., set aside for smaller communities, expansion of the Strategic Growth Council's Transformative Climate Communities program) to enable community-driven infrastructure needs assessment.

1C Establish a strike team to help prioritize resources and identify when regions lack required capabilities to implement and/or review planning for regionally significant projects.

1D Ensure infrastructure will meet community needs by engaging residents through culturally competent approaches.

1E Engage philanthropic partners to provide seed funding for community engagement on local needs and potential project ideas.

Impact of taking these actions
Enabling communities to better understand their infrastructure needs will lead to higher-quality infrastructure projects and enable effective development planning.

4.2 Revisit and revise project pipeline and prioritize multi-benefit projects

Why this matters

There is no standard approach in California to address infrastructure needs of local communities, such as the best types of projects to meet specific needs. This means that communities are not always leveraging the full suite of potential solutions, often leading state and local governments to reinvent the wheel with one-off projects that can incur delays and cost overruns.

Projects tend to be identified individually and reviewed in silos rather than as part of a portfolio to solve an interrelated set of needs. Not all projects satisfy standards for a "shovel-worthy" project portfolio. Poor coordination across the state results in low-quality projects being proposed and agencies reviewing similar issues sequentially, resulting in delays. Further, lack of early project review requirements and cross-agency coordination to identify shared capital expenditure (integrated project delivery) can drive delays and costs overruns.

Some legacy projects are designed without current environmental, labor, and climate impacts in mind. Unless the pipeline is reconsidered, we may inadvertently fund projects that reinforce past mistakes and compound historical inequities.

Proposed actions

2A Develop a playbook in collaboration with philanthropy on how to translate infrastructure needs assessment into a portfolio of projects aligned with state policy goals and promote integrated delivery and cross-agency collaboration.

2B Establish a strike team to help implement and review planning from regions/local for regionally significant projects.

2C Adopt legislation to develop a framework for projects over a minimum threshold to follow prior to procurement, such as standard project definitions, with input from vendors and state agencies.

2D Introduce early project quality review for projects over a designated threshold, before funding or shovel-worthy designations are granted. These reviews should include early contractor involvement.

2E Review and prioritize projects in pipeline to ensure they meet climate, equity, and economic prosperity goals. Revise or cancel if appropriate.

2F Review portfolio of projects for a given geography to identify opportunities to coordinate and combine projects ("dig once" integrated project delivery), manage bottlenecks, and reduce project delays and cost overruns.

Impact of taking these actions
Potential of 10% time and 7% in capital expense savings[29] with effective project review and early contractor involvement; potential for capital expense savings increase to 10–30%[30] through integrated project delivery such as combining broadband and electricity projects.

29. Benchmark from infrastructure development expert interviews.

30. "A Blueprint for Transformative US Infrastructure," Boston Consulting Group (October 2022).

Perpetuating the status quo will reinforce historical inequities, delay the shift to carbon neutrality and fail to make our infrastructure more resilient to the physical threat of climate impacts.

4.3 Amplify sources of funding and expand approaches to project finance

(i) Public funding

Why this matters

There is insufficient public funding to fully meet all community infrastructure needs, forcing localities to search for gap funding. Yet there is no coordinated state program to drive the uptake of federal tax incentives, which leaves potential private investment and federal funding on the table.

In addition to the limited public funding, there is no clear process to ensure that the best shovel-ready projects apply and win awards. The lack of clear funding prioritization hinders optimal matching of funds to community needs. Restrictive funds are not necessarily utilized first, leading to wasted funding, inefficiencies, and higher overall costs.

The funding application is also viewed to many as incohesive and contradictory, putting smaller local agencies that lack expertise in applying for federal and state funding at a disadvantage. Competition among applicants on the same funds is also common, further contributing to the inequitable and inefficient distribution of awards.

Proposed actions

3A Drive awareness of available discretionary funds to local and regional organizations such as through educational programs.

3B Provide targeted technical assistance (grant-writing resources, capacity building) with available resources and support from philanthropic partners to local agencies that may lack resources to secure funding (such as historically disadvantaged counties and cities).

3C Look for opportunities to streamline and revise state infrastructure development funding applications in concert with philanthropic partners.

3D Assist project developers to meet requirements that qualify them for maximum tax credits. These requirements could include meeting workforce needs, domestic-sourcing restrictions, or serving low-income communities.

3E Work with California public employee pension funds to identify potential investment opportunities in CA infrastructure that fully meet pension risk / return profiles and needs while satisfying all fiduciary duties.

3F Identify opportunities to leverage complementary IIJA/IRA funds within the existing priority project pipeline. Example: Bundle broadband and electric vehicle infrastructure into road and other transit projects.

3G Take actions to increase outreach and awareness with developers, non-profits and investors, such as through trade and industry groups, to increase uptake of IRA tax incentives.

Impact of taking these actions
Approximately $28 billion in estimated discretionary funds from IIJA/IRA for infrastructure project delivery if California secures fair share.[31]

(ii) Private financing and alternative delivery models

Why this matters

California agencies rely heavily on traditional financing and delivery models such as design-bid-build, where construction is offered to the lowest-bidding contractor, but with limited input into design, and entirely reliant on public funding. Traditional models are inefficient with larger or more complex projects and can result in canceled projects. Furthermore, they limit private funding while not providing enough public funding to meet infrastructure needs.

Private financing can help make up the funding gap. It can be engaged through alternative delivery models such as progressive design-build, public-private partnerships, and early contractor engagement. These models enable significant additional private funding while also improving project delivery timeliness and budgets.

Despite the advantages to alternative delivery models and private financing, agencies across the state often lack the authority to use these methods. They are restricted by rules on how to engage with contractors and contractor selection, such as lowest-bidder requirements. And even with the correct authority, many agencies lack the expertise and support necessary to implement alternative delivery models.

Proposed actions

3H Develop state guidelines for how and when to use P3s. Establish a navigator service to support and coordinate agencies to balance risk-sharing, continued operations and maintenance, and on-time delivery.

3I Develop and adopt framework for larger infrastructure projects go through a cost benefit analysis (social, climate, value delivered) to determine if using alternative delivery models would lead to better outcomes.

3J Advocate for additional state access to federal TIFIA[32] loans and increase alignment of the state code authorizing the establishment of Enhanced Infrastructure Finance Districts (EIFDs) with TIFIA financial terms and Infrastructure Finance District provisions with TIFIA to enable access to more loans and increased use of these infrastructure financing tools.

3K Introduce legislation to expand agency and municipality authorization to utilize alternative delivery models.

3L Actively engage with state pension funds including CalSTRS, CalPERS and UCRP to identify infrastructure investment opportunities (that fully meet each pensions return/reward guidelines, profiles and needs while fulfilling all pensions fiduciary duties) such as leveraging the California Climate Investment Framework.

3M Engage labor early in project development to solicit feedback on using an alternative delivery model approach.

Impact of taking these actions
Up to 10% reduction[33] in capital project expense and estimated $50–$60 billion[34] of incremental new private capital can be accessed leveraging alternative delivery models.

4.4 Optimize project review, permitting, and entitlement

Why this matters

The multitude of federal and state reviewing agencies lead to misalignment and difficulties in environmental approvals. California often requires extensive environmental reviews for projects with significant environmental benefits. Projects that have minimal-to-no environmental impacts can be significantly delayed by the environmental review process, which increases overall costs and risks delaying projects to the point of becoming ineligible for federal funding.

31. Estimated assuming CA receives discretionary funding proportional to formula allocation.
32. TIFIA = Transportation Infrastructure Finance and Innovation Act, providing federally guaranteed loans at treasury rate for qualified infrastructure projects.
33. 10% reduction in expense based on typical project savings from using most suitable alternative delivery model.
34. Additional $55–60B new private capital is based on private capital investment levels relative to state GDP in best-performing states in drawing private capital (VA, NY).

Adding to long approvals is the slow challenge process often used to delay or deny development for non-environmental reasons. These challenges to environmental approvals can add five to 10 years to project delivery, increasing the risk of cancelation. And by one analysis, 80% of CEQA lawsuits challenging developments were located in infill areas, which is within existing development patterns.[35]

However, there is a history of California making exceptions for fast-track approvals for high-priority projects. For example, Governor Newsom recently issued Executive Order N-7-22 to support vulnerable communities dependent on diminishing groundwater for their drinking water. There should be additional urgent action on equitable and climate-resilient projects to ensure that California is continuing to accelerate its climate and infrastructure goals.

Proposed Actions

4A Develop policy guidelines, time limits, incentives, and an infrastructure navigator/strike teams to expedite review and permitting across state authorities.

4B Provide financial incentives *(contingent on improvements in the budget)*, contingent funding, and capacity to authorities that can streamline local permitting for high-priority, multi-benefit projects.

4C Secure federal reciprocity for SB922 (e.g., NEPA statutory exemptions for CEQA statutory exemptions), advocate for greater review capacity and standardization of NEPA reviews, and obtain additional NEPA assignments for state and regional agencies to facilitate joint CEQA/NEPA reviews.

4D Eliminate the need for additional CEQA reviews for projects that were included in an adopted plan such as STIP[37] and RTP[38] that has already received CEQA approval.

4E Expand and extend statutory exemptions and categorical exclusions for environmentally or multi-benefit projects and limited-impact projects.

4F Reform the process for challenging permits and approvals with targeted and proportionate remedies, expedited processes, and limited standing for challenges.

4G Frontload community, labor, and other stakeholder engagement to address concerns and secure early support for projects.

Impact of taking these actions
Save two-plus years on the approvals process.[39]

This work in action: Golden State Warriors Chase Center

The Work	Actions	Key Results
 New arena developed in San Francisco for the Golden State Warriors through streamlined judicial process.	• AB900 created environmental leadership development projects to receive streamlined litigation in exchange for environment and economic commitments. • Required to produce no net greenhouse gas emissions, have a project labor agreement, pay prevailing wages and invest $100 million into California. • Creates requirements for resolution of environmental challenges within 270 days.	• Chase Center received ELDP designation in late 2015. • Subsequent CEQA challenges were resolved within approximately one year — more than 270 days, but far lower than comparable projects without judicial streamlining.

35. "In the Name of the Environment: Litigation Abuse Under CEQA," Holland & Knight, August 2015.

37. STIP = State Transportation Improvement Plan.

38. RTP = Regional Transportation Plan.

39. Based on expanding and extending statutory & categorical exemptions for environmentally beneficial projects and limited-impact/multi-benefit projects, and reforming challenge process.

4.5 Reshape and expedite project delivery

(i) Enabling public- and private-sector stakeholders

Why this matters

California can better achieve its climate and equity goals by bolstering its current delivery process, such as expanding its opportunities for BIPOC businesses. Creating a statewide green procurement plan enables infrastructure to be built in line with state climate targets or with climate-resilient materials and technologies. Similarly, California can align on the varying equity requirements across agencies and jurisdictions to push equitable project delivery.

To address cost and time overruns, public and private procurement teams should be provided additional training and expertise to enable the acceleration of infrastructure delivery, With the increased capacity from adequate resources and critical expertise, procurement teams can create high-quality project delivery RFPs, particularly for novel or complex projects. This can expedite the delivery of $100 billion in infrastructure projects.

Proposed actions

5A Enable procurement employees to identify infrastructure needs and produce comprehensive RFPs through training programs and technology such as e-procurement.

- Prioritize engaging the supplier diversity department for high-value projects and train the general procurement office to efficiently incorporate DEI initiatives for lower-value projects.

5B Broaden pool of vendors, particularly for SMBs[40] and BIPOC-led firms:

- Develop a list of pre-qualified SMBs/BIPOC-led firms to ensure vendor access and accelerate procurement in line with Proposition 209 and other state regulations
- Split large projects into multiple contracts that are accessible to SMBs.
- Ensure the spirit and intent of AB 2974 and AB 2019 are applied in respect to procurement diversification: namely, small businesses, micro businesses, businesses owned by people of color, etc.
- Proactively engage vendors early in project development.
- Better market RFPs through prequalifying a national list of vendors.

5C Enable SMBs and BIPOC-led firms to navigate the procurement process:

- Provide training and develop relationships between general contractors and BIPOC-led firms. These could include bidding workshops for new vendors and alliances and mentorships between general contractors and BIPOC-led firms to diversify capabilities.
- Expand funding flexibility in contract requirements (e.g., indirect funding and advance funding).

> **Impact of taking these actions**
> Improved project quality and greater opportunities for BIPOC-founded businesses and SMBs, created by public-sector staff and private-sector vendor enablement.

(ii) Procurement

Why this matters

The current project delivery process makes meeting climate and equity goals more difficult. This is evident in the procurement process, where the nonstandard climate and equity requirements across agencies and jurisdictions complicate the process for vendors.

Current climate and equity requirements are set by each procuring agency, causing significant difficulty to potential contractors as they consider each separate entity's rules, leading to delays and limiting the number of contractors willing to work with each agency and resulting in potential price increases and delays.

The current procurement process is also prone to driving delays and lowering project quality. Rather than moving in parallel, the procurement process moves sequentially, adding extra time overall. The current procurement process also requires competitive bidding rather than best-value bidding or alternative delivery models. This encourages vendors to underestimate costs and restricts indexing on vendor quality.

Another challenge within the procurement process is lack of input from vendors, which increases the risk of project

40. Small and midsize businesses.

scope changes and corresponding delays and budget overruns, leading to suboptimal projects. The poor marketing of RFPs and lack of a consolidated source of vendors by type limits the pool of potential qualified vendors. There are also limits on using alternative delivery models, which prevents adapting delivery models to project complexity, such as models that encourage early vendor engagement. The limited use of early vendor engagement then leads to poorly structured RFPs and project delays.

Proposed actions

5D Propose guidelines and best practices to standardize and streamline procurement across agencies and jurisdictions using, for example, a formal template library. Define a vendor and delivery model assessment and compile a list of statewide goals such as clear equity requirements on using SMBs.

5E Where possible, adopt green procurement policies — carbon reduction plans, climate-resilient technology/materials guidelines — that can be adapted across localities and employ incentives to encourage their adoption including performance bonuses, administration flexibility, and advance funding options.

5F Enact legislation to expand the use and number of alternative delivery models to allow for early vendor input and best-value bidding.

5G Shorten construction times and reduce costs for projects over a designated threshold by emphasizing speed over disruption mitigation and providing incentives for contractors and agency staff to meet or beat deadlines.

5H Standardize the reimbursement process so contractors, particularly SMBs, are paid more quickly.

Impact of taking these actions
Up to 30%[41] time can be saved in the overall procurement process

4.6 Ensure ongoing funding for operations and maintenance

Why this matters

The additional capital investment from the IIJA, IRA, and state funds could increase operating spend up to $25 billion. When including inflation, operating spend is expected to increase by an estimated $45 billion by 2031.

This work in action: Infrastructure New South Wales

The Work	Actions	Key Results
 Australian State created an infrastructure agency to support infrastructure project delivery.	• Created Infrastructure New South Wales to streamline project delivery. • Structured as a collaboration of state and local government, including treasury and department of environmental planning. • **Planning:** Developed 20-year infrastructure plan and strategy to recommend projects to best enhance living standards and productivity for the state. • **Funding:** Established standard project definitions and project bundling for priority assessment program, enabling alternative delivery models for improved efficiency. • **Delivery:** Standardized project procurement and established early contractor involvement to promote more effective project delivery. • Established guidelines for private financing processes.	• Infrastructure planning & standardization cut assessment timelines for large projects in half. • Fast-tracked 101 major infrastructure projects over 11 years, worth estimated AUD $25B. • With AUD $2.4B in 252 local projects, only one project went over-budget. • Received AUD $2.42 in private capital per AUD $1 of public funding.

41. Based on 6–8-week reduction of 24–32-week procurement process from infrastructure development expert interview.

Approximately $12B of this projected incremental O&M spend does not have currently identified funding sources. It will require a combination of increasing the efficiency of current spend via use of technology approaches to incorporate more of O&M funding in upfront infrastructure delivery.

In particular, transportation faces significant O&M cost challenges, driven in part by declining gas taxes and a shortage of labor. These issues will require California to explore new options for asset management that increase efficiency of spend, to offset reduced revenues. Similarly, transit faces a fiscal cliff following the expiration of the federal COVID relief operating funds from the delay in ridership returning to pre-COVID levels and subsequent revenues for operational funding.

Proposed actions

6A Develop a framework for major projects to estimate long-run operating costs and explore new innovative approaches in infrastructure development and asset management that increase utilization and efficiency of O&M spend.

6B Identify initial sourcing of funding state, regional, and local infrastructure operating funds, such as via reallocating capital expenditure to operational expenses.

6C Examine mechanisms to embed project operating costs into build costs.

6D Review and look for opportunities where possible to expand and extend statutory exemptions for tolls, congestion fees, and vehicle miles traveled (VMT) pricing and enable implementation at the local level

Impact of taking these actions
Ability to address additional $25 billion in incremental annual operating spend needed by 2031; this is expected to be created by additional IIJA, IRA, and state capital project funding.

4.7 Improve the training for and quality of all levels of the infrastructure workforce

Why this matters

The wave of new infrastructure funding is expected to generate a need for 400,000 direct and indirect construction jobs that the current California workforce will be unable to fill. Yet a lack of coordination among state, industry, and education stakeholders clouds visibility on future labor needs. Adding to the issue, the limited focus on pathways for underrepresented communities hinders meeting the state's equity goals.

One major challenge is the shortage of training capacity and resources that lead to direct job placement. Key job pathways, such as college, high school, trade school, and union programs, have low uptake because they do not guarantee job placement following the completion of the program.

A promising initiative that responds to some of these challenges is the California Workforce Development Board's High Road Training Partnership (HRTP) program where labor and industry work in partnership on innovative training programs to provide pathways to quality jobs with employers who adhere to high-road principles.

In one example, the Port of Los Angeles received a grant for an HRTP and developed a partnership with the Pacific Maritime Association (PMA), the International Longshore and Warehouse Union (ILWU), and the Office of the Mayor. With the grant money, the Port, ILWU, and PMA are currently working together to develop innovative training programs for the longshore workforce and also toward development of an ILWU-PMA Workforce Training Center that will focus on attracting new workers into the cargo industry, addressing skill shortages, and providing opportunities for workforce up-skilling or re-skilling to meet the rapidly changing needs of the cargo industry.

Another challenge is that certain critical infrastructure jobs have trouble retaining and recruiting talent. Many high school youths who are not college-bound lack pathways to high-quality jobs. Additionally, restrictive job requirements imposed by some infrastructure projects discourage new workers and limit the potential labor pool, such as second-chance workers and skill-based hires. Broadening these pathways is needed to fill the remaining infrastructure job demand.

Proposed actions

7A Strengthen partnerships with union stakeholders through labor agreements (e.g. project labor agreements) and local hiring requirements.

7B Develop guidelines and framework for statewide coordination between industry and education stakeholders to form a job creation framework, guiding needed skills, employer incentives and procurement practices, and training curriculum to California's economic development goals such as programs for disadvantaged or under-resourced communities.

7C Continue the allocation of state and federal funding to address specific needs of workforce demand, including college training program scaling.

7D Scale the education training pipeline to ensure access to quality jobs aligned to industry needs including union apprenticeships, community college pre-apprenticeship programs, and high school pathways.

7E Incentivize employers to revist job requirements and employment incentives to quickly attract a broader talent pool. These measures could include skill-based hiring, second-chance programs, and improved compensation packages.

7F Retrain and upskill workers for jobs in opportunity sectors to enable a just transition, especially for those most at risk of job displacement.

7G Support and expand Community Workforce Agreements and Community Benefit Agreements to ensure continuing workforce demand through agreements such as local hiring, increased apprenticeship ratios, and workforce pipeline diversity.

Impact of taking these actions
Create 400,000 infrastructure jobs that can support California's infrastructure projects with an approximately $6 billion investment into the workforce.[42]

4.8 Develop and deploy digital and technology standards

Why this matters

Current technology use and standards within infrastructure are limited across the state. The low awareness and lack of training leads to an underappreciation of the vast benefits of digital technology adoption.

Software and technology are critical to transforming the way in which California manages critical infrastructure such as the power grid. In this case, technology can enable the transition into carbon-free energy generation; the existing power grid is not suited to integrate renewables.

Without a common platform of agreed-upon standards for infrastructure operations, collected data is often incompatible. The absence of interoperable data limits the state's ability to leverage digital assets for the public. Similarly, the lack of a standard digital project delivery framework leads to project delays and cost overruns.

With cyberterrorism growing as a global threat, the lack of common standards puts infrastructure assets at a higher vulnerability to cyberattacks. While there are clear benefits of integrating digital technology into infrastructure, it also makes them a prime target. Thus, establishing clear security guidelines is crucial to protecting critical infrastructure.

Proposed actions

8A Empower a statewide strike team to to provide technical and educational assistance in partnership with philanthropic partners (where budgetary resources permit) to jurisdictions, agencies, and firms.

8B Begin development of a framework for digital technology integration (e.g., digital standards for Building Information Management) to implement on public projects.

8C Research best practices for a project delivery framework utilizing Building Information Management (BIM) approaches and techniques for public infrastructure projects.

8D Create a cybersecurity framework and ensure digital standards include aspects of data security and privacy.

8E Partner with philanthropy to establish joint funds and technology centers to advance digital technology innovation and effectiveness

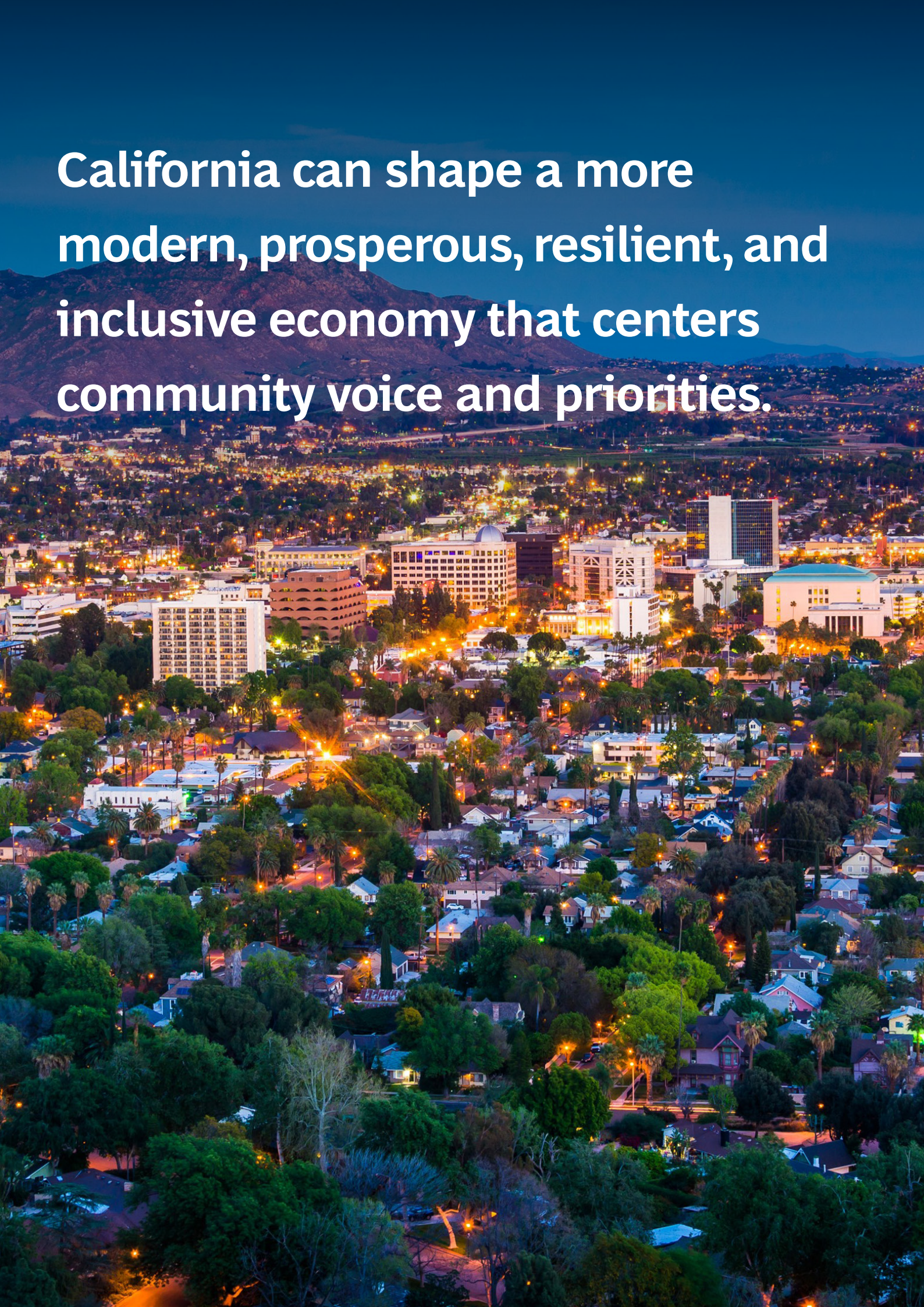
8F Adopt open digital standards for public infrastructure to address standard data models, data management, integration, and sharing.

Impact of taking these actions
10–20% life cycle cost savings[43] for infrastructure projects with BIM implemented throughout; and critical infrastructure safeguarded from security concerns.

42. Estimated based on Rhode Island's Back to Work RI initiative

43. Based on typical highway project cost savings observed with the integration of BIM

California can shape a more modern, prosperous, resilient, and inclusive economy that centers community voice and priorities.



4.9 Elevate regional institutions to ensure a strong connection between infrastructure investments and regional economic development

Why this matters

Infrastructure systems (e.g., transportation, energy, water, broadband) are interconnected and the demand for these systems is intertwined with where in a community or region new housing or commercial development takes place. Yet the agencies managing each of these systems are separate and new projects are proposed in silos. For example, each new transit project or electrical upgrade or water repair is designed, operated, and governed by a different board and funded by different revenue sources. Not only does each agency lobby independently for funding for its specific project, but this siloed approach also misses opportunities to identify multi-benefit projects that could be funded and delivered together.

Additionally, the State's 18 Metropolitan Planning Organizations (MPOs) produce regional transportation plans that identify transportation projects and land use strategies to meet housing and per capita greenhouse gas reduction goals. Yet there is no requirement for such adopted regional plans to consider related infrastructure needs (i.e., energy, water, broadband).

Enabling better regional coordination could help California secure more federal resources. Local governments often compete against each other for scarce project funding as there is insufficient incentive for collaboration on cross-jurisdictional projects. By leveraging existing regional organizations and processes, the state can better coordinate its approach to infrastructure.

California has already embarked on an ambitious regional economic planning process (CERF) where inclusive groups of stakeholders at the regional scale are identifying infrastructure needs and potential projects to support transition to a high-road economy. Plus, the Sacramento region has initiated a process to identify infrastructure needs that would support infill in low-carbon communities (e.g., SACOG's[44] Green Means Go). This approach and the funding to support the infill infrastructure needs is worth further exploring as a potential model that could be strengthened and applied to other regions.

Proposed actions

9A Continue to leverage existing regional planning and economic development structures to identify and prioritize needed infrastructure projects for state and federal funding. as the US EDA's Economic Development Districts (EDD), the state's High Road Transition Collaboratives (HRTC's established through the Community Economic Resilience Fund (CERF), and the regional Metropolitan Planning Organizations (MPOs) who product Regional Transportation Plans and Sustainable Communities Strategies. The identification process should involve an inclusive group of stakeholders including, but not limited to, government, industry, education/training, community groups, labor, special districts, philanthropy, and community members.

9B Provide state coordination support for the prioritized projects identified in a regional investment portfolio when seeking federal funding augmenting implementation funds in existing programs (e.g., CERF and REAP[45] 2.0.

9C Leverage a trusted regional institution (e.g., MPO or EDD) or regional process (e.g., CERF) to prioritize across a range of regional infrastructure projects and organize it into a portfolio of projects that are competitive for federal funds.

9D Coordinate across systems (housing, transportation, workforce training, energy, water, broadband) to compile, analyze, and prioritize high-priority, cross-systems projects that need state/federal funding for implementation. Develop a coherent narrative about how prioritized infrastructure projects will jointly achieve a more inclusive, sustainable, and prosperous future.

9E Collaborate with philanthropy to provide long-term funding to regions to identify and prepare a portfolio of regionally significant and high- impact projects that match local needs with regional priorities.

> **Impact of taking these actions**
> Statewide portfolio of multibenefit projects that better meet regional needs and economic development goals.

4.10 Modify governance to ensure agencies have appropriate authority and staff to plan, fund, approve, and deliver projects

Why this matters

Delivering infrastructure across jurisdictions is exceedingly complicated, as projects are typically developed in silos rather than in a portfolio of balanced projects. There is no funding for development and implementation of regional plans, nor is there a cross-agency coordinating infrastructure projects. This leads to a complex process to plan, approve, procure, and deliver projects, often leading to project delays, cost overruns, and cancellations.

44. Sacramento Area Council of Governments.

45. REAP = Regional Early Action Planning grants.

State and regional priorities are often deprioritized or halted by state agencies. Priority state projects can be stalled by local agencies and opposition based on local priorities or concerns, as locales have veto power over projects. One reason is that local agencies feel pressure to appease all stakeholders, thus sometimes preventing high-priority initiatives due to local friction.

The disconnect between planning, construction, and maintenance leads to a loss of knowledge throughout a project. Project construction and oversight often lack project-specific knowledge, such as in the design process. Further along in the project delivery, maintenance and other future work lack prior project context due to changing advisors and contractors.

Proposed actions

10A Define clear guidelines for each level of government institution. For example, the state sets the regulation and goal while regions prioritize projects and local agencies manage and deliver the project.

10B Empower strike team to convene and coordinate across agencies - identify priority and/or challenging projects to focus streamlining efforts and hold departments and agencies accountable to deliver in an expedited fashion.

10C Establish infrastructure strike team with authority and appropriate staffing to help state and local agencies deliver projects that incorporate economic development goals. This support could include performing reviews, helping with procurement, and delivery of large, multi-benefit projects prioritized by regional or local entities.

10D Provide incentives to enable multi-jurisdictional collaboration to review project pipelines and develop new project ideas.

10E Increase the capacity of state, regional, and local government agencies to train, plan, coordinate, and deliver.

Impact of taking these actions
Faster delivery of multi-benefit projects through stronger coordination of state and local governments and new infrastructure navigator/strike team.

4.11 Develop a comprehensive system to track project needs and progress toward completion

Why this matters

As California embarks on its massive infrastructure deployment program, there creates an opportunity to improve visibility of data that optimizes the infrastructure delivery process. Investing in a statewide metric standard and public project dashboard that unifies metric requirements and coordination makes interventions by state or regional authorities more efficient, thus allowing for a better prioritization of resources.

Building a standard model for tracking and reporting metrics will produce comparable, high quality data across project portfolios and enable better decision making. California can further this process through reporting standards that allow insight into project progress and delivery efficiency. This provides clarity on where infrastructure delivery excels and areas that can be improved.

To increase visibility on the effective usage of public dollars, California should build a central source from which it can track project progress. A standardized public dashboard can increase transparency and accountability on funding usage and project progress. Branching away from private, uncoordinated data storage and reporting limits, California can expedite its ability to make targeted interventions to avoid costly delays and schedule overruns while expanding transparency and optimizing the allocation of resources that drives the delivery process forward.

Proposed actions

11A Develop and require standardized infrastructure delivery and impact metrics across agencies and localities to evaluate project delivery performance, identify project risk, and understand the social and environmental impacts of a project portfolio.

11B Develop a framework to standardize data tracking and regular reporting of project performance to stakeholders using consistent, comparable data across a project portfolio.

11C Create a public and internal dashboard for each of the major seven infrastructure categories– broadband, climate restoration, energy, EV infrastructure, science (CHIPS), transportation, and water with cross program and common metrics to measure success (e.g., project delivery, budget status, funding allocations).

Impact of taking these actions

Reduced project delivery risk due to earlier identification of potential issues and comprehensive improvements to delivery across the state.

Chapter 5 | The impact

Key questions: *What will we get if we apply these principles and take the proposed actions? What can the State Executive Branch, legislature, state and local government, and stakeholders consider doing now?*

5.1 California can deliver up to $180 billion in infrastructure by pulling levers across the project life cycle

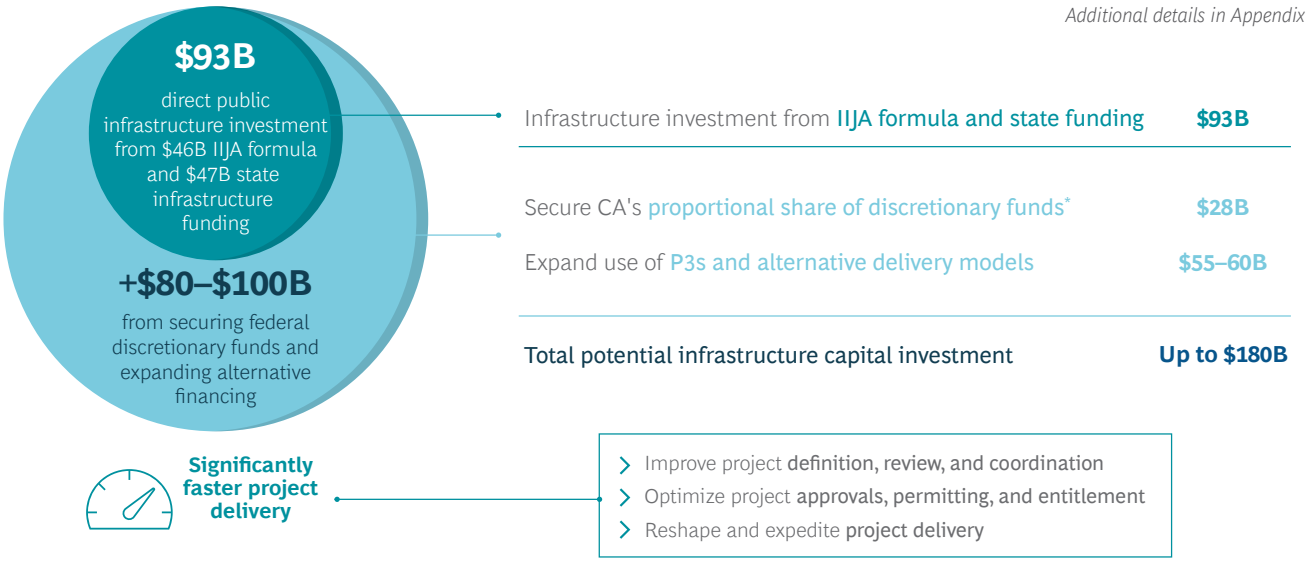
By implementing the above recommended actions, California can utilize federal and state infrastructure spending to deliver up to $180 billion worth of infrastructure projects. On top of $93 billion of direct federal and state infrastructure investment:

- Securing California's proportional share of discretionary federal funds could deliver up to $28 billion.[46]
- Expanding use of P3s and alternative delivery models would deliver $55–$60 billion.

Furthermore, significantly faster project delivery can be realized through improved project definition, review, and coordination, optimized project approvals, permitting and entitlement, and reshaped and expedited project delivery. (Exhibit 6).

46. Estimated assuming CA receives funding proportional to formula allocation of IIJA and IRA discretionary programs (i.e., competitive grants).

Exhibit 6: California can utilize new federal funding to deliver up to $190B of projects by pulling levers across infrastructure delivery lifecycle



Note: Detailed breakdown of methodology in appendix; assumes implementation of recommended actions from inception of funding in 2022; total value may not be fully realized due to delays in deploying recommend actions; Source: BPC State Matching datasheet; White House IIJA Fact Sheet; White House IRA CA Fact Sheet; BCG Analysis.

*Estimated assuming CA receives funding proportional to formula allocation of IIJA and IRA discretionary programs (i.e., competitive grants).

5.2 California can deliver more inclusive and sustainable prosperity for residents

As well as vastly increasing the value infrastructure delivered in a quicker time frame, implementing our recommendations will also help California deliver on equity and inclusion, climate and sustainability, and economic prosperity goals.

Equity and inclusion. We estimate our actions will lead to an incremental 12 million annual riders on light/heavy rail for very low-income residents[48] and 1.2 million additional households connected to broadband.[49] They will also deliver equitable mobility for disadvantaged communities; utilities that are accessible, safe, and high-quality; desirable housing and affordability for disadvantaged communities; and expanded opportunity for residents from supplier diversification, such as use of minority-owned businesses.

Climate and sustainability. We estimate that taking these actions will help deliver about 80GW of additional utility-scale solar and wind deployed by 2030, equivalent to 15 MtCO2e per year increased abatement.[50] They will also ensure community protection from climate and environmental degradation, accelerate climate and sustainability practices nationwide as a result of state policy leadership, improve health outcomes due to cleaner environment, and enhance California's climate resilience.

Economic prosperity. Enacting these recommendations will ensure the state is able to fill 400,000 direct and indirect construction jobs created by the infrastructure investment, equitably increasing GDP across the state. Other knock-on effects of amplifying and accelerating infrastructure delivery include attracting more businesses and residents to California, economic equality improvements through delivery of high-quality infrastructure to underserved areas, and more opportunities for small and mid-size businesses across the state.

5.3 Recommended actions can significantly decrease infrastructure development delivery time

Furthermore, implementing the recommended actions will significantly decrease the time required to implement infrastructure projects in California through reduced approval times, faster project delivery, and streamlined planning.

48. Households earning <$15k per year. Calculated from a historical analysis of CA light/heavy rail project costs and ridership across multiple state regions

49. Calculated from available funds for last mile infrastructure as well as CAPEX cost estimates for each unconnected household

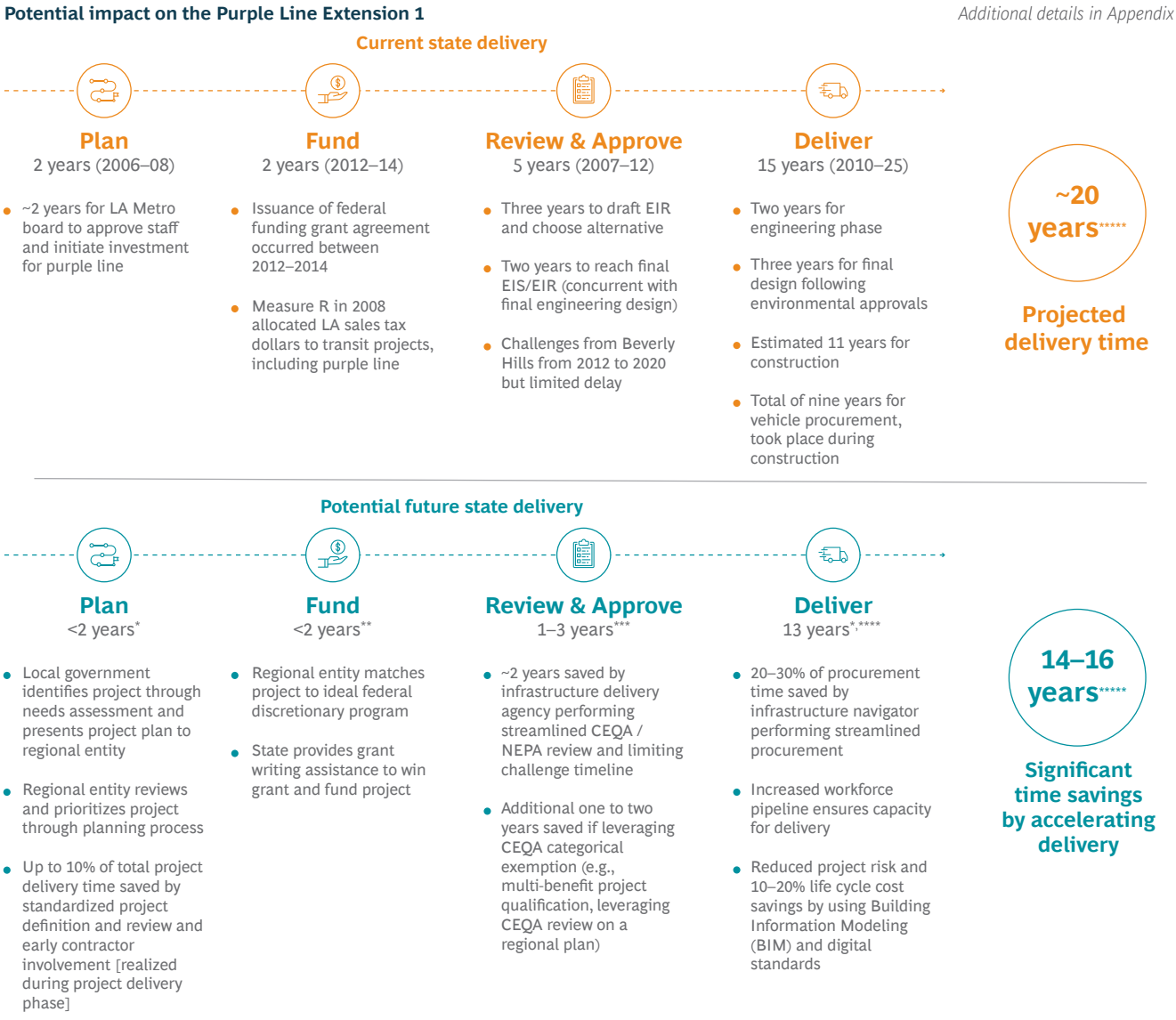
50. Leveraged national IRA tax credit impact projects from Wood Mackenzie, SEIA, and Rystad Energy to project capacity growth in CA as well as abatement;

45. REAP = Regional Early Action Planning grants.

Taking the LA Metro Purple Line extension project as an illustrative example, there are several areas to accelerate (Exhibit 7).

- **Streamlining approvals.** Creating accelerated pathway for priority transit projects would shorten the initial environmental reviews and additional iterations required to final EIS/EIR, likely saving an estimated two years in the process. Additionally, it would lessen long-term legal risks such as the eight years of litigation with Beverly Hills.
- **Accelerate delivery.** Streamlined procurement, improved workforce capacity and increased incorporation technology, such as Building Information Modeling and digital standards, can reduce delays and ensure feasibility of a large infrastructure program.
- **Increased planning engagement.** Increasing early engagement of contractors and standardizing project definition mitigates risks of challenges later in project delivery, reducing project delivery time by an estimated 10%, or 1–2 years for a 10–15 year project delivery.

Exhibit 7: Example of how taking these actions can accelerate project delivery up to 30%



*Expedited planning process by 10% from aligning project definition and prioritization criteria to identify shovel-ready/worthy projects.

**Accelerated funding through regional funding assurances and coordinated funds.

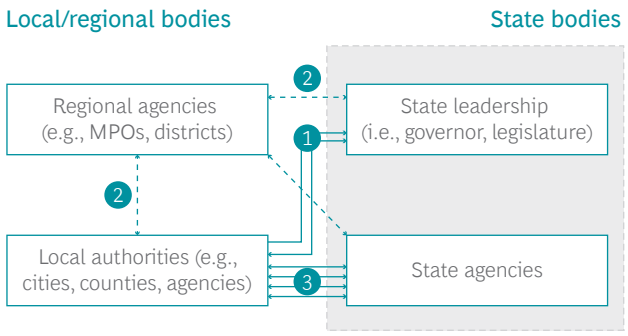
***Approvals timeline shortened by ~40% based on one-year savings from NEPA assignment, one year from agency review and challenge timeline to reduce rework to final EIS/EIR. One year timeline for NEPA-only based on comparable projects such as Hudson Yards subway extension as part of Hudson Yards redevelopment.

****Procurement time reduced by 20–30% with early contractor engagement improving designs, standardization of processes accelerating delivery, and e-procurement technology.

*****Total delivery time shorter than the sum of individual delivery stages due to overlap in funding, permitting and approvals, and delivery processes.

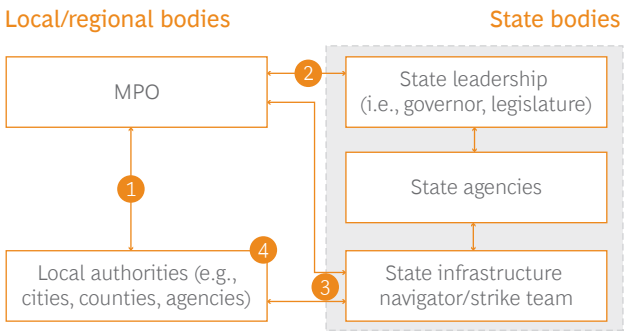
5.4 New regional approach will help deliver a stronger portfolio of projects and support faster delivery

Current fragmented process to select and fund infrastructure projects across jurisdictions



1. Today, fragmented **local authorities independently** separately vie for limited funding (from state, regional, and local sources) for local priorities. These local agencies are often in competition and have limited coordination with each other.
2. **Limited connection between local needs, regional priorities, and funding requests** hinders integrated economic development planning, leading to disconnect between local requests, regional priorities, and state grants.
3. Many **disconnected state agencies and local authorities are required for funding, approval, and project delivery,** with each able to veto projects and block approval (e.g., local authorities leveraging veto power on high-priority projects for the state).

Example of future process that leverages a regional institution (such as the MPO) to vet and prioritize key projects



1. **Strengthened regional institution** will coordinate with locals and identify a pipeline of infrastructure projects that meet state priorities and would be competitive federally.
2. Regions will **create prioritized infrastructure and development plan (e.g., RTP + CERF plan) to bring to state leadership** to guide state allocation federal funding application.
3. New **state infrastructure navigator/strike team will support local and regional bodies to deliver projects** through better project design, delivery, and coordination with state entities through state expertise and authority.
4. Prioritized **major projects may still apply directly to state for funding** (e.g., within state development areas or for state priorities) and collaborate directly with state agencies.

Note: Illustrates one example of a large, multi-benefit project across jurisdictions developed, funded, and delivered by new governance model. The recommendation does not assume that current pathways to develop projects or secure funding at the state, regional, and local level would be eliminated (e.g., local government seeking funding directly from state for projects); based on Bay Area Metropolitan Transportation Commission's approach to regional planning and prioritization.

Chapter 6 | Conclusion

California faces many infrastructure challenges over the next decade as climate, water, energy, and transit needs grow, requiring an estimated $350 billion investment into infrastructure and associated operation and maintenance.

With the large influx of federal funding from the IIJA and IRA and matching state funding, there is a once-in-a-generation opportunity to meet these needs with $120 billion in available public infrastructure funding.

However, unless California changes how it delivers, operates and maintains its infrastructure, there is a significant risk that state infrastructure needs will not be met and that historical inequities and climate impacts will become even more concerning. As California looks to meet this moment - the opportunity will require building on the bold leadership of the state in order to deliver on these historic investments. We provide recommendations on how California can seek to address these challenges and adapt to create a more effective, equitable, and just way for conducting infrastructure over the next decade.

California can potentially increase the value of current infrastructure investment capacity by up to $80B–$90B and significantly expedite project delivery, saving three to five years from a typical 15-year project, while also doing so in a way that improves equity, climate, and economic prosperity for Californians..

The time to act is now. The opportunity diminishes with each day to capitalize on a generational opportunity presented by the current environment in California to create change and create a better infrastructure for today and tomorrow.

End Notes

1. Based on $46 billion from IIJA formula funding, $47 billion from CA state funding, and $28 billion from IIJA & IRA discretionary funding (see Chapter 2.1 for further details).
2. Based on $46 billion from IIJA formula funding, $47 billion from CA state funding, $28 billion from IIJA and IRA discretionary funding.
3. The American Society of Civil Engineers (ASCE) defines critical infrastructure as systems, facilities, and assets so vital that their destruction or incapacitation would have a debilitating impact on national security, the economy, or public health, safety, and welfare.
4. Estimated incremental direct/indirect construction workforce demand from IIJA, IRA, and state funding through 2032 (see Chapter 2.1 for further details).
5. Based on taking proposed actions across the lifecycle of infrastructure delivery to streamline and accelerate development (see Chapter 5.3 for further details).

California Forward (CA FWD) leads a statewide movement, bringing people together across communities, regions and interests to improve government and create inclusive, sustainable growth for everyone.

A 501(c)(3) organization, CA FWD drives collective action to identify solutions that can be taken to scale to meet the challenges the state is facing. CA FWD serves as the backbone for the California Stewardship Network, an alliance of regional economic development leaders, and is home to the California Economic Summit, an event and network designed to develop a shared prosperity agenda for the year ahead, and the California Dream Index, a data platform tracking economic mobility across multiple indicators and all regions of California.

Boston Consulting Group is the premier strategic advisor to deliver the new infrastructure ecosystem, partnering with a variety of players–from planners, owners, and operators to investors and suppliers–and we are actively helping prepare them for a rapid change in infrastructure that requires new solutions and new ways of thinking to solve some of the most difficult challenges. This includes the redesign of infrastructure as a service, mobility cutting across multiple sectors including broadband, transportation, and energy, as well as the need to develop new business and delivery models to ensure all residents can take advantage of this new infrastructure paradigm. Our cross-sector approach makes us uniquely able to deliver holistic and equitable solutions to plan and deliver tomorrow's infrastructure solutions today.

Additionally, we are one of the few organizations leading the charge on rethinking impacts on sustainability and climate. We are helping the World Economic Forum (WEF) redefine the State of Global Climate Action and working with members of the European Union (EU) to chart a decarbonized future. We are a leader in assisting government and corporate clients set ambitious goals and reasonable plans to reach net-zero and have built a set of proprietary tools (e.g., Co2.AI, greenhouse gas abatement matrix, renewable energy models) and partnerships (e.g., Breakthrough Energy) to drive a step-change in sustainability for our clients. A key part of our approach is how the strategic use of infrastructure can help unlock not only a greener, more sustainable future for states, but also using infrastructure programs as a catalyst to propel economies forward.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