
LA RIVER

MASTER

PLAN

APPENDIX VOLUME I

DESIGN GUIDELINES



PUBLIC DRAFT
JANUARY 2021





**PREPARED FOR:
LOS ANGELES COUNTY AND LOS ANGELES COUNTY PUBLIC WORKS**



THIS BOOK IS APPENDIX VOLUME I FOR THE 2020 LA RIVER MASTER PLAN

These guidelines represent the Flood Control District permit requirements. Project proponents are responsible for implementing these guidelines in accordance with prevailing codes, LA County policies, and other authorities having jurisdiction.

While these guidelines are specific to the LA River, certain approaches and techniques may be applicable to other rivers and tributaries in LA County.

PREPARED BY:

Geosyntec[®] **OLIN** Gehry Partners, LLP

DRAFT

TABLE OF CONTENTS

SECTION I: INTRODUCTION

11 1. Executive Summary

12 About the Guidelines

15 2. Design Considerations

17 LA River Right-of-Way
and Channel

18 Programming and Engagement

20 Project Programming

22 Principles of Design

26 Integration of Arts and Culture

30 Ongoing Project Success

32 Permitting

34 LACFCD Permitting Checklist

38 Other Permits

40 Planning Frames

SECTION II: DESIGN GUIDELINES

63 3. Access and Mobility

64 What's in the Chapter

66 Multiuse Trails

69 Trail Components

70 Right-of-Way Combinations

72 Trails in Wide
Right-of-Way Areas

73 Trails in Narrow
Right-of-Way Areas

78 Trail Assemblies

81 Paving Materials

83 Fences, Guardrails, Railings,
and Gates

86 Gateways

88 Bridges

94 Access and Mobility Checklist

97

98

100

105

113

118

121

126

131

134

143

145

147

148

150

154

4. Environmental Graphics

What's in the Chapter

Standard Design Features

Sequence and Placement of
Environmental Graphics

Suite of LA River
Environmental Graphics

Informational

Regulatory

Confirmation

Interpretive

Directional

Mile Markers

Pavement Markings

Large Scale Icon Graphics

Community Expression

Installation & Maintenance

Environmental Graphics
Checklist

157

5. Ecology, Habitat, and Planting

158

What's in the Chapter

162

Setbacks and Buffers

164

Planting Along Levees and
Floodwalls

166

Maintenance Buffers and
Clearances

168

Rights-of-Way

170

Safety Best Practices
Along the River

172

Planted Buffers

174

Stormwater Best
Management Practices

179

Channel Modifications:
Innovation





SECTION I: INTRODUCTION



Figure 1. The LA River begins at the confluence of Arroyo Calabasas and Bell Creek at river mile 51. Source: OLIN, 2018.

1.

EXECUTIVE SUMMARY

ABOUT THE GUIDELINES

The goals of the 2020 LA River Master Plan are intended to integrate design and performance objectives in a multi-jurisdictional context. These guidelines will aid designers and engineers in the establishment of a 51-mile connected open space that is a well-organized, functional, and accessible environment reflecting the diverse and shared identities of LA County. To facilitate decision-making and ensure a standard for design, the guidelines present a unified, cohesive identity while promoting best practices and resiliency for the river corridor. Adaptive design considerations and planting palettes for climate change are critical to success. Equally important, the guidelines provide flexibility for site-specific needs and expressions of neighboring communities' cultural identities. With this in mind, a structure is provided to support projects at all scales and help to define the look and feel of the LA River corridor.



Figure 2. The LA River brings people and communities together in more ways than one, as can be seen in this photo of the SELA Arts Festival at river mile 11.7 in July 2018. Source: OLIN, 2018

ABOUT THE GUIDELINES

The document is organized into four chapters, focusing on elements ranging from trails to environmental graphics to habitat to facilities. Rather than requiring one set of fixed solutions for all 51 miles, these guidelines promote the idea of a consistent approach with reach-specific identity within the greater whole. Ecology, habitat, and art should all reflect the physiography or culture of a specific reach of the river. Other elements, such as environmental graphics, access points, and lighting should be unified to ensure connectivity, wayfinding, and equitable access. In all cases, the adjacent communities should be understood in order for improvements along the river corridor to have the appropriate scale and feel for the neighborhood.

To address the need for site-specific approaches, the design guidelines have been organized through the nine planning frames established in the 2020 Master Plan. The beginning of every chapter has a key map which functions as a visual index for the reader to link to applicable guidelines for each frame of the river. These context-based guidelines will allow the reader to quickly identify

key areas or topics of concern related to the reach. Lists, references, and sources that cover the entire river are located at the end of this document.

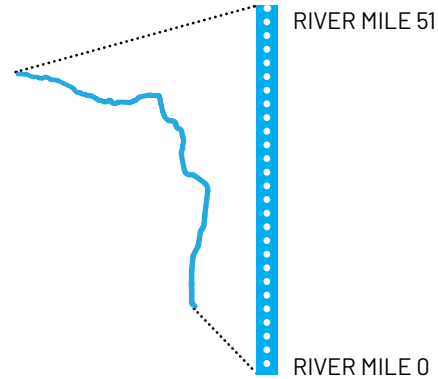
Design guidelines are not a ‘cookbook’ for the design process for sites; rather, they are the frame for good project development. The knowledge and experience of landscape architects, engineers, architects, botanists, ecologists, and artists are invaluable in creating spaces that enhance life along the river. The 2020 LA River Master Plan Design Guidelines are a tool for these professionals and reflect the baseline of values for promoting smart design along the river corridor.

THE ROLE OF LA COUNTY

The LA County Flood Control District was established to provide flood risk reduction, water conservation, recreation, and aesthetic enhancement for cities and unincorporated areas in LA County outside of the Antelope Valley. LA County Public Works, which is responsible for the planning and operational activities of the Flood Control District, served as the lead agency for



DESIGN GUIDELINES ARE NOT
A 'COOKBOOK' FOR THE DESIGN
PROCESS FOR SITES, RATHER THEY
ARE THE FRAME FOR GOOD PROJECT
DEVELOPMENT



The river ruler is a vertical,
straight-line representation
of the 51 miles of the LA River.

development of the LA River Master Plan (1996, updated in 2020). The reimagined river envisioned in that plan promotes 51 miles of connected open space, which will require a concerted and sustained effort by many LA County agencies, in cooperation with incorporated cities. The guidelines contained in this book apply to areas of the LA River corridor maintained, operated, or owned by LA County (typically referred to as the right-of-way) and all projects permitted by LA County Public Works along the LA River.

LA RIVER MILES

The LA River is 51 miles long, flowing from mile 51 in Canoga Park within the City of LA to mile zero at Long Beach where the river meets the Pacific Ocean. The river mile system was developed in 2016 to reduce confusion between different jurisdictional reach designations.

Referencing this consistent numbering system is required for all LAC Public Works projects permitted under these guidelines.

RIVER RULER

The LA River is a complex system with many layers of information and data. To better understand the data available for the river and new data that was created as part of the Master Plan process, the LA River Master Plan used LA River Rulers to organize and collect data.

The river ruler is a vertical, straight-line diagram that represents and takes measure of the entire 51 miles of the LA River. Straightening the river simplifies and reinforces its linearity, allowing the eye to quickly perceive how conditions along the river change from one river mile to the next.

The vertical axis of the river ruler represents the 51 miles of the LA River starting at mile 51 in the West San Fernando Valley at Canoga Park to river mile zero at Long Beach



Figure 3. The LA River channel has two different profiles: box and trapezoid. This section of box channel runs through Studio City, near river mile 39. Source: OLIN, 2018.

2. DESIGN CONSIDERATIONS

THE DESIGN PROCESS

Excellence in design enhances function. From the earliest stages of project development, it is important to consider how a project can be aesthetically engaging while addressing multiple needs of adjacent communities. Design excellence requires an attention to quality of built structures, the landscape, the way buildings and landscapes interact with each other, and how projects interface with the river and surrounding communities. Elevating the quality of design along the LA River will also serve to elevate the level of design across LA County. The design process should include consideration of the LA River channel, the design principles outlined in this chapter, adjacent communities, and the 2020 LA River Master Plan.



Figure 4. Certain reaches of the LA River, such as this segment near river mile 25, are soft-bottom rather than concrete. Source: OLIN, 2018.



Figure 5. Certain reaches of the river, such as this segment at river mile 14, are entrenched rather than leveed. Source: OLIN, 2018.

LA RIVER RIGHT-OF-WAY AND CHANNEL

The 51-mile LA River is an engineered channel designed in response to historic flood events to convey stormwater to the Pacific Ocean as quickly and efficiently as possible. The material, shape, and size of the river changes along its length.

More than 75% of the length of the river has a concrete bed. The river has a “soft bottom,” earthen riverbed in the Glendale Narrows, the Sepulveda Flood Control Basin, and the Estuary region. If not maintained, the soft bottom reaches can become heavily vegetated, often with invasive species, which decreases conveyance capacity.

The shape of the LA River channel is predominantly trapezoidal, with sides that flare out as they move up and away from the bottom of the channel. Rectangular sections of the channel, where its sides are completely vertical, are limited to the San Fernando Valley between Sherman Oaks and Burbank and a one-mile stretch near Vernon. To manage additional flood risk, the sides of the channel are often higher than the ground level of surrounding communities, forming levees or flood walls.

The width of the channel generally increases going downstream, from Canoga Park to Long Beach, to account for the increasing accumulation of runoff and changes in the channel's slope. At its narrowest, between Sherman Oaks and Studio City, the channel is about 55 feet wide. At its widest, where the river meets the Pacific Ocean, the channel is more than ten times that width.

The LA River right-of-way includes the entirety of the river channel as well as landside areas immediately adjacent to the channel banks that facilitate continuous operations and maintenance access by the LA County Flood Control District (LACFCD). About 21% of the river's two banks are constrained, with less than the 12 feet of landside area width that the LACFCD seeks to have for routine operations and maintenance. In some areas, particularly south of Compton, the landside area can surpass 100 or 200 feet in width.

THE KIT OF PARTS MATRIX CONNECTS DESIGN COMPONENTS TO THE NINE MASTER PLAN GOALS

PROGRAMMING AND ENGAGEMENT

Each project along the LA River should respond to the needs of adjacent communities. The LA River Master Plan identifies needs along the river for each of the plan's nine goals. The goals can be used to determine appropriate interventions in a particular project location.

Goals of the LA River Master Plan

- Reduce flood risk and improve resiliency.
- Provide equitable, inclusive, and safe parks, open space, and trails.
- Support healthy, connected ecosystems.
- Enhance opportunities for equitable access to the river corridor.
- Embrace and enhance opportunities for arts and culture.
- Address potential adverse impacts to housing affordability and people experiencing homelessness.
- Foster opportunities for continued community engagement, development, and education.
- Improve local water supply reliability.
- Promote healthy, safe, clean water.

Over time, a community's needs may shift, so robust community engagement must be built into all projects.

KIT OF PARTS AND COMMON ELEMENTS

The LA River Master Plan utilizes a kit of parts that includes possible design strategies for sites along the LA River. Each strategy is associated with certain Master Plan goals. The kit of parts is a recommended collection of multi-benefit design components organized within six major infrastructure and urban river typologies. These include: trails and access gateways, channel modifications, crossings and platforms, diversions, floodplain reclamation, and off-channel land assets.

In addition to the project-scaled design components in the kit of parts, smaller common design elements include pavilions, access stairs and ramps, and site furnishing such as lights, hygiene facilities, seating, trash and recycling, water fountains, guardrails, gates, bike racks, environmental graphics, emergency call boxes, and art.



Figure 6. Design strategies can be categorized into six infrastructure and urban river typologies. See Chapter 8 in the LA River Master Plan for more information. Source: LA River Master Plan, 2020.

IMPACT	ACREAGE / LENGTH	OCCUPANT RANGE
XL	> 150 acres or > 10 miles	>5,000
L	40 - 150 acres or 5 - 10 miles	1,000 - 10,000
M	< 40 acres or < 5 miles	100 - 5,000
S	1 - 3 acres / 1 - 5 miles	5 - 500
XS	< 1 acres / < 1 miles	n/a

Figure 7. The LA River Master Plan proposes five scales of impact for sites along the river: XS, S, M, L, XL. Each scale has varying needs for facilities, amenities, gathering spaces, performance areas, and recreation.

PROJECT PROGRAMMING

Project programming should be completed for each project based on their anticipated uses, size, and occupancy loads. The LA River Master Plan proposes five scales of sites along the river.

Each scale of project has varying needs for facilities, amenities, gathering spaces, performance areas, and recreation.

Medium (M), large (L), and extra-large (XL) projects in the LA River Master Plan are defined as projects greater than 5 acres, and they may include hundreds of acres. Projects of a smaller acreage may also be included in a larger category based on their ability to serve very high adjacent community needs. For example, a large performing arts center on a single acre of land may positively impact many community needs and, thus, qualify as a large project.

Depending on the scale and typology of the project, it is useful to plan for spaces that can flexibly accommodate smaller day-to-day uses as well as larger events such as festivals or recreation events.

Generally, M projects should accommodate between 100-5,000 occupants.

L projects should accommodate between 1,000-10,000 occupants.

XL projects should have spaces for large gatherings of hundreds, and in some cases thousands of people. They should accommodate more than 5,000 occupants.

**PROJECTS OF A SMALLER ACREAGE
MAY ALSO BE INCLUDED IN A LARGER
CATEGORY BASED ON THEIR ABILITY
TO SERVE VERY HIGH ADJACENT
COMMUNITY NEEDS**

S and XS projects are very different than their larger counterparts. An extra-small project may be as limited as the installation of a bench, sign, light pole, or sculpture. Access points, gateways, and other amenities commonly fall in this category.

XS and S projects, may also take the form of river pavilions, typically on a site of under a quarter acre and a quarter to a full acre, respectively. They have an approximate building square footage range of 250 to 10,500 square feet and have occupancies between five and 500 occupants. Chapter 6, Facilities and Amenities, outlines specific design criteria for the river pavilions, which range in size to accommodate varying activities and programs. Shade Pavilions (Tier I), the smallest pavilions with the simplest programming, should accommodate five to 20 occupants. Rest Pavilions (Tier II) that offer enhanced programming such as restrooms, a snack station, and picnic table, should accommodate 20 to 50 occupants. Gathering Pavilions (Tier III), those with the most substantive facilities and amenities such as a cafe, locker room, and bike rental station, should accommodate 50 to 500 occupants. However, some XS and S projects may have more significant facilities that necessitate increased area and result in a higher occupancy.



Figure 8. (Top) The LA River can host community performances, such as the one shown in the image by a local high school at the SELA Arts Festival at river mile 11.7.

Source: OLIN, 2018.

Figure 9. (Middle) The LA River Campout at river mile 26 is an example of programming that broadens participants' understanding of the LA River.

Source: Clockshop, The Bowtie Project, 2017.

Figure 10. (Bottom) The LA River is an important resource to the Indigenous Peoples of Los Angeles. This image shows the Native American Veterans Association's annual Veterans Appreciation and Heritage Pow Wow at river mile 13.

Source: Marvin Lynchard, 2014.

THE GOAL IS TO CREATE A
COMPLEMENTARY APPROACH
BETWEEN WHAT IS SHARED
AND WHAT IS UNIQUE WITHIN EACH
FRAME, NEIGHBORHOOD, AND
ENVIRONMENT ALONG THE RIVER

PRINCIPLES OF DESIGN

A UNIQUE AND SHARED RIVER COMMONS

The design of plantings, structures, buildings, and trails should share some common attributes along the river course. For residents and visitors this means it should be apparent when they are in the LA River corridor commons. The goal is to create a complementary approach between what is shared and what is unique along each frame, neighborhood, and environment along the river. The balance between celebrating the unique and providing a common design formality should not be a heavy-handed exercise. There are so many iconic vistas along the river: Sepulveda Basin, Griffith Park, the Glendale Narrows, the historic bridges crossing over the river in downtown City of LA, the rising 6th Street Viaduct, Hollydale Park, the Dominguez Gap Wetlands, and the Long Beach Estuary to name but a few. The shared identity should be a common platform for connecting and celebrating these destinations and future sites of interest.

The most logical way to do this is to create a trail identity that unites and connects just as the river corridor itself does: connective elements such as trail dimensions, path materiality, lighting, artwork, and environmental graphics should create this common identity. By contrast, points of arrival, vistas, and destinations should be inspired by high design ambition, community context, and environmental resilience. Ultimately, the common connection and destinations along the river should reveal a greater understanding of the river itself as a unique and diverse commons serving the people of LA County.



Figure 11. Projects along the LA River should improve ecosystem function and provide educational opportunities. Source: OLIN, 2019.

PROSPECT AND REFUGE

For the river to be connective it must be inclusive, inviting, and useful to everyday life. Design is not a formula, but there are underlying fundamentals that all good design includes. One is to provide places of prospect (views) to see the greater landscape—to observe those around us and natural phenomena—and to be a safe place for us individually and for us, our family, and friends to use and enjoy.

A successful public space is a destination within the public realm that encourages social interaction and a sense of community. We are uneasy in places that are vacant, missing convenient crossings, or have difficult and obscured lines of sight. These environments put us on the defensive and create unease. Every destination and path along the river should be readily accessed and exited within no more than a half mile. Open spaces must be programmed to support a diversity of regular users. The strategies employed may vary and need not be complex, an extraordinary natural view, places to perch and observe activity in comfort and shade, areas to watch active gameplay or see a performance or an all ages adventure playground can all serve as strong attractors. In combination with comfort and convenient access these places will be safe, vital, and attractive.

SAFETY

Of paramount concern is that the river is safe for all and that the feeling of safety is perceptible. To ensure safety along the river the guidelines have developed a framework of environmental design that requires projects to maintain: clear lines of sight, provide minimum standards of lighting uniformity along all routes of circulation and to post clear guidance on avoiding flood and storm hazards from within the channel. Every half mile of the river corridor will provide a station for rest and where adjacent to a neighboring community access to and from the river corridor commons. The entirety of the 51 miles of the LA River shall maintain emergency access for first responders and emergency personnel and maintenance vehicles. Ultimately, the river will be maintained for both the personal safety of visitors of the commons as well as the importance to maintain the channel corridor for the protection of life and property along the entire corridor.



Figure 12. Vendors set up booths within the river channel at the SELA Arts Festival at river mile 11.7. Source: OLIN, 2019.



Figure 13. The industrial land that hems in the LA River, such as this example at river mile 18, is representative of over ten percent of all land within the river corridor. Source: OLIN, 2018.

CULTURAL IDENTITY

The river is a series of unique communities and environments united by the flow of the river. The corridor is envisioned to become a major environmental and cultural asset for the citizens of LA County. All design projects should be informed by the resources, assets and needs provided by the local context of each mile of the river. The river should reflect the diversity and the creativity of LA County where a majority speak a language other than English, is multiracial as well as multicultural. Facilities for the river should acknowledge and be informed by the histories, cultural expressions, and familial uses of communities along the river to maximize local use and authentically reflect the river's diversity.

CADENCE

In order to make the 51 miles of the river accessible and useful to the communities of LA County, reliable access to amenities, services, and destination uses should be established. The planning framework prescribes that these elements occur at regular intervals, a cadence. The intent is to create both equity in access to open space and amenity throughout the river and to improve access and safety while setting reliable expectations for services and facilities along the river.

INTEGRATION OF ARTS AND CULTURE

Incorporating arts and culture along the LA River is essential to creating a thriving, continuous 51-mile arts and culture corridor as outlined in Goal 5 of the LA River Master Plan. Communities along the LA River should have equitable access to arts and culture assets and programming. This is reinforced by a 2017 LA County Arts and Culture report on the Cultural Equity and Inclusion Initiative, which focuses on inclusive cultural and arts programs for all residents of LA County. Many jurisdictions also have a “percent for art” policy that requires private construction or development projects to invest in public art. Further incentives and new programs supporting arts and culture along the LA River will continue to be developed in the future.

The LA River Master Plan suggests that a methodology should be developed for the inclusive mapping of arts and culture in neighborhoods adjacent to the river. This methodology should be participatory and include informal and improvisational community spaces and groups, as well as temporary art installations and recurring community events and festivals. Mapped assets should also include places, people, and events that convey the cultural heritage of riverside communities. An example of comprehensive field mapping is the City of LA Department of Planning SurveyLA Program, which was completed from 2010 to 2017 and identified historic resources for each community plan area of the city.¹ As development and construction takes place along the river, cultural historic resources need to be safeguarded. Mapping these sites is an important way to ensure the historic and social fabric is not lost or if it is threatened, mitigation is provided.

Innovative approaches to art and design are strongly encouraged in this document. Throughout the design process, there are opportunities at each stage to integrate arts and culture. Designers, lead agencies, and partnering organizations can maximize the impact of this integration by engaging artists at the earliest stages of a project and considering arts visibility and communication as crucial components of their proposals and implementation strategies. Early inclusion of artists in the project development process ensures that art is part of the overall project vision and site design rather than being a siloed component added on after construction is complete. Artists bring unique perspectives to the table that can benefit projects. For example, LA Metro integrates its arts and design team into early phases of project planning, allowing for the mapping and understanding of existing cultural assets through the incorporation of arts into community engagement.

Public art can play a role in all scales of projects along the LA River. The flexible and inclusive categories of public art include permanent and temporary installations, cultural facilities and uses, environmental graphics, and community engagement and programming. Access to arts education and other informal arts and culture programming is equally as important as permanent art institutions.

Designers can seek guidance and support from the LA County Department of Arts and Culture, municipal arts departments, community arts agencies, and other arts non-profit organizations to facilitate the development of works of public art that celebrates the diverse cultural heritage of the LA River.

Examples of public art can be both permanent and temporary installations.

Permanent public art examples include, but are not limited to:

- Sculpture: Free standing, wall supported or suspended, kinetic, electronic or mechanical in material or combination of materials
- Murals, portable paintings, panels, pavers, or tiles
- Earthworks, neon, glass, mosaics, photographs, prints
- Site furnishings or fixtures
- Environmental graphics
- Exhibit or performance space: Public gallery/exhibition space, public performance spaces, public artistic studio spaces, and public art education facilities

Temporary public art examples include, but are not limited to:

- Forms of media including sound, film, holographic, and video systems, hybrids of any media and new genres
- Performing arts: Theatre, dance, music and performance art
- Literary art: Poetry readings and storytelling
- Food culture
- Education programming and arts services
- Special events: Parades, festivals and celebrations
- Community engagement



Figure 14. (Top) The Bowtie Project at river mile 26 has hosted many artist projects, such as the 2014 project “Building: a simulacrum of power” by Rafa Esparza. Source: “The Bowtie Project, <https://clockshop.org/project/bowtie/>.

Figure 15. (Middle) The LA River can host student art installations and sculptures, as shown in this image at river mile 26. Source: 2016, “ACE Spring Design Studio” by Woodbury University.

Figure 16. (Bottom) Programs such as Turnaround Arts foster art education in schools and communities along the LA River. Source: Turnaround Arts: California, <https://bit.ly/2QBK5tt>.



Figure 17. This example of an art installation at a Tier III Pavilion at RM 28.4 portrays a data-based installation that could show real-time water quality through the color of the lights.

The following should be considered for integration of arts and culture along the LA River:

- Projects should incorporate artists and other arts and culture groups at the earliest phases of project development as an integral part of the design team drawing from local artists and cultural assets Art and design can be incorporated into all stages of community engagement.
- Project design teams should consider and highlight the cultural heritage of the site and existing, historic, and indigenous communities for projects along the LA River.

**PUBLIC ART CAN PLAY
A ROLE IN ALL SCALES
OF PROJECTS ALONG
THE LA RIVER**



- Opportunities should be explored for art along the LA River that can be integrated with various aspects of a project. It can become a part of and evolve with the infrastructure of the river itself.
- Design teams should select durable materials appropriate for their application, establish strategies for responsible parties, and identify potential funding scenarios. Additionally, these material selections and strategies should distinguish between requirements for temporary versus permanent installations.
- Arts and culture projects along the LA River must be for all. This especially includes current residents of LA River adjacent neighborhoods who currently may not have access to arts and culture programming.
- Site specific criteria and community input should frame a competitive project selection process.
- Arts and culture projects can include programs and residencies for the incubation of youth and community talent, along with other community programming.

ONGOING PROJECT SUCCESS

Almost 25 years ago, LA County developed a transformative plan to re-envision the river as an 'Urban Treasure' and a 'valuable natural asset' that would enrich the quality of life for residents and help to sustain the economy of the region.² Since publication miles of trails have been added for pedestrians and cyclists, and the river has emerged as an iconic presence in Angeleno's minds. Today, new concerns have shifted from what was once aspirational into something that brings tangible value and improvement to all communities along the river and those who travel along its banks. The Master Plan assembled today has been constructed from robust data sets that have provided clear metrics for addressing flood risk, water resources, connectivity, and, critically, social health and equity.

Building great projects that meet the goals of the LA River Master Plan is not enough. During project development the on-going success of projects must be a significant consideration. Topics such as life cycle costs, including operations and maintenance funding and responsibility, must be planned for. Other items that can frequently cause issues after project development if not considered in how elements are designed, such as pest and vector control, should be addressed during the design phases. Additional stressors on long-term success may be related to the use of the LA River right-of-way by persons experiencing homelessness. Thinking through all of these elements during the design process is required.

LIFE CYCLE COSTS AND O&M

The LA River flows through various cross-sectional conditions along its 51-mile course including concrete lined and earthen reaches as well as trapezoidal and rectangular section reaches. The typical river right-of-way includes flood management structures such as levees, the channel itself as well as access roads, and various recreational amenities such as bike paths and trails, which are primarily maintained by the United States Army Corps of Engineers (USACE) and the Los Angeles County Flood Control District (LACFCD). In some cases, other entities such as municipalities, non-governmental agencies, or developers provide O&M of the various recreational and habitat amenities.

Maintenance costs must be considered and planned for during project development to determine responsibility for funding the day-to-day operations and maintenance of projects. The responsible agency for maintenance of projects and improvements must be identified for any projects in the LA County Flood Control District right-of-way in order to receive a permit.

Every project permitted under these guidelines requires the submission of a one year maintenance plan and three year monitoring program for the site along with the expected budget for the maintenance. The agency responsible for maintenance must agree in writing to the maintenance plan and budget. See the permitting checklist (on page 34) for full maintenance plan requirements.

In addition to day to day maintenance costs, the long-term needs for rebuilding and repairing projects should be considered by the responsible agency to ensure success. Upon completion of a project, operations and maintenance alone may average 0.1-1% of the capital costs annually depending on the type of project and facility. Replacement costs are in addition to these numbers. Significant replacement of infrastructure, such as levees and floodwalls, while required much less frequently, can be a significant life cycle cost.

PERSONS EXPERIENCING HOMELESSNESS

Los Angeles has one of the largest populations of persons experiencing homelessness in the United States, and many of the county's unsheltered residents take refuge within the LA River right-of-way. The presence of homeless encampments can impede operations and maintenance efforts along the river, exacerbate pollution, and discourage recreational users from visiting the river. Those living in encampments also face chronic health risks due, in great part, to a lack of access to sanitation and hygiene facilities. The ongoing success of projects along the LA River largely depends on how communities experiencing homelessness dwelling on the river banks or in the channel are addressed—with such, it is critical that river improvements do not result in spaces of exclusion. Rather, what is needed is an overarching commitment to provide opportunities for sanitation and personal hygiene that are both accessible and humane. The construction and maintenance of pavilions where one can use the restroom, wash their hands, take a shower, and dispose of trash will have a resoundingly positive impact on the health, dignity, and general well-being of all people along the river, as well as the health and safety of the river itself.

Likewise, the LA River should be an environment that reflects active care. Avoid overgrown vegetation along walkways and gateways to convey that the river is well-tended and that its improvements are welcoming. The maintenance of clear sight lines is equally critical for both safety and comfort, as they prevent visual isolation and enable “eyes on the street” (in this case, “eyes on the river”). Utilize palettes of plants that are not harmful to the touch or poisonous to eat to reduce further hazards to all river users, notably young children and pets. Finally, street furniture provides an essential place to rest, and

the design of common elements like seating should be varied enough to allow for different types of uses. To endure as a public space that truly serves all, including persons experiencing homelessness, the LA River should incorporate a multiplicity of facilities, large and small, that ensure safety, provide comfort, amplify beauty, and encourage the coexistence of diverse populations.

PEST/VECTOR CONTROL

At the beginning of project development, it is critical to review design ideas with the vector control district of jurisdiction to assure proper mosquito minimization measures are incorporated into the project. Mosquitoes threaten public health by transmitting a number of potentially debilitating, even fatal, diseases. Mosquito minimization measures should include natural predation, mosquito exclusion, and a comprehensive operation and maintenance plan including vegetation management. The system should be designed to facilitate necessary surveillance as well as physical and chemical mosquito control efforts by the vector control agency. A checklist developed by the California Department of Public Health entitled “Checklist for Minimizing Vector Production in Stormwater Management Structures” is available to assist designers, <https://www.cdph.ca.gov/>. The project should be designed to facilitate necessary surveillance as well as physical and chemical mosquito control efforts by the vector control agency. Projects that fail to incorporate proper mosquito minimization will be subject to costly corrective actions including potential abatement proceedings pursuant to the California Health and Safety Code Section 2000-2007.

PERMITTING

Depending on the project type, location, and site-specific conditions there are many permit requirements to meet in order to plan and develop a project along the LA River.

The most common types of approvals and permits required for projects along the LA River are included below to assist in project development, but project teams should always review the latest information available from each agency at the time of project planning to confirm requirements.

Projects that require discretionary approval; meaning the approval requires the exercise of judgement or deliberation by the reviewing public agency(ies) prior to approving or disapproving a project, require some level of environmental review pursuant to the California Environmental Quality Act (CEQA). Projects that also impact a federal facility, such as the LA River Channel itself, are also subject to the National Environmental Policy Act (NEPA).

Proponents of projects in and along the LA River corridor may also need to consider and plan for:

- Site access through acquisition or easement.
- Municipal permits such as Building and Safety and/or permits for work within the public right-of-way.
- Coordination with rail corridors as much of the river corridor is flanked by rail (SCRRA, MTA, UPRR, etc.).
- Utilities, including connections/hook ups, crossings, relocations.
- Site remediation, including clean up of toxic soils, may require coordination with the EPA, CALEPA, or DTSC.

In addition to the above, there is a consistent suite of permits that may be required for projects in and along the LA River Corridor.

LA COUNTY FLOOD CONTROL DISTRICT (LACFCD) (FCD PERMITS ARE ISSUED BY LA COUNTY PUBLIC WORKS)

A Flood Control Permit is required where the LACFCD owns the land or controls the operations and maintenance of the LA River Corridor, to ensure that the proposed project does not interfere with the LACFCD's operation and maintenance responsibilities. Some of the more common types of Flood Control Permits are:

Access Permit: required for temporary use of LACFCD right-of-way. Examples include community or educational events, volunteer trash cleanup events, or filming.³

Connection Permit: required when a private citizen, developer, or agency proposes to connect a drainage system to an existing LACFCD facility. Examples include connecting a small pipe to the rear of a catch basin or a new storm drain connecting to a larger storm drain or channel.⁴

Temporary Discharge Permit: required for the temporary discharge of non-stormwater such as water well start up, construction dewatering, municipal water supply system flushing, swimming pool discharge etc.⁵

Construction Permit: required for encroachment onto and/or alteration of LACFCD right-of-way for new construction. A few examples of permitted activities are storm drain realignment, landscape improvements, parks, bikeway construction, or installation of structural BMP devices.⁶

The LA River Design Guidelines contained within this document must be followed for projects seeking this type of permit. The design of recreational amenities, parks, and plantings for the LA River requires a series of steps and procedures to achieve optimum success, which includes the development of plans and specifications that meet the permit criteria of the LA County Public Works. Project proponents must submit plans for approval by LA County Public Works on a project by project basis. Permittee is responsible for adhering to all requirements. Requirements for jurisdictional reviews and permits procedural issues are outlined in detail on the following pages:

LA RIVER MAINTENANCE RESPONSIBILITIES

Agency:

 Los Angeles District,
US Army Corps of Engineers
(USACE: 23.5 miles)

 Los Angeles County Flood
Control District
(LACFCD: 27.5 miles)



Figure 18. LA River Maintenance Responsibilities. Currently, the LA River and its tributaries are operated and maintained by the USACE or the FCD. This map indicates which entity has jurisdiction in different segments of the river. Source: LA County Public Works, GIS Maintenance Map, 2016.

LACFCD PERMITTING CHECKLIST

Detailed Checklist for LA County Flood Control District (LACFCD)

Background Review

- ☐ Determine river mile location of project and list on all documents associated with the project.
- ☐ Review the LA River Master Plan documents to identify local and site-specific opportunities.
- ☐ Review the LA River Design Guidelines (this document) for applicable requirements.
- ☐ Review LA County Public Works LA River Housing Checklist (document under development during LARMP process—to be completed before publishing this document) to determine if the project will require a housing assessment.
- ☐ Determine location of nearest river pavilion and amenities to determine what is required onsite.
- ☐ Meet with LA County Public Works staff and local municipality staff (as required per site location).
- ☐ Review other relevant documents, such as adjacent city plans.
- ☐ Meet with sponsoring groups (as required).
- ☐ Begin community engagement process.
- ☐ Hire a professional design team (may include landscape architect, engineer, architect, ecologist, artist, botanist, and others depending on project type). (Best Practice: Early integration of all disciplines, particularly designers and artists).

Evaluate Site for Opportunities and Constraints

- ☐ Determine maintenance jurisdiction.
- ☐ Determine all land ownerships and easements/rights-of-way.
- ☐ Contact all agencies involved and owners for concept approval.
- ☐ Identify water source (point of connection) if required and funding responsibility.
- ☐ Conduct site analysis:
 - Assess topographic, hydrologic, and microclimate conditions.
 - Conduct agronomic and biological activity soil test.
 - Determine existing utilities (gas lines, water lines, electric lines).
 - Review applicable codes, which may include, but is not limited to CA Title 24 Building Energy Efficiency Standards, LA County Public Works and/or American Public Works Association (APWA) Standard Plans, LA County Flood Control District Code, Municipal Codes, USACE Policy, LID Ordinance and Manual, LA County Parks and Rec Guidelines.
- ☐ Research adjacent arts and cultural assets determine if project should have an art component.

Conceptual Design Stage

- ☐ Develop a site-specific program (include multi-benefit opportunities as outlined in the LA River Master Plan Kit of Parts)
- ☐ Develop preliminary plant palettes per the Design Guidelines starting on page 218.
- ☐ Develop conceptual planting and grading.
- ☐ Develop conceptual public art program (as required).
- ☐ Prepare section-view illustrations, including topography, planting, and architectural features.

- ❑ Identify irrigation basis of design
- ❑ Submit to LA County Public Works for review.
- ❑ Discuss applicability of plant nursery contract growing for the project.
- ❑ Review O&M requirements for project success and begin to plan for how O&M will be accomplished.

Schematic Design Stage

- ❑ Prepare design and irrigation plans with preliminary details.
- ❑ Consult LA County LID manual and municipality requirements regarding irrigation equipment.
- ❑ Prepare comprehensive plant palettes including species types, quantities, sizes, and installation details.
- ❑ Begin contract growing process (as required).
- ❑ Prepare preliminary cost estimate and project specifications.
- ❑ Complete preliminary site engineering analyses as required for project including stormwater calculations, hydraulic analyses, and site structures.
- ❑ Prepare public art proposal (as required).

Monitoring and Maintenance Program

- ❑ Prepare irrigation schedule.
- ❑ Prepare a 12 month maintenance program for planting.
- ❑ Prepare a 3 year monitoring and maintenance program, including all planting and improvements (pavilions, site furnishings, etc). See pages 96-97, 156-157, 302-305 and 348-349 for technical drawing and specific requirements for trails, environmental graphics, planting, and site amenities.
- ❑ Submit budget for maintenance, and include a written statement of intention to perform and fund maintenance.
- ❑ List agencies responsible for maintaining the project.
- ❑ Prepare O&M for public art proposal (as required).

Technical Drawings and Specifications

- ❑ Coordinate technical drawings with public art (as required).
- ❑ Submit technical drawings and specifications to the county for review and approval. Landscape plans, irrigation plans, and specifications to be prepared by a registered landscape architect licensed to practice in California. Engineering plans, calculations, and specifications to be prepared by a California registered engineer. For structural amenities not shown in the county or APWA standard plans, the designer should provide detailed drawings and design calculations, prepared, signed, and stamped by a California registered civil or structural Engineer. See pages 96-97, 156-157, 302-305 and 348-349 for technical drawing and specific requirements for trails, environmental graphics, planting, and site amenities.
- ❑ Submit maintenance and monitoring programs for both 12-month and 3-years as part of the technical specifications required for project approval.
- ❑ Require underground service alert (Sponsored by the Underground Service Alert of Southern California, a non-profit mutual-benefit organization dedicated to ensuring public safety and that of workers of underground utility lines: www.digalert.org).

As-Built Drawings

- ❑ Submit an updated planting plan, irrigation schematics, site engineering plans, and other applicable as-built record drawings to LAC Public Works. (As built drawings should be prepared by the installing contractor).

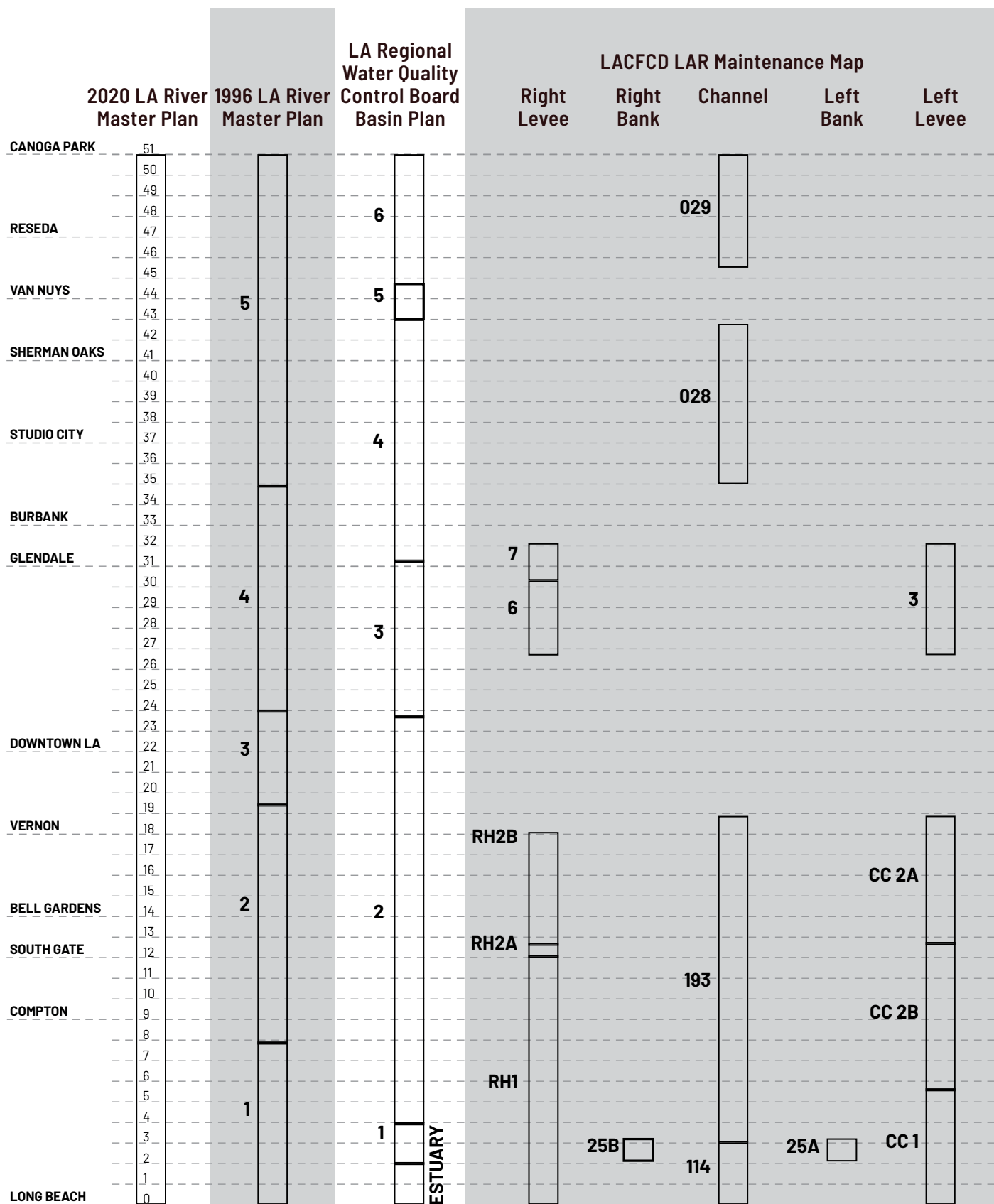


Figure 19. Various governmental entities use differing methods to define river segments, as shown in this diagram. However, all projects permitted under these guidelines are required to reference the 51 mile LA River numbering system. This diagram is for reference only. Other entities may change their definitions over time, so consult with the applicable entity as needed. Source: LA River Master Plan, 2020.

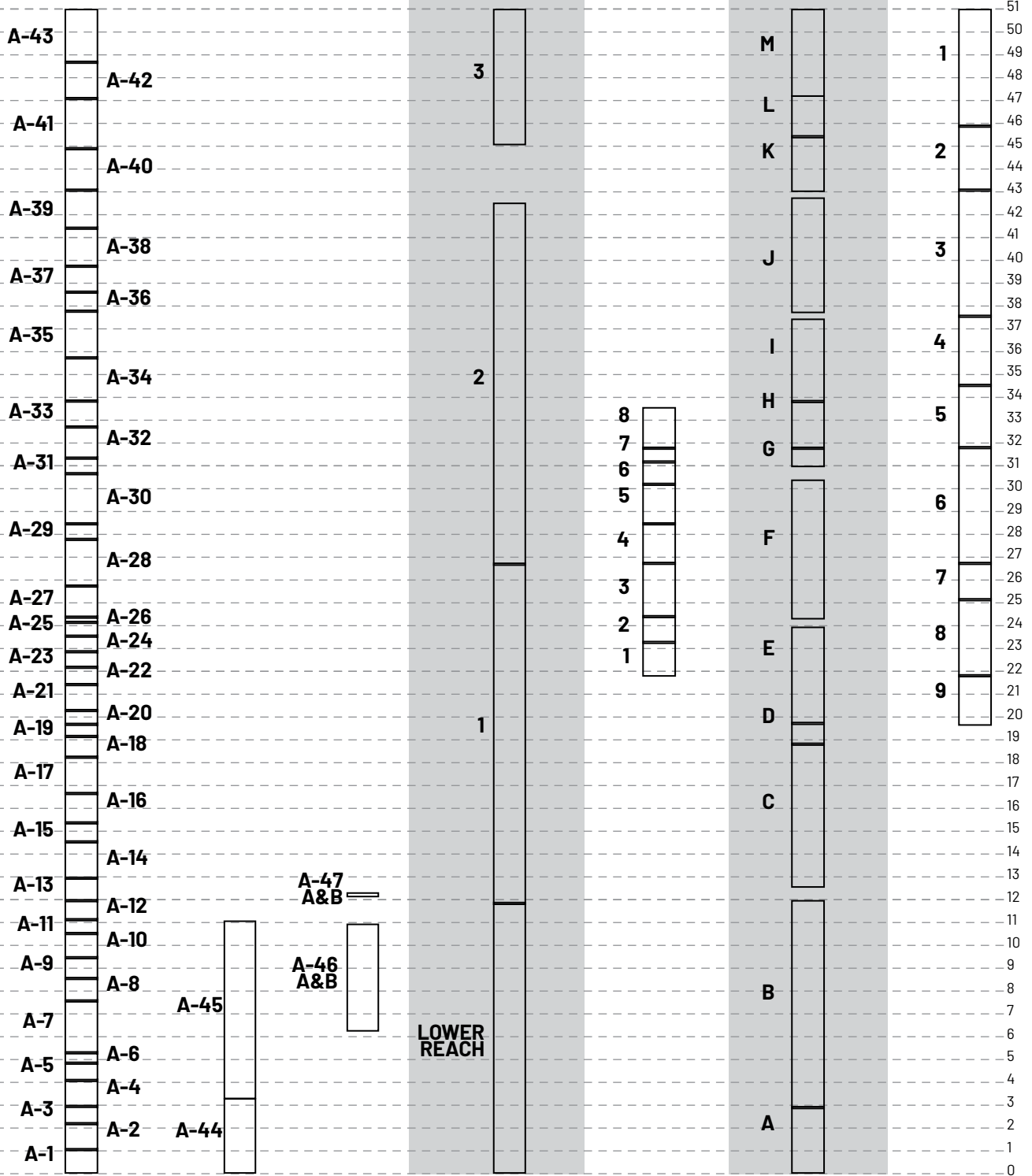
USACE LA County Drainage Area
Operation, Maintenance, Repair,
Replacement and Rehabilitation Manual

USACE
HEC-RAS Model

USACE
ARBOR Study

LA River
Integrated
Design

LA River
Revitalization
Master Plan



LA River
Miles

DRAFT

OTHER PERMITS

US ARMY CORPS OF ENGINEERS (USACE) LOS ANGELES DISTRICT

404: Section 404 of the Clean Water Act (CWA) establishes a program to regulate the discharge of dredged or fill material into waters of the United States (WOUS), including wetlands. Activities in waters of the United States regulated under this program include the construction, modification, or removal of structures and work involving dredging, disposal of dredged material, filling, excavation, or other modification to a WOUS. Proposed activities that modify a WOUS are regulated through a USACE permit review process. The USACE issues both individual and two types of general permits; including nationwide and regional permits that are required before dredged or fill material may be discharged into WOUS. General permits provide a more streamlined application and expedited review process and are applicable for work that is typically more common in nature (e.g., outfall structures) and generally minimal in nature. An individual permit is generally required for more complex projects or projects that may potentially result in significant impacts. Individual permits require a public review and compliance with CWA Section 404(b)(1) Guidelines, promulgated by the Environmental Protection Agency⁷ including completion of an alternative's analysis. Both individual and general permit applications need to demonstrate that steps have been taken to avoid impacts to wetlands, streams and other aquatic resources; that potential impacts have been minimized; and that compensation will be provided for all remaining unavoidable impacts.⁸ Projects requiring individual permits also need to demonstrate that the Least Environmentally Damaging Practicable Alternative (LEDPA) is selected.

408: USACE, in partnership with local partners, has constructed many Civil Works projects across the nation's landscape, including the LA River. Over time, there may be a need for others outside of the USACE to alter or occupy these projects and their associated lands. In order to ensure that these projects continue to provide their intended benefits to the public, Congress mandated that any use or alteration of a Civil Works project by another party is subject to the approval of USACE. This requirement was established in Section 14 of the Rivers and Harbors Act of 1899 and codified

in 33 USC 408, commonly referred to as "Section 408." USACE Section 408 policy, contained in the document Engineer Circular (EC) 1165-2-220 effective September 10, 2018, sets forth the process and criteria USACE uses to review requests to alter USACE Civil Works projects.⁹

US FISH AND WILDLIFE SERVICE (USFWS)

The USFWS reviews and comments on projects pursuant to the Fish and Wildlife Coordination Act, the CWA, and the NEPA. The USFWS's comments focus on the effects of projects on all fish and wildlife resources and the habitats that support those resources. Such projects may be, but not limited to, flood risk management, urban and industrial development, habitat restoration activities, etc. The USFWS also reviews projects for their affects pursuant to the Federal Endangered Species Act (ESA). The ESA, through Section 9, prohibits the take of any species listed as threatened or endangered pursuant to the Act. The USFWS is responsible for issuing permits authorizing the incidental take of threatened or endangered species that is consistent with conservation of that species and exempts the take from the Section 9 prohibitions. When projects or activities require a federal permit, such as a CWA section 404 permit from USACE, Section 7 ESA consultation with USFWS is required. The consultation typically starts as informal consultation during the planning stage. If the informal consultation identifies the proposed project is not likely to affect listed species, consultation between the USACE and the USFWS is considered complete. If listed species may be affected the USACE will request formal consultation with the USFWS, and the USFWS will prepare a biological opinion outlining if the proposed development is likely to adversely affect or take of a listed species. If identified reasonable and prudent alternatives still result in adverse effects or take of a listed species, the USFWS will prepare an incidental take statement that outlines project conditions and exempts the take from the Section 9 prohibitions. If there is no Federal involvement, and the project may result in an incidental take, Section 10 requires a Habitat Conservation Plan (HCP) be prepared as part of an application to obtain an incidental take permit from the USFWS. Similar to the incidental take statement, the incidental take permit exempts the take from Section 9 prohibitions.¹⁰

NATIONAL MARINE FISHERIES SERVICE (NMFS)

This is the federal agency responsible for the conservation and management of the nation's living marine resources. Projects or activities that may affect marine fish and related habitat within NMFS jurisdiction are reviewed for any potentially harmful effects. These evaluations are conducted under the authority of the ESA, Magnuson-Stevens Fishery Conservation and Management Act, Fish and Wildlife Coordination Act, and NEPA. The purpose of the reviews conducted by NMFS is to ensure that sensitive populations of marine and anadromous fish (such as salmon and steelhead), as well as the aquatic and riparian habitats that support these fish, can survive and recover in the presence of human activities. Through these reviews, the need to conserve and protect fish and habitat is balanced with the need to responsibly utilize natural resources for economic and other purposes. When projects or activities require a federal permit, such as a CWA section 404 permit from USACE, Section 7 ESA consultation with the NMFS, in addition to the USFWS, may be required if applicable. If there is no Federal involvement, and the project may result in an incidental take, Section 10 requires a HCP be prepared and an incidental take permit be obtained through the NMFS, in addition to the USFWS, if applicable.¹¹

CALIFORNIA DEPARTMENT OF FISH AND WILDLIFE (CDFW)

1602: The Fish and Game Code section 1602 requires any person, state, or local government agency, or public utility to notify the CDFW before beginning any activity that will:

- substantially divert or obstruct the natural flow of any river, stream or lake; or
- substantially change or use any material from the bed, channel, or bank of any river, stream or lake; or
- deposit or dispose of debris, waste, or other material containing crumbled, flaked, or ground pavement where it may pass into any river, stream or lake.

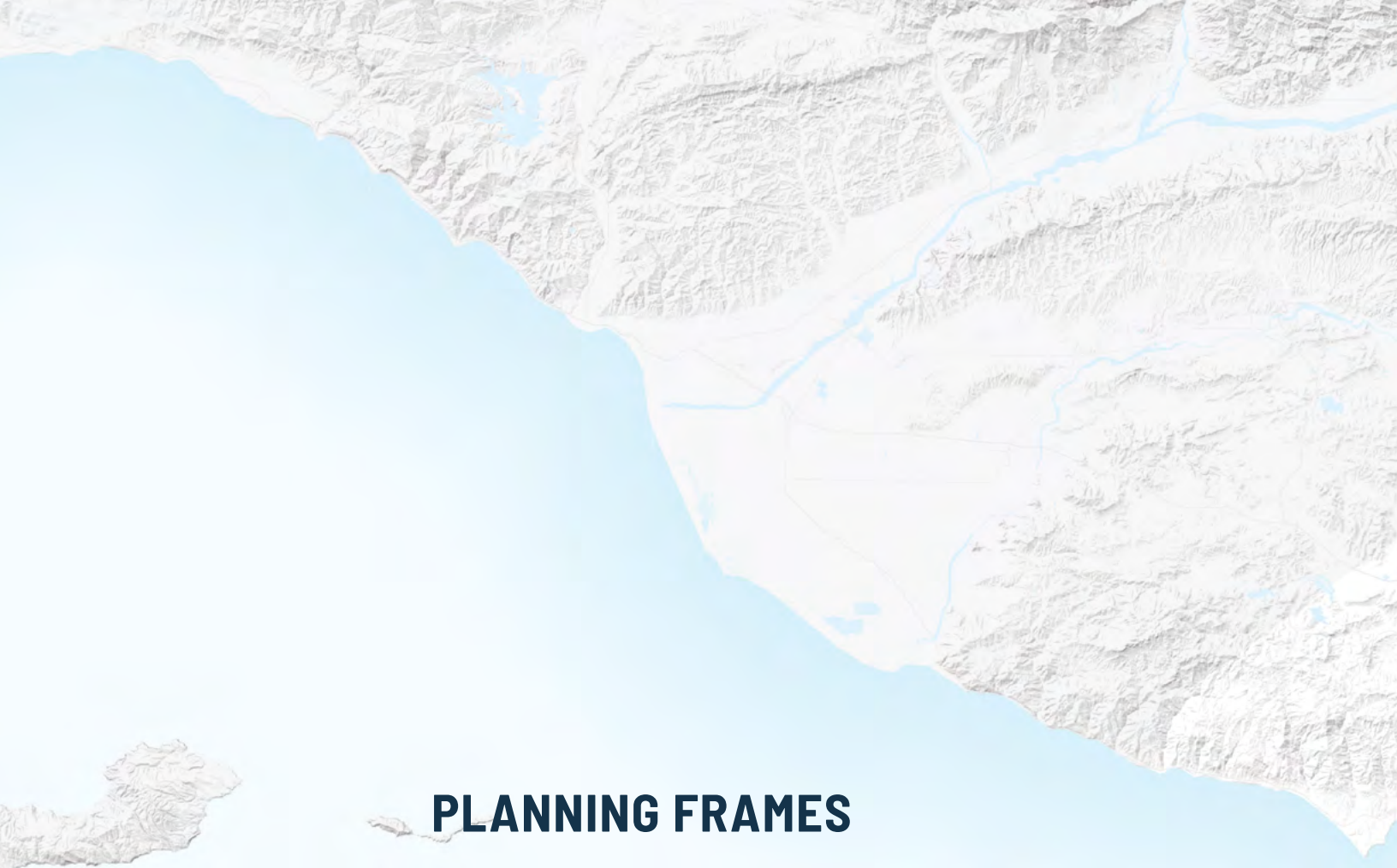
If CDFW determines that the activity may substantially adversely affect fish and wildlife resources, a Lake or Streambed Alteration (LSA) Agreement will be required that is compliant with CEQA.¹²

CALIFORNIA COASTAL COMMISSION

Coastal Development Permit: The California Coastal Act of 1976 requires any person proposing to undertake development in the Coastal Zone to obtain a Coastal Development Permit. The Coastal Zone extends inland anywhere from approximately 500 yards in developed urban areas to five miles in undeveloped areas. If projects are proposed in or adjacent to existing or historic coastal wetland areas, they will require Coastal Development Permits issued by the Coastal Commission.¹³ The Coastal Act defines development broadly (with a few narrow exceptions), to include not only typical land development activities such as construction of buildings, but also changes in the intensity of use of land or water, even where no construction is involved. Coastal Development Permits are the regulatory mechanism by which proposed developments in the coastal zone are brought into compliance with the coastal resources planning and management policies of Chapter 3 of the Coastal Act.¹⁴

LOS ANGELES REGIONAL WATER QUALITY CONTROL BOARD

401: Section 401 of the CWA requires that any person applying for a federal permit or license which may result in a discharge of pollutants into WOUS must obtain a state water quality certification that the activity complies with all applicable water quality standards, limitations, and restrictions. No license or permit may be issued by a federal agency until certification required under Section 401 has been granted.¹⁵ Meaning, that before the Corps can issue a 404 permit, a 401 permit must be obtained from the Los Angeles Regional Water Quality Control Board (LA RWQCB).

A topographic map of the Los Angeles River watershed, showing the river's course from the mountains in the north to the ocean in the south. The map is rendered in a light blue and tan color scheme, with the river highlighted in a darker blue. The terrain is shown with subtle shading to indicate elevation changes.

PLANNING FRAMES

A series of nine geographical frames assists in understanding where specific site opportunities are located in relation to municipal, hydraulic, and ecological zones. There is no single design solution that is applicable to all 51-miles of the LA River, therefore, it is critical to understand where a site is located in the larger context of the river as well as its local context. The frames allow river champions to take responsibility for specific sections of the Master Plan implementation and work together to bring them into reality.

The nine frames are divided as follows:

Frame 9 - West Valley: City of Los Angeles; river mile 51.0 - 43.1

Frame 8 - Mid Valley: City of Los Angeles; river mile 43.1 - 37.8

Frame 7 - East Valley: Cities of Los Angeles & Burbank; river mile 37.8 - 32.0

Frame 6 - Narrows: Cities of Los Angeles, Burbank & Glendale; river mile 32.0 - 24.5

Frame 5 - Heights: City of Los Angeles; river mile 24.5 - 19.5

Frame 4 - North Plain: Cities of Bell Gardens, Bell Maywood Vernon, Commerce; river mile 19.5 - 14.14

Frame 3 - Central Plain: Cities of Compton, Paramount, Downey, Lynwood, South Gate, and Cudahy; river mile 14.14 - 8.4

Frame 2 - South Plain: City of Long Beach; river mile 8.4 - 4.0

Frame 1 - Estuary: City of Long Beach; river mile 4.0 - 0.0

LA RIVER PLANNING FRAMES

- 9** Frame 9 - West Valley
- 8** Frame 8 - Mid Valley
- 7** Frame 7 - East Valley
- 6** Frame 6- Narrows
- 5** Frame 5 - Heights
- 4** Frame 4 - North Plain
- 3** Frame 3 - Central Plain
- 2** Frame 2 - South Plain
- 1** Frame 1 - Estuary

0 3mi 6mi 

Figure 20. LA River Planning Frames.

FRAME 9: WEST VALLEY

Location: City of Los Angeles; river mile 51 – 43.1

Channel Characteristics: The channel in this frame begins as a soft bottom with riparian edges at Sepulveda Basin, and transitions to entrenched trapezoidal concrete channel at mile 45.5. with a typical width of 180 ft. At mile 51, the channel transitions to an entrenched concrete box channel with a typical width of approximately 60 ft.

Average Channel Slope: 0.2%

Landside Right-of-Way Characteristics: In this frame, the landside right-of-way ranges from 20-30 ft with a few larger tracts in the western portion of Canoga Park that are closer to 40-50 ft in width. The eastern soft bottom portion of the river channel has no landside right-of-way in Sepulveda Basin for approximately two miles (about 25% of the frame).

Notable Features:

- Dense residential context
- Bell Creek confluence at river mile 51 – also the location of Canoga Park High School
- Browns Canyon Wash confluence at river mile 49.8
- Aliso Canyon Wash confluence at river mile 47.3
- Reseda Park from river mile 46.6 to 47.0 along the right bank
- Sepulveda Basin Recreation Area and Wildlife Reserve from river mile 43.1 to 45.5; a significant ecological area

Significant Design Considerations for this Frame:

- Mile 51 at the Bell Creek confluence marks the headwaters of the LA River and projects nearby should consider the significance of this moment of the LA River.
- Projects in this frame have the opportunity to enhance native habitat and connect to other important habitat area in the region, such as the Santa Monica Mountains.
- Sepulveda Basin occurs in this frame, and as a soft-bottomed sediment basin approximately 2,000 acres large, it provides a tremendous opportunity for native habitat and biodiversity.
- Generally surface water in the channel portions of this frame is insignificant, except during rain events.



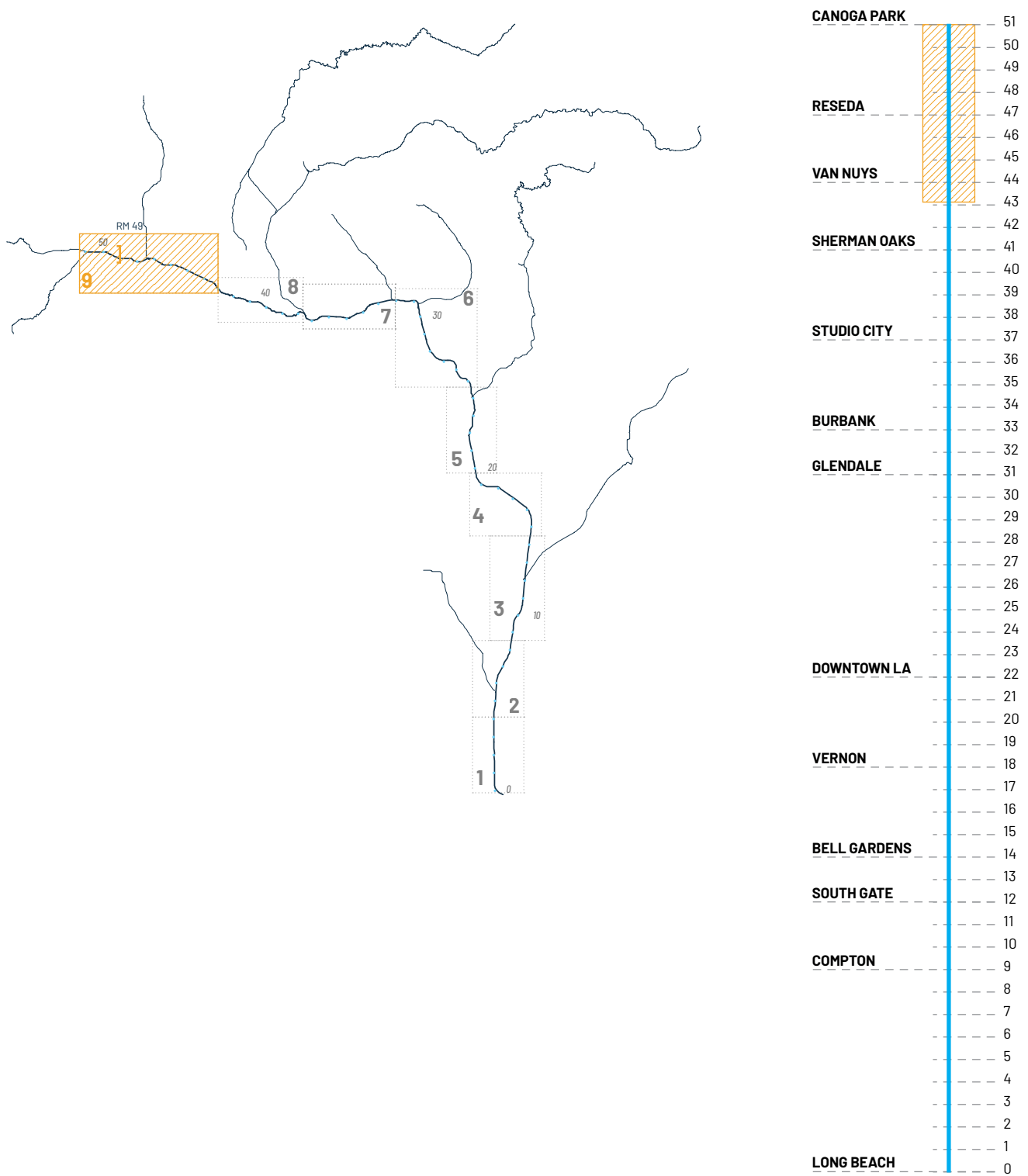


Figure 21. The channel conditions of LA River Planning Frame 9 range from soft bottom to trapezoidal to concrete. Much of the frame occurs in a dense residential context. Source: LA River Master Plan, 2020.

FRAME 8: MID VALLEY

Location: City of Los Angeles; river mile 43.1 – 37.8

Channel Characteristics: In this frame, the channel is an entrenched rectangular box concrete channel with a typical width of 60 ft.

Average Channel Slope: 0.3%

Landside Right-of-Way Characteristics: In this frame, the landside right-of-way ranges from 30-60 ft before terminating at the northwestern edge of the frame where Sepulveda Basin begins.

Notable Features:

- Dense residential context
- Several greenways from river mile 37.8 to 38.6 along the right bank, from river mile 38.7 to 39.1 along the left bank, and from river mile 39.2 to 39.7 along both the left and right banks

Significant Design Considerations for this Frame:

- The sections of the frame with a narrower right-of-way may require using the width of the channel or external land acquisition for projects of larger impact.
- Multiuse trails and access for wildlife should both be accommodated, even in tighter right-of-way space. Methods such as habitat ramps into the channel may be considered.
- Connections for wildlife could also be made to the multiple creeks of the Santa Monica Mountains in this area.



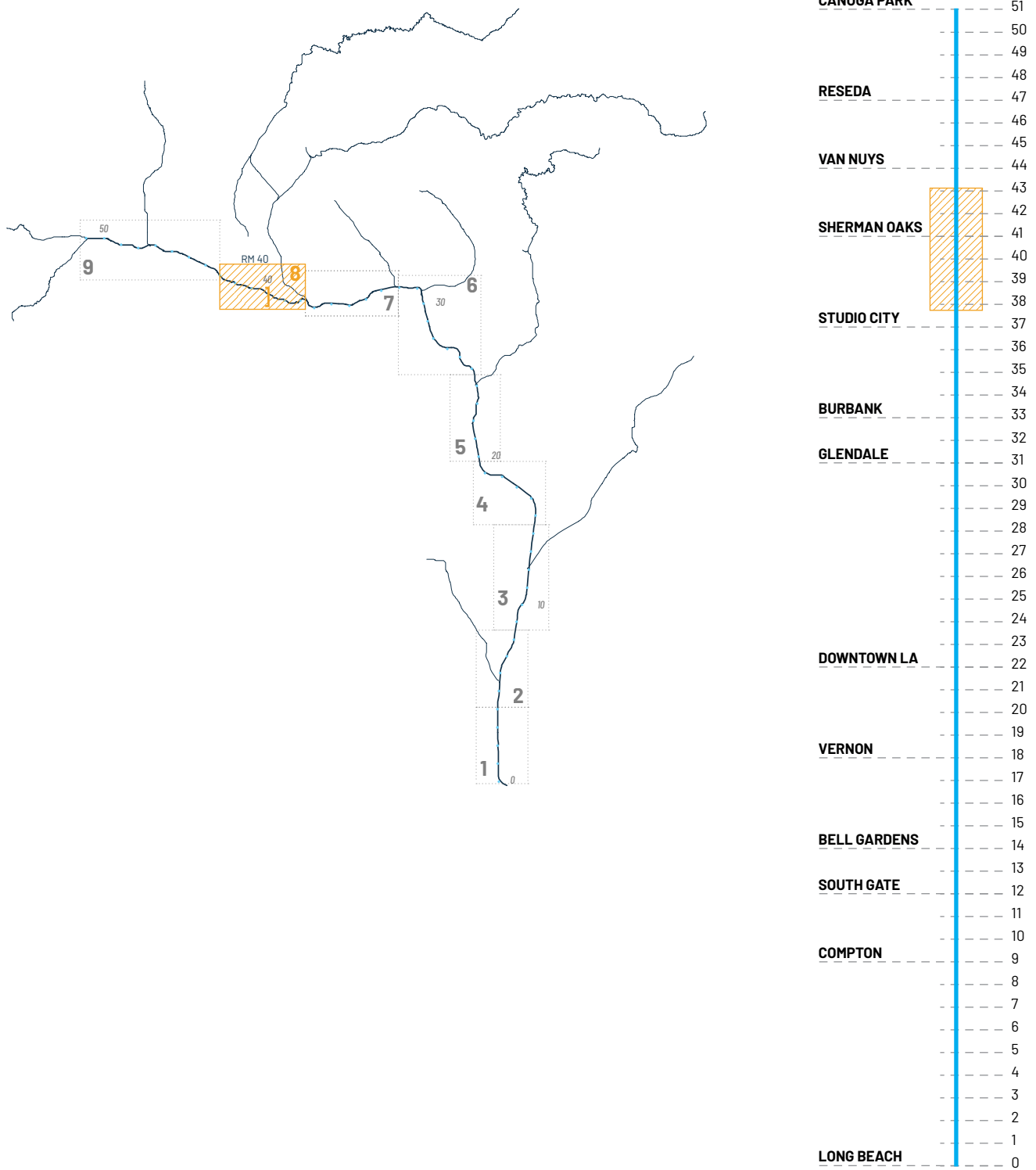


Figure 22. LA River Planning Frame 8 occurs in a dense urban and residential context and the river has a narrow, rectangular box channel section. Source: LA River Master Plan, 2020.

FRAME 7: EAST VALLEY

Location: Cities of Los Angeles and Burbank; river mile 37.8 – 32.0

Channel Characteristics: The channel in this frame is an entrenched rectangular box concrete channel, with a typical width of approximately 130 ft.

Average Channel Slope: 0.6%

Landside Right-of-Way Characteristics: As the channel narrows in Frame 7, landside right-of-way increases to 30-50 ft with a couple of large parcels that extend 200-450 ft into adjacent development. However, there is also approximately a mile on each bank (about 20% of the frame) where there is no landside right-of-way due to Warner Brothers and Universal Studios and the Lakeside Golf Course. The landside right-of-way parcels in this frame are both north and south facing, sometimes on slopes.

Notable Features:

- Dense residential context
- Tujunga Wash confluence at river mile 37.5
- Lakeside Golf Club from river mile 34.6 to 35.6 along the left bank, no ROW
- Warner Bros Studios from approximately river mile 34 to 34.5 along the left bank, no ROW
- Adjacent to Griffith Park from approximately river mile 32 to 34.5 along the right bank
- Sennett Canyon and Creek at river mile 33.5 along the right bank
- Burbank Channel confluence at river mile 32

Significant Design Considerations for this Frame:

- Projects in this frame have the opportunity to enhance native habitat and connect to other important habitat corridors in the region, especially the riparian to upland connection along the right bank with Griffith Park.
- Significant equestrian community in this area would utilize an expanded network of equestrian trails.
- The sections of the frame with no ROW may require using the width of the channel or external land acquisition for projects of larger impact.



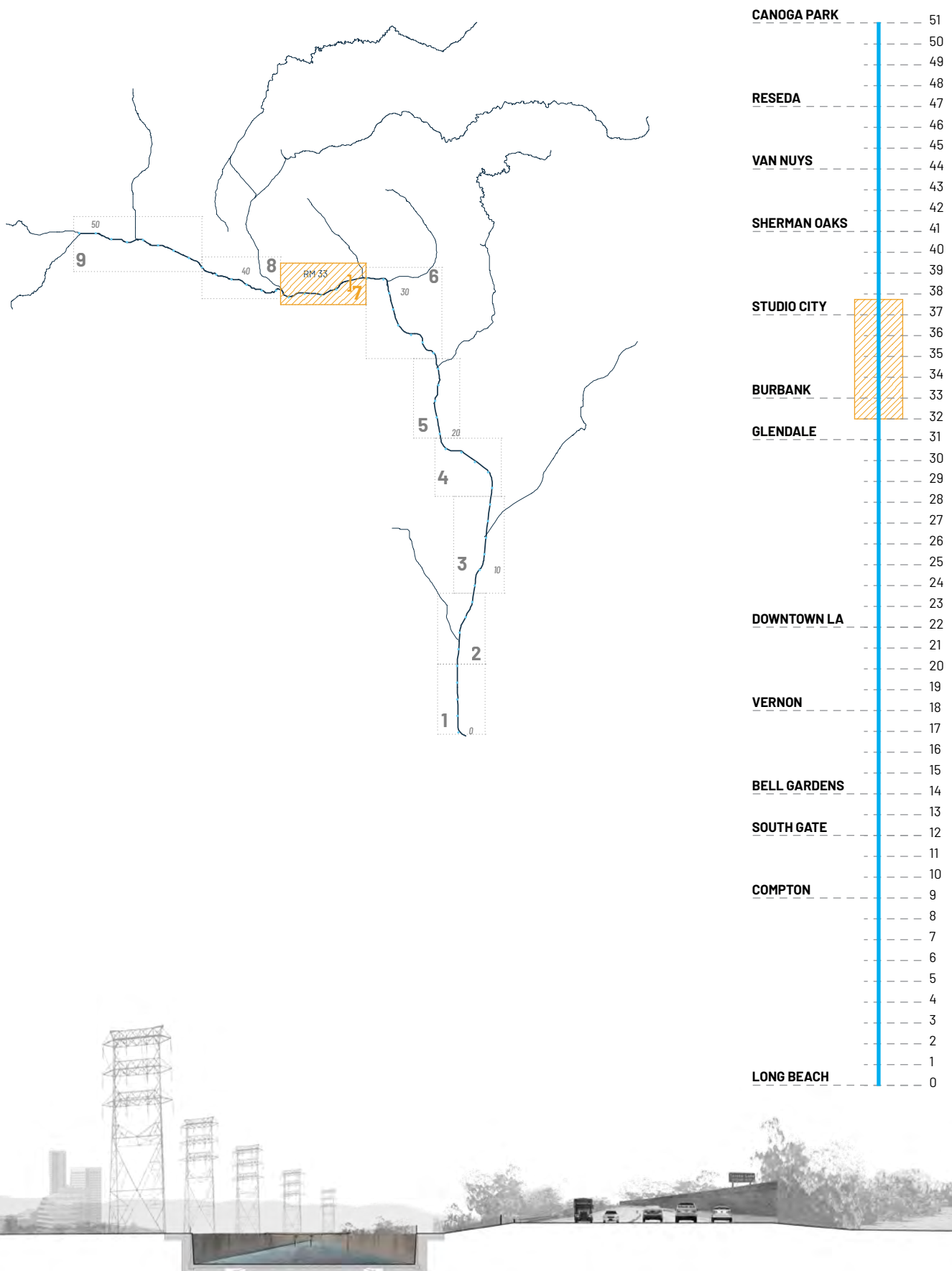


Figure 23. This channel condition of LA River Planning Frame 7 is a rectangular box section. Certain areas of the river have no ROW due to large private land holdings. Source: LA River Master Plan, 2020.

FRAME 6: NARROWS

Location: Cities of Los Angeles, Burbank, and Glendale; river mile 32.0 – 24.5

Channel Characteristics: In this frame, the channel is primarily soft bottom with entrenched trapezoid concrete walls. Typical channel width is approximately 300 ft. The channel bottom becomes concrete for about a half mile stretch as the river turns a corner just north of the Verdugo Wash confluence.

Average Channel Slope: 0.4%

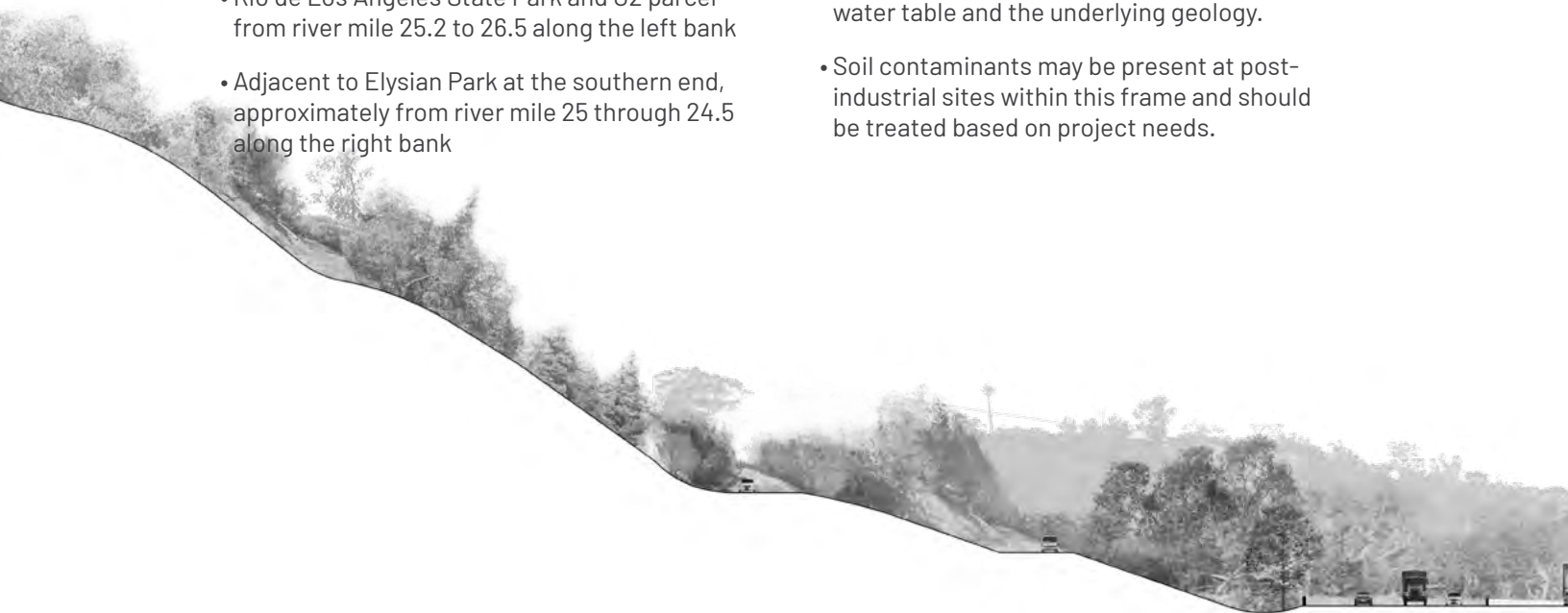
Landside Right-of-Way Characteristics: In this frame, the landside right-of-way ranges between 12-30 ft. There are also some gaps in the landside right-of-way along each bank. It consists of northeast and southwest facing parcels.

Notable Features:

- Significant ecological area with adjacency to Griffith Park from approximately river mile 28.5 through 32 along the right bank
- Barrier between the river and Griffith Park in this frame due to the 5 Freeway and Ventura Freeway
- Heavy sediment and vegetation are present in the channel
- River trail and park improvements
- Verdugo Wash confluence at river mile 30.6 along the left bank
- Rio de Los Angeles State Park and G2 parcel from river mile 25.2 to 26.5 along the left bank
- Adjacent to Elysian Park at the southern end, approximately from river mile 25 through 24.5 along the right bank

Significant Design Considerations for this Frame:

- Projects in this frame have the opportunity to enhance native habitat and connect to other important habitat corridors in the region (Santa Monica Mountains), although freeway barriers have to be considered in these connections.
- Flooding is a particular concern for residents in this community.
- Significant equestrian community in this area would utilize an expanded network of equestrian trails.
- Surface water is present in the channel bottom of this frame year-round due to a high water table and the underlying geology.
- Soil contaminants may be present at post-industrial sites within this frame and should be treated based on project needs.



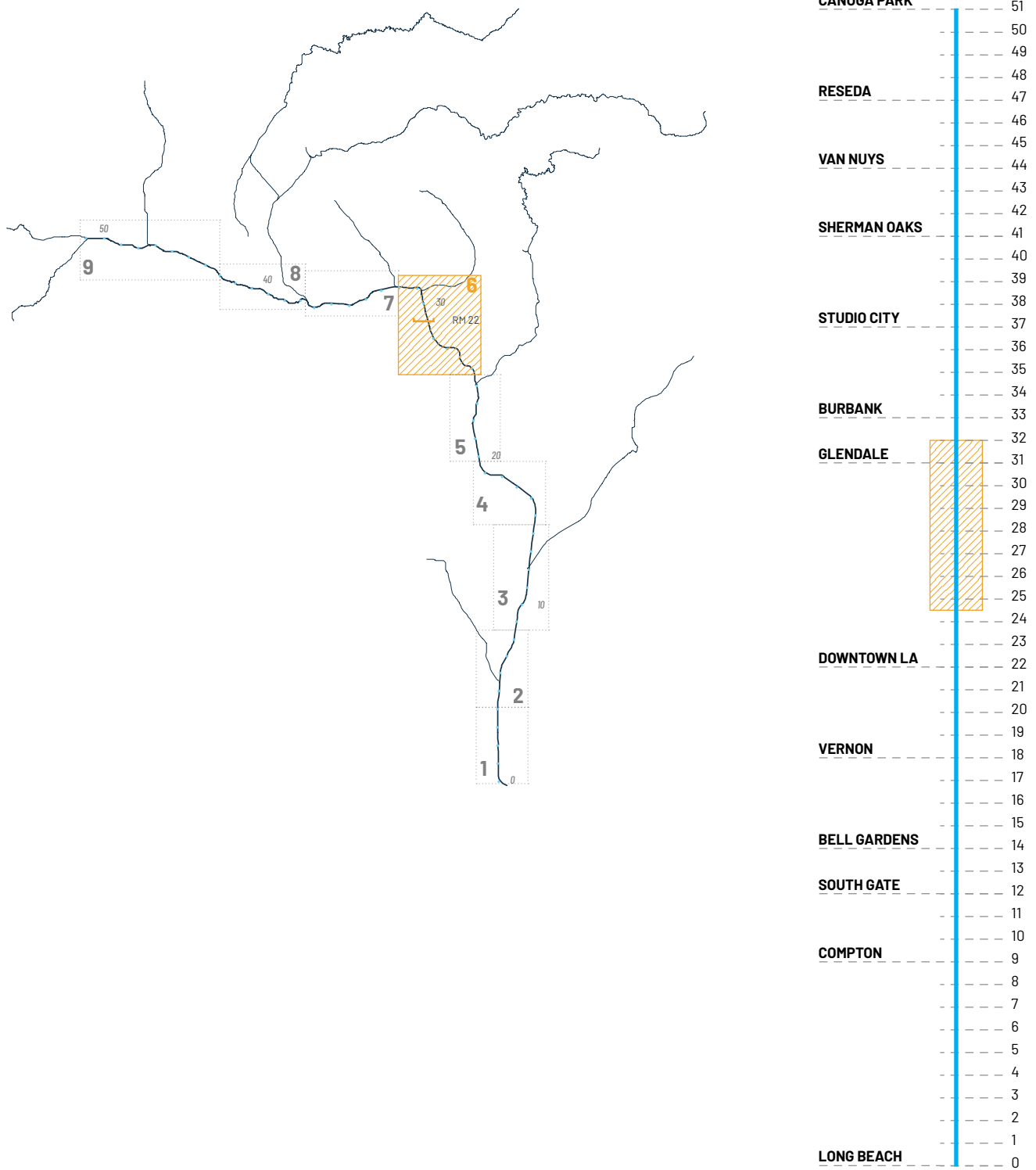


Figure 24. LA River Planning Frame 6 contains soft bottom river profiles and runs adjacent to Griffith Park . Source: LA River Master Plan, 2020.

FRAME 5: HEIGHTS

Location: City of Los Angeles; river mile 24.5 – 19.5

Channel characteristics: The channel in this frame is an entrenched concrete trapezoid section, with a typical width of 225 ft.

Average Channel Slope: 0.4%

Landside Right-of-Way Characteristics: In this frame, the landside right-of-way is typically less than 12 ft wide, widening at the northern edge. It consists of south, east, and west facing parcels.

Notable Features:

- Dense urban context – Downtown Los Angeles adjacent, several notable historic bridges
- High concentration of arts and cultural facilities
- Railroad lines and larger industrial yards along both sides of the river, several former industrial areas
- Los Angeles State Historic Park near river mile 23.5 along the right bank
- Arroyo Seco confluence near river mile 24, where the 110 freeway crosses the LA River

Significant Design Considerations for this Frame:

- Soil contaminants and air pollution mitigation and treatment are especially important in post-industrial sites prevalent in this frame.
- The often narrow right-of-way may require using the width of the channel or external land acquisition for projects of larger impact.
- Railroads and other transportation networks make it challenging to access the river in this frame.
- Surrounding urban development increases the urban heat island effect, so providing shade is critical.



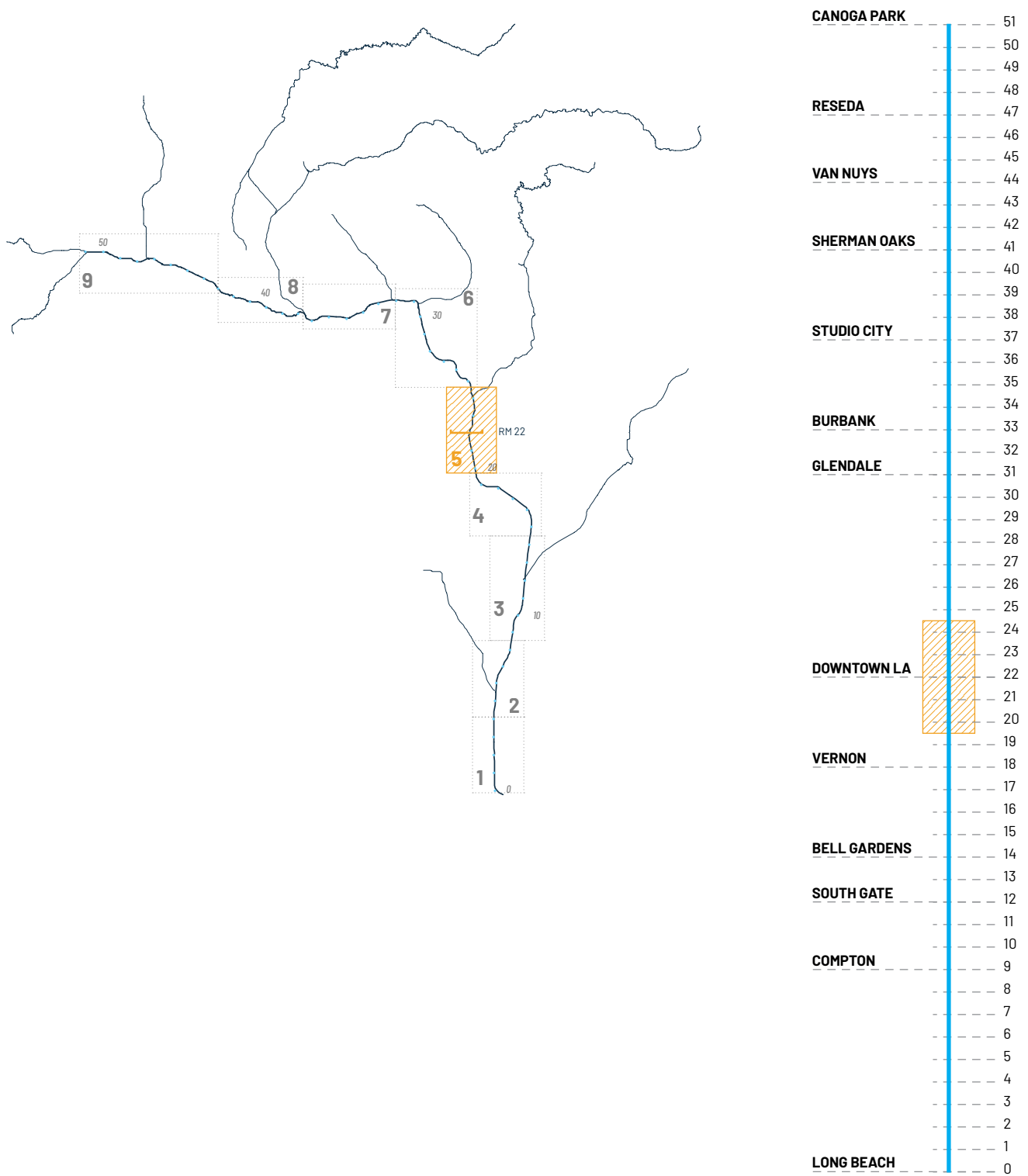


Figure 25. LA River Planning Frame 5 includes the section of the river that runs through Downtown LA, often near railroads or industrial sites. Source: LA River Master Plan, 2020.

FRAME 4: NORTH PLAIN

Location: Cities of Bell Gardens, Bell, Maywood, Vernon, Commerce, Huntington Park; river mile 19.5 – 14.14

Channel Characteristics: The channel in this frame is a concrete leveed trapezoidal section that is approximately 415 ft wide at the southernmost end. It transitions to a concrete entrenched trapezoidal section and then to a concrete entrenched rectangular section at river mile 19 at the northern end, with a width of about 285 ft

Average Channel Slope: 0.2%

Landside Right-of-Way Characteristics: In this frame, industrial development and several adjacent rail lines limit the landside right-of-way to consistently less than 15 ft. In the northern portion of the frame, there is no landside right-of-way along the right bank. Right-of-way parcels in this frame are south, east, and west facing.

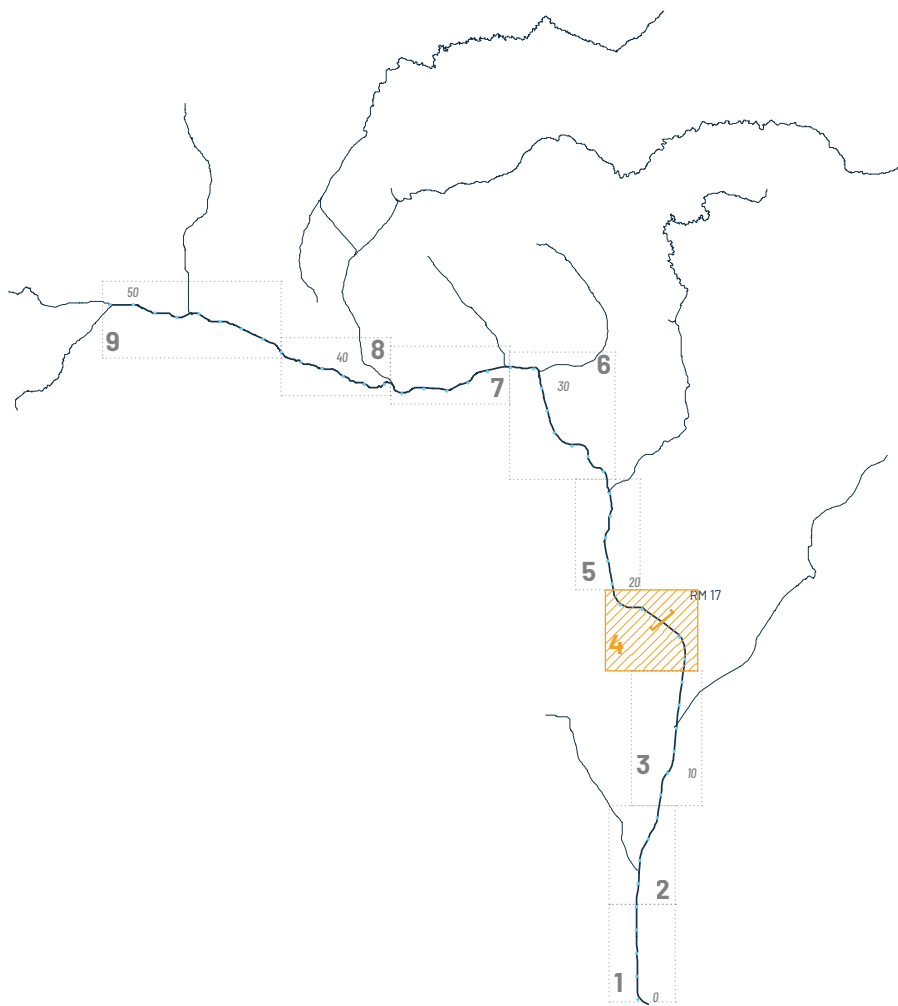
Notable Features:

- Dense industrial context
- Pollution and soil contamination present from heavy industry
- Utility rights-of-way and freight yards along both sides of the river
- Maywood Riverfront Park from river mile 15.7 to 15.8 along the right bank

Significant Design Considerations for this Frame:

- Soil contaminant and air pollution mitigation and treatment are especially important in post-industrial sites prevalent in this frame.
- Utility right-of-way projects require further coordination with power companies, but also provide a significant amount of land for corridor connectivity.
- Very high park needs and industrial land uses limit access to the LA River and healthy open space.
- Access to the river is limited by the 710 Interstate so projects may need to consider how barriers to reaching the river can be navigated.





CANOGA PARK	51
	50
	49
	48
RESEDA	47
	46
	45
VAN NUYS	44
	43
	42
SHERMAN OAKS	41
	40
	39
STUDIO CITY	38
	37
	36
	35
BURBANK	34
	33
	32
GLENDALE	31
	30
	29
	28
	27
	26
	25
	24
	23
DOWNTOWN LA	22
	21
	20
VERNON	19
	18
	17
	16
	15
BELL GARDENS	14
	13
SOUTH GATE	12
	11
	10
COMPTON	9
	8
	7
	6
	5
	4
	3
	2
	1
LONG BEACH	0



Figure 26. The river widens to a concrete trapezoidal channel in LA River Planning Frame 4, with many sites that have contamination from adjacent industrial land uses. Source: LA River Master Plan, 2020.

FRAME 3: CENTRAL PLAIN

Location: Cities of Compton, Paramount, Downey, Lynwood, South Gate, and Cudahy; river mile 14.14 – 8.4

Channel Characteristics: The channel in this frame is a trapezoidal concrete leveed cross section with an approximate width of 400 ft.

Average Channel Slope: 0.2%

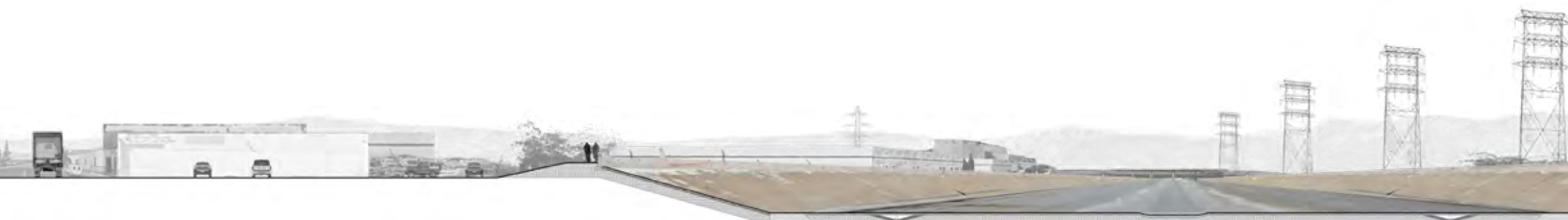
Landside Right-of-Way Characteristics: The landside right-of-way in this frame contains both east and west facing parcels, and is further limited by industrial and residential development, transmission easements, and Interstate 710 and the 105. It exists for extensive lengths at about 15 ft in width. However, there are large 200 ft wide tracts of the right-of-way incorporated into recreational park space (Ralph C. Dills and Hollydale Parks along with portions of the LA River Trail). Dense residential context, east and west facing parcels along levee of varying widths, areas typically 15 ft wide, in addition to utility corridors.

Notable Features:

- Dense residential context
- Utility ROWs along the left bank of the river
- Rio Hondo confluence at river mile 12.0 along the left bank
- Hollydale Park from river mile 11 to 11.5 along the left bank
- Ralph C. Dills Park from river mile 9.5 to 10.0 along the left bank

Significant Design Considerations for this Frame:

- Utility ROW projects require further coordination with power companies, but also provide a significant amount of land for corridor connectivity.



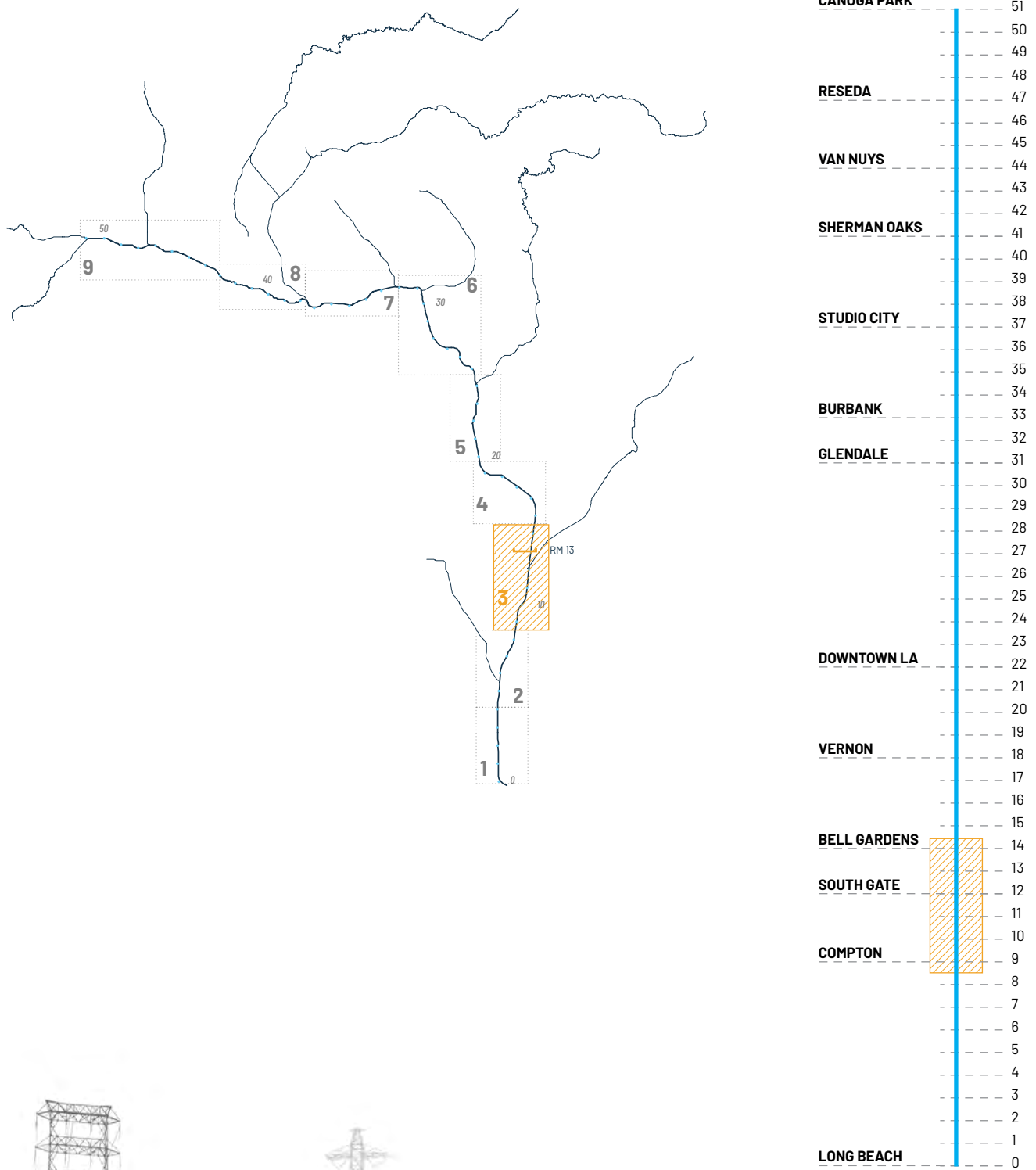


Figure 27. LA River Planning Frame 3 includes the section of the river that runs through South Gate, and often includes power lines from major utilities. Source: LA River Master Plan, 2020.

FRAME 2: SOUTH PLAIN

Location: City of Long Beach; river mile 8.4 – 4.0

Channel Characteristics: The channel in this frame is a trapezoidal concrete leveed cross section with an approximate width of 350 ft.

Average Channel Slope: 0.1%

Landside Right-of-Way Characteristics: This frame has some of the widest right-of-way parcels along the LA River. The parcels are east and west facing parcels along the levee. The landside right-of-way is widest in the southern portion of the frame, at widths of over 200 ft on each bank. Industrial and residential development, transmission easements, and Interstate 710 and the 91 Freeway cut into the landside right-of-way in the northern portion of the frame. The landside right-of-way is on average 50 ft wide.

Notable Features:

- Important bird habitat area
- Freshwater year round
- Utility ROWs along both sides of the river
- De Forest Park from river mile 6.8 to 7.5 along the left bank
- Dominguez Gap Wetlands from river mile 4.8 to 5.8 along the left bank
- Compton Creek confluence at river mile 5.4 along the right bank

Significant Design Considerations for this Frame:

- Significant equestrian community in this area would utilize an expanded network of equestrian trails.
- Algae mats on the concrete channel bottom provide an important food source for migrating birds.
- The widest portions of the landside ROW provides opportunity for significant habitat areas.
- Utility ROW projects require further coordination with power companies, but also provide a significant amount of land for corridor connectivity.



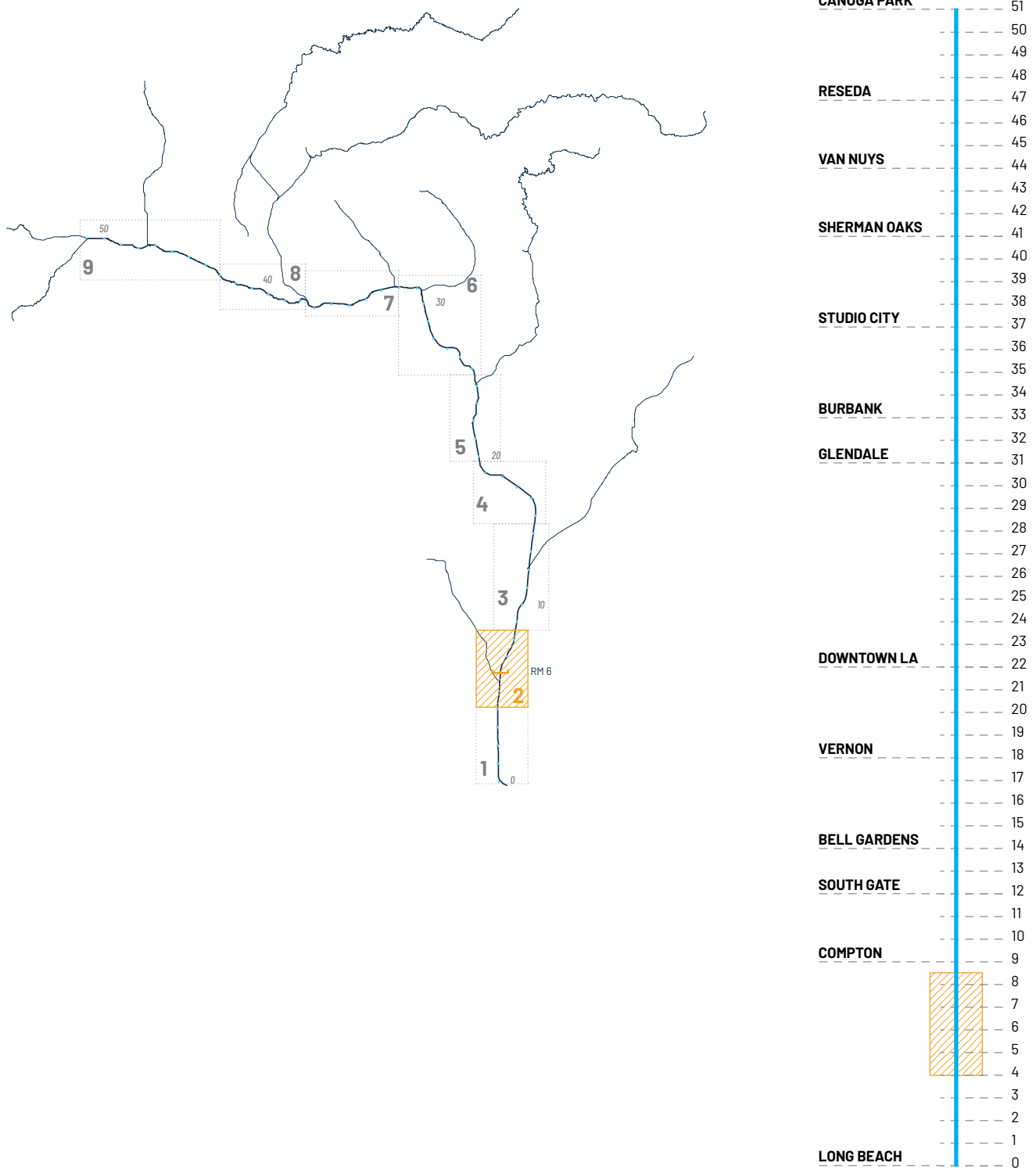


Figure 28. The channel in LA River Planning Frame 2 has a trapezoidal concrete section. There is a significant equestrian community that uses trails along this portion of the river. Source: LA River Master Plan, 2020.

FRAME 1: ESTUARY

Location: City of Long Beach; river mile 4.0 – 0.0

Channel Characteristics: The channel in this frame is a leveed trapezoidal concrete cross section with a width of approximately 400 ft. The soft channel bottom with year-round water transitions at mile 3 to a concrete bottom section with hard rip-rap sides, with a typical width of 585 ft.

Average Channel Slope: < 0.1%

Landside Right-of-Way Characteristics: This frame contains east and west facing parcels along levee, with areas that vary from approximately 15ft to 100-150ft wide.

Notable Features:

- Estuary (including projections for sea level rise)
- Important bird habitat area
- Brackish water year round
- Present fall line is at Willow Street
- Wrigley Greenbelt from river mile 2.9 to 4.0 along the left bank
- Santa Cruz Park, Golden Park, and Cesar Chavez Park from river mile 0.3 to 0.8 along the left bank, bisected from the river by West Shoreline Drive.
- Shoreline Aquatic Park and the Queen Mary at river mile 0

Significant Design Considerations for this Frame:

- This frame is in closest proximity to the ocean and Port of Long Beach, with unique site conditions for projects along the LA River.
- Projects here are potentially subject to high amounts of salt spray and salt content in the water and soil. Material and plant selections should be able to tolerate these conditions.
- Raised banks along the channel bottom allow for planting and should be managed as to not encourage the spread of invasive species.
- The wide ROW parcels, year-round presence of water, and proximity to the ocean provides opportunities for the creation and enhancement of valuable coastal habitat such as wetlands and nesting grounds.
- Sea level rise may occur in coming decades in this frame.



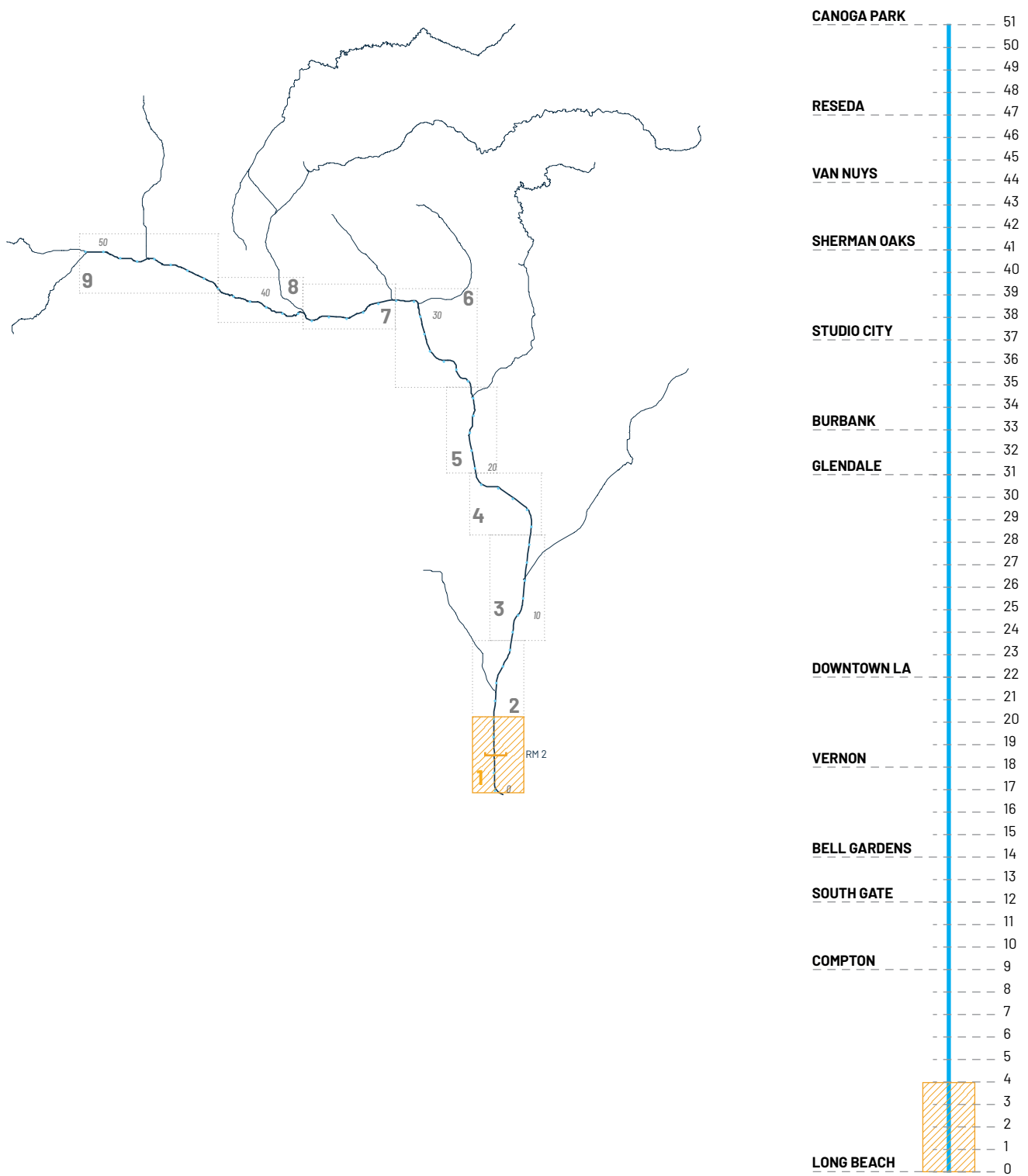
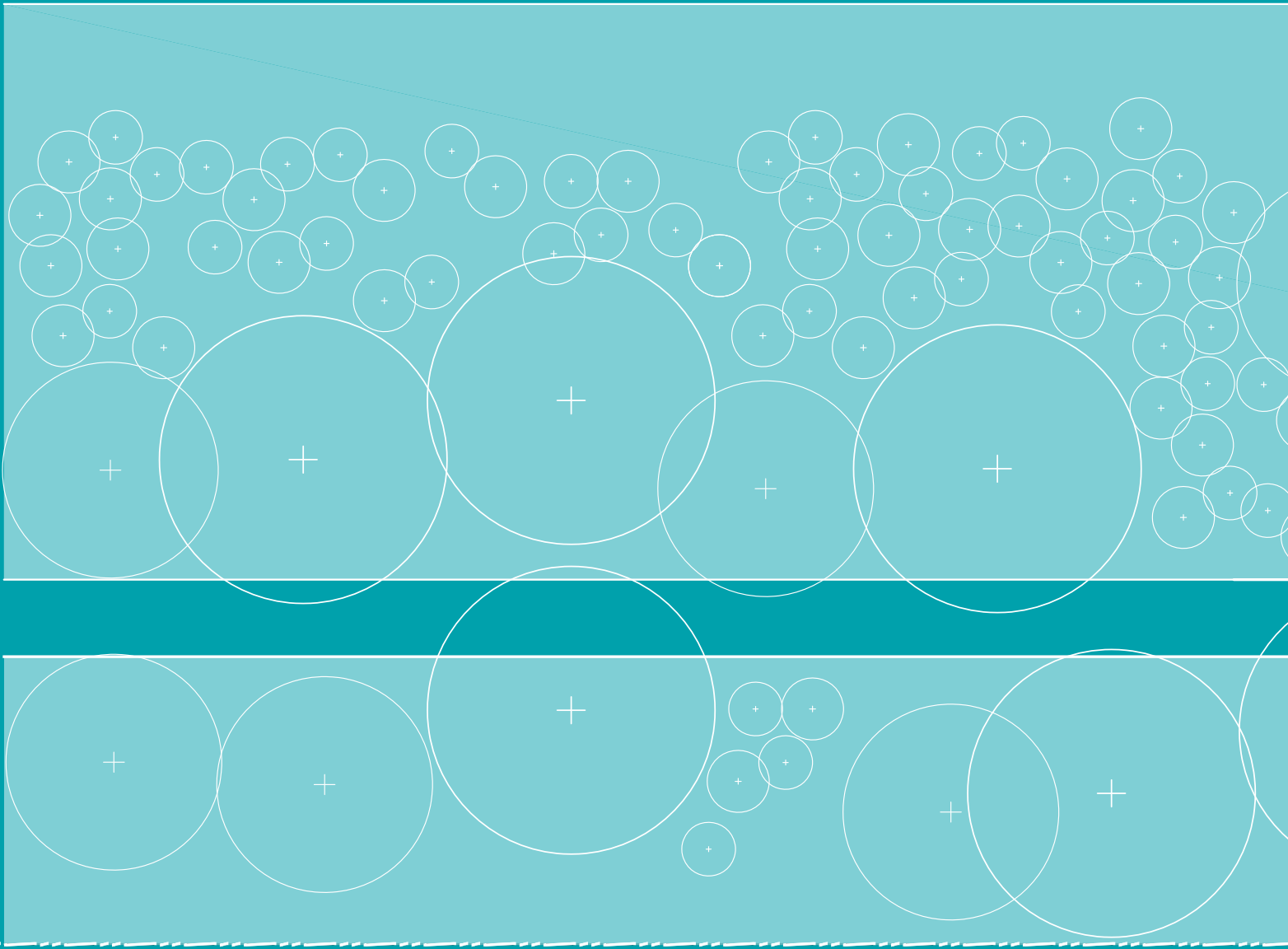
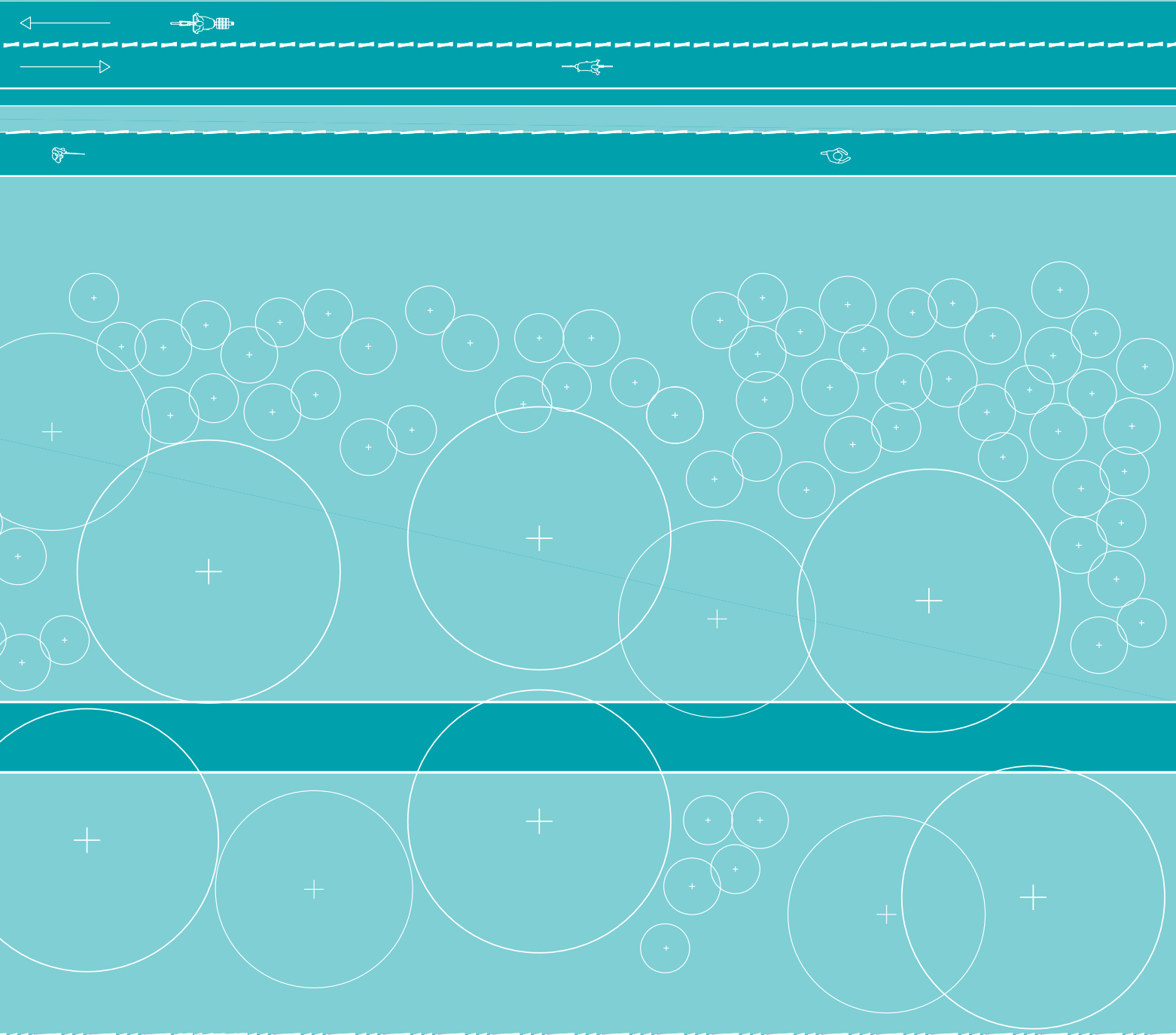


Figure 29. The estuary in LA River Planning Frame 1 contains brackish water and is a significant bird habitat. Source: LA River Master Plan, 2020.





SECTION II: DESIGN GUIDELINES

LA RIVER ACCESS

-  Metro Rail Stop within 1 mi of access point
-  Bus Stops within 1/2 mi of access point
-  Access Point
-  Existing LA River Trail
-  Proposed LA River Trail
-  Bike Path/Lane Connected to River Path
-  Other Bike Paths and Lanes

0 3mi 6mi N

Figure 30. LA River Access. Access points, trails, and public transportation stops along or adjacent to the LA River.
Source: LA River Master Plan, 2020.

3.

ACCESS AND MOBILITY

BUILDING AN INCLUSIVE MULTI-MODAL NETWORK FOR THE RIVER

The LA River is intended to be a resource for use by all people in LA County. To be this resource, the river must be accessible and usable. In community meetings and surveys during the LA River Master Plan process, people indicated that walking and biking are the two activities they participate in the most along the river, with combined participation more than all other activities combined. However, ease and availability of access to trails along the LA River is highly variable.

Trail guidelines ensure a degree of consistency in experience from one segment of the LA River trails to the next. Whether LA County Public Works or one of its partners implements a segment of trail, it should meet the same minimum standards. The more regular and frequent access is to trails along the LA River, the more people from surrounding communities will be able to take advantage of these amenities. With increased visibility of access points and consistency of experience, more people will become aware of the river and the experience of using any part of the river will become more familiar. As trails along the LA River become better connected to other trails in the county network, the value of the river trail will increase exponentially, opening up destinations that people can reach by getting on the river trails and making the LA River a destination by trail for more of the county. Better connections to transit will enable those without cars the opportunity to take advantage of the river and increase the viability of multi-modal trips. Finally, the addition of amenities such as water fountains or benches at regular intervals will make the experience more pleasant for both the casual recreation user and the seasoned commuter (see Chapter 6 for further discussion on amenities).

WHAT'S IN THE CHAPTER

The following pages contain the dimensional and material guidelines for multi-modal trails connecting to and along the LA River. This chapter will provide information regarding right-of-way scenarios, gateways, and bridges among other aspects related to access and mobility. The designer or engineer shall be responsible for ensuring the implementation of these guidelines is compliant with prevailing building codes and regulations. Consult the checklist at the end of the chapter to ensure the correct guideline items are followed.

63	3. Access and Mobility
64	What's in the Chapter
66	Multiuse Trails
69	Trail Components
70	Right-of-Way Combinations
72	Trails in Wide Right-of-Way Areas
73	Trails in Narrow Right-of-Way Areas
78	Trail Assemblies
81	Paving Materials
83	Fences, Guardrails, Railings, and Gates
86	Gateways
88	Bridges
94	Access and Mobility Checklist

THE LA RIVER TRAIL SHOULD CONNECT TO
OTHER TRAILS ALONG THE LENGTH OF THE
RIVER TO CREATE A NETWORK OF TRAILS
ACROSS LA COUNTY FOR CYCLISTS,
PEDESTRIANS, AND EQUESTRIANS

MULTIUSE TRAILS

A primary goal of the LA River Master Plan is to create 51 miles of connected open space with equitable access, including trails, gateways, and access points. The LA River Trail should connect to other trails and paths along the length of the river to create a mobility network across LA County for cyclists, pedestrians, and equestrians. The LA River Trail should always seek to accommodate as many user types as safely possible, although all types of users may not always be accommodated based on specific projects and site conditions. Additionally, operations and maintenance vehicles need to access the right-of-way.

The various trail conditions along the LA River should be designed with their intended use in mind. Each type of trail user has different needs in terms of width and materiality.

SEPARATED USES: EQUESTRIAN, PEDESTRIAN, AND BICYCLE

In a condition where ample right-of-way space is available, the pedestrian, bicycle, and equestrian trails should give each user group a dedicated passageway with buffers in between the trails. In this scenario, the condition of the buffer spaces between the paths is important. The vegetated buffers should be at least three feet wide. The trail widths shall be dictated by their expected usage and informed by the site conditions. A 12 feet minimum width is required for either the pedestrian or the bicycle trail to accommodate the service/maintenance vehicles.

When there is not enough space to separate all three trail uses, the pedestrian and bicycle trails should be adjacent to one another and a vegetated buffer or trail divider should be used to separate those uses from the equestrian trails. A 12 feet minimum width is required of the pedestrian and bicycle trails to provide access for service/maintenance vehicles.

ADJACENT USES: EQUESTRIAN, PEDESTRIAN, AND BICYCLE

Where there are more space constraints in the LA River right-of-way, pedestrian and bicycle trails may need to be directly adjacent or share a trail. These two trails can coexist next to one another as long as there is correct striping and clear signage designating the trail uses. The combined width must be a minimum of 12 feet in order to provide access for service and maintenance vehicles.

COMBINED USES: EQUESTRIAN, PEDESTRIAN, AND BICYCLE

In some instances along the river where there is the tightest right-of-way, the most efficient trail option is a single trail that is designed to be used by pedestrians, bicyclists, and equestrians. Clear trail environmental graphics and striping must be present. For equestrian uses, rough brushed concrete paving should be installed and a recommended length of half a mile maximum. The width of this multiuse trail must be a minimum of 12 feet in order to provide access for service and maintenance vehicles.

MULTIUSE TRAIL COMBINATIONS

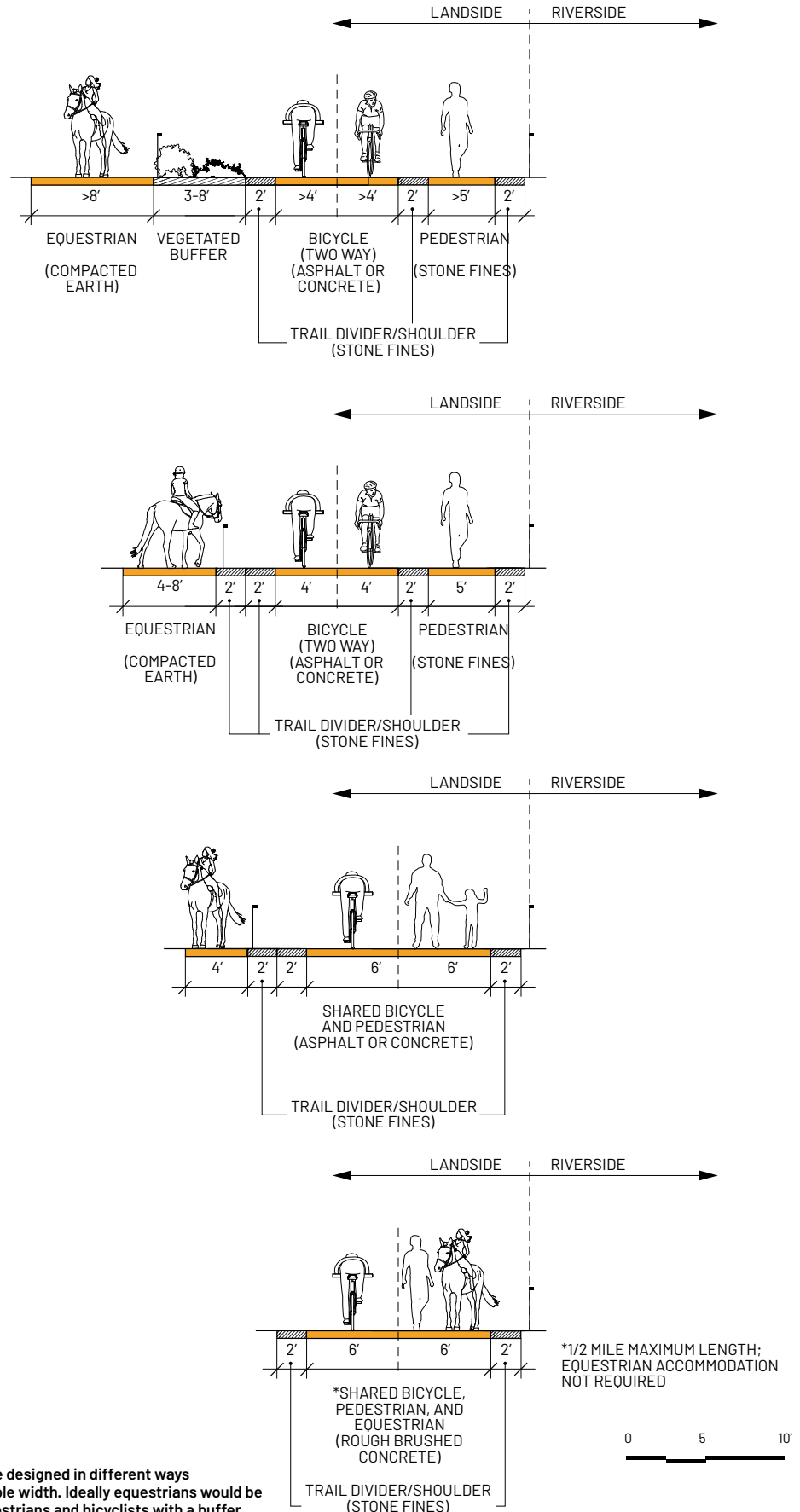


Figure 32. Multiuse trails can be designed in different ways depending on available width. Ideally equestrians would be separated from pedestrians and bicyclists with a buffer. Dimensions illustrated for bikes are based on the County of LA Bike Plan.

COMPONENTS OF MULTIUSE TRAILS



Figure 33. Pedestrian, bicycle, and equestrian trail components vary in width and are most often used in combination with one another, but they may also be implemented as standalone trails in certain projects. Dimensions illustrated for bikes are based on the County of LA Bike Plan.

TRAIL COMPONENTS

PEDESTRIAN TRAILS

Pedestrians make up the largest user group of the river. The main paths of travel should be linear and efficiently designed for active transport. Paths that are for passive uses may meander. The pedestrian trails should range anywhere from 4 ft wide (for secondary/recreation use only) up to the preferred 12 ft wide where there is a need to share the share with other types of users. Two foot shoulders should also be provided on either side of the path. Regardless of usage, there must be clear visibility to the surrounding paths for safety.

BICYCLE TRAILS

Bicycle trails along the entirety of the river should be designed to meet Caltrans Class I minimum standards with a design speed of 20mph. These trails should allow for four foot lanes of two-way traffic with two foot shoulders on each side. Clear environmental graphics and striping must be included for safety (see "Bike Trail Paint" in Chapter 4 for more details).

EQUESTRIAN TRAILS

Where possible, equestrian trails should be kept separate from other trails. Equestrian trails should range from four ft wide, where low usage is expected, to 12 feet wide where high, two-way usage occurs. Where applicable, they should provide safe access across the river bed and to other recreational areas. Equestrian trails exist adjacent to the river in several frames. Linking these facilities in the future would provide equestrians with greater opportunities for all day rides or longer trail loop systems not currently available.

When there is not enough space to accommodate all uses, the first priority remains to create a connected LA River Trail. Design teams shall determine a method to maintain pedestrian and bicycle connections regardless of constraints.

RIGHT-OF-WAY COMBINATIONS

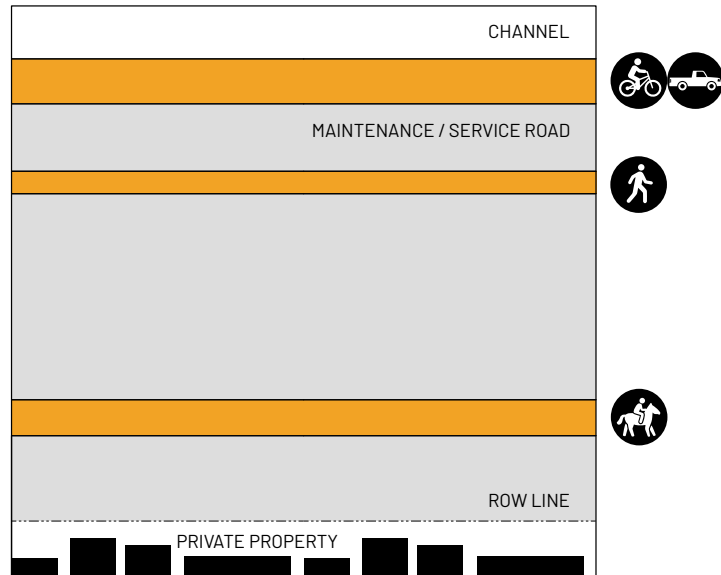
The design and location of trails is primarily affected by the channel configuration, the US Army Corps of Engineers (USACE), City of Los Angeles, or LA County (LAC) right-of-way widths, maintenance requirements of flood control and auxiliary uses, and utility easements.

The right-of-way conditions along the LA River vary substantially in each frame. LA County Public Works and the USACE maintain various segments of the river channel. In order to access and maintain the river, these right-of-way contain service roads, both paved and unpaved, along the top of the channel. These service roads are used by LAC and the USACE crews to: inspect the channel, clean out weir structures on an annual basis at various locations, and respond to emergency situations. The location of the service road varies depending on the right-of-way condition. In general, there are 4 different sizes of right-of-way:

- Extra Large (>12 ft, extends beyond base of levee)
- Large (>12 ft, along entrenched condition)
- Narrow (approximately 12 ft)
- Very Narrow (< 12 ft)

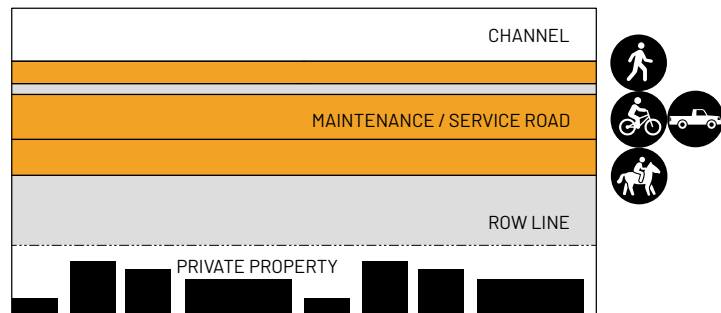
Within each of the different right-of-way conditions, the trails and service roads are organized in different ways. Along some sections of the river, the service road runs along both banks and in some sections on one bank. Through the industrial parts of downtown LA and in the San Fernando basin, no room is currently provided for service roads.

RIGHT-OF-WAY TYPOLOGIES



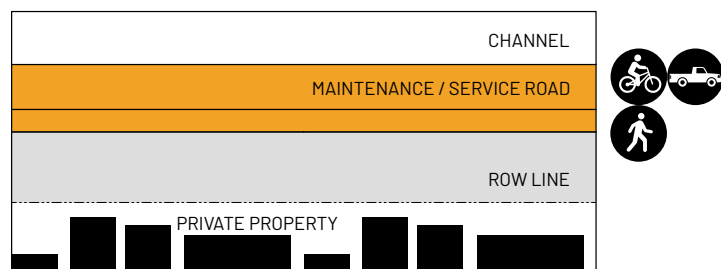
EXTRA LARGE RIGHT-OF-WAY

See Figure 35 on page 72.



LARGE RIGHT-OF-WAY

See Figure 36 on page 73.



NARROW RIGHT-OF-WAY

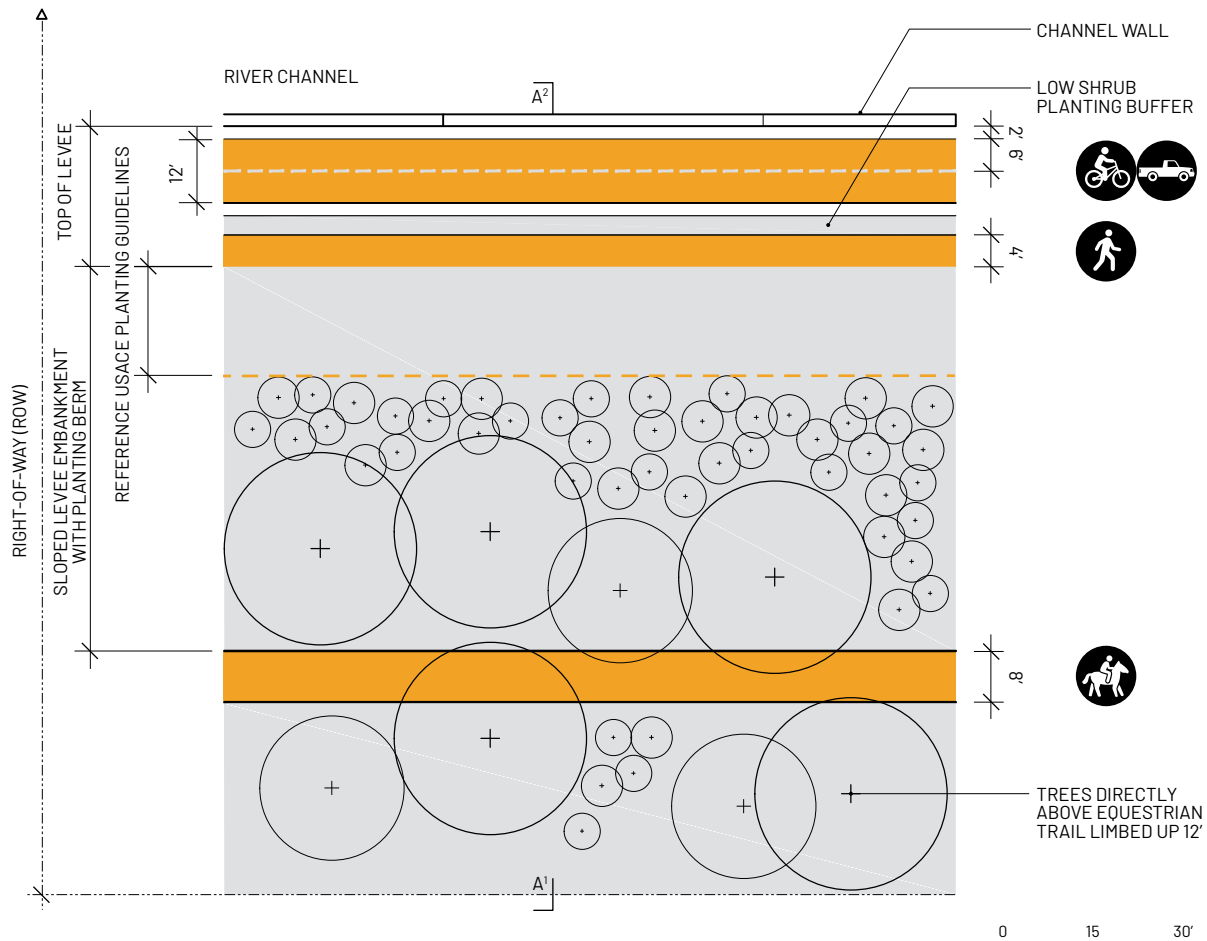
See Figure 37 on page 74.



VERY NARROW RIGHT-OF-WAY

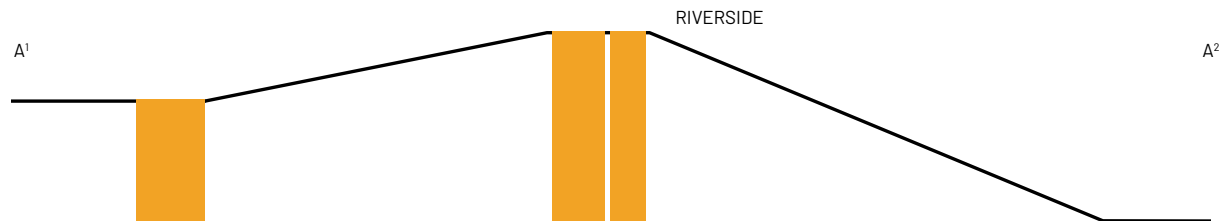
See Figure 38 on page 74.

Figure 34. Right-of-way conditions vary greatly along the 51 miles of the river. In general, there are four typologies that represent the majority of conditions along the river.



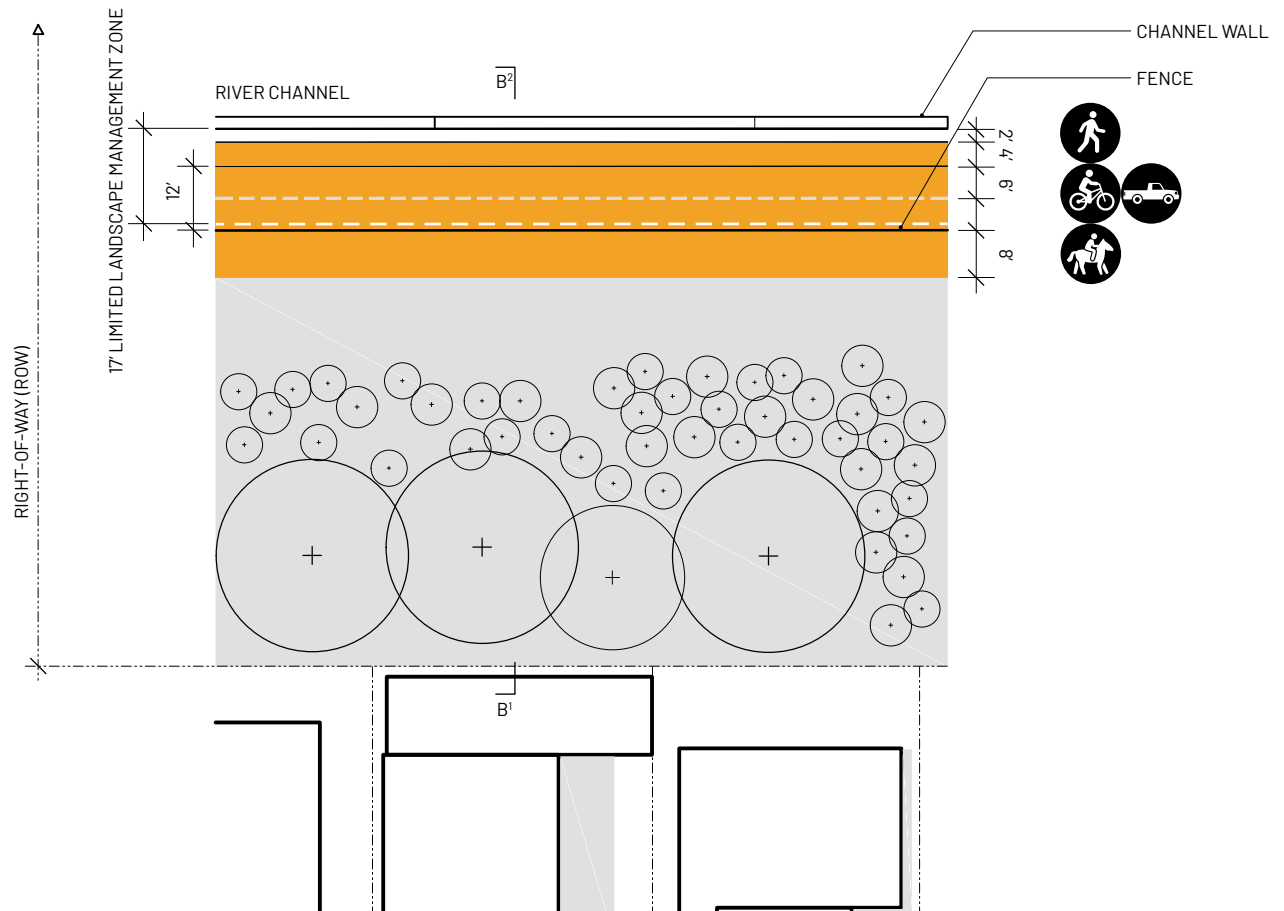
WIDE LANDSIDE ROW > 12', SEPARATED MULTIUSE TRAIL ALONG LEVEE

Figure 35. A wide landside ROW would allow for the separation of trail types. This presents the possibility to have wide trail dimensions and highest safety measures. This figure represents one possible configuration of this typology.



TRAILS IN WIDE RIGHT-OF-WAY AREAS

Areas with large rights-of-way along the LA River should utilize that space to separate the different trail typologies. To promote safe usage, bicycle, pedestrian, and equestrian trails should have their own designated trails with adequate buffers or trail dividers. Special consideration should be given to areas where different types of trail users intersect, such as access points and bridge crossings.



WIDE LANDSIDE ROW > 12', CONSOLIDATED MULTIUSE TRAIL ALONG ENTRENCHED CHANNEL

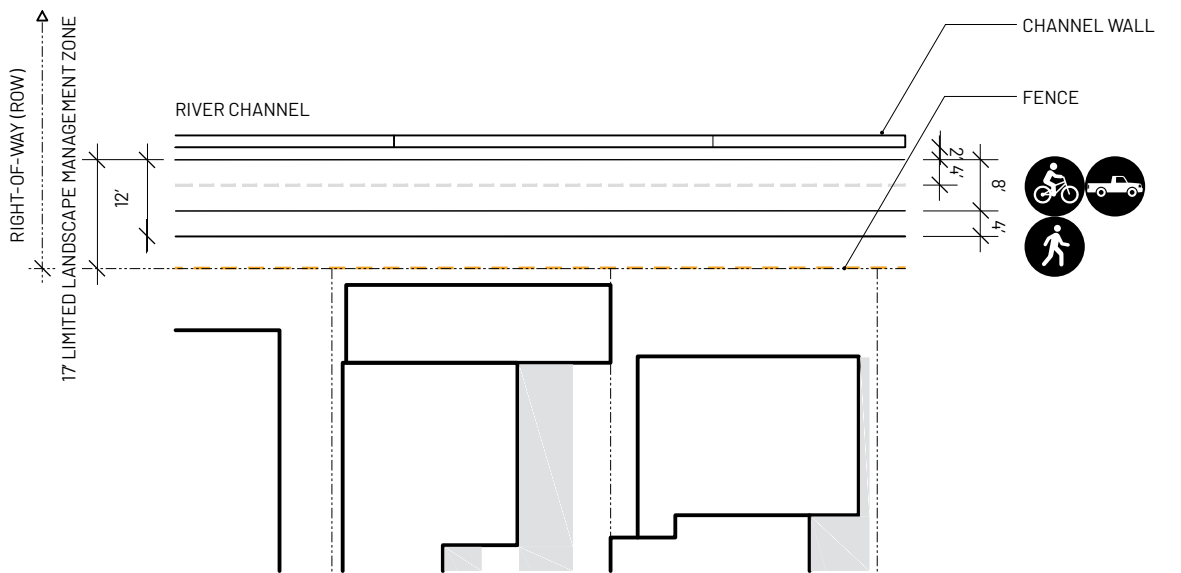
Figure 36. Trails may be consolidated when a wide landside right-of-way (ROW) is present. When the trails are consolidated, more land becomes available for parks, planting, and habitat. This figure represents one possible configuration of this typology.



TRAILS IN NARROW RIGHT-OF-WAY AREAS

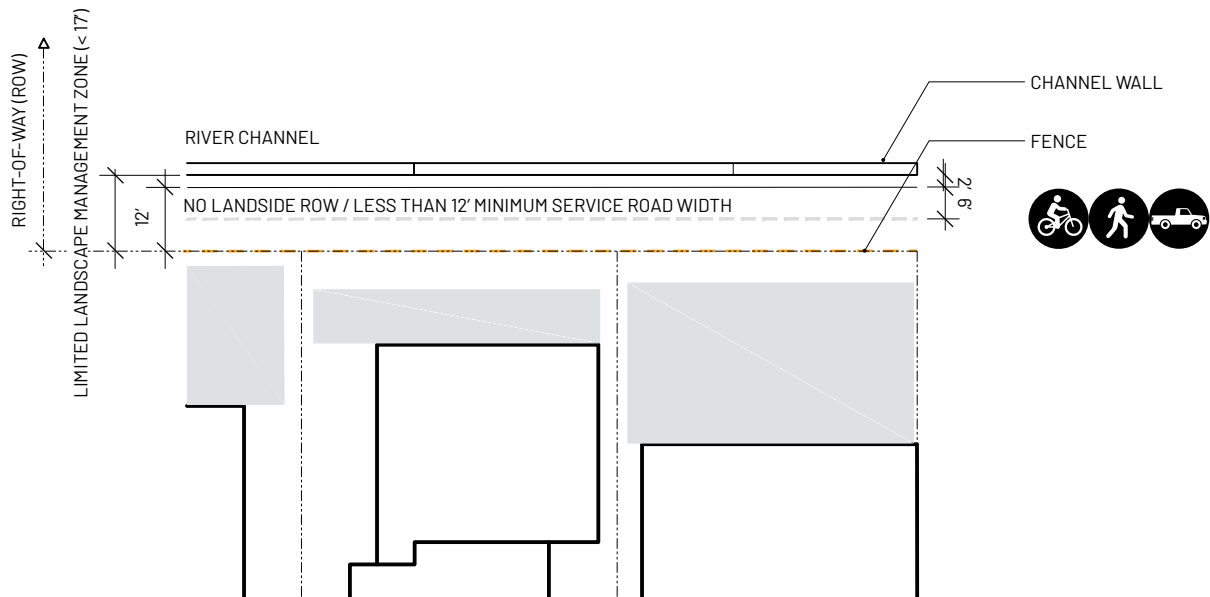
Connectivity of the trail network along all 51 miles of the LA River is critical, therefore, in areas where the right-of-way is narrow, innovative methods to create connectivity should be explored, such as cantilevers, bridges, elevated trails, and platforms. When necessary, paths can be shared by cyclists, pedestrians, and equestrians.

RIGHT-OF-WAY CONDITIONS VARY GREATLY ALONG THE 51 MILES OF THE LA RIVER. THE FIGURES ABOVE REPRESENT ONE POSSIBLE CONFIGURATION OF THE RIGHT-OF-WAY



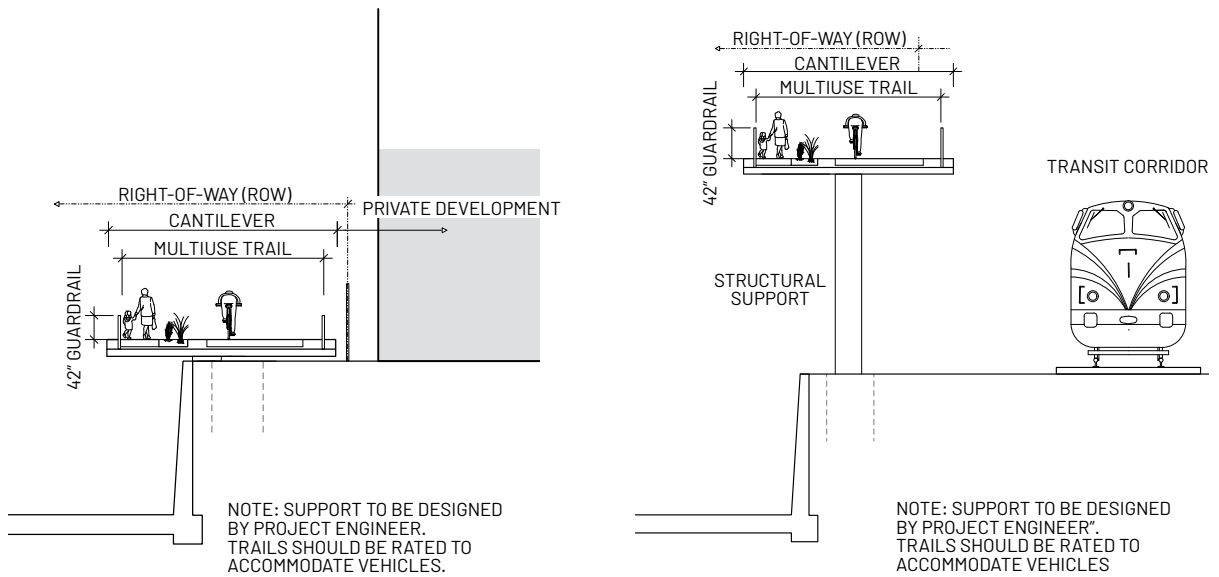
LANDSIDE ROW = APPROX. 17', MULTIUSE TRAIL

Figure 37. Narrow landside rights-of-way (ROW) allow for the separation of pedestrian and bike trails. However, they do not allow room for separate equestrian trails. In this condition, room for buffer planting is present, allowing separation between the trail users and the property owners. This figure represents one possible configuration of this typology.



LANDSIDE ROW = 14', MULTIUSE TRAIL

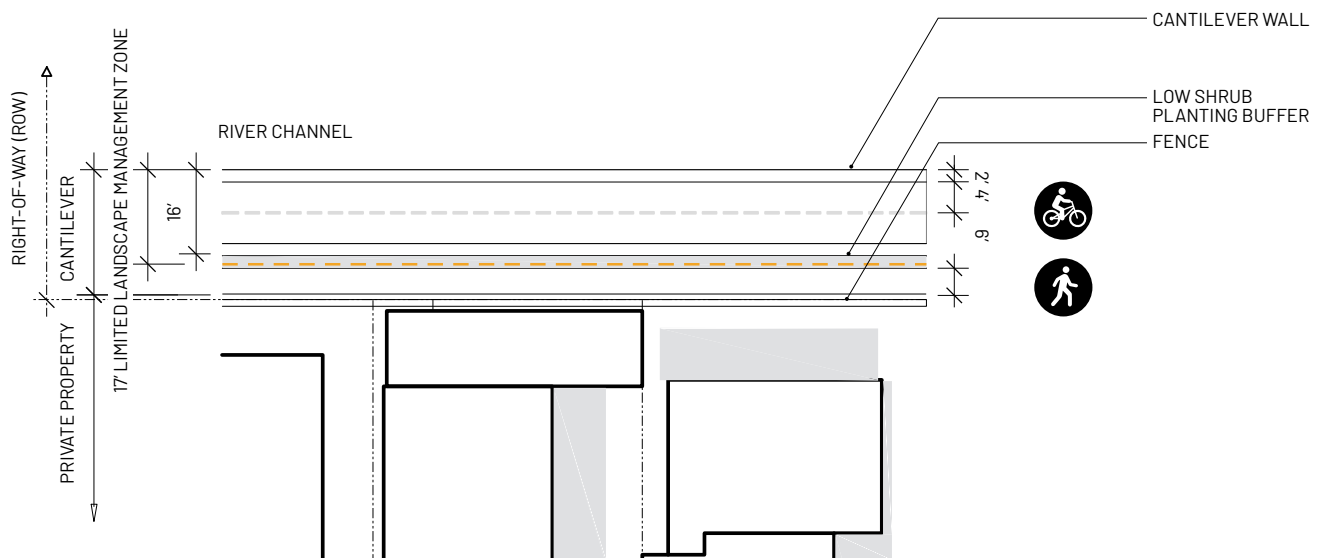
Figure 38. Narrow landside rights-of-way (ROW) allow for the separation of pedestrian and bike trails. However, they do not allow room for separate equestrian trails. This figure represents one possible configuration of this typology.



NO LANDSIDE ROW, CANTILEVERED OR ELEVATED MULTIUSE TRAIL

Figure 40. The cantilevered and elevated trails allow pedestrians and cyclists to utilize the right-of-way (ROW) when there is not enough room between the channel and adjacent property, infrastructure, or utilities. Guardrails on both sides of the trail help keep users safe. This typology could stay open during storm events and offer elevated views. This figure represents one possible configuration of this typology.

0' 10' 20'



NO LANDSIDE ROW, CANTILEVERED MULTIUSE TRAIL

Figure 39. For instances where there is no landside rights-of-way (ROW), a cantilevered condition can create space for an accessible multiuse trail. This figure represents one possible configuration of this typology.

0 15 30'

DRAFT

MULTIUSE TRAILS IN WIDE ROW: BEST CASE SCENARIO

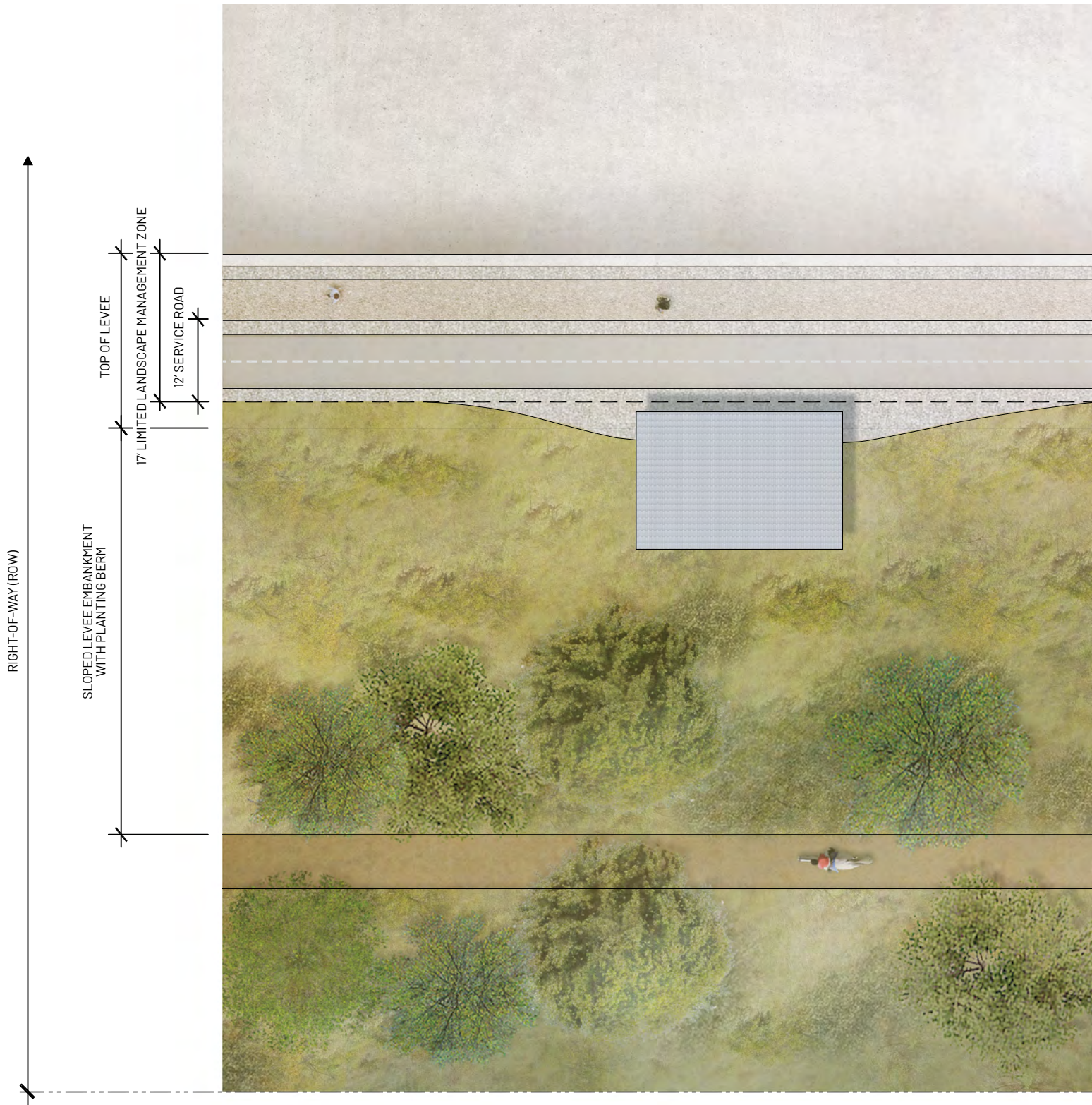
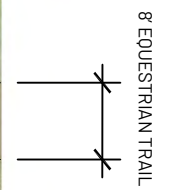
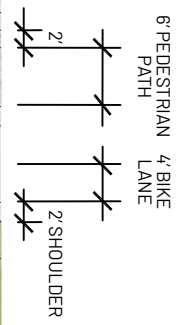


Figure 41. Wide landside rights-of-way (ROW) allow for the separation of trail types with vegetated buffers. This figure represents one possible configuration of this typology.

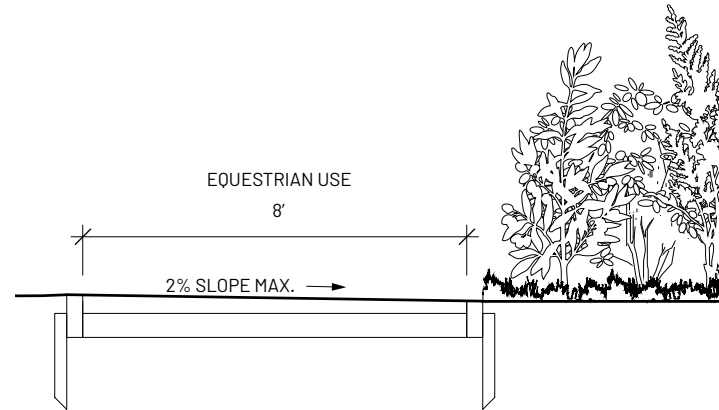


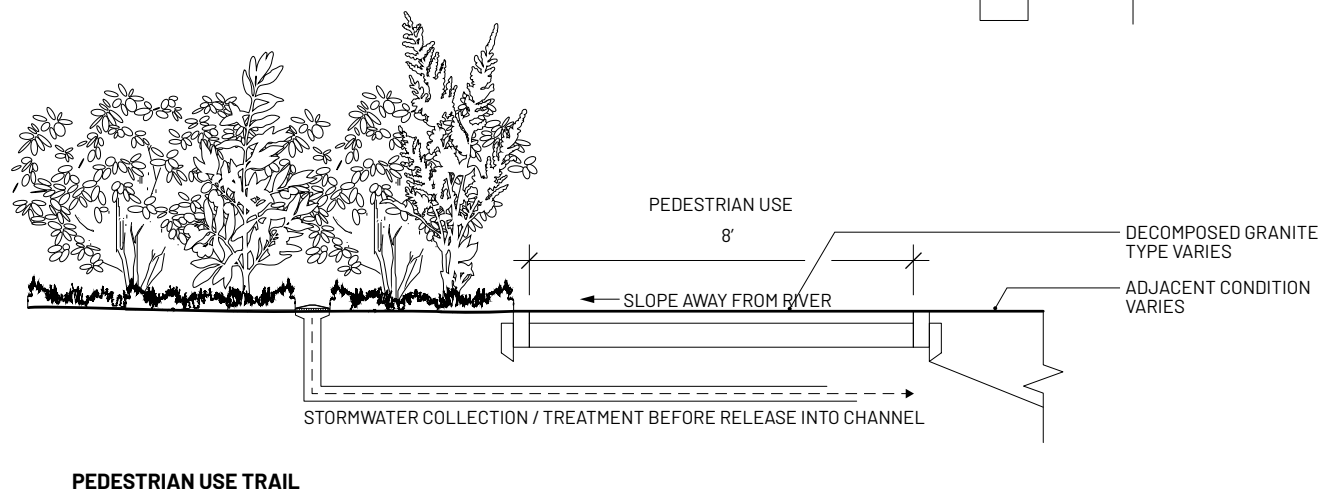
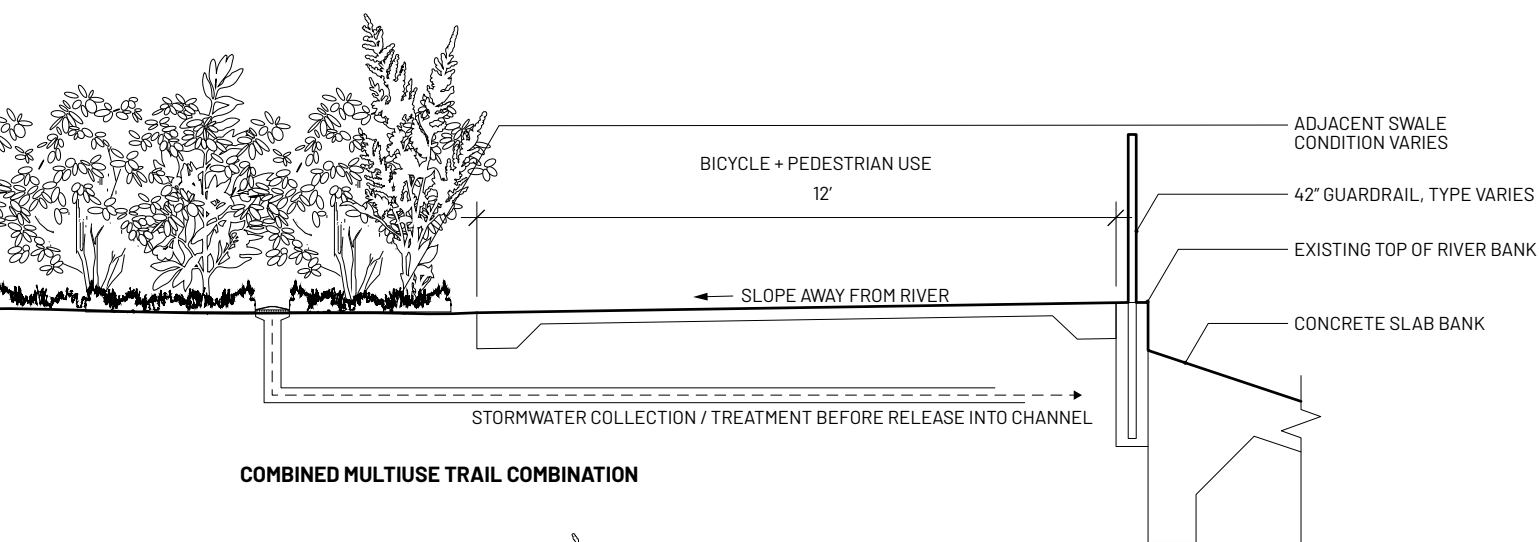
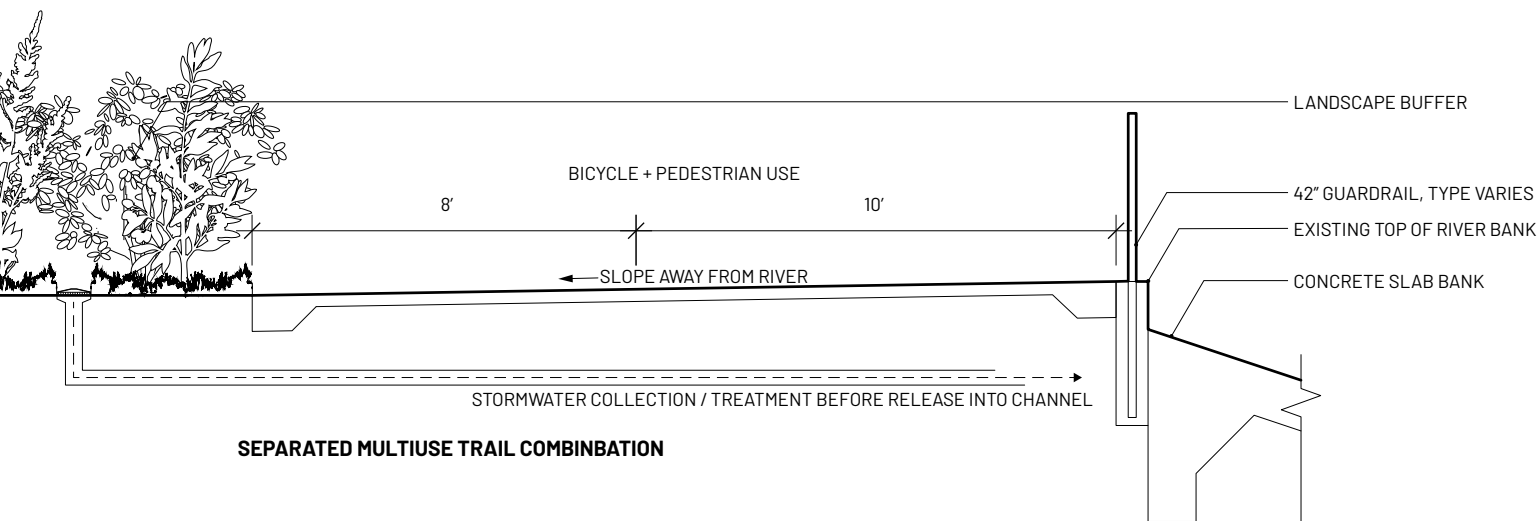
0 10 20'

DRAFT

TRAIL ASSEMBLIES

The relationship between the trails and their adjacent conditions should be considered when designing and constructing along the LA River. While the trail widths vary based on the combination of usage type and materiality, there are design principles that should be followed universally where possible. To improve water quality, trails should generally slope away from the river channel and filter runoff prior to discharge into the channel. In some circumstances, such as elevated or cantilevered paths, underpasses, and tight right-of-ways, this condition may not be preferred.





0 2 4 8'

Figure 42. Where possible, trails should slope away from the river and to a landscape drain or infiltration zone. That water should then be filtered and conveyed into the river.

PAVING TYPOLOGIES

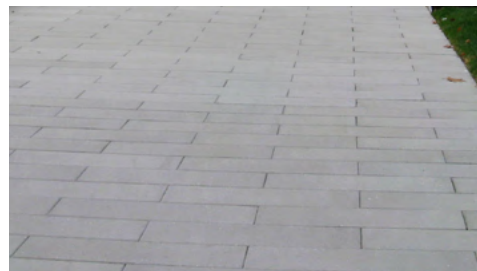
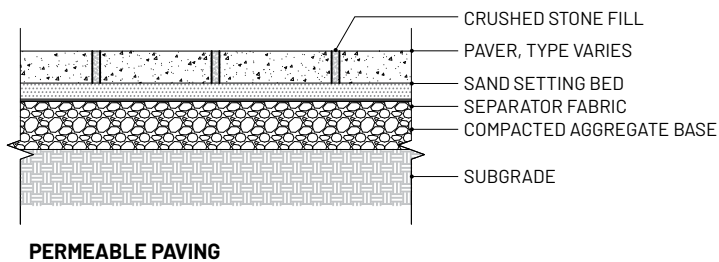
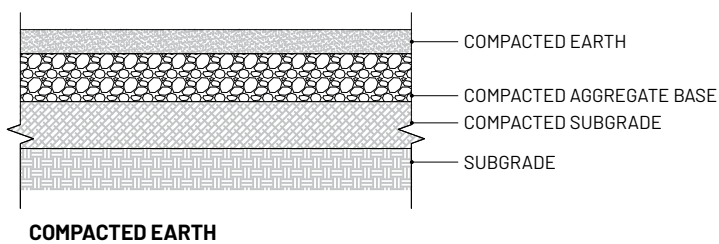
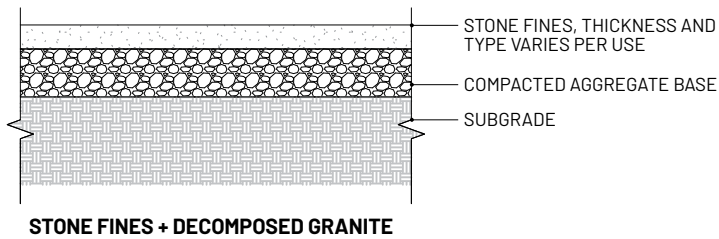
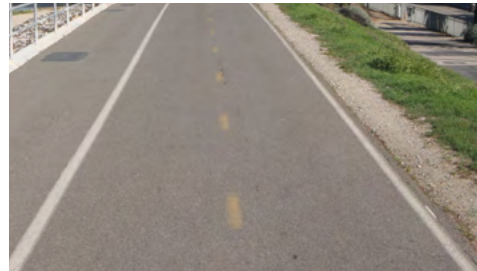
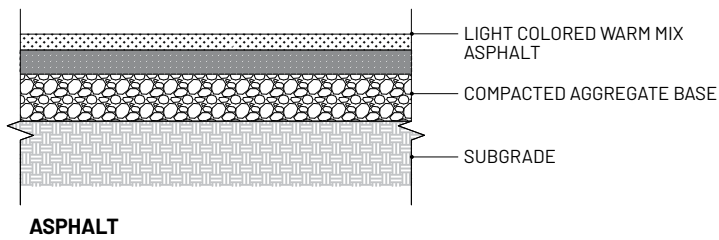
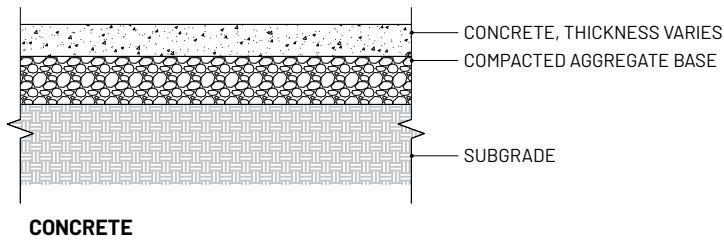


Figure 43. Paving types are not limited to those above and vary based on the intended use. Paving material thicknesses and sub-base dimensions vary according to use. Any geotechnical conditions should be studied and reviewed by a licensed State of California Civil engineer.
Source: All images OLIN, 2019.

USED FOR

- Maintenance and service roads
- Bicycles
- Pedestrians
- Equestrians (must be rough brushed)

-
- Maintenance and service roads
 - Bicycles
 - Pedestrians

-
- Pedestrians

-
- Maintenance and service roads
 - Equestrians

-
- Pedestrians
 - Gathering spaces

PAVING MATERIALS

There is no single perfect material for trails along the LA River. Cyclists prefer smooth continuous surfaces such as asphalt or concrete whereas pedestrians typically prefer more forgiving surfaces such as bonded stone fines and equestrians a larger aggregate.

When possible, these “ideal” surfaces should be used; however, all design conditions, material thicknesses/assemblies, and colors should be reviewed by design professionals for site specific considerations. Additionally, paving has the potential to feature artwork.

Concrete: A durable paving material that consists of aggregate and cement over a compacted aggregate base. Suitable for maintenance roads and bicycle and pedestrian trails.

Asphalt: Durable and relatively inexpensive paving material that consists of aggregates held together by asphalt cement over an aggregate base. Can withstand heavy loads of a maintenance vehicle, while also being a suitable material for bicycle trails. A light-colored, low VOC warm mix must be used to offset the urban heat island effect.

Stone Fines and Decomposed Granite (DG): A stable, natural-looking paving material consisting of crushed rock that can be found in a variety of different colors and granular sizes. A larger granular size is recommended, as fine DG becomes slippery when wet. Where erosion is a concern, DG should be protected with a resin-binder and should not be used on sloped areas greater than 3% unless a drainage system is installed.

Compacted Earth: This inexpensive method should be primarily used for equestrian trails when no other option is available since erosion and wear can be a maintenance problem. Care should be taken to stabilize the path with a well-graded aggregate base.

Permeable Paving: Crushed stone fill between paving, or open, coarse aggregate held together by asphalt concrete or cement. Problems can occur with silting which reduces permeability if surfaces are not cleaned and maintained regularly to allow maximum water percolation.

WHERE TO SITE FENCES, GUARDRAILS, AND RAILINGS

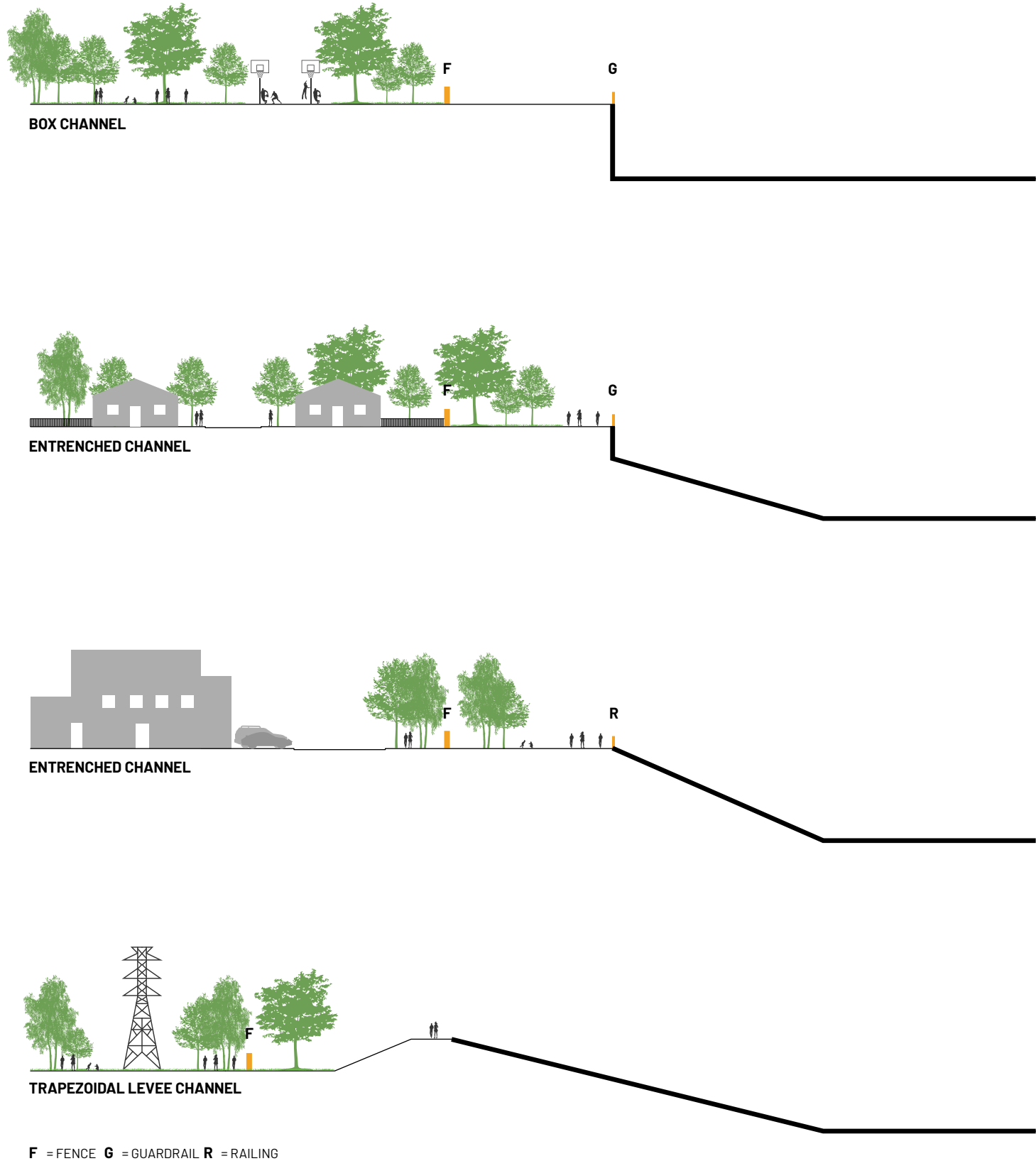


Figure 44. Fences, guardrails, and railings should be utilized in the correct locations along the river. These locations are dictated by channel characteristics, user access, adjacent land uses, and programming.

FENCES, GUARDRAILS, RAILINGS, AND GATES

Use of the river corridor for public activities requires the re-evaluation of fencing in terms of function, aesthetics, and the perception of safety vs. real hazard. Fences to keep the public away from the channel are not applicable to an open space corridor, except where public safety is a concern.

In some areas along the LA River, vertical drops require guardrails for fall protection. In other areas, a simple railing may be recommended where steep slopes are adjacent to paths of travel. Opportunities exist to provide the appropriate type of fencing for a variety of proposed recreational uses and to remove fencing that is redundant or does not meet a multi-objective approach to river management. This includes situations that utilize a fence to disconnect the river from adjacent parks and other public open spaces rather than provide the parks an opportunity to function as part of the river corridor by gating the park entrance.

The reduction of fencing along the LA River is reliant on:

- The reduction of public hazards
- The implementation of other types of buffers and barriers
- Safety/warning notification system including a comprehensive environmental graphics system (see Chapter 4)

Safety from flood waters is critical along the LA River. Flood channels within LA County are gated for public safety, so that access can be prohibited during flood conditions. Gates are to be placed at access points and major arterials and are to be connected to adjacent fencing. Vehicular and pedestrian gates must have the ability to close and lock. The design of new projects should maintain a level of safety while promoting a welcoming and connected open space river corridor.

FENCE, GUARDRAIL, RAILING, AND GATE DEFINITIONS

Fence: A barrier for public safety along LA County watercourses at least 60 inches high off the adjacent surface.

Guardrail: A barrier at least 42 inches high near the open sides of elevated surfaces that minimizes the possibility of a fall. Guardrails should follow the latest code and ADA requirements (such as restrictions on openings).

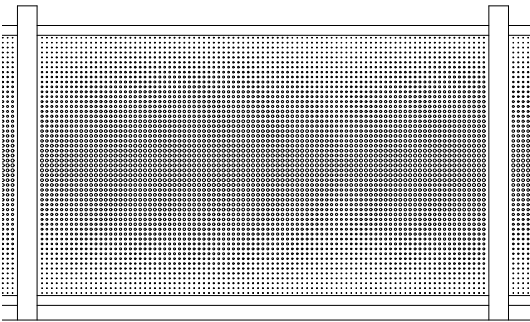
Railing: A barrier that separates trail uses or provides a visual separation but is not required by code.

Gate: An aperture along a fence to provide access while maintaining public safety.

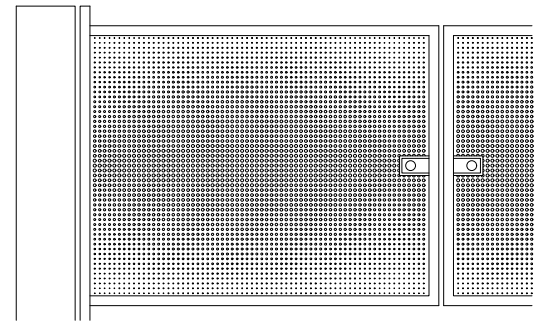
Figure 45. The terms above are defined as used in this document.

FENCE OR GUARDRAIL TYPOLOGIES

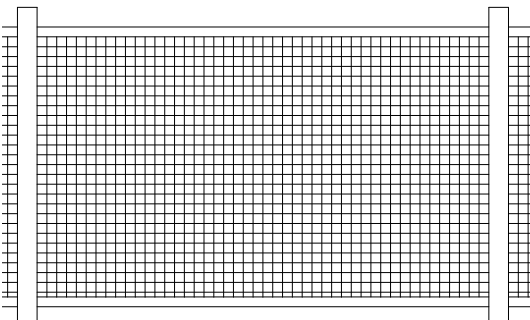
CORRESPONDING GATES



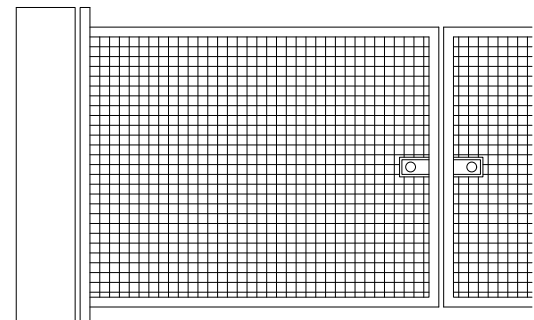
CUSTOM METAL



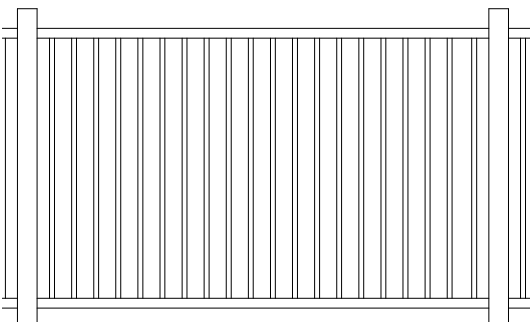
CUSTOM METAL GATE



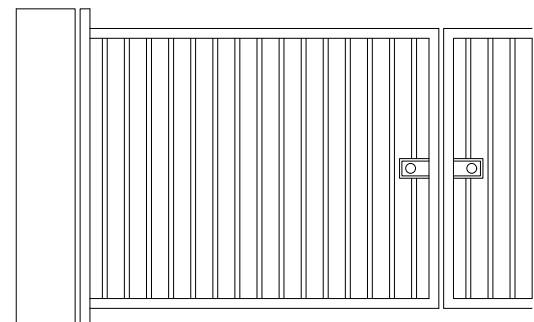
WELDED WIRE



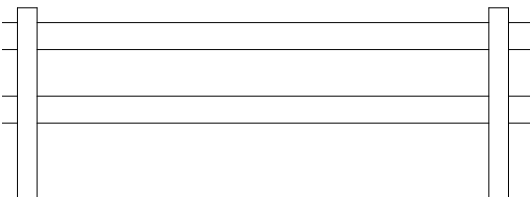
WELDED WIRE GATE



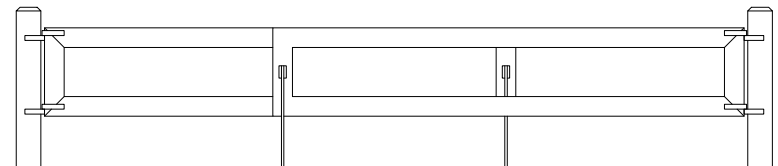
TUBULAR STEEL



TUBULAR STEEL GATE



LODGEPOLE SPLIT RAIL (FOR TRAIL SEPARATION)



EQUESTRIAN GATE

Figure 46. Fence, guardrail, or gate type is determined by location on the river and the intended use.

FENCE EXAMPLES

USED FOR



- Prominent trail access points
- Gateways
- Statement art piece



- Adjacent to Channel
- Adjacent to Parks



- Adjacent to Channel
- Adjacent to Parks



- Maintenance and service roads
- Equestrian trails
- Trail dividers

**MINIMIZE THE USE OF
CHAINLINK FENCING AND DO NOT
USE IN HIGH-VISIBILITY AREAS**

Figure 47. Fence types along the LA River vary due to intended uses and adjacent elements. Source: (Top) OLIN/ Sahar Coston-Hardy, 2013. All other images OLIN, 2019.

GATEWAYS ARE PLACED ALONG
THE RIVER AT KEY MOMENTS
WHERE MAJOR ACCESS POINTS,
ADJACENT PROGRAMMING, AND
LA RIVER COMMUNITIES INTERSECT

GATEWAYS

Gateways represent instances along the river to welcome, inform, and allow users to utilize the LA River Trail. They are access points at key moments along the river, and are usually identified by a visual marker, either through a large specimen tree, environmental graphics (see Chapter 4), or another kind of community artwork or cultural expression. Gateways call attention to the presence of the river and the access through their design and can also provide educational opportunities for visitors. While all gateways are access points, not all access points are gateways. Typically, gateways are placed along the river at moments where major access points, adjacent programming, and LA River communities intersect. Gateways represent a great opportunity to connect adjacent communities to the river and create a neighborhood identity based on the LA River.

There are three different scales of gateways that can be implemented depending on site conditions. All of the gateways must include the following items, no matter the type:

- Ample lighting for safety
- ADA accessibility
- Environmental graphics

Preferred

Preferred gateways have a large or eye-catching visual marker and a gracious entrance (landside right-of-way larger than 17'). They include the most complete suite of amenities, including but not limited to, a Tier II or III river pavilion (see Chapter 6), environmental graphics (see Chapter 4), and native planting and specimen or shade trees (see Chapter 5).

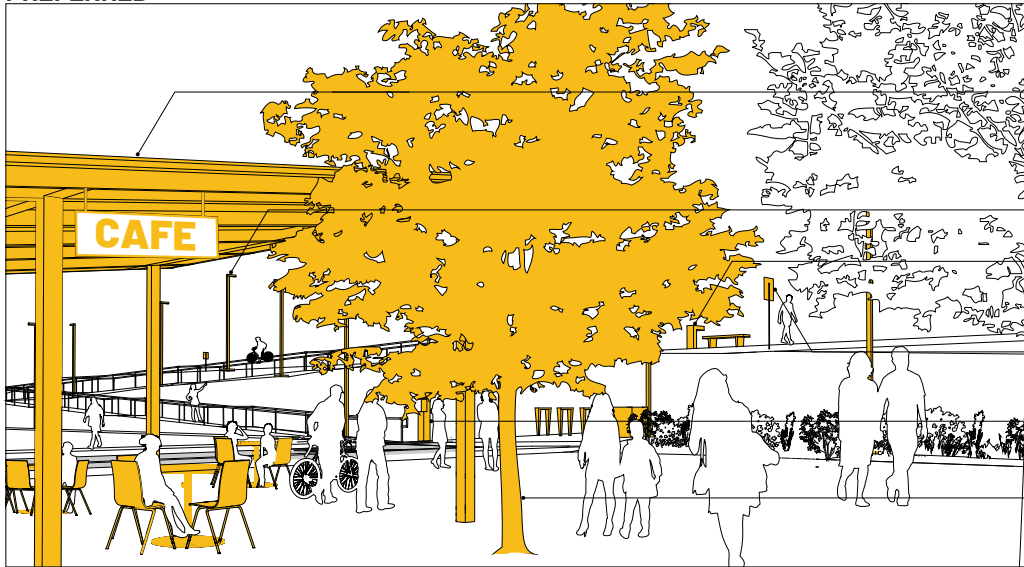
Average

Average gateways include a distinctive visual marker or artwork at its entrance and occur in areas that have a narrower landside right-of-way than the preferred gateways (approx. 12'-17'). These gateways can include a Tier I river pavilion (see: Chapter 6), artwork, stormwater BMPs, and a native vegetation buffer to designate the LA River access point.

Minimum

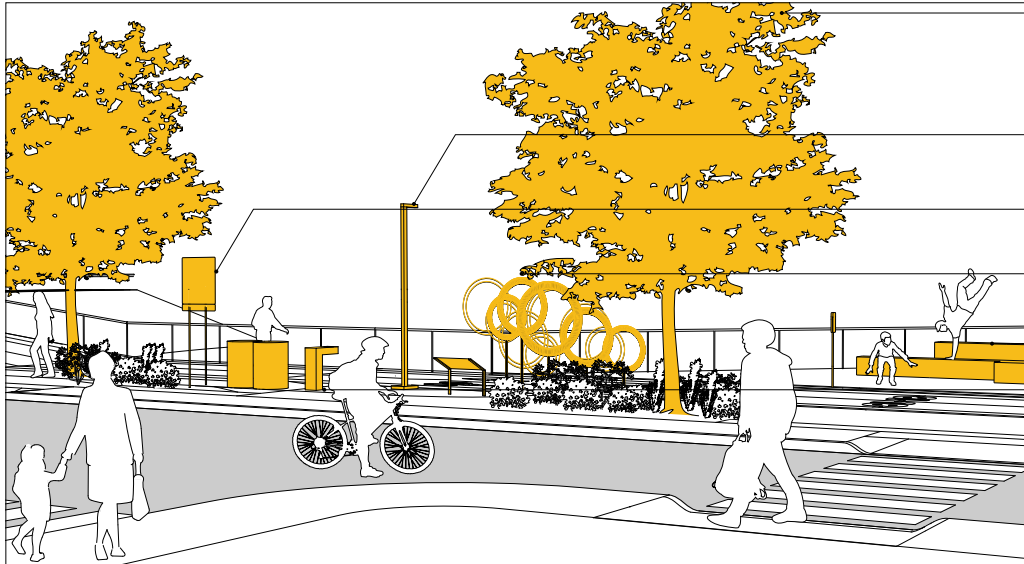
The minimum gateways provide an enhanced access point to the LA River in narrow landside right-of-way. Environmental graphics are often the primary visual markers for these gateways, and allow users to locate themselves on the river and educate themselves about different facets of the river. These gateways can also include site furnishings, stormwater BMPs, and a native vegetation buffer to welcome users to access the river.

PREFERRED



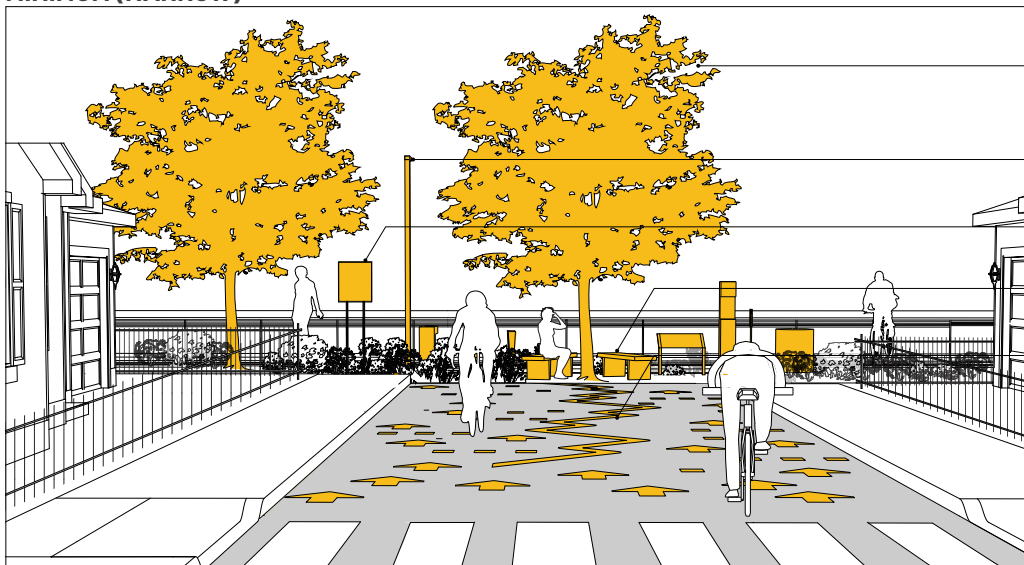
- RIVER PAVILION
(SEE CH. 6)
- LIGHTING (SEE CH. 6)
- SITE FURNISHINGS
(SEE CH. 6)
- ENVIRONMENTAL
GRAPHICS (SEE CH. 4)
- EMERGENCY CALL BOX
(SEE CH. 6)
- SPECIMEN SHADE TREE
(SEE CH. 5)

AVERAGE



- SPECIMEN SHADE TREE
(SEE CH. 5)
- LIGHTING (SEE CH. 6)
- ENVIRONMENTAL
GRAPHICS (SEE CH. 4)
- COMMUNITY EXPRESSION -
PUBLIC ART (SEE CH. 2)
- ART/PERFORMANCE
SPACE (SEE CH. 6)
- SITE FURNISHINGS
(SEE CH. 6)

MINIMUM (NARROW)



- SPECIMEN SHADE TREE
(SEE CH. 5)
- LIGHTING (SEE CH. 6)
- ENVIRONMENTAL
GRAPHICS (SEE CH. 4)
- SITE FURNISHINGS
(SEE CH. 6)
- COMMUNITY EXPRESSION -
PAVEMENT GRAPHICS
(SEE CH. 4)

Figure 48. Gateway conditions vary depending on the space available. Gateways signify entrances to the LA River Trail and vary from trail access points with clear environmental graphics and minimum site-specific amenities to access points with pavilions and programming.

DRAFT

BRIDGES

Connectivity across the LA River is just as important as connectivity along it. Where feasible, bridges should be implemented to connect all users to the river and the adjacent neighborhoods. While the overall look and structure of these bridges will be different based on the location and intended use, there are certain elements that should be present in all instances.

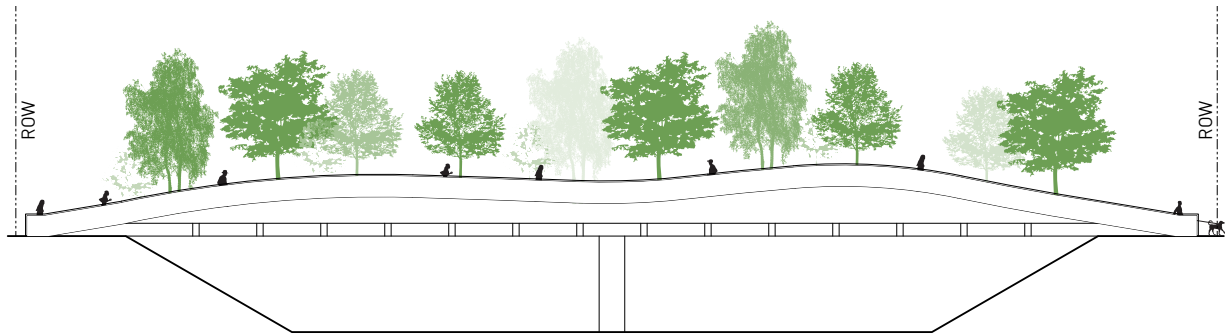
Ideally, a bridge would be able to connect all users of the LA River corridor, including habitats and animals. Where the construction or investment of a land bridge is not possible, equestrian, bicycle, and pedestrian trails should be connected across the river. At a minimum, bicycles and pedestrians should be able to cross to enjoy amenities and destinations along both sides of the river. Guardrail heights should follow the standards put forth in the applicable codes as stated in the LACFCD Permitting Checklist in Chapter 2.

Wherever a bridge is implemented, connections to the correct trail systems and users is paramount. Trail intersections should be carefully considered in the design of bridges to ensure seamless circulation between different kinds of users. For example, when building an equestrian bridge, that bridge should connect users to a corresponding equestrian trail. In all instances of crossing, ample environmental graphics and striping must be included to warn users of a crossing. The specific design, materiality, and form of each bridge should be developed for intended use and on a project-by-project basis. Bridges also provide an opportunity for artwork.

All bridge proposals should be studied for hydraulic impacts on the flood capacity of the channel and shall aim to convey at a minimum the 1% annual chance flood event, including freeboard. Bridge height and width should also consider future climate and channel condition.

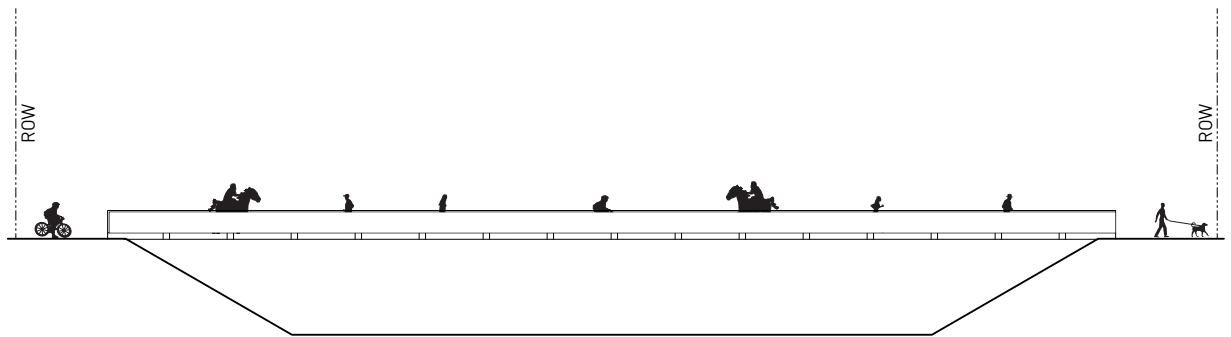
BRIDGE TYPOLOGIES

PREFERRED



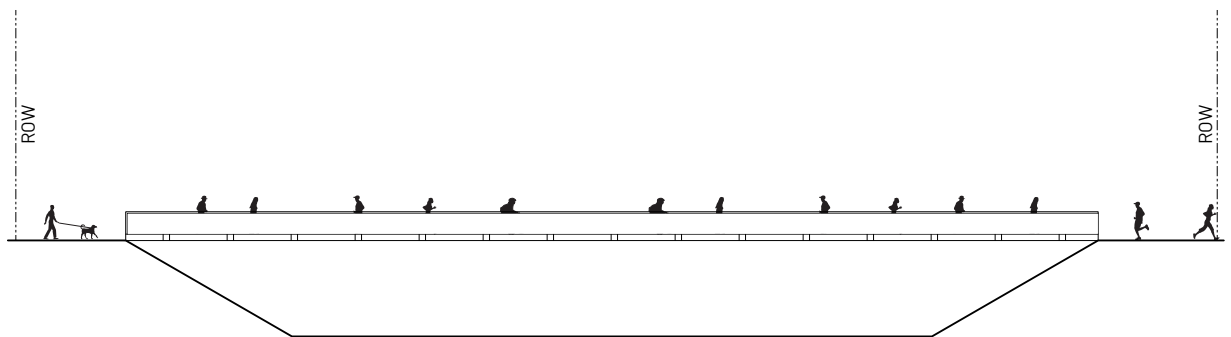
LAND BRIDGE/HABITAT CONNECTIONS + MULTIUSE TRAIL BRIDGE

See Figure 50 on page 90.



MULTIUSE TRAIL BRIDGE

See Figure 51 on page 90.



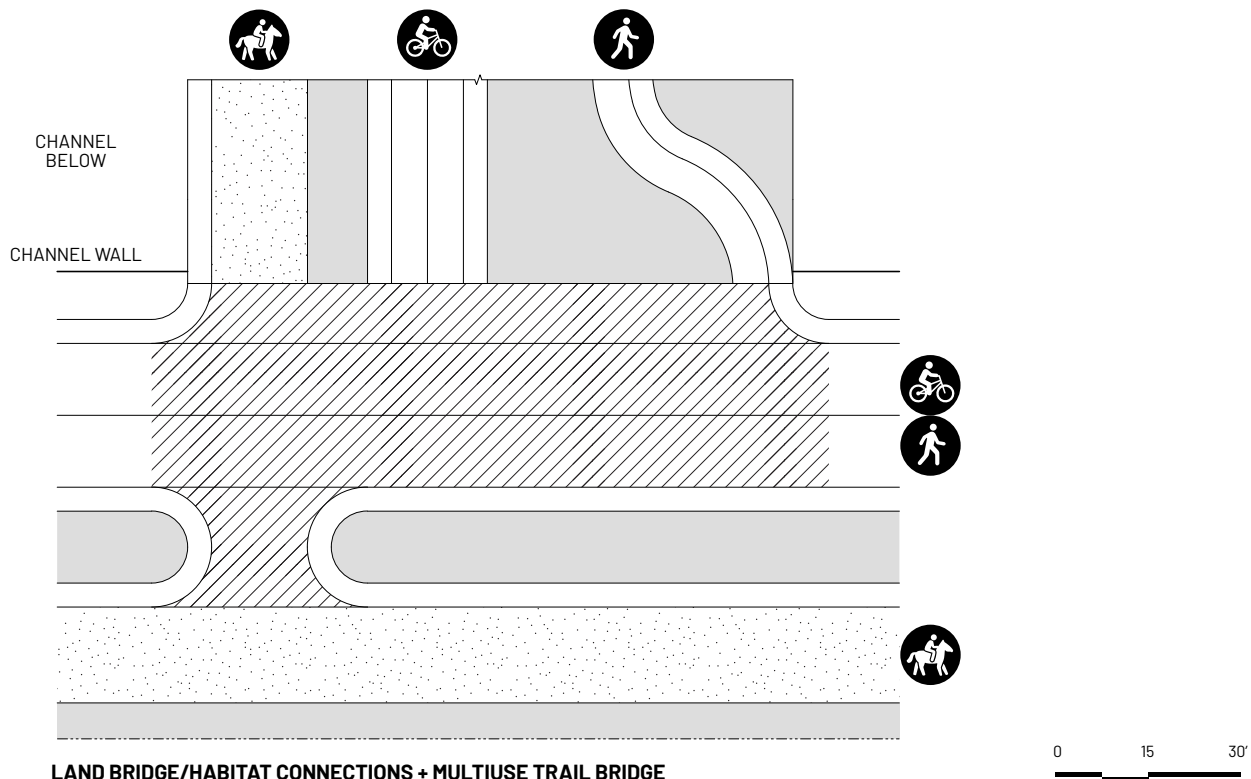
PEDESTRIAN + BIKE TRAIL BRIDGE

See Figure 53 on page 91.

MINIMUM

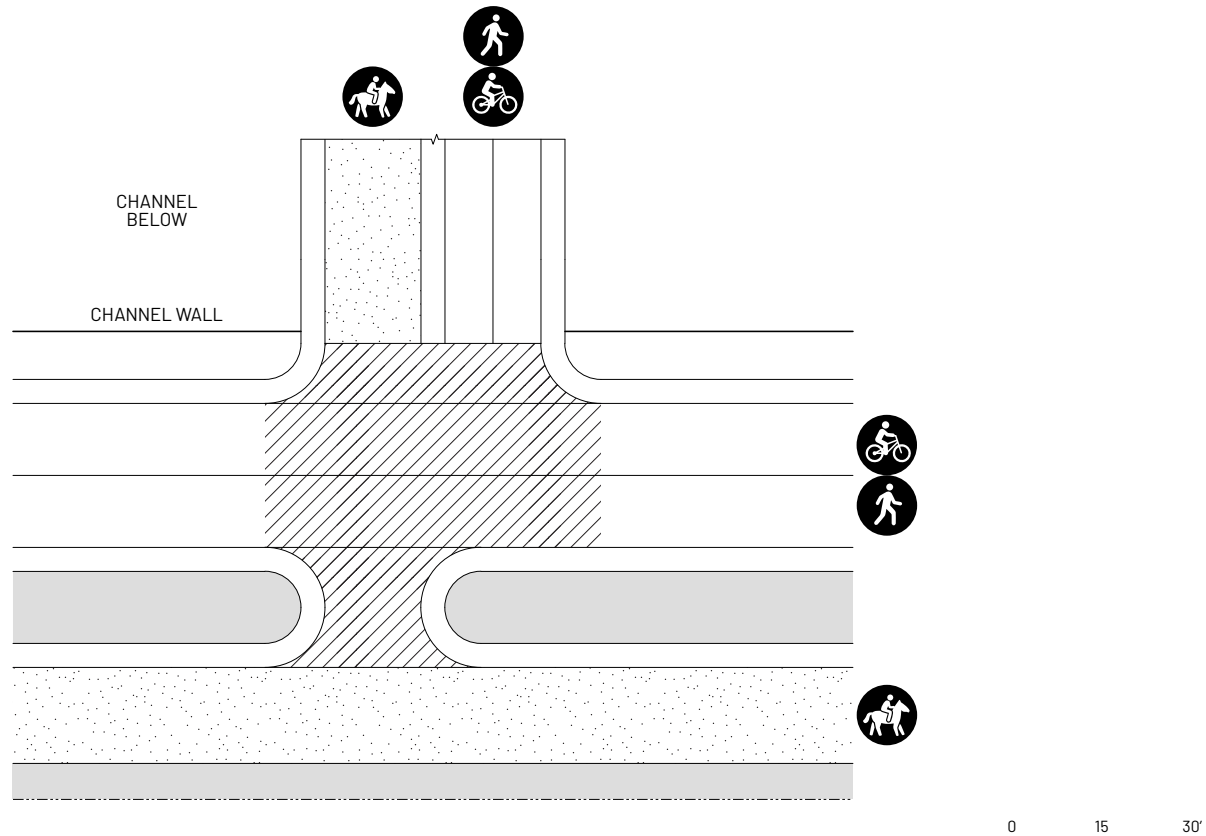
Figure 49. Bridge crossings are unique to the use of the bridge. The design, materiality, and form of each bridge should be determined based on the intended use. All bridge proposals shall be studied for hydraulic impacts on the flood capacity of the channel.

DRAFT



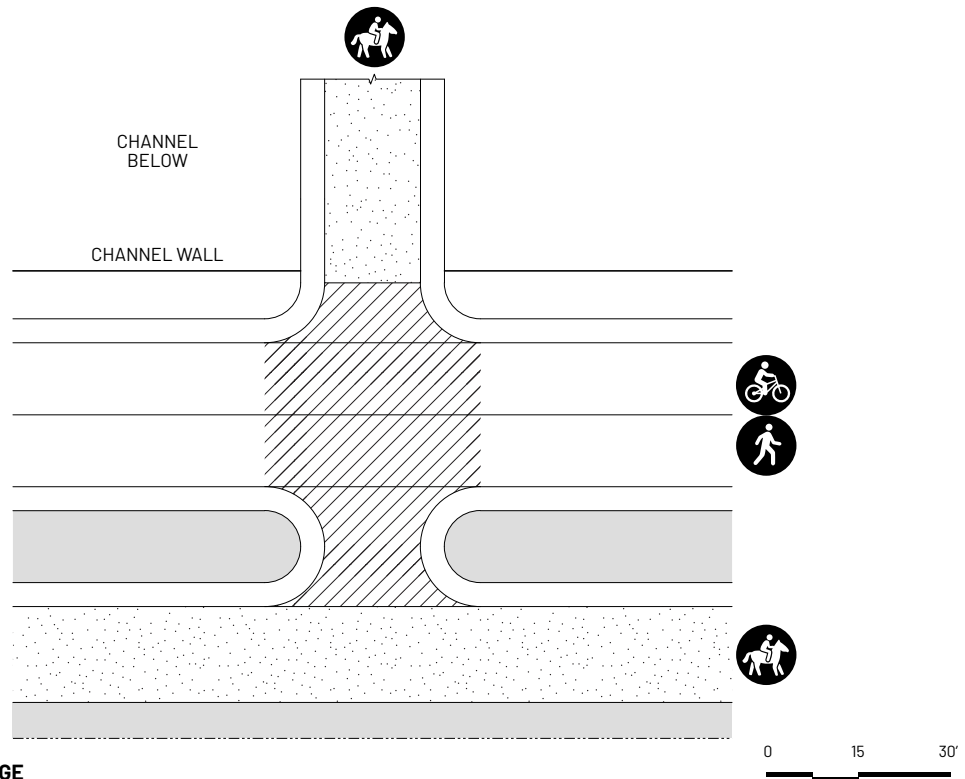
LAND BRIDGE/HABITAT CONNECTIONS + MULTIUSE TRAIL BRIDGE

Figure 50. Land bridges create habitat and movement opportunities through varied planting and topography. Pedestrian, bicycle, and equestrian paths should be a minimum of 12' wide between railings. When possible, slope bridge paths to a maximum of 5%. If sloped up to 8.33% or more, provide landings and railings as per ADA requirements for accessible ramps. Cross-slope should be a maximum of 2%. Use clear centerline striping and environmental graphics, developed with a project's specific needs, to warn trail users of a bridge crossing and provide a clear connection to equestrian trail.



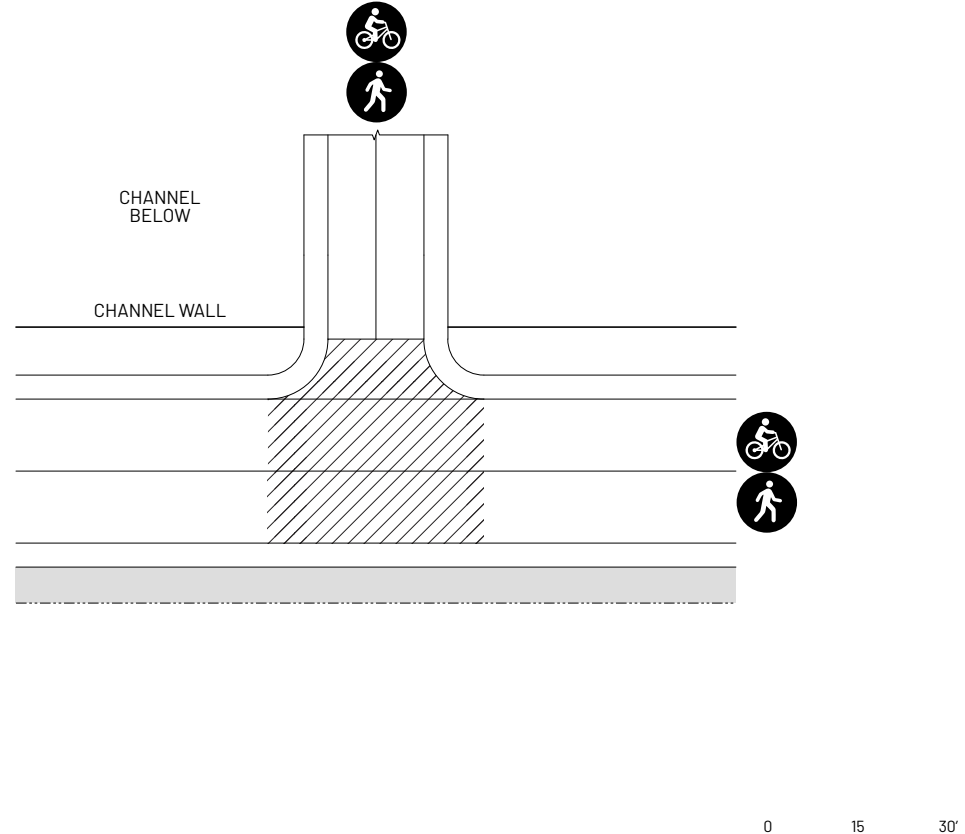
MULTIUSE TRAIL BRIDGE

Figure 51. Pedestrian, bicycle, and equestrian paths should be a minimum of 12' wide between railings. When possible, slope bridge paths to a maximum of 5%. If sloped up to 8.33% or more, provide landings and railings as per ADA requirements for accessible ramps. Cross-slope should be a maximum of 2%. Use clear centerline striping and environmental graphics, developed with a project's specific needs, to warn trail users of a bridge crossing and provide a clear connection to equestrian trail.



EQUESTRIAN TRAIL BRIDGE

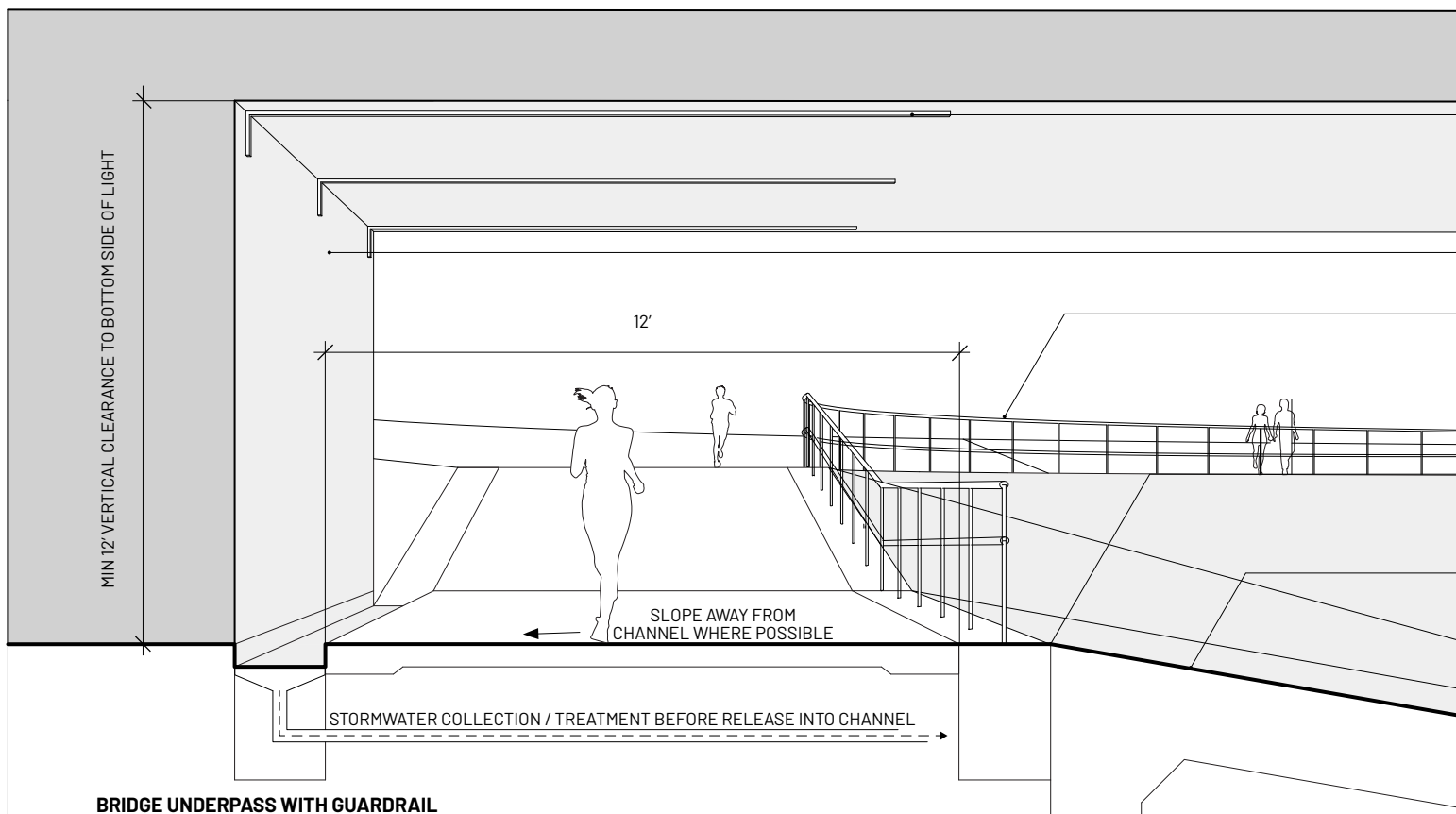
Figure 52. Equestrian bridge to be a minimum of 12' wide between railings. When possible, slope equestrian bridge paths to a maximum of 5%. If sloped up to 8.33% or more, provide landings and railings as per ADA requirements for accessible ramps. Cross-slope should be a maximum of 2%. Use clear centerline striping and environmental graphics, developed with a project's specific needs, to warn trail users of a bridge crossing and provide a clear connection to equestrian trail.



PEDESTRIAN + BIKE TRAIL BRIDGE

Figure 53. Pedestrian and bicycle paths should be a minimum of 12' wide between railings. When possible, slope bridge paths to a maximum of 5%. If sloped up to 8.33% or more, provide landings and railings as per ADA requirements for accessible ramps. Cross-slope should be a maximum of 2%. Use clear centerline striping and environmental graphics, developed with a project's specific needs, to warn trail users of a bridge crossing.

DRAFT

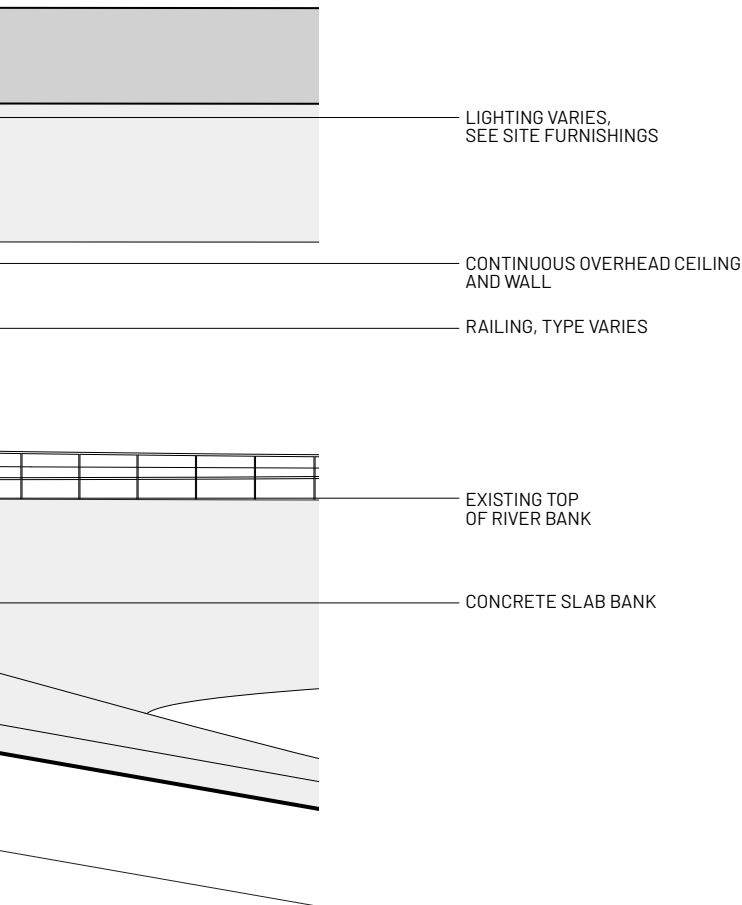


BRIDGE UNDERPASS WITH GUARDRAIL

Figure 54. Lighting, safety, grading, and opportunities for art are key design considerations at underpass locations.

0 1 2 4'

THE SLOPE OF THE TRAIL AT ANY UNDERPASS OR OVERPASS SHOULD BE BETWEEN A MAXIMUM OF 5-8%, WITH LANDINGS PER ADA REQUIREMENTS



RIVER TRAIL BRIDGE UNDERPASS

Trails that run parallel to the river often pass under or over existing or proposed bridge crossings. At these crossings, the slope of the trail at any underpass or overpass should ideally be less than 5%, but no more than 8.33%. The trail should follow the standards outlined in the multiuse trails section. It may be necessary to separate users from the river with a guardrail depending on the riverside condition and local jurisdiction requirements. Ample lighting must be provided in all underpass conditions to ensure visibility and to create a safe trail experience. Opportunities for art can also be considered to create a bright and welcoming space. Where possible, stormwater treatment should be included so that the trail slopes away from the river so that any rainfall drains to a shallow gutter that runs along the bridge footing. This allows for water to be transferred to a treatment location before being released back into the river. Special consideration can be given for underpasses with tight right-of way conditions.

All underpass conditions shall be designed with continuous surfaces, without notches above and on the side, to prohibit the use of the spaces between structural members.

ACCESS AND MOBILITY CHECKLIST

Reference the LACFCD and Public Works Permitting checklist on page 36 for an overview of project permitting and applicable codes.

Detailed Technical Requirements Checklist for Access and Mobility

Trail Assembly

- ☐ Connect all trails to the LA River trail system as outlined in the LA River Master Plan 2020 Update.
- ☐ Slope all trails at a maximum of 2% away from the river to encourage runoff collection.
- ☐ Slope all trails, where feasible, into a vegetated area that is designed to collect, retain, and infiltrate stormwater runoff.

Paving

- ☐ Do not use dark surfacing, such as black asphalt, along the trail as it intensifies the urban heat island effect.
- ☐ Only use low VOC, warm mix asphalt when asphalt surfacing is specified.

Fences and Gates

- ☐ Use the correct type of fence, guardrail, or railing for the location.
- ☐ Where possible, do not use chain link fencing anywhere on the river. Chain link fencing should not be used in highly-visible areas/
- ☐ Treat all metal fencing with corrosion-resistant coatings such as powder coating. Special attention should be paid to mitigate zinc-leaching materials.

Access Points

- ☐ All access points must have the following:
 - Lighting see Chapter 6
 - Environmental graphics Chapter 4
- ☐ Where feasible, add or relocate bus stops to existing or proposed river trail access points.

Gateways

- ☐ All Gateways must have the following:
 - Lighting see Chapter 6
 - ADA access
 - Environmental graphics see Chapter 4
- ☐ Tier III gateways should include the following:
 - Vegetation buffer
 - Community expression or art
 - River Pavilion see Chapter 6

Bridges

- ☐ Bridges should be a minimum of 8' wide.
- ☐ Slope bridge path up to a maximum of 5% on main paths.
- ☐ Use environmental graphics to warn users of trail and bridge intersections.
- ☐ Connect bridge paths of travels to appropriate multiuse trails. (For example, connect equestrian bridges to adjacent equestrian trails).

Underpasses

- ☐ Allow a minimum 10' clearance at underpasses.
- ☐ Add lighting to ensure visibility.
- ☐ Design smooth straight surfaces along underpasses, without notches, to prohibit the use of the spaces between structural members.
- ☐ Add art or community expression to underpass walls (if required).

Detailed Maintenance Program Checklist for Access and Mobility

Paving

- ☐ Inspect paving on a regular schedule for cracks, potholes, or erosion.

Fences and Gates

- ☐ Inspect fencing and guardrails for vandalism or weathering.
- ☐ Reduce use of fencing and deploy only where necessary for safety.

Gateways, Bridges, and Underpasses

- ☐ Identify inspection requirements for gateways, bridges, or underpasses.
- ☐ Treat materials to deter graffiti and vandalism.



Figure 55. Environmental graphics help to define river gateways, as shown in this Shade Pavilion example at river mile 14.7.

4.

ENVIRONMENTAL GRAPHICS

ENVIRONMENTAL GRAPHICS ALONG THE RIVER PROMOTE ACCESSIBILITY, SAFETY, AND COMMUNITY EXPRESSION

The Environmental Graphics Guidelines for the 2020 LA River Master Plan Design Guidelines have been developed with a common set of values for their design and proposed use. These guidelines create a framework for consistent wayfinding and promote a unique identity for the LA River. They aim to be accessible to all. Legibility and graphic clarity are critical for the success of all wayfinding elements. The sign designs detailed in this chapter have a simple, timeless aesthetic while allowing for community expression and art at gateways and other special instances. Environmental graphics can be integrated, where appropriate, into the design of architecture and public art rather than consisting exclusively of stand-alone signs. Wayfinding from bike routes and pedestrian streets is also crucial for directing people to the river itself. The programmed sequence, placement, and content of information conveyed through wayfinding elements should be carefully calibrated using established environmental graphic design 'best practices' to optimize clarity and avoid visual clutter as pedestrians or cyclists approach and enter the LA River right-of-way.

WHAT'S IN THE CHAPTER

There are eight categories of environmental graphics: informational, regulatory, confirmation, interpretive signs and displays, directional, mile markers, pavement markings, and large scale icon graphics. This chapter includes a suite of LA River environmental graphics which outlines which categories are required at a minimum for different scales of projects (XS-XL, as defined in the Chapter 1 programming section and the 2020 LA River Master Plan Update) at various distances leading to and within the site. Further, there is a permitting matrix that identifies what features each category should or should not have, such as which environmental graphics should always be bilingual.

Wayfinding signs must comply with the Federal Highway Administration's Manual on Uniform Traffic Control Devices (MUTCD) guidelines. All mile markers must use the 51-mile river mile numbering system with the mouth at river mile 0, and the headwaters at river mile 51.

97	4. Environmental Graphics
98	What's in the Chapter
100	Standard Design Features
105	Sequence and Placement of Environmental Graphics
113	Suite of LA River Environmental Graphics
118	Informational
121	Regulatory
126	Confirmation
131	Interpretive
134	Directional
143	Mile Markers
145	Pavement Markings
147	Large Scale Icon Graphics
148	Community Expression
150	Installation & Maintenance
154	Environmental Graphics Checklist

