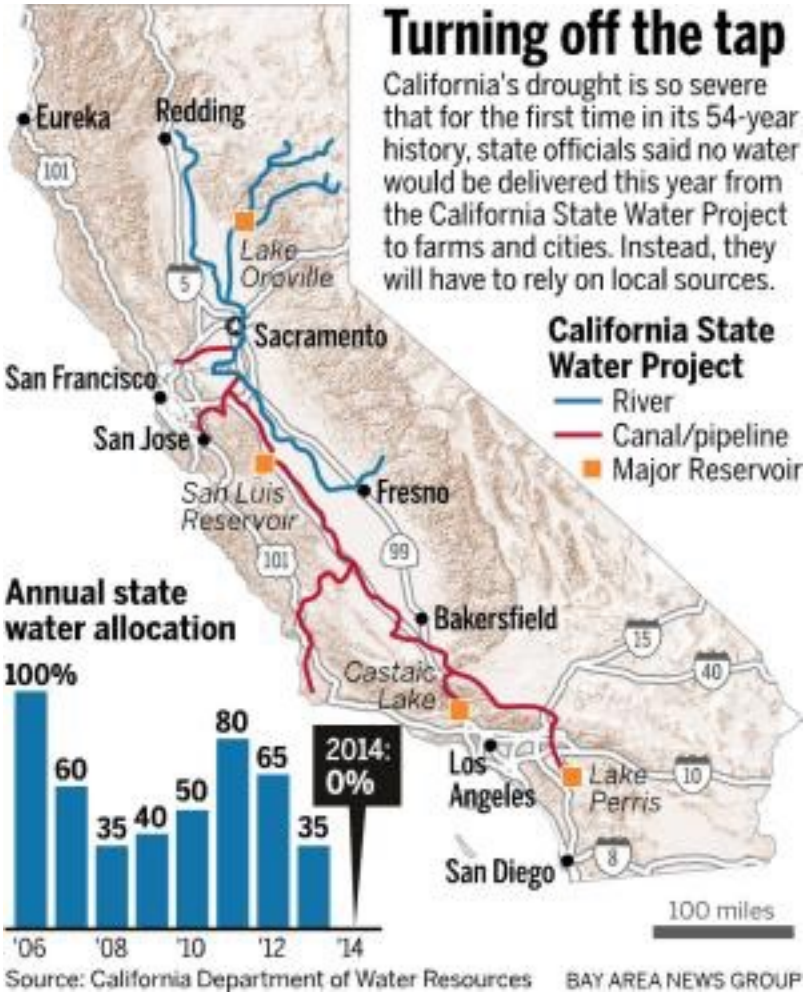
Lesson One: What Does the California Water Project Tell Us About Public Works Infrastructures?

The California State Water Project



The California State Water project provides drinking water for more than 20 million people, most of them living in Southern California. About 30% of its water is used for Central Valley agriculture. This very complicated, far reaching, and expensive project took years to design and build, often against bitter and determined opposition by different groups. At one time, both Northern Californians and the city of Los Angeles were against it. The bond needed to fund the first stage passed in 1959 by a very narrow margin. It has continued to grow since then, and currently, it is the largest publicly built and operated water delivery system in the world. It has been estimated that this water project adds $400 billion dollars to the California economy.

Step One of the Infrastructure: Dams

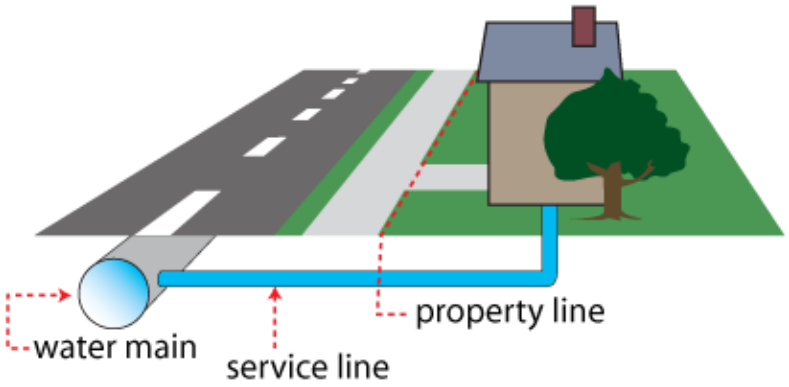
The California Water Project has constructed 21 dams since 1960, one of them being the Oroville Dam. This dam is the tallest in the United States, measuring over 770 feet from top to bottom. Behind it lies the huge Lake Oroville. These dams store runoff from Sierra mountains in the spring and deliver it to its customers throughout the year. 2014/2015 were drought years, and for the first time in history, it delivered NO water to its many customers throughout the state.

Like most dams, this dam was very controversial from the start. There were not only the usual environmental issues, but also the added regional problem of sending water from Northern California down to Southern California.

Step Two of the Infrastructure: The California Aqueduct System

The next task for the infrastructure is to move the water from the storage reservoirs to its 23 million customers. Transferring the water from the Oroville Dam and the Sacramento River in Northern California south to Los Angeles presented engineers with several problems. Over 300 miles of canals had to be built with concrete to prevent the water from disappearing into the dry earth. A typical aqueduct canal is about 30 feet deep and up to 300 feet wide. Another problem was moving the water over the Tehachapi Mountains, which are more than 2,000 feet above sea level. The canals use gravity whenever possible, but at different places in the system, massive pumping stations elevate the water up and over the Tehachapis. The Dos Amigos pumping station is the largest, lifting over 110,000 gallons of water a second! These pumping stations use so much electricity that several power lines may be needed to keep the big stations in operation. The final task is to pump the water over the Tehachapi Mountains, after which the water flows downhill to Los Angeles and other southern California cities.

Step Three of the Infrastructure: Municipal Water Systems



After a long journey, the water finally arrives in Southern California, where the Los Angeles Department of Water and Power takes responsibility for the final delivery of purified and treated water to the many homes and businesses in the city. To serve over 3.8 million residents, the city hires almost 9,000 employees and has a budget of 1.5 million dollars. The city water infrastructure includes 24 chlorination stations, 78 pumping stations, 60,000 fire hydrants, and 7,000 miles of water mains. The UCLA break occurred on one of these 7,000 miles of old, rusting pipes.

Water Infrastructure Chart

	DAMS	AQUADUCTS	MAIN SYSTEMS
very important			
government in charge			
expensive to maintain			
may be deteriorating			
large and complex			
expensive to build			
can be controversial			
parts may be privately owned			