

A RIVER SOMETIMES RUNS THROUGH IT
THE STORY OF THE LACDA FLOOD CONTROL CHANNEL UPGRADE PROJECT

Scriptwriter: Richard Bellikoff

VIDEO	AUDIO
Stock footage, stereotypical Southern California images: sun, sand, joggers, surfers, etc.	<u>NARRATOR (V.O.)</u> : The old song, “It never rains in Southern California” is based on a fundamental misconception. It’s true that the Los Angeles area is warm and sunny most of the year. But when the winter rainy season arrives, it can bring devastation.
SHOCK CUT to flood footage &/or stills	<i>(Music &/or natural water flow sound)</i>
Footage &/or animation showing topography of L.A. Basin, with mountains, coastal plain, & flash flood runoff from rain	<u>NARRATOR (V.O.)</u> : The unique topography of the Los Angeles basin makes it one of the most flood-prone regions in the world.
Interview, LACDA Alliance tape, Carl Blum, former Deputy Director, Los Angeles County Dept of Public Works, 2:23:34	<u>BLUM</u> : The rain that falls here comes from the mountains to the ocean within hours.
Split screen, L.A. River dry vs. at flood stage	<u>NARRATOR (V.O.)</u> : The result is that rivers which run dry most of the year can suddenly reach flood stage and inundate the surrounding communities.
Interview, LACDA Alliance tape, Carl Blum, former Deputy Director, Los Angeles County Dept of Public Works, 2:24:30	<u>BLUM</u> : That’s what makes it very dangerous here is, they come up very quickly and they catch people unexpectedly.

Montage of historical flood footage, stills and newspaper headlines

NARRATOR (V.O.): Long before “El Niño” became a household phrase, dozens of major floods struck the Los Angeles area -- eight from 1815 to 1876, and nine more from 1884 to 1938. The floods of 1934 and 1938 were a deadly double-header that made the public very receptive to flood control measures.

Super:
Los Angeles County Drainage Area

In 1940, Congress authorized funds for the Los Angeles County Drainage Area project -- LACDA for short.

Letters fly out to form: **LACDA**

Map of complete LACDA system

Over the next three decades, the U.S. Army Corps of Engineers

Detail of map shows L.A. River

designed and built the most extensive metropolitan flood control

L.A. river footage, aerial views and other angles

system in the country. Its centerpiece was the Los Angeles River -- straightened, deepened and widened, and lined with concrete, in order to increase its water-carrying capacity and give floodwaters the quickest route to the sea. These modifications were designed to protect the public from the devastating effects of flooding.

L.A. River footage

Map shows entire L.A. River

Detail of map shows lower portion of river

Various shots of completed LACDA upgrade project

The LACDA flood control system was remarkably effective -- until 1980, when events on the lower or southernmost portion of the L.A. River led the Army Corps of Engineers to embark on a massive upgrade project for the system. Ultimately, the project would come in 5 years ahead of schedule and 150 million dollars under budget. It would provide flood protection for over half a million people, and relief from costly flood insurance premiums for over 70,000 people . In short, it would prove to be a major success story for government and the public.

This is the story of the upgrading of the LACDA flood control system -- how and why it happened, and what it accomplished.

Opening titles:

**A RIVER SOMETIMES RUNS
THROUGH IT
The Story of the LACDA Flood Control
Channel Upgrade Project**

(Music up for titles)

Detail of Southern California (LACDA area) map showing location of Wardlow Rd in Long Beach

NARRATOR (V.O.): It all started one morning in 1980, after a winter storm. A routine patrol of the lower Los Angeles River near Wardlow Road in the city of Long Beach revealed a disturbing development.

Interview, Chris Stone, LACDA Project Manager, Los Angeles County Dept of Public Works, 1:17:03

STONE: Our maintenance crews observed debris on top of the access roads which line, or are adjacent to, the channel itself.

Animation showing river channel, levees & access roads, with water rising to top of channel, depositing debris, then water level dropping

NARRATOR (V.O.): The debris they found was mostly vegetation and trash which are routinely carried downstream by the river.

Finding them adjacent to the river channel could mean only one thing -- the water had risen to the top of the channel as a result of the storm, and deposited the debris alongside it.

Footage &/or stills & news headlines of 1980 storm & flood

This was surprising, since all indications were that the storm had not been a hundred-year flood event. Protection from a hundred-year flood is the standard for most flood control projects in the U.S.

Interview, Joe Evelyn, Chief, Hydrology & Hydraulics, Corps, Los Angeles District, 1:03:19

EVELYN: The hundred-year flood is a flood that has a probability in any year of one-in-one-hundred chance of occurring. In other words, there's a one percent chance in any given year that a flood of that magnitude will be equaled or exceeded.

Map showing LACDA flood plain area & rivers & communities affected: Bellflower, Carson, Compton, Downey, Lakewood, Long Beach, Lynwood, Montebello, Paramount, Pico Rivera, South Gate

NARRATOR (V.O.): Investigation by the Army Corps of Engineers revealed that the LACDA flood control system in place on the lower Los Angeles River and its tributaries, the Rio Hondo and Compton Creek, did not provide the desired hundred-year protection. In fact, some stretches provided as little as 25-year protection. Officials estimated that a hundred-year flood would inundate an 82-square mile area south of the city of Los Angeles that is home to over half a million people. Such a flood could cause an estimated 2.3 billion dollars in damage. Clearly, this was a wake-up call for the Corps, L.A. County, and the citizens in the flood risk area.

Interview, Joe Evelyn, Chief, Hydrology & Hydraulics, Corps, Los Angeles District, 2:07:49

EVELYN: If it had rained a little bit harder, we might have wound up with a flood large enough to actually overtop and cause a levee failure. So, a very significant event.

Footage of lower L.A. River & Rio Hondo

NARRATOR (V.O.): The question immediately arose, why didn't the LACDA system protect against a hundred-year flood on the lower L.A. River and the Rio Hondo? Further investigation revealed several factors that had caused more water to come into the rivers over the years. One of the main causes was increased real estate development or urbanization.

Interview, Colonel Richard Thompson,
Commander, Corps, Los Angeles District,
1:06:16

THOMPSON: Urbanization in the Los Angeles River basin has drastically increased the amount of runoff that can be expected to come into the river.

Interview, Joe Evelyn, Chief, Hydrology &
Hydraulics, Corps, Los Angeles District,
1:17:49

EVELYN: If you put down an impervious surface like concrete or asphalt, that water no longer has an opportunity to soak into the soil. It winds up running off, and it runs off very quickly on a paved, smooth surface.

Aerial views of L.A.

NARRATOR (V.O.): Extensive development along the river channels also means there's more property that's vulnerable to flood damage -- a legacy of L.A.'s notorious urban sprawl.

Interview, LACDA Alliance tape, Carl Blum,
former Deputy Director, Los Angeles
County Dept of Public Works, 2:21:40

BLUM: And what happened here with the Los Angeles River project was that the assumptions that were made in the 1930s on how big this should be built assumed that a large part of Los Angeles would not be developed.

Stock footage, aerial views of L.A., showing
extensive development

Footage &/or map of LACDA system,
showing river & stream channels, storm
drains, debris basins, etc.

NARRATOR (V.O.): But it was developed -- straining the water capacity of the system. And so over the years, L.A. County and the Army Corps of Engineers had to add more and more storm drains -- which in turn increased the amount of water going into the system.

Interview, David Cozakos, Senior Hydraulic Engineer, Corps, Los Angeles District, 5:10:24

Animation showing runoff from channels & storm drains coming into L.A. River & Rio Hondo

Footage of L.A. River & Rio Hondo

FEMA map of flood-hazard zone

COZAKOS: In the Los Angeles area, we have the largest flood control system in the country and there's something like several hundred miles of channels and a few thousand miles of storm drains. And the effect of this system is to bring the runoff into the channels much quicker. So it's the same type of problem as a lot of cars trying to get on the freeway at the same time during rush hour and overloading the freeway.

NARRATOR (V.O.): To protect nearby residents and businesses from a 100-year flood, it would be necessary to upgrade the system. The need for an upgrade became even more urgent when FEMA -- the Federal Emergency Management Agency -- identified the 82 square mile area as a flood-hazard zone. This meant that residents and businesses with federally-backed loans were required to buy flood insurance. It's mandated by federal law for any property located in an area with less than hundred-year flood protection.

News footage of recent floods in various non-Los Angeles locations, e.g. Mississippi, etc.

FEMA administers the National Flood Insurance Program. The program was established in 1968 by Congress, in response to the rising cost of taxpayer-funded disaster relief for flood victims. It was designed to make insurance available at reasonable rates. The program also made flood insurance mandatory in flood-hazard zones if local governments wanted to remain eligible for federal disaster assistance.

Interview, Ray Lenaburg, Senior Engineer, FEMA regional office, San Francisco, 3:21:00

LENABURG: It's a lot easier to have a flood insurance policy to guarantee that you can get the repairs to your house and get yourself back on your feet, rather than having to ask for federal aid from the federal government.

Footage of homes & businesses near river channels

NARRATOR (V.O.): But many residents didn't see mandatory flood insurance that way. They took to referring to it as "the flood tax."

Soundbite, unidentified old man standing up in audience at LACDA Summit, Long Beach CA, 4/1/99 (Tape #1, Side A transcript, no time codes)

MAN: I don't see why we have to pay for insurance, especially us retirees, veterans, and people that can ill afford any more burden of insurance on their backs.

Super:
LACDA Summit meeting
Long Beach, CA

Interview, Don Knabe, Los Angeles County Supervisor, 4th Supervisorial District, 3:05:31

KNABE: Along this river, many of the people that were so impacted by the insurance requirements are the least able to afford it.

Soundbite, unidentified woman standing up in audience & reading from prepared statement at LACDA Summit, Long Beach CA, 4/1/99 (Tape #1, Side B transcript, no time codes)

Super:

**LACDA Summit meeting
Long Beach, CA**

Interview, Stephen Horn, Congressman, 38th District, California, 13:51:48

Interview, LACDA Alliance tape, John K. Pratt, Mayor, city of Bellflower, CA, & property manager, 1:18:57

Insert map showing locations of Bellflower & Lynwood in relation to city of L.A.

FEMA map of flood-hazard area

LACDA Summit & Town Hall meeting footage

Stock footage, Capitol building & congressional buildings

WOMAN: When will you introduce legislation to stop mandatory flood insurance so families can, instead, send their children to college, and seniors don't have to sell their homes?

HORN: The cost averaged about four hundred dollars a year for each home. Even so, this cost was a burden to many residents.

PRATT: I had one property in Lynwood that had seven houses on the lot, so that's 2800 dollars a year just for flood insurance.

NARRATOR (V.O.): Community leaders in the flood-hazard areas soon realized that the quickest way to free their constituents from flood insurance premiums was to have the LACDA system upgraded to protect against a hundred-year flood.

In 1991, they established a coalition of cities called the LACDA Alliance. The Alliance had one main purpose: to lobby congressional representatives and secure federal funding for the LACDA project improvement.

Interview, LACDA Alliance tape, Dennis Courtemarche, City Manager, Pico Rivera, 3:07:40

Map showing L.A. County & city of L.A. in relation to cities affected by LACDA project: Bellflower, Carson, Compton, Downey, Lakewood, Long Beach, Lynwood, Montebello, Paramount, Pico Rivera, South Gate

Stock footage, Capitol building & congressional buildings

Interview, Stephen Horn, Congressman, 38th District, California, 13:53:52

Interview, LACDA Alliance tape, Dennis Courtemarche, City Manager, Pico Rivera, 1:21:43

COURTEMARCHE: Early on, when we talked about the Los Angeles River, they immediately -- the representatives in Washington -- thought of only the city of Los Angeles. And we spent more than one trip educating them and convincing them that Los Angeles, the city of Los Angeles, represents only a portion of Los Angeles County. And here was an area that was more than a half a million people that would be affected that didn't even touch the city of Los Angeles.

NARRATOR (V.O.): The members of the LACDA Alliance quickly discovered that federally-funded public works projects were not usually fast-tracked through Congress. The typical timeline for a project like LACDA was 10 to 12 years.

HORN: When construction began in 1996, the White House had proposed a funding schedule that would have delayed the project's completion until 2006.

COURTEMARCHE: And we needed to condense that, because each year there were 131 million dollars worth of premiums, insurance premiums, that were to be paid, yet the project was only a 300 million dollar project.

Interview, Don Knabe, Los Angeles County Supervisor, 4th Supervisorial District, 3:05:31

KNABE: We helped initiate letter writing campaigns, saying, “Hey, you know, this is a big issue here. You can’t, you know, take 130 million dollars a year out of our economy in insurance and then, say, not want to give us 50 million dollars back to keep the project on target and under budget.”

Interview, LACDA Alliance tape, Dennis Courtemarche, City Manager, Pico Rivera, 1:21:43

COURTEMARCHE: If you just took two years' worth of premiums, you could pay for the project. And so, with that kind of approach, we were able to convince Congress that it was important to accelerate the funding for this project.

Juanita Millender McDonald, Congresswoman, 37th District, at conference table, moderating LACDA Summit meeting, Long Beach, CA, 4/1/99 (no time codes)

McDONALD: The members of Congress who live in this area especially have been on the dime every second when the President's budget comes out . . . Congress has worked tirelessly to try to bring an end to your flood insurance.

Super (in addition to name & title):

**LACDA Summit meeting
Long Beach, CA**

Interview, Don Knabe, Los Angeles County Supervisor, 4th Supervisorial District, 3:08:00

KNABE: The elected officials in this area, Republican, Democrat, Independent, stood shoulder to shoulder saying, “Hey we want this to happen.”

LACDA Summit and Town Hall Meeting
footage

NARRATOR (V.O.): While the LACDA Alliance was lobbying on Capitol Hill, it was also informing and educating the local communities at the grass roots level. The Alliance found out that many residents thought their flood insurance premiums were a far bigger threat to their well-being than an actual flood would be.

Soundbite, unidentified man seated in audience at LACDA Summit, Long Beach CA, 4/1/99 (Tape #1, Side B transcript, no time codes)

MAN: I didn't see any flooding in this area A lot of folks don't believe that we really are in danger.

Super:
**LACDA Summit meeting
Long Beach, CA**

Stock footage, stereotypical Southern California images: sun, sand, joggers, surfers, etc.

NARRATOR (V.O.): With a Southern California climate that at times seems to be in perpetual drought, a flood can be hard to imagine.

Interview, LACDA Alliance tape, Carl Blum, former Deputy Director, Los Angeles County Dept of Public Works, 2:22:11

BLUM: The wet and dry cycles that we have here in Southern California sometimes go ten, fifteen years between them. . .

Stock footage, stereotypical Southern California images: sun, sand, joggers, surfers, etc.

.(2:22:49) A lot of people move in and it's been dry for three years, so therefore they expect it to be that way.

Interview, LACDA Alliance tape, Keith McCarthy, City Council member, Downey, CA, 1:15:49

McCARTHY: And for those who'd never been exposed to flooding, the whole thing sounded like Chicken Little.

Historical flood footage, stills & headlines

NARRATOR (V.O.): But the leaders of the LACDA Alliance knew that once a flood struck, it would be too late to take preventive action. Over a period of years, they were successful in building support for the LACDA upgrade project, both among their constituents and in the nation's Capitol.

Interview, LACDA Alliance tape, Dennis Courtemarche, City Manager, Pico Rivera, 2:12:08

COURTEMARCHE: We had in fact become a political force.

Stock footage, L.A. City Hall, downtown skyline

NARRATOR (V.O.): But not all the funding for the project would come from the federal government. A local sponsor also had to be located.

Interview, Chris Stone, LACDA Project Manager, Los Angeles County Dept of Public Works, 1:02:10

STONE: The Federal government has to authorize, approve and fund Federal projects. Along with that authorization they have to find a local entity to be the local sponsor for the project.

Interview, Nino Issakhan, LACDA Project Manager, Corps, Los Angeles District, 1:13:28

ISSAKHAN: Our sponsor in this particular project has been Los Angeles County Department of Public Works.

Construction footage

NARRATOR (V.O.): As sponsor, the L.A. County Department of Public Works provided 25% of the project's funding, with the remaining 75% coming from federal funds. They were also responsible for obtaining permits and rights of way needed to construct the project, along with any utility lines, roads and bridges that had to be moved or relocated. They provided design and construction expertise. And once the project was completed, the sponsor's long-term responsibilities would begin.

Interview, Nino Issakhan, LACDA Project Manager, 1:24:14

ISSAKHAN: L.A. County Department of Public Works is the eventual owner, and responsible for maintenance of the system.

Interview, George Beams, Chief, Construction Operations Division, Corps, Los Angeles District, 4:10:14

BEAMS: And then when we finish the project, we turn it over to the sponsor for them to operate and maintain.

Map showing area of LACDA project upgrade

NARRATOR (V.O.): While the LACDA Alliance was lobbying for federal and county funding for the project, the Army Corps of Engineers was looking at alternatives for upgrading the water-carrying capacity of the lower Los Angeles River and the Rio Hondo, to bring them up to the hundred-year-flood protection standard.

Interview, LACDA Alliance tape, Keith McCarthy, City Council member, Downey, 1:27:00

McCARTHY: And there were a number of public meetings. There was a good deal of rancor expressed, but if you're going to take on a project of this size, you have to expect that.

Footage of LACDA Summit and Town Hall meetings

Interview, Joe Evelyn, Chief, Hydrology & Hydraulics, Corps, Los Angeles District, 1:20:43

Footage &/or animation of levees along river, showing how raising their height increases water-carrying capacity

Footage of parapet walls atop levees

Closer view of parapet wall

Interview, David Cozakos, Senior Hydraulic Engineer, Corps, Los Angeles District, 6:19:41

EVELYN: And it turned out that the most economical, the least environmentally damaging and the most publicly acceptable

alternative was one in which we simply increased the channel capacity of the Rio Hondo and the lower Los Angeles Rivers. And we did that by simply raising the levees -- and therefore if you have higher, basically, walls in which to carry water, you have a higher capacity to carry flows.

NARRATOR (V.O.): Along many portions of the rivers, it turned out that the levees couldn't be raised -- and so parapet walls had to be erected on top of them.

A parapet wall is a vertical retaining wall made of reinforced concrete.

COZAKOS: The only reason parapet walls were used instead of raising the levees is because in certain situations, there just isn't sufficient vacant land available next to the levee to raise it by a significant amount.

Aerial view of river, levees and surrounding urbanization

Footage &/or animation, illustrating why additional land is needed to raise a levee

Footage of levees & parapet walls

Interview, Chris Stone, LACDA Project Manager, Los Angeles County Dept of Public Works, 1:07:10

Footage, parapet walls, showing textured surfaces & vines

Footage of bike riders

Map showing length of bike path

NARRATOR (V.O.): Because of the trapezoidal shape of a levee, raising it by just a single foot would require widening it by two feet on each side. Since it would be too costly to widen levees on the river side, four more feet on the land side would be needed for each added foot of height. But with the areas along the river channels extensively developed, vacant land for horizontal expansion of levees is a scarce commodity.

So parapet walls were the only alternative. And since this was a public works project, the public felt free to express its concern about how those walls would look.

STONE: A lot of the residents in the area didn't want to see more concrete being poured along the channel, to provide that extra protection.

NARRATOR (V.O.): In response, the Army Corps of Engineers designed and built parapet walls with textured surfaces. They also planted climbing vines which will eventually cover the walls and inhibit graffiti.

A bicycle path already in place from the original LACDA project was improved, so that people could ride all the way from Whittier Narrows Dam to the ocean. And there were other improvements.

Interview, Chris Stone, LACDA Project Manager, Los Angeles County Dept of Public Works, 3:03:25

Footage of horse trail & riders

Landscaping shots

Interview, Ron Lockmann, Environmental Manager, Corps, Los Angeles District, 3:05:47

Footage of L.A. River & Rio Hondo

Interview, Joe Evelyn, Chief, Hydrology & Hydraulics, Corps, Los Angeles District, 1:26:58

Animation showing water level rising to bridge level, forming choke point in river, overtopping levee

STONE: There is a horse trail, or an equestrian trail that basically parallels the entire project through the entire length. . . . (3:02:54)

Aesthetically this area is so much nicer than what it was prior to the project, because of all the landscaping, the additional work that went into making it a nice project for the community as a whole.

LOCKMANN: I think it's fair to say that this project has kicked off a new era of environmental awareness, of the potential value of the civic-public beneficial uses of this stream channel.

NARRATOR (V.O.): While all this work was going on, hydrologists at the Army Corps of Engineers realized that increasing the water-carrying capacity of the rivers could have unintended consequences.

EVELYN: We're talking about an increase in the wall heights, or the levee heights and having higher water surface elevations in the channel, the bridges that were there were not designed for this higher water surface elevation. . . . (1:27:19) If the water depth gets high enough to actually impact the bridge, it tends to basically form a choke point in the river, which causes the water elevation to rise very rapidly upstream of the bridge, and then cause overtopping.

Interview, Chris Stone, LACDA Project Manager, Los Angeles County Dept of Public Works, 1:24:32

Footage of bridge, with graphic labels showing piers & bridge deck

Animation showing rising water hitting piers and bridge deck

Interview, Nino Issakhan, LACDA Project Manager, 2:00:50

Footage of various bridges &/or map showing locations of bridges

Interview, Tony Nefas, Design Leader, Corps, Los Angeles District, 7:20:08

Bridge footage

Interview, Colonel Richard Thompson, Commander, Corps, Los Angeles District, 1:12:13

Aerial footage, L.A. freeways, bridge traffic crossing L.A. River

STONE: This obstruction is caused by two things -- one, by the piers that support the bridge deck that crosses over the channel, and also the bridge deck itself if it's down in the channel to where it could block flows coming down the channel.

ISSAKHAN: The bridges would be acting like dams during a flood event.

NARRATOR (V.O.): The Army Corps of Engineers was suddenly faced with the possibility of having to raise a large number of bridges spanning the lower Los Angeles River and the Rio Hondo.

NEFAS: Each one would have been a project in itself It would have dragged on for many more years if we had to raise all the bridges.

THOMPSON: Raising of those bridges would have been an expensive proposition from a financial perspective, but also a nightmare for everyone who has to commute across those, because those would have forced alternate transportation routes and construction traffic in the middle of some of the most urban areas of Los Angeles.

Interview, Joe Evelyn, Chief, Hydrology & Hydraulics, Corps, Los Angeles District, 1:23:52

EVELYN: We had to try to work around how to increase the capacity of the channel and minimize the number of bridges that would have to be either replaced, or raised, or modified in some way.

CU, mathematical hydrology model, computer screen shot &/or printout

NARRATOR (V.O.): Hydrologists at the Army Corps of Engineers began looking for solutions by using mathematical models. But they soon encountered another obstacle.

Interview, David Cozakos, Senior Hydraulic Engineer, Corps, Los Angeles District, 5:20:28

COZAKOS: The great majority of the project reach for the Los Angeles River and basically all of the Rio Hondo can be characterized with unstable flow conditions.

Animation showing unstable flow conditions

NARRATOR (V.O.): This unstable flow is caused by many factors - including the size, shape, slope and roughness of the river channels. Instability of flow means that the water surface is especially sensitive to changes in the flow boundary, such as at bridges and access ramps. In certain cases, instability can create large waves on the water surface that can significantly increase the flow depth against levees. To complicate things further, water flow conditions are unique at each bridge.

Interview, Joe Evelyn, Chief, Hydrology & Hydraulics, Corps, Los Angeles District, 2:14:55

EVELYN: And it's so complicated that you can't reliably mathematically model it.

WES model footage

Super:

Waterways Experiment Station

Letters fly out to form: **WES**

NARRATOR (V.O.): For that reason, the Corps decided to construct a scale model of the LACDA project site at its Waterways Experiment Station -- known as WES -- in Vicksburg, Mississippi. But at the L.A. County Department of Public Works and the LACDA Alliance, there was a good deal of skepticism about the cost-effectiveness of conducting experimental model studies.

Interview, LACDA Alliance tape, Carl Blum, former Deputy Director, Los Angeles County Dept of Public Works, 3:00:52

BLUM: When the local office came to us as a local sponsor and suggested that we do a model study on this, and they said the price tag was a couple million dollars, I about choked.

Interview, LACDA Alliance tape, Dennis Courtemarche, City Manager, Pico Rivera, 2:25:49

COURTEMARCHE: I had heard about it, and I frankly was skeptical. But I went. And I saw it. And I was made a believer.

WES model footage

NARRATOR (V.O.): Eventually, five models were built at WES, on a scale of 1-to-50 and 1-to-55. Their total length was 2100 feet, ranging in individual length from 110 to 630 feet.

Interview, David Cozakos, Senior Hydraulic Engineer, Corps, Los Angeles District, 6:01:19

COZAKOS: The model for the LACDA Project, the physical model, is so large that it had to be constructed in five separate segments because it was too large to house, even in the large buildings down at the Waterways Experiment Station.

Interview, Joe Evelyn, Chief, Hydrology & Hydraulics, Corps, Los Angeles District, 2:17:16

EVELYN: When you talk about a channel that you're modeling for that distance, it requires facilities that are basically aircraft hangar-type size of facilities in order to place these models.

WES model footage

NARRATOR (V.O.): The models built at WES were based on the Army Corps of Engineers' designs for the LACDA project. They reproduced every feature of the river channels, down to the last detail.

Interview, Joe Evelyn, Chief, Hydrology & Hydraulics, Corps, Los Angeles District, 2:18:03

EVELYN: You have every project feature in terms of the bridge piers, the access ramps, the height of the levees, their slope, all these things have to be set to provide what we call "hydraulic similitude" with the real world.

Interview, Chris Stone, LACDA Project Manager, Los Angeles County Dept of Public Works, 2:04:39

STONE: With the physical model in place, engineers were able to actually see, visually see how water flows down the channel.

WES model footage

NARRATOR (V.O.): Engineers at WES used dyes to visually track and measure water currents and waves, and see how they were affected by structures like bridges, levees, parapet walls and access ramps. They experimented and modified the Corps's designs in a way that would have been both logistically impossible and prohibitively expensive at the actual project site.

Historical footage &/or stills, original LACDA project, bridges

One solution to the bridge problem soon emerged from the model testing at WES. It was based on a design feature that went all the way back to the construction of the original LACDA project in the 1940s.

Footage of pier noses

At that time, some of the bridges had been equipped with a sloping structure called a pier nose on the upstream ends of their piers. The pier noses were designed to keep floating trash and debris from matting up on the upstream faces of the piers -- possibly creating a blockage which could cause the water upstream to rise and overtop the levees.

Animation showing how pier nose keeps debris moving downstream

Interview, Joe Evelyn, Chief, Hydrology & Hydraulics, Corps, Los Angeles District, 3:02:54

EVELYN: If there's trash and floating debris, the sloping shape of the pier helps that debris to ride up the face of the pier and fall off to the sides, and then be carried safely downstream, instead of building up in a large mat that goes all the way from the bottom of the channel, all the way to the top.

Animation showing how pier nose keeps debris moving downstream

Footage of extended pier noses

NARRATOR (V.O.): In the 1990s, hydrologists at the Army Corps of Engineers made a breakthrough discovery: They could avoid having to raise some of the bridges by modifying their pier noses to take advantage of a phenomenon called the draw-down or acceleration effect.

Animation showing how bridge pier nose extensions accelerate water flow

As water flows toward a bridge pier, it accelerates and draws down or dips lower. This effect normally starts when the water first hits the upstream portion of a pier. By extending the pier noses further upstream on a number of the bridges, the water would be made to hit the pier sooner and start its draw-down some distance upstream of the bridge. The result: Water flowing smoothly under the bridge without touching the deck.

Interview, Chris Stone, LACDA Project Manager, Los Angeles County Dept of Public Works, 2:08:33

STONE: Essentially these pier modifications would speed up the flow of the water in the channel and cause the water to actually duck and go underneath the bridge, so that we would not have to raise the bridge.

WES model footage

NARRATOR (V.O.): Variations of this technique were used in different situations.

Interview, Joe Evelyn, Chief, Hydrology & Hydraulics, Corps, Los Angeles District, 2:19:37

EVELYN: In the case where there are multiple piers, sometimes it paid to extend the piers into one long pier, instead of having the

WES footage &/or animation of multiple piers on adjacent bridges

hydraulic effects of two separate sets of piers on bridges that were close together. It might be better to have one single bridge pier that extended from one bridge into the next bridge. That might improve the flow conditions.

Footage &/or animation of MTA bridge, showing skewed angle crossing

NARRATOR (V.O.): Yet another variation of the pier nose modification technique was used in the case of one particular bridge. This bridge crosses the Los Angeles River channel at a skewed angle, rather than at right angles like most bridges.

Interview, Joe Evelyn, Chief, Hydrology & Hydraulics, Corps, Los Angeles District, 2:24:32

EVELYN: The problem there is that each bridge pier can produce wave effects that impact the next bridge pier and the next bridge pier and so forth. You have this sometimes increasing effect of these waves coming off the pier upstream, affecting the next pier downstream. And so that can make it very difficult to design a solution to minimize changes to that bridge. You, in some instances, have to wind up extending the piers all the way upstream so they all start at the same point, as though the bridge went across at a right angle. And that's one approach that we did use on one of the bridges.

Footage of actual bridges & WES model bridges

NARRATOR (V.O.): All the bridges presented unique problems, because the flow conditions were different for each one. A solution that was appropriate for one particular bridge might not work at all for another. This was a challenge for the Army Corps of Engineers.

Interview, David Cozakos, Senior Hydraulic Engineer, Corps, Los Angeles District, 5:17:26

WES model footage

Split screen, WES footage vs. mathematical hydrology model (screen shot or printout)

Interview, Joe Evelyn, Chief, Hydrology & Hydraulics, Corps, Los Angeles District, 2:20:25

WES model footage

WES models & actual bridge footage

Interview, Colonel Richard Thompson, Commander, Corps, Los Angeles District, 1:14:15

COZAKOS: We had to look at each bridge individually. You look at the flow characteristics and determine what the problem was at each bridge, and, mostly by experimentation and the physical model, determine which solution would be the best for that particular bridge.

NARRATOR (V.O.): The three-dimensional scale models built at Waterways Experiment Station allowed a wide variety of water flow problems to be solved in a way that a one- or two-dimensional mathematical model never would have.

EVELYN: All these things could be done in the model and measurements taken to see how they performed. And on the basis of that, that's how we arrived at the final design configuration for the project. . . . (1:25:16) And by doing so, we minimized the cost and disruption and were able to complete the project much more quickly than what we first thought possible.

NARRATOR (V.O.): The savings in construction costs from not having to raise most of the bridges turned out to be many times more than the cost of the model testing.

THOMPSON: For a small investment in research, we were able to see about 150 million dollar savings in project cost.

Interview, Joe Evelyn, Chief, Hydrology & Hydraulics, Corps, Los Angeles District, 2:27:41

EVELYN: I believe we have spent approximately five million dollars on physical model testing at W.E.S. . . . Tremendous return on that investment.

Footage of WES models, LACDA project site

Bridge footage, including construction on railroad bridges

NARRATOR (V.O.): In the end, a few railroad and utility bridges needed to be modified, but not a single bridge carrying automobile traffic had to be raised. This was a major achievement, saving a great deal of time and money.

(Music up for transition to next segment)

Construction footage

NARRATOR (V.O.): As construction of the LACDA improvement project proceeded, the Army Corps of Engineers and the L.A. County Department of Public Works realized that certain portions of the project would meet the hundred-year flood protection standard before the entire project was complete. This meant that relief from flood insurance premiums could be provided for property owners near those project segments.

Interview, LACDA Alliance tape, Carl Blum, former Deputy Director, Los Angeles County Dept of Public Works, 2:10:53

BLUM: FEMA's original requirement was that once the whole project is done, then we will lift the entire eighty-two square miles of mandatory flood insurance. And we realized that levels of protection were being provided as the project was being progressively built.

Construction footage

Construction footage

NARRATOR (V.O.): As portions of the LACDA Project were

FEMA flood-plain map of Lower L.A. River
& Rio Hondo

certified as providing hundred-year flood protection, FEMA revised their flood-hazard maps and lifted the requirement for flood insurance in those areas. In fact, the design and construction sequence of the project was partially determined by the desire to relieve flood insurance requirements.

Interview, George Beams, Chief,
Construction Operations Division, Corps,
Los Angeles District, 4:03:05

BEAMS: We changed our work schedule around so that we could get the most people out as soon as possible.

Interview, LACDA Alliance tape, Dennis
Courtemarche, City Manager, Pico Rivera,
2:07:52

COURTEMARCHE: I think people sometimes view the federal government as bureaucratic and unresponsive. But I must say that the Corps of Engineers, and in this particular case FEMA, were flexible. They understood the problem. And they did their best to try to minimize the impact on the communities.

FEMA map showing location of first
LACDA phase

NARRATOR (V.O.): There were three phases of the project where hundred-year flood protection was achieved and flood insurance requirements lifted by FEMA. The first phase, the downstream or southernmost section of the project, was completed in early 2000.

Jack Eldridge, FEMA, speaking at LACDA map revision ceremony, Phase I completion, 2/25/00

ELDRIDGE: I am pleased to be here today to celebrate the progress on this flood control project by presenting letters of map revision.

Super (in addition to name & title):
Phase I LACDA Map Revision Ceremony
2/25/00

CU, FEMA letter of map revision

NARRATOR (V.O.): A letter of map revision is FEMA's official notification that their flood-hazard map has been revised, and insurance requirements lifted in a particular area.

Grace Flores Napolitano, Congresswoman, 34th District, speaking at LACDA map revision ceremony, Phase I completion, 2/25/00

NAPOLITANO: The Army Corps, thank you, gentlemen, you are doing a great job, and to all of you who have been involved, I thank you and God bless you.

Super (in addition to name & title):
Phase I LACDA Map Revision Ceremony
2/25/00

FEMA map showing location of second LACDA phase

NARRATOR (V.O.): The second phase, the upstream or northernmost section of the project, was completed in mid-2001.

Super:
Phase II LACDA Map Revision
5/01

FEMA map showing location of final LACDA phase

The final phase of the project was completed in early 2001. It removed the remaining area from flood insurance requirements. The completion of this phase was announced in a press conference and celebrated with a dedication ceremony.

Colonel Richard Thompson, Commander, Corps, Los Angeles District, speaking at LACDA press conference, 1/11/02, 0:15:35

Super:
Press Conference
Final FEMA Map Revision
1/11/02

Intercut soundbite sequence with project footage to avoid jump cuts

Sally Hovice, California state assemblywoman, 56th district, speaking at LACDA press conference, 1/11/02, 0:17:50

Bob Wagner, former Mayor, city of Lakewood, CA (was mayor in 1991 when LACDA Alliance was formed), speaking at LACDA press conference, 1/11/02, 0:27:00

Beverly O'Neil (CORRECT SPELLING?), Mayor, Long Beach, CA, speaking at LACDA press conference, 1/11/02, 0:20:39

Map showing location of Long Beach in L.A. County

Ray Smith, former Mayor, city of Bellflower, CA, speaking at LACDA press conference, 1/11/02, 0:27:46

Map showing location of Bellflower in L.A. County

THOMPSON: This is a 200 million dollar-plus project that would not have been made possible without the support of local community involvement, particularly Los Angeles County, that is putting up a substantial share of that, and the local congressional delegation, who made sure that the Corps of Engineers funding was sufficient to carry us through this project.

HOVICE: And together, all of us, and regardless of what our affiliation happened to be, we worked together on it.

WAGNER: This will be the highlight of many of our careers in terms of what's been done for the public.

O'NEIL: And they can rest assured now that their house will not be flooded and their wallets will have a little relief.

SMITH: Just to say thank you from the citizens of Bellflower for all the hard work that's been done. . . . And it will be my pleasure to go down tomorrow and apply for my rebate. Thank you. (*Audience Laughter*)

(*Music up for transition to Dedication Ceremony*)

Mike Parker, Former Assistant Secretary of US Army for Civil Works, speaking at dedication ceremony, 2/6/02, 2:11:23

PARKER: We are sitting here today at the culmination of a tremendous project that's going to have tremendous benefits for the people of this area. The payoff on this project is huge.

Super (in addition to names & titles of speakers):

LACDA Dedication Ceremony
2/6/02

Intercut soundbite sequence with project footage to avoid jump cuts

Don Knabe, Los Angeles County Supervisor, 4th Supervisorial District, speaking at dedication ceremony, 2/6/02, 2:08:36

KNABE: This project came in five years ahead of schedule, five years! One hundred and fifty million dollars under budget.

Mike Parker, Former Assistant Secretary of US Army for Civil Works, speaking at dedication ceremony, 2/6/02, 2:17:59

PARKER: It is a politician's dream. (*Audience laughter & applause*)

Jim Noyes, Director, Los Angeles County Dept. of Public Works, speaking at dedication ceremony, 2/6/02, 2:21:07

NOYES: It truly was a marvelous engineering accomplishment, and my hat's off to the Corps.

WES footage

Don Knabe, Los Angeles County Supervisor, 4th Supervisorial District, speaking at dedication ceremony, 2/6/02, 2:10:20

KNABE: So we're very very grateful to our members of Congress representing the entire area here for their strong help.

Mike Parker, Former Assistant Secretary of US Army for Civil Works, speaking at dedication ceremony, 2/6/02, 2:18:30

PARKER: You all should be very proud.

Don Knabe, Los Angeles County Supervisor, 4th Supervisorial District, speaking at dedication ceremony, 2/6/02, 2:10:20

KNABE: Everyone made it happen.
(*Music up for transition to Awards sequence*)

Footage of awards as available

NARRATOR (V.O.): In recognition of its many achievements, the LACDA upgrade project team has received numerous awards, including the following.

Super:
**American Public Works Association
Public Works Project of the Year**

2002 Public Works Project of the Year, from the American Public Works Association. This award recognizes excellence in forming an alliance between the managing agencies, consultants, and contractors.

Super:
**ASCE
Los Angeles Section
Outstanding Government Civil
Engineering Project of the Year**

2002 Outstanding Government Civil Engineering Project of the Year, from the Los Angeles Section of the American Society of Civil Engineers. This award recognizes the outstanding efforts of government organizations and civil engineers.

(To be added: ASCE national award, if LACDA wins it)

Super:
**Los Angeles County
Quality & Productivity Commission
Gold Eagle Award**

Gold Eagle Award, from the Los Angeles County Quality and Productivity Commission. This award recognizes the County Department that's responsible for the project judged to have the best productivity and quality.

Super:
USACE
Project Delivery Team Honor Award

Project Delivery Team Honor Award, from the US Army Corps of Engineers. This award is for outstanding teamwork and cooperation with other organizations involved in the project.

(Music up for transition to LACDA II sequence)

Footage of completed project & bridges

NARRATOR (V.O.): The LACDA upgrade project is now history -
- water under the bridge, you might say. But that's not quite the end of our story.

Interview, LACDA Alliance tape, Carl Blum, former Deputy Director, Los Angeles County Dept of Public Works, 3:02:16

BLUM: The question arises, now that we've built LACDA, will there be a LACDA 2 fifty years down the road?

Interview, Chris Stone, LACDA Project Manager, Los Angeles County Dept of Public Works, 2:24:03

STONE: As part of the cooperation agreement that we signed with the Corps of Engineers, there was a clause inserted in it that required that there never be another LACDA 2.

Interview, LACDA Alliance tape, Carl Blum, former Deputy Director, Los Angeles County Dept of Public Works, 3:02:16

BLUM: The reason we got LACDA One was because development took place and exceeded the capacity, the runoff capacity. What has taken place since then is, we've really changed our focus here in Southern California to start addressing watershed management.

Interview, Joe Evelyn, Chief, Hydrology & Hydraulics, Corps, Los Angeles District, 2:05:56

EVELYN: The watershed for the LACDA Project is approximately 1500 square miles, and it's composed of both the Los Angeles River

Map showing LACDA watershed

basin and the San Gabriel River.

Interview, Chris Stone, LACDA Project Manager, Los Angeles County Dept of Public Works, 2:25:10

STONE: So what we intend to do is develop a watershed management plan in conjunction with the Corps of Engineers, that will allow development to occur in the watershed, but yet ensure that the flows into the rivers upstream do not jeopardize the level of flood protection that's being provided by the project. . . . (2:25:46) We have to report back to them every five years, so that we can ensure them that the level of flood protection is not being reduced because of development in the watershed.

Interview, Nino Issakhan, LACDA Project Manager, 1:22:37

ISSAKHAN: That's in our agreement with L.A. County and therefore, I don't believe that a LACDA 2 will happen.

(Music up for transition to closing sequence)

Various shots of LACDA project

NARRATOR (V.O.): Over half a century ago, the U.S. Army Corps of Engineers designed and built the first Los Angeles County Drainage Area flood control project. In 1980, the Corps was called upon once again to develop a plan to protect homes and businesses from floods. The LACDA upgrade project took seven years to construct and cost a little over 220 million dollars. Today, it protects over half a million people from devastating floods and frees over 70,000 of them from paying costly flood insurance premiums.

<p>Interview, Don Knabe, Los Angeles County Supervisor, 4th Supervisorial District, 3:07:30</p>	<p><u>KNABE</u>: This wasn't just a little road project. This wasn't filling a pothole. This is 21 miles of river, and the lives of a half a million to a million people impacted by this.</p>
<p>Interview, Colonel Richard Thompson, Commander, Corps, Los Angeles District, 1:20:36</p>	<p><u>THOMPSON</u>: This was a project that all the participants have a right to be very proud of. . . . And it can really set the standard for other work that we do on similar projects throughout the region.</p>
<p>Completed LACDA project footage</p>	
<p>Interview, Don Knabe, Los Angeles County Supervisor, 4th Supervisorial District, 3:03:24</p>	<p><u>KNABE</u>: And everyone working together: the Corps, the County, the cities, everyone.</p>
<p>Interview, LACDA Alliance tape, Dennis Courtemarche, City Manager, Pico Rivera, 2:12:36</p>	<p><u>COURTEMARCHE</u>: If ever communities want a model as to how to effectuate positive results from the agencies within the federal government, banding together and forming alliances such as we did, at least for us it was very effective.</p>
<p>Interview, Don Knabe, Los Angeles County Supervisor, 4th Supervisorial District, 3:03:24</p>	<p><u>KNABE</u>: This project is five years ahead of schedule, and 150 million dollars under budget. That just doesn't happen in government.</p>
<p>Interview, Chris Stone, LACDA Project Manager, Los Angeles County Dept of Public Works, 3:08:47</p>	<p><u>STONE</u>: To have a project come in that quickly and that much under budget means that you have to have a very close working relationship with all those agencies.</p>
<p>Interview, Stephen Horn, Congressman, 38th District, California, 13:55:29</p>	<p><u>HORN</u>: The remarkable cooperation among these agencies made LACDA a model for any major public works project.</p>

Interview, Brigadier General Larry Davis,
Commander, South Pacific Division, (former
Commander, Los Angeles District), Corps,
1:08:10

DAVIS: And so it's really turned out to be a win-win project all the
way around.

Various shots of LACDA project

NARRATOR (V.O.): In an era of widespread public mistrust of
government, the LACDA upgrade project stands as a benchmark --
a shining example of a public works project that not only met
everyone's expectations, but exceeded them.

Interview, Don Knabe, Los Angeles County
Supervisor, 4th Supervisorial District,
3:08:00

KNABE: This is a great day.

Mayor Meredith Perkins, Downey, speaking
at LACDA press conference, 1/11/02,
0:09:15

PERKINS: This is indeed a great day.

Sally Hovice, California state
assemblywoman, 56th district, speaking at
LACDA press conference, 1/11/02, 0:18:58

HOVICE: Wonderful, wonderful work. Thank you.