



Conveyance to Meet Climate Change Needs Background Policy Brief

October 2020

INTRODUCTION

The California Water Commission (Commission) is assessing a potential state role in financing conveyance infrastructure projects that could help meet needs in a changing climate. This work is precipitated by a convergence of factors that make considering how to finance conveyance both timely and important. Climate change is no longer an impending threat: California is currently experiencing the impacts of a warming world, including sea level rise, temperature extremes, and more variable and extreme precipitation patterns. At the same time, water conveyance structures within the state are aging, damaged by subsidence, and in need of repair. Adapting to climate change will require improved and new conveyance designed for different purposes than historic infrastructure. It will require looking at our current water management system and figuring out where it makes sense to upgrade or improve systems. Limited funding, a growing population, and the need to recover both damaged aquatic habitats and over-drafted groundwater aquifers necessitate a smart, careful analysis of conveyance investments.

The work proposed by the Commission is consistent with Goal 1 of the Commission's Strategic Plan, which is "to serve as a primary public forum for the discussion of improving water management policy to assist regions in achieving climate resiliency...including those actions of the Water Resilience Portfolio assigned to the Commission." On July 27, 2020, the California Natural Resources Agency, California Environmental Protection Agency, and the California Department of Food and Agriculture issued the final version of the Water Resilience Portfolio (portfolio) in response to Governor Newsom's Executive Order N-10-19, which calls for a "set of actions to meet California water needs through the 21st century." The portfolio outlines a broad suite of actions designed to move the state toward water resilience. Action 19.4 calls on the Commission to "assess a state role in financing conveyance projects that could help meet needs in a changing climate."

The portfolio proposes to advance water resilience within the state by "enabling regional resilience while continuing to set statewide standards, invest in projects of statewide scale and importance, and address challenges beyond the scope of any region" (p. 17). This duality of intent – promoting regional resilience to advance the resilience objectives of the state – frames the Commission's work, which will consider conveyance solutions at the regional level that will benefit the state at large. Additional context for the Commission's work can be found in the portfolio: Action 19.4 falls under Action 19 – modernize inter-regional conveyance to help regions capture, store, and move water – and is embedded in a section of the portfolio that is focused on building connections: physical infrastructure connections, factual and data-driven connections, human connections, and connections between state agencies. The Commission's role, then, is to convey recommendations regarding financing for conveyance projects that accommodate a changing climate by building connections – both across regions and between regions and the state – in order to advance statewide water resilience. Because there is no immediate source of state funding for conveyance projects on the horizon, the Commission will broadly assess possible financing mechanisms for conveyance infrastructure, including local, federal, and private financing. The Commission's work will examine how conveyance needs, opportunities, and priorities at the local and regional level might contribute to broader resiliency, and how, when state funds are available, the state could use its funding to advance the statewide benefits of these projects.

THE COMMISSION'S APPROACH

PUBLICLY INFORMED RECOMMENDATIONS

To advance Action 19.4, the Commission proposes to produce a succinct white paper, including recommendations, for state policymakers, describing key issues and mechanisms to consider as they weigh how to finance water conveyance infrastructure. The paper will describe the essential criteria for resilient water conveyance projects that meet the needs of a changing climate, the potential public benefits of such projects, and the implications of various financing options. The paper will focus on conveyance other than the pending proposal to improve State Water Project conveyance through the Sacramento-San Joaquin Delta. The paper will not include an inventory of potential conveyance projects, nor will it specifically identify types of projects needed in specific locations, but it will broadly mention different regional priorities. The Commission's work will align with the Department of Water Resources' efforts under action 19.3: "Conduct a feasibility analysis for improved and expanded capacity of federal, state, and local conveyance facilities to enhance water transfers and water markets. The analysis must incorporate climate change projections of hydrologic conditions."

To inform the white paper, the Commission will hold four workshops focused on the northern, southern, central, and southeastern regions of California. The Commission will invite public input from diverse regional interests, including small and under-represented communities, on how improved conveyance could assist in adapting to climate change and the potential mechanisms to pay for conveyance projects. These workshops will examine regional conveyance priorities and needs, identify the public benefits associated with these conveyance projects, and discuss potential financing mechanisms. The stakeholder-driven workshops will be complemented by panel discussions with experts on topics of relevance to the white paper. Staff will summarize public and expert input to compose a draft white paper for Commission consideration. The draft will be revised based on Commission input prior to delivery to Administration officials and the public.

BACKGROUND BRIEF

This background brief frames the key policy issues associated with Action 19.4. The information included herein provides a partial synthesis of interviews with thought leaders and stakeholders representing the water industry, agriculture, environmental groups, disadvantaged communities, and other interests. A comprehensive synopsis of stakeholder feedback will be provided as a supplementary presentation to this document.

This document provides the Commission with questions to consider as it advances its work. Primarily, the Commission will consider:

- How can water conveyance projects augment water resilience and help meet the needs of a changing climate?
- What are the public benefits to state taxpayers that may justify state financing of conveyance projects?
- What are the advantages and disadvantages (including political challenges) associated with using various funding sources and mechanisms, and how can these mechanisms be applied to promote resilient conveyance projects?

These high-level questions set the parameters for the overarching effort. Additional guiding questions are organized around the following topics:

- Defining Resilience and Considering Conveyance in the Context of Climate Change
- Determining and Assessing Public Benefits
- Assessing Financing Mechanisms and Challenges

Guiding questions are designed to elicit responses that will form the Commission’s ultimate recommendations on how to proceed.

DEFINING RESILIENCE AND CONSIDERING CONVEYANCE IN THE CONTEXT OF CLIMATE CHANGE

DEFINING RESILIENCE

The concept of resilience is at the core of the Water Resilience Portfolio and applying that concept to water conveyance projects is essential to the Commission’s work. Constructing a common definition of resilience creates a foundational lexicon on which the Commission can build its recommendations. Merriam-Webster defines resiliency as “an ability to recover from or adjust easily to misfortune or change.” The portfolio does not offer a definition of the term resiliency, but the intent can be inferred from the Governor’s directive that catalyzed the portfolio by calling for a set of actions to meet California water needs through the 21st century. Per the Governor’s directive, resiliency is embedded in the concept of taking action to create a durable water management system. At the Commission’s June 2019 Listening Session for the Water Resilience Portfolio, Dr. Robert Wilkinson addressed resilience, defining it as the ability of a system to bounce back, which includes three qualities:

- Sensitivity – the degree to which a system will respond to a change in conditions.
- Adaptability – the degree to which adjustments are possible within the system.
- Vulnerability – the extent to which change may damage or harm a system.

Dr. Wilkinson drew attention to the word “system,” pointing out that resilience is the ability for interconnected components – not stand-alone units – to continue to successfully exist and function in the face of changing conditions. He also noted that planned adaptation yields better results than spontaneous adaptation. It is impossible, however, to foresee – and therefore to plan for – all possible changes. Recognizing this, the Commission may wish to consider how planning and management of complex systems can allow for on-going flexibility to allow opportunities for responding to unforeseen changes.

The concepts of sustainability and reliability are also applied to water systems and are related to resilience. Reliability, defined as the quality of performing consistently well, is applied to a water system that continues to provide water when and where needed, operating through damages. Reliability may be intertwined with resilience. As an example, diversifying a district’s water supply portfolio – such as by adding a connection to a near-by district – increases water supply reliability and also serves a system’s resilience by allowing it to better accommodate change when its primary water source is depleted during a drought year. Sustainability, defined as the ability to be maintained at a certain level, speaks to

a water system's ability to avoid damages and thus continue operating in its current manner. Sustainability may be conflated with resilience. Making a system sustainable by replacing deficient infrastructure to ensure that it continues to provide water supply under current conditions does not guarantee that that system is resilient to future changes. The Commission's consideration of resilience may need to tease apart places where these terms are either confused or interwoven to understand whether and how a project is truly resilient.

What emerges from this collection of definitions is an understanding of resilience as the ability of a system to respond to and accommodate change, thus ensuring its functionality and longevity for an extended time horizon. Planning for and taking action to adapt to the crises and changing conditions that climate change presents is a facet of resilience, aligning the Commission's role of assessing conveyance to meet the needs of a changing climate with building statewide water resilience.

CONVEYANCE IN THE CONTEXT OF CLIMATE CHANGE

Conveyance involves moving water from one place to another, usually via some form of conveyance infrastructure, such as pipes and canals or streams and rivers. These physical attributes are underpinned by legal, regulatory, and policy frameworks that can promote the movement of water (e.g., water transfers). Conveyance infrastructure can be long, such as the California Aqueduct, which stretches over 400 miles from the Delta to Southern California, or relatively short, such as a ditch that takes water from a river to use on an adjacent farm field. Conveyance includes local water distribution systems, and even the pipes that distribute water to individual buildings. Notable conveyance projects include the federally-owned Friant-Kern and Delta Mendota canals, both of which are critically important, have subsidence problems, and need costly repairs. As noted above, the Commission's work will not catalog potential conveyance projects in the state, nor will it consider the pending proposal to improve State Water Project conveyance through the Delta.

Water conveyance – moving water via manmade and/or natural systems – is only one facet of water management, and it cannot be divorced from other considerations. Conveyance presumes that water is being taken from someplace – from a source, such as a stream, reservoir, or aquifer – and delivered elsewhere – such as to a water district that will store and manage the water on behalf of its ratepayers, or to an end user or beneficiary, such as a farm field, household, or wetland. The temporal aspect of conveyance is another consideration: conveyance projects serve to move water from one place to another based on when water is available from the source and when it is needed by the beneficiary. Within this situational context, conveyance projects become a proxy for considering broader water management issues; absent this context, conveyance cannot be robustly evaluated based on its impacts on and benefits to a larger system.

In California, the potential impacts of climate change on water resources include an increased ratio of rain to snow in mountainous regions, causing earlier runoff and reduced natural storage in snowpack; increased evaporation and transpiration due to warmer temperatures; increased frequency and intensity of both droughts and floods due to increased variability; and an increased demand for water due to higher temperatures. To prepare for and accommodate these changes will require managing conveyance as part of a larger water system responsible for supplying water for human and environmental needs and, importantly, managing flood flows. The operators of conveyance systems will need to embrace resilience, planning and implementing strategies to move water at different times and to overcome periods of flood and drought. Conveyance can also serve larger climate response

strategies, which may include water conservation, water recycling, water desalination, reservoir reoperation, storm and flood water capture, and groundwater recharge. Each of these strategies could require conveyance.

It is generally accepted that, under a changing climate, the state will experience bigger floods and more extreme droughts. There is a growing need for both small and large-scale conveyance to move flood flows and transfers to recharge basins, storage reservoirs, and habitat areas. Capturing and storing flood flows and then using that water later, to supplement water supply during periods of drought, could become an important resilience strategy that is widely deployed across the state to ensure system reliability during years with little precipitation. One example of this strategy is “flood-managed aquifer recharge,” or Flood-MAR, and involves conveying peak flood flows onto agricultural lands, natural landscapes, or designated spreading grounds to recharge groundwater basins. Flood-MAR presents an opportunity for a watershed approach to addressing climate vulnerabilities (increased flood risk) while also adapting water supply management to meet the needs of a changing climate (increase water supply reliability by recharging groundwater). When paired with reservoir reoperation, a Flood-MAR approach might be utilized to take water from reservoirs in the winter, moving it to places where it can be used for groundwater recharge and stored until that water supply is needed by water rights holders in the hotter months. By keeping reservoirs relatively low in the winter, they will be better able to accommodate the large floods that accompany a changing climate. Moving water out of reservoirs and to recharge areas in the winter can more closely mimic natural flow patterns in rivers. This approach could use existing canals and rivers to move flows to water rights holders, but the timing of those deliveries would shift from dry months to wet months. Those with rights to that water may need new infrastructure to store and redistribute the water delivered in the winter, and, if they are unable to store flood flows, they may need to contract with another entity to store their water and deliver it when needed. Flood and stormwater capture present a compelling example of how the water system could be managed to accommodate climate change.

RESILIENCE CRITERIA

The state’s interest in funding conveyance projects will stem from a project’s ability to demonstrate that it is promoting resilience. A resilient water system accounts for environmental water needs as well as the needs of all humans, including those who do not currently have safe and reliable water. It is adaptable, responsive to crisis, and reliable during changing conditions, and long-term thinking and planning guide its operation. Consistently, interviewees stressed the fact that conveyance solutions are only part of the answer: conveyance must be considered within the context of the source of the water it is conveying and the system it is benefitting.

Water conveyance that enhances resilience to climate change may address other water resilience needs, as well. Redundancy would help maintain operations during non-climate related disasters, such as earthquakes, fires, acts of terrorism, or a shut-down of Delta pumping. By increasing “inerties,” or connections between water systems, conveyance can facilitate water transfers to help cope with drought, or to generally make water transfers more efficient.

To assess a project’s ability to deliver climate resilience, the Commission may find it helpful to consider the project’s durability, flexibility, and adaptability. Durability answers the question: is the project likely to function as intended for the lifespan of the project (e.g., 50 years)? Flexibility and adaptability speak to the project’s ability to adapt to foreseeable changes and to remain mutable enough to adapt to

unforeseen changes. System redundancies and interconnectivity may promote flexibility and adaptivity. Proper planning can help meet these criteria: Projects that are framed by and responsive to a climate change vulnerability analysis and that have assessed other potential risk factors (e.g., earthquake, subsidence, fire) can be evaluated against these planning frameworks.

Interviewees suggest that, when determining resiliency criteria for conveyance projects, the state should look at how a project can provide water for multiple beneficiaries under multiple hydrologic conditions, maximizing its usefulness across beneficiaries and time. For instance, the size, location, and/or design of a project may allow it to serve many needs (e.g., disadvantaged communities, the environment, agriculture, and urban areas) so long as the ability to manage water to serve multiple beneficiaries over the long term is embedded in the structure of the project. Projects that can respond to droughts as well as floods ensure that an investment is not sitting idle under certain conditions.

The Commission may wish to consider the scale of a project's impacts as an important resilience factor, looking at how the project will impact systemwide and statewide resources and water management. Water source, water balances, and water storage are all important facets of a resilient system, and resilience may be assessed by looking at how the project is benefitting the larger system (be it a basin, or watershed), and if these benefits are extensive and/or comprehensive. The state may be able to play a role in setting metrics for performance, requiring a scientifically based water budget and climate change planning that demonstrates how a project will perform under a range of climate scenarios before permitting or paying for water projects.

Interview responses indicate that some interviewees are interested in seeing bigger projects resourced first because these fixes will be the most broadly beneficial. However, some cautioned that this assumption must be tested through a careful valuation of the purported benefits, ensuring that benefits are being provided in the most cost-effective, efficient manner. Decentralized systems may offer increased water supply reliability and facilitate resilience by allowing a system to respond more quickly to change. Centralized systems can create increased vulnerabilities: The risk associated with a centralized system failing to perform has more extensive impacts on a broad network of users.

Building connections within watersheds or groundwater basins will likely enhance local stakeholders' ability to advance solutions that promote resilience: having a network of partners presents opportunities for joint problem solving, resource pooling, and operational flexibility as systems continually adapt to changes. Connections – partnerships – could become an essential criterion on which a project will be evaluated. Building relationships with partners can inform current management and adaptive decision making in the future. Regional networks that mimic ecological connectivity, operating at a basin or watershed level by engaging and integrating all the water and land-use management entities that could benefit from or be impacted by a conveyance project, could be well-suited to institutionalize resiliency and decrease fragmentation, building governance systems that can make informed, coordinated, efficient, and broadly beneficial decisions about on-going adaptation. The inclusiveness and transparency of a network's process for vetting and deciding on conveyance priorities may also indicate its strength. When considering the guiding questions below, the Commission may wish to look at how the number and variety of partners working together to advance a conveyance project increases a project's resilience.

A Note on Regions

The Water Resilience Portfolio notes that California is home to “distinct regional conditions,” making a one-size-fits-all approach to water resilience difficult and unadvisable, and states that “effective water management and preparing for the future are best achieved at a regional scale.” The question of defining planning regions can be considered extensively: California could be divided into regions along hydrologic or geographic criteria, or by climate, or by watersheds. The Department of Water Resources is already considering how best to define meaningful regional boundaries for water planning and management without creating undue administrative burdens or inefficiencies. In various instances, the state has prescribed regional boundaries for water-related planning purposes. The Integrated Regional Water Management (IRWM) program prescribes boundaries for voluntary, regional water planning. The Sustainable Groundwater Management Act (SGMA) delineated groundwater basins, requiring local entities to form groundwater sustainability agencies and develop groundwater sustainability plans (GSPs). If the 260 new local agencies fail to meet the deadlines or the criteria for achieving sustainability, the State Water Resources Control Board will step in and develop the GSPs. This “backstop” of state intervention is a powerful incentive for local agencies to comply with the groundwater management requirements.

Defined regions for water resource planning may not be a necessary precursor to regional coordination. In some instances, regional networks coalesce around water issues, drawing in the partners and stakeholders necessary to advance a project or suite of projects. Most interviewees did not wish to see the state define regions, allowing project partnerships to form more organically around existing vulnerabilities. The portfolio acknowledges that, in some parts of the state, “flood control, groundwater management, stormwater management, forest health, and other issues provide an impetus for coordination.” Importantly, the portfolio also calls for coordination around shared water resources, ensuring that a regionalized approach does not further fragment water management.

GUIDING QUESTIONS:

The Commission will consider how water conveyance projects can augment resilience to help meet the needs of a changing climate.

- What are the overarching characteristics of conveyance projects that will advance water resilience, particularly considering climate change?
- What criteria should the state use to assess the effectiveness of conveyance in improving resilience at local, regional, and state level? Are some resilience criteria more critical than others?
- What types of climate-resilient conveyance projects should be resourced first?
- How can the state foster regional partnerships and collaboration to promote projects that advance watershed- or basin-wide resilience?

DETERMINING AND ASSESSING PUBLIC BENEFITS

DETERMINING PUBLIC BENEFITS

Determining the public benefits associated with conveyance projects that warrant state financing requires looking at what the state is responsible for providing to its citizenry and, from those

responsibilities, selecting public priorities that the state wishes to advance. The state of California has codified a human right to water in section 106.3 of the California Water Code, which specifies that “every human being has the right to safe, clean, affordable, and accessible water adequate for human consumption, cooking, and sanitary purposes.” This human right to water extends to all Californians; the state has a responsibility for ensuring water is provided for human consumption. Broadly, the interviewees stressed the need for the state to prioritize the human right to water when investing in conveyance.

Other state responsibilities:

- enhancing public trust resources, such as fisheries, wildlife, aesthetics, and navigation, beyond what is required under existing regulatory requirement;
- ensuring public health and safety by providing a backstop to the cities, counties, and special districts tasked with the daily oversight of these matters;
- establishing state resource goals by enacting statutes and creating new programs and facilitating the achievement of these goals; and
- establishing and enforcing rules of behavior, which may include funding research or the completion of products necessary to support the establishment or enforcement of rules of behavior. (The SGMA programs for technical support, outreach, and data development are good examples of this use of state funding.)

To determine the public benefits that justify the state financing of conveyance projects, the Commission may choose to focus on benefits that are important to the people of California but do not readily accrue to private users, and therefore lack an easily identifiable beneficiary to pay for them, such as greenhouse gas emissions reduction or habitat and ecosystem enhancement. Regional conveyance projects may decrease greenhouse gas emissions by decreasing reliance on energy-intensive pumping needed to import water. Conveyance may be used to provide water to habitat areas, such as wildlife refuges. Utilizing streambeds or rivers to move water may increase ecosystem benefits, particularly if in-stream conveyance is paired with the reconnection and rewetting of adjacent floodplains.

As noted in the introduction to this document, the Water Resilience Portfolio outlines a state role in water resilience that includes investing in projects of statewide scale and importance, as well as addressing challenges beyond the scope of any region. The state could opt, then, to finance projects that promote sustainability benefits related to subsidence, sea level rise/saltwater intrusion, water quality, or flood protection at a scale that exceeds the responsibility of a single region, that is not feasible for a region to accomplish alone, or that poses significant risk to the people and resources of California. The Commission may wish to consider whether these benefits are best accomplished through a resilient conveyance project, or if they could be more efficiently and cost-effectively tackled separately. If private benefits are substantial enough, the state may not need to invest scarce public dollars in a project to gain its associated public benefits.

It may also make sense to think of state funding as justified to encourage innovative projects or foster cooperation among different jurisdictions to achieve resilience. Utilizing state funds to make large leaps in project design and/or collaborative governance structures may be a necessary catalyst to incentivize progress. The federal Clean Water Act, enacted in 1972, may be seen as a progenitor for using public

funds to spur progress¹. Passage of the Act created a major, new regulatory program that required treating polluted wastewater and was accompanied a grant program designed to pay for 75 percent of the costs of constructing the facilities necessary to implement the Act. By paying for the water treatment, the government alleviated political opposition and brought about rapid compliance with the new law. Similarly, by financing the construction of the State Water Project, the state assumed the risk for advancing a massive shift in water management in the state, leveraging the power of its purse to implement policy matters that precipitated societal change. The state may consider how to foment innovation and spur systemic changes by funding the planning and partnership-building efforts that provide the foundation for advancing new ways of doing business.

In light of the current, COVID-related recession, the state may also consider economic stimulus as a public benefit, using funding to spur economic growth. A recent study by the American Society of Civil Engineers² concludes that, nationally, investments in water infrastructure could generate large financial gains by boosting business sales, creating jobs, and increasing disposable income.

ASSESSING PUBLIC BENEFITS

There is a long-standing tradition, and, in some cases, a legal requirement, that beneficiaries pay (the “beneficiaries pay principle”) for the costs of infrastructure projects from which they derive benefits. Water users, as the recipients of the benefits of clean, reliable water sources for agriculture, industrial, commercial, and residential consumption, are the direct beneficiaries of most water infrastructure projects. These benefits are often referred to as private benefits and are generally paid for by water users themselves through their fees and assessments paid to their local water districts. At its core, a private benefit is a property right – something for which a person can be charged access and from which others can be excluded without payment. Identifying beneficiaries and assigning them a cost-allocation proportionate to the benefit becomes complex.

A companion principle is “stressors pay,” which calls on those responsible for negative operational or environmental impacts to pay to repair the damage³. Polluting industries may be asked to pay for damages to water quality, or groundwater pumpers may be called upon to pay for damages related to subsidence.

State and federal funding for water infrastructure projects is used to direct public funding to public priorities and is contingent upon the projects’ provisioning of one or more strong public benefits in addition to their private benefits. When the state invests in public benefits, the citizenry is the beneficiary that pays for a benefit through tax dollars. When investing in conveyance projects, the state will need to demonstrate to taxpayers that it is a responsible steward of taxpayer dollars. Carefully identifying public priorities and then determining the value of the public benefits for which the state is paying can be used to demonstrate the need for the state’s investment. In some cases, private benefits may be great enough that beneficiaries are able to finance a project that includes public benefits without accessing state funding. In other cases, private benefits may be so diffuse that it is difficult to

¹ Fixing the Delta: How Will we Pay for it, PPIC, https://www.ppic.org/content/pubs/report/R_809DMR.pdf

² http://uswateralliance.org/sites/uswateralliance.org/files/publications/Final_VOW_Economic%20Paper_0.pdf

³ <https://deltacouncil.ca.gov/pdf/delta-plan/2013-ch-08.pdf>

assign them to a beneficiary, but the resilience benefits provided by the project may be important, making it a good candidate for state investment.

The process of determining the cost of the public benefit of a project is complex and nuanced; it is difficult to tease out the specific cost for any single benefit. The Commission's Water Storage Investment Program (WSIP) is one of the first attempts by the state to base state funding on the value of the public benefits provided. For WSIP, public benefits include ecosystem improvements, public trust water quality improvements and groundwater resources, flood control benefits to offset hydrologic changes, emergency preparedness, and recreational access. On the federal side, the U.S. Army Corps of Engineers (ACOE) uses a Principles and Guidelines document that describes a benefit-cost analysis employed by the Corps to ensure that publicly funded projects provide benefits for the public. Generally, ACOE pays for the value of identified public benefits and a commensurate percentage of other project costs that cannot be allocated to a particular benefit. In some cases, the federal government may finance an entire project with a mix of grants for public benefits and loans for private benefits.

Ultimately, the Commission should consider how the state can be explicit about what it is getting out of a project by asking: What public priorities do a project meet? Do the public benefits outweigh the impacts (e.g., to the environment)? Is there a way to meet public priorities in a more cost-effective, sustainable way? The benefits of each project will vary: A careful evaluation of the project will determine who benefits, how to assign costs accordingly, and which projects provide significant aggregate benefits to warrant state financing. The state may also opt to set aside the question of valuing public benefits, choosing instead to provide loans to cover part or all of certain types of projects.

GUIDING QUESTIONS:

The Commission will consider the public benefits to the state that justify state financing of conveyance infrastructure.

- What are the public benefits of conveyance projects?
- Are some benefits more of a public priority than others? Should certain benefits be resourced before others?
- How should the state determine the value of public benefits?

ASSESSING FINANCING MECHANISMS AND CHALLENGES

TRADITIONAL FINANCING OPTIONS

Looking at existing financing for conveyance infrastructure will help to build the Commission's understanding of the financing options available going forward. As noted above, generally water users pay for water infrastructure with some state and/or federal match. As detailed in the technical appendix⁴ to the Public Policy Institute of California's (PPIC) 2014 [report](#) titled "Paying for Water in California," cities, counties, and special districts raises funds for water projects using some or all of the following:

⁴ https://www.ppic.org/content/pubs/other/314EHR_appendix.pdf

- Property taxes, which, once collected, are divided among local governments, school districts, and special districts, including water service districts.
- Other general revenue, such as sales tax, as well as taxes on business licenses, utility users, and tourists.
- Water fees for water services, such as monthly water bills paid by homeowners.
- Special assessments and taxes levied by local districts for water services (often for flood control and in some cases for stormwater programs), such as special parcel assessments, which are proportional to the special benefit received by each parcel, and parcel taxes, which can be used for any voter-approved purposes.

In some cases, such as the State Water Project contractors, legal contracts obligate water users to pay for certain costs associated with a water system. Water supply contracts are essential to the State Water Project's function: In return for State financing, construction, operation and maintenance of State Water Project facilities, the 29 local water agencies contractually agree to repay all associated capital and operating costs. Where these types of legal agreements exist, the contractual mechanism determines how infrastructure is financed.

California has funded many infrastructure projects with general obligation bonds, including most recently the \$2.7 billion allocated to WSIP through Proposition 1. Importantly, general obligation bond funds can only be used for capital assets, leaving local and regional entities to foot the bill for ongoing operations and maintenance obligations. Additionally, interviewees remarked upon the challenges associated with applying for and managing state bond funds. Other state funding sources include the Safe and Affordable Drinking Water Fund, which helps under-funded communities build and maintain water systems, and general fund monies. Unfortunately, the current outlook for these state funding sources is grim: The pandemic has cut revenues sharply, and the state's response to the public health emergency takes precedence over other issues. A water resilience bond is not on the ballot for the next election. The prospect of a direct appropriation of general fund money is unlikely given other competing demands.

The use of loans provides a possible alternative to grants of state funding. To avoid granting public funds to pay for aspects of conveyance that are not a state responsibility, the state may consider loaning state funds that are eventually repaid with interest. The State Water Resources Control Board uses the State Revolving Fund to provide loans that help bring drinking water and wastewater system into compliance with state regulations. Initial capital is provided by the state, and then the non-public portion of that capital gets paid back over time by the beneficiaries. The California Infrastructure and Economic Development Bank (IBank) sells bonds and uses money from its investment portfolio to provide low-interest loans to fund construction projects. IBank does not distinguish between public and private benefits; because funding is repaid, it is not necessary to make the case for public benefits. The federal government uses a "reimbursable" (private benefit) and a "non-reimbursable" (public benefit) approach, using loans to support private benefits, which the applicant repays with interest, and grants for public benefits. The U.S. Environmental Protection Agency's Water Infrastructure Finance and Innovation Act (WIFIA) program provides long-term, low-cost loans for up to 49 percent of costs for regionally and nationally significant water infrastructure projects⁵.

⁵ <https://www.epa.gov/wifia>

EMERGING FINANCING OPTIONS

Given the resource constraints facing local governments and the state, the Commission may wish to consider how new or innovative funding sources can be applied to funding water infrastructure projects. It is possible that the state will receive unrestricted federal stimulus funds, which could be used for water infrastructure. If federal stimulus funds mimic those provided during the 2008 recession, the funds may need to be utilized quickly on shovel-ready projects. The ability to efficiently navigate cumbersome regulatory frameworks may make it easier to ensure that projects that provide important public benefits are poised to receive federal stimulus funds.

Enhanced Infrastructure Finance Districts (EIFDs), identified as a “novel” funding source in the 2018 California Water Plan⁶, allow communities to form special districts that can issue bonds to and tap into other funding and financing powers not usually available to local governments to pay for infrastructure projects that benefit the community. EIFDs may be organized around a watershed, making them a useful tool for small agencies to fund mutually beneficial, watershed-scale projects.

In some cases, public-private partnerships have formed to provide local water managers with the up-front funds needed to construct water infrastructure. Private organizations can leverage state and other funding to attract investors who will be paid back by public and private beneficiaries over time. Local water districts will repay these investors with user fees over long repayment terms. In some cases, these organizations can identify overlooked beneficiaries, helping them properly forecast their return on investment. Infrastructure projects that are supported by diverse partnerships and that benefit multiple water users – such as agricultural and environmental – may make a project more appealing to outside investors.

The energy sector is able to finance efficiency measures, innovative technologies, and research using funds collected through a Public Goods Charge (PGC), a fee that consumers pay on electricity consumption. Funding is managed by the California Public Utilities Commission (CPUC), which regulates most energy entities in the state, giving the CPUC the ability to be flexible and nimble, responding to emerging concerns without going through a lengthy and expensive legislative or voter approval process. With the right criteria and governance, this model might be applicable to the water sector.

Green bonds – or debt issued by corporations or public agencies to finance climate-friendly or environmental capital projects – present another emerging financing opportunity. The California State Treasurer’s Office is exploring the use of green bonds to finance climate-resilient infrastructure in the state, and, recently, the San Francisco Public Utilities Commission listed a green bond on the London Stock Exchange.

FINANCING CHALLENGES

Understanding financing challenges may help the Commission understand how the state can better apply future funding. Some water districts or agencies, such as small, rural community water systems, have insufficient users to pay for needed infrastructure or ongoing maintenance and operations. The current pandemic and resulting recession will likely exacerbate this issue, leading to a decline in revenue that makes it difficult for water districts to finance capital projects and ongoing operations and

⁶ <https://water.ca.gov/-/media/DWR-Website/Web-Pages/Programs/California-Water-Plan/Docs/Update2018/Final/California-Water-Plan-Update-2018.pdf>

maintenance⁷. Nationally, drinking water utilities may experience a \$13.9 billion impact due to revenue losses and increased operational costs caused by the pandemic⁸. It is possible that, given a scarcity of revenue, water districts may resist projects that fully consider the complexity of climate resilience in favor of more immediate fixes to urgent problems.

The Public Policy Institute of California report, “Paying for Water in California,” examines the financial and legal challenges associated with funding water management. The report outlines the concerns associated with Proposition 218 (1996), which requires that water agencies’ fees must be specifically linked to the services for each property, limiting their ability to raise funds for programs and projects that benefit the greater good, such as “lifeline” discounts to low-income households. Agencies are required to justify service charges that do not directly benefit individual customers and to explain how fees used to pay for externalities of water use are properly allocated. The authors found that:

Proposition 218 poses problems, requiring voter approval for fees and assessments for “property-related” flood protection and stormwater management. Moreover, anything not qualifying as a fee is a tax, and earmarked “special” taxes require a two-thirds supermajority of local voters since the passage of Proposition 13 in 1978. Proposition 26, a newer constitutional reform passed in 2010, restricts the definition of other, non-property-related fees, potentially further hampering fundraising for stormwater management and ecosystem improvement.

The Commission may wish to consider how these laws impact the ability of water managers to meet climate resilience goals and whether there is a role for the state to play in addressing any challenges they may pose.

GUIDING QUESTIONS:

The Commission will consider the advantages and disadvantages (including political challenges) associated with using various funding sources and mechanisms, and how these mechanisms be applied to promote resilient conveyance projects.

- How are conveyance projects funded currently? How are costs being shared between funding sources?
- Would project proponents prefer to use certain funding mechanisms going forward?
- What models exist for innovative funding of projects?
- What are the biggest challenges to financing conveyance projects? What role can the state play in overcoming these challenges?
- What funding mechanisms will best advance resilient water conveyance that could help meet needs in a changing climate?

⁷ <https://calmatters.org/commentary/my-turn/2020/09/three-lessons-for-californias-water-funding-challenges-in-todays-recession/>

⁸ <http://uswateralliance.org/resources/publications>