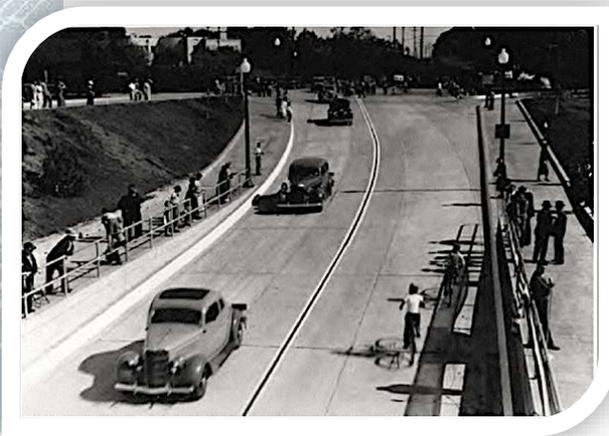


# The Remarkable Story of 10 Historic Concrete Pavements in California

Ten of these historic concrete streets are profiled to tell this magnificent story. In-depth documentation compiled by NCE includes sources such as: historical societies, local agency records, period newspapers, and current visual surveys.

Each profile describes the construction and maintenance aspects, but also touches on the important role the street has played in the community!

**BELOW** - NCE selected these 10 California streets for this study.



**ABOVE** - More than mere streets, these collectors hosted a wide range of local community activities.

City	Street Name	Year Built
Palo Alto	Somersel Place	1937
	Embarcadero Street Underpass	1936
Santa Cruz	Lighthouse Avenue	1928
	Anthony Street	1929
Whittier	Washington Avenue	1926
	Beverly Boulevard	1928
Santa Rosa	Sauslin Way	1942
Balboa Island	Sapphire Street	1925
Los Galos	Almendra Avenue	1931
Newport Beach	East Ocean Boulevard	1924

**Many concrete pavements constructed in the 1920s and 1930s in California are still in use today, serving communities for 70 to 90 years with little to no maintenance.**

Concrete pavements were first constructed in the United States at the end of the 19<sup>th</sup> century. Several of these concrete streets are just now coming up for rehabilitation or reconstruction, making it a perfect time to tell their story.

The construction and material details for these projects largely followed specifications from their era. Some interesting construction practices show wet curing by means of damp dirt or sand cover with an exposed aggregate finish. From a materials standpoint, the concrete consistently featured an aggregate top size of 1" to 1 ½".

The original bid information provides a sharp contrast to current pricing. Nostalgia sets in with the realization that \$183,339 bought the infrastructure as well as 90-year concrete pavements for all of Balboa Island in 1925.

Cost analysis shows that construction and maintenance of these roads represents roughly \$0.10/square yard annually.



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Street Name	Year Bid	Bid Total	Notes
Embarcadero Street Underpass	1936	\$103,687	Bid for entire underpass structure
Lighthouse Avenue	1928	\$21,782	None
Sapphire Street	1925	\$183,339	Bid for 18 street, Curbing, Sidewalks
Almendra Avenue	1931	\$57,000	Bid for multiple streets
East Ocean Boulevard	1924	\$250,000	Bid for 10 concrete pavements and sidewalks including sewer, water lines and electric lights

**ABOVE** - Original bids as recorded at the time of design.

**Designs for these streets exemplify the strength and durability of well-placed Portland cement concrete. Thicknesses range from 4" to 8" of jointed plain concrete pavement (no rebar reinforcement) with typical thicknesses between 5" to 7".**



Cross section excerpt from original plans.

**ABOVE** – Cross-section excerpt from original plans.

Modern design uses shortened joint spacing, but these streets feature transverse joints 20' to 100' apart. Further testament to the durability and design of these streets can be seen in the population (and resulting traffic) increases that have grown between 4 and 40 times since original construction!

Visual distress surveys found varying degrees of cracking on all of these streets, mostly attributable to the large slab sizes. Localized patching is prevalent on these streets for both repair and utility cut purposes.

In general, with the California climate being conducive to long-life concrete pavements, this study demonstrates that with superior design, wise material choices, and robust construction practices, concrete pavements have the potential to remain in service for 90 years or more!



**ABOVE** – Concrete pavement promotion from the San Bernardino County Sun, December 5, 1930.

The detailed study report is available for download directly form the CNCA website homepage at [www.cncement.org](http://www.cncement.org).

In addition, the California Nevada Cement Association provides a wide range of case studies, design and construction resources, research and more for pavements, geotechnical and other cement applications.