

THE PIGGYBACK YARD

FEASIBILITY STUDY



DESIGN & PLANNING REPORT | JUNE 2013

Friends of the Los Angeles River + LA River Revitalization Corporation
Consultant Team: Geosyntec Consultants, ELP Advisors LLC, Mia Lehrer + Associates

Funded by the Santa Monica Mountains Conservancy



CHANGE THE COURSE OF LA
LA RIVER REVITALIZATION CORPORATION



SANTA MONICA
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Bird's-eye view of the Piggyback Yard site, also known as the Los Angeles Transportation Center, Source: Ben Feldmann

Cover Image: Vision Plan Physical Model, Source: Piggyback Yard Feasibility Study Team (PYFST)

INTRODUCTION

PART ONE: The City's Forgotten Water Course

When the railroads came to Southern California in the 1870s seeking an easily developable right-of-way, the Los Angeles River Valley, which had previously watered fertile agricultural land, became an industrial corridor. Factories went up where once were wetlands. Railroad tracks lined the River, cutting off any access to the river and its banks. When the Los Angeles Aqueduct opened in 1913, bringing water south from the Owens Valley, the River, which had once served as the City of the Angel's primary water supply, became the City's forgotten water course.

Major floods in 1934 and 1938 sealed the river's fate. Lives were lost, properties were destroyed and railroad infrastructure that lined its course was at constant risk of being wiped off the map. Though the standard narrative says the decision to channelize and pave the river was about flood control, a compelling case could also be made that it was a real estate decision, and one heavily influenced by the railroads. On the eve of World War II, 17,000 men began paving the River, pouring three million barrels of concrete, one of the only public works projects in the United States to continue throughout the war. The river became a standing joke, a symbol of the destruction man could wreak on nature, a brutish canard, a symbol of a city divided and cut off from its own nature. To this end, it became my belief, my passion, my soul's purpose to explain to the people of Los Angeles that a river exists... and it needs our help.

PART TWO: The Friends of the LA River

Friends of the Los Angeles River (FoLAR) arose out of a three act performance art piece commissioned by the LA Museum of Contemporary Art. The piece involved Sculptor Pat Patterson, gallery owner Roger Wong, and myself carrying out the three acts, that included 1) illegally cutting through the perimeter fence to declare the river open, 2) asking the river at the confluence of the Los Angeles River and the Arroyo Seco if we could speak for it in the human realm; and it didn't say no, and finally 3) giving a live performance at the *Wallenboyd Theater* that showcased artifacts of the river and called to the creatures of the River from rattle snake to red-tailed hawk to come home.

At the beginning I thought all I had to do was convince people the river could be a better, healthier, more beautiful place while still maintaining its flood detention capacity. I quickly realized that first I had to convince people the River even existed, my first lesson in making the invisible visible.

Almost everything we did in the ensuing decade was about bringing people to the River, usually for the first time. FoLAR's Gran Limpieza, the Great Los Angeles River Clean-Up, was about picking up trash – at least 25 tons at 14 different sites from the San Gabriel Mountains to the Pacific annually over the last four years – but it was just as much about showing people the river. The first year, we called for 10,000 people to join us in cleaning the River, Less than twenty showed up. Almost a quarter century later, the Gran Limpieza has grown to almost 4,000 people.

Probably the most important development in the early years was something FoLAR had no control over. Heal the Bay sued the City of Los Angeles to force it to stop dumping minimally treated sewage into Santa Monica Bay. The City was forced to build a tertiary treated sewage plant in the Sepulveda basin in the middle of the San Fernando Valley. Suddenly, the seasonal river with no water most of the year had a half million gallons of tertiary treated, recycled sewage water, legal to put on food crops, going down it every day. About ten of the River's 52 miles – an estuary in Long Beach, a long stretch between Griffith Park and the Glendale Narrows, a mile or so in the Sepulveda Basin - had no concrete on the bottom, creating almost instant habitat which the U.S. Army Corps of Engineers (USACE) and the County Department of Public Works saw fit to bulldoze every other year. The County still referred to the River as a flood control channel; but to FoLAR and a slowly growing network of allies, it had become a river.

PART THREE: Growing Awareness for the River

One of the ways we brought people down to the River was by holding a series of planning workshops, or charettes. The biggest and most ambitious was 1988's "The River Through Downtown," which FoLAR did in collaboration with the Sierra Club. The Deputy Assistant Secretary of the Army, Mike Davis, the civilian who over saw the USACE for the White House, spoke enthusiastically about restoring the River, the first Corps higher-up ever to do so. Congressman Xavier Becerra gave the keynote address. It was the first time that East Side politicians and west side environmentalists came together to talk about the future of the River, and the first time people began looking at two recently shuttered Southern Pacific switching facilities, the Cornfield and Taylor rail yards, as anything other than millions of square feet of future tilt-up warehouses.

Friends of the Los Angeles River put together one of the largest multi-racial, multi-cultural, multi-class coalitions the city of Los Angeles had ever seen to fight then Mayor Riordan's real estate plans. A bond issue spearheaded by then State Senator Tom Hayden and then State Assembly speaker and future L.A. Mayor Antonio Villaraigosa at a moment when the State coffers were flush with cash, supplied the money. After a three year battle, the would-be developers gave up and sold most of the land to create two regional river parks, the State Historical Park in the Cornfield, and the Rio de Los Angeles State Park. At that point, few Angelenos were even aware of the existence, much less the potential of a hundred year old, 125 acre rail facility currently owned by the Union Pacific Railroad, on the east bank of the river a few blocks east of the Cornfield, the last active rail yard in the City, where containers were humped between flat cars and eighteen wheelers. If they knew the property at all, most knew it as the Los Angeles Transportation Center (LATC). A very, very few, knew the property with its three-quarter of a mile of riverfront just across the River from Union Station, as the Piggyback Yard.

PART FOUR: The Invisible Site

Even as the political battles over the Cornfield and the Taylor Yard raged, the four and a half miles of the River through the Central City, between the Hahamongna confluence and the city's southern boundary with Vernon, remained the most isolated, invisible and bleak stretch of the river's entire fifty-two miles. That perception began to shift in 2004 when I took New Yorker reporter Tad Friend up on the helicopter landing pad atop of the roof of the sheriff's parking garage at L.A. County's "Twin Towers" prison. Other than from a helicopter, it's about the only way you can see the entire Piggyback Yard, which stands at the center of a Los Angeles River Valley stretching from Chavez Ravine and Dodger Stadium on the west to the Los Angeles County USC Medical center and the bluffs of Boyle Heights on the east.

Lining the west bank of the River are major civic infrastructures – a Metro bus repair facility; an under-utilized Department of Water and Power "campus;" and Piper Tech where the City's helicopter fleet is maintained. Separating the city from the river's west bank are the publically owned and operated railroad right-of-way of Metrolink and Amtrak. Separating the Piggyback Yard's riverfront from the east bank of the river are the privately-owned rails of the Union Pacific and the Burlington Northern Santa Fe, which includes the main lines that connect Southern California to the Pacific Northwest and the Midwest.

The south side of the yard is bordered by Avenida Cesar Chavez and Mission Road, home of some of L.A.'s "lowest and worst use" properties, a junk auto parts yard, and Shamrock, a mountainous concrete aggregate facility which is said to be in bankruptcy, and might be particularly vulnerable to public purchase. The north side of the Yard is bordered by the San Antonio Winery, an immense United Parcel Service (UPS) transfer terminal, and the Artist-in-Residence colony known as "the Brewery." The largest institution actively engaged in development in the area is the Los Angeles County Hospital and USC Medical Center separated from the rail yard by the I-5 freeway.

PART FIVE: An Aging Rail Yard

For 120 years the Piggyback Yard has been used by Union Pacific and its predecessor, Southern Pacific, for maintenance and repairs. Historic photos of the site show the robust operations of the Southern Pacific General Shops and Roadhouse that stood until the 1960s. With the modernization of the rail industry and movement of goods, the site transitioned its operations and became an intermodal rail facility - transitioning freight containers from railcar to truck - known today as the Los Angeles Transportation Center (LATC). The term "piggyback" relates to the way in which the shipping containers *piggyback* on either a flat railcar or flatbed truck. As this form of freight operation proved efficient, the length of trains became longer and longer, whereby trains can stretch to two miles in length. Since the site was originally planned as a maintenance yard, its physical proportion does not lend itself to efficiently processing trains, whereby a single train will be broken down into multiple segments. The LATC got its "Piggyback Yard" nickname as the result of an old railroad joke. In the era of long-distance passenger train, the Southern Pacific operated a luxurious passenger service between Chicago and Los Angeles called The Golden State Route. The "Golden Pig Service" was meant to celebrate the speed and efficiency of the Southern Pacific's freight service.

The Piggyback Yard's greatest value to its owners these days remains as real estate. One reason oil and gas mogul Philip Anschutz took control of the Southern Pacific Railroad and then Union Pacific was for its inner city rail yards. "Lo Do" in Denver, a once vast rail yard, is now high rises. The Illinois Central Yard that once separated Chicago from its Lake Front is now undergrounded beneath the highly successful Millennium Park. Anschutz was able to lay fiber-optic cable for his phone company, Quest across the western half of the U.S. with minimal regulatory oversight because he did it on Union Pacific's right-of-way.

PART SIX: Creating an Image

It's been said that a good strategy in times of no money is planning, so when opportunity comes knocking again – you're ready. The Great Recession of 2008 left a lot of good architects, landscape architects and planners dangerously under-employed, a situation FoLAR moved quickly to take full advantage of. The first person we reached out to was Michael Maltzan, the Silver Lake "star-architect" and Frank Gehry alumnus best-known for his skid row housing projects. At the time, Maltzan was working on the proposed 1 Santa Fe, situated between SCI-Arc and the Los Angeles River. Maltzan brought in another Gehry alum, French-Canadian architect and urban thinker, Marc Salette. Subsequently, the global architecture and urban design practice of Perkins+Will donated an incredible amount of time through their firm-wide Social Responsibility Program and enabled architect Leigh Christy to lead the collective team through the process. As the obvious choice for the landscape architectural component, Mia Lehrer provided key insight into the river and development of the site as a multi-benefit open space. Finally the project was fortunate to enlist the services of Jackie Kain, former head of new media at public television station KCET, who oversaw the creation of the successful website piggybackyard.org which created a portal of insight to the endeavor. In short time, the 'Dream Team' of designers was formed, known as the Piggyback Yard Collaborative Group, whom worked tirelessly for over a year, entirely pro bono, with the ultimate aim of creating an image – to make the invisible, visible again. Together, we created the Piggyback Yard Conceptual Master Plan. At its heart, at the midway point in its 52 mile flow, at the center of a rarely glimpsed Los Angeles River Valley, the Piggyback Yard Conceptual Master Plan offers genuine access to a unique urban riparian landscape for a diverse population, bridging a gap between East and West L.A., with a combination of wetlands restoration, parkland creation, flood detention and community development that supports a livable Los Angeles River.

PART SEVEN: Furthering the Cause

Propelling the Piggyback Yard closer to becoming a river reality, the Santa Monica Mountains Conservancy (SMMC) enabled a small fund to take the results of the original Piggyback Yard Conceptual Master Plan further and deeper. At the SMMC's direction, the FoLAR partnered with the LA River Revitalization Corporation (LARRC) to conduct the study. As a result of the *Los Angeles River Revitalization Master Plan*, the LARRC, under the leadership of Omar Brownson, is tasked with creating public/private partnerships to foster appropriate development along the 32 miles of river through the City.

The Piggyback Yard Feasibility Study serves as a second phase effort to look at two fundamental issues that the original team didn't have the resources to look at in-depth – 1) hydraulic and hydrological possibilities and 2) economic development. To execute the study, the firms of Geosyntec Consultants, led by Mark Hanna, and ELP Advisors LLC, led by Katherine Perez and Cecilia Estalano, were brought on to understand the feasibility of the design ideas established from the Piggyback Yard Conceptual Master Plan. Working with original team members Mia Lehrer and Ben Feldmann (previously with Perkins + Will), the Feasibility Study team developed a refined design described as the "Vision Plan" which was the result of the process fed by discussion and findings throughout the study.

The document you have in front of you is the result of more than three years of work by many extraordinarily talented people; and we have just begun to scratch the surface of the problems and opportunities inherent in the redevelopment of the Piggyback Yard. As identified within this report, we intend for the next phase to focus on the understanding of the regional transportation system as it relates to the movement of freight and opportunities to relocate the existing facility to free up the Piggyback Yard to be dedicated as the City's River Destination. If you would like to be involved in the next stage, contact us at www.folar.org. We look forward to working with you to create a Los Angeles River Greenway – from the mountains to the sea.

Lewis MacAdams

President, Friends of the Los Angeles River (FoLAR)

¹ According to FoLAR, the 52 miles includes the one mile stretch that was lost due to the straightening of the river as part of the ACOE's flood protection improvements.

EXECUTIVE SUMMARY

The Piggyback Yard Conceptual Master Plan presents an ambitious, transformative vision that would form the cornerstone of the revitalization of the Los Angeles River corridor. Completed in 2007, the Los Angeles River Revitalization Master Plan (LARRMP) envisions a bold and comprehensive revitalization of the L.A. River that would renew its environmental qualities, reinvest in local communities and provide economic development opportunities. The size and location of the Piggyback Yard site along the Los Angeles River offers a unique opportunity to allow the river to regain some of its natural character, create neighborhood enhancement opportunities and increase economic prosperity through redevelopment. **The Piggyback Yard Feasibility Study outlines the development and hydrological programs that will transform Piggyback Yard from a concrete industrial landscape to a “River Destination” with the L.A. River featured as its primary asset.**

The Piggyback Yard Feasibility Study follows the frameworks established from the 2010 Conceptual Master Plan which reflect the core principles of the LARRMP that look to transform the River into an environmental, community and economic asset for the city of Los Angeles. These principles include the following: 1) provide opportunities to address a renewal of the River’s environmental qualities through ecological restoration, 2) greening of neighborhoods along the River corridor by repurposing underutilized or vacant lots for open space and recreation needs to strengthen community connections to the River, 3) revitalization efforts that aim to identify opportunities for neighborhood enhancement, empowerment and reinvestment, 4) creating value – improving the quality of life for residents, increasing the attractiveness of the city as a place to work and live, and increasing economic prosperity

The Piggyback Yard Vision provides specific design recommendations that fulfill each of these principles, including opportunities for ecological regeneration, sustainable development and community reinvestment. Realizing the Piggyback Yard as described in this report would offer the most significant opportunity to spur on similar projects that approach infrastructure, development and open space holistically and continue to implement the LARRMP in an interconnected and meaningful way.

The Piggyback Yard Feasibility Study, managed by the Friends of the Los Angeles River (FOLAR) and the LA River Revitalization Corporation (RRC), team is comprised of – Geosyntec Consultants, hydrologic engineers, who analyzed preliminary

design concepts on hydrology, hydraulic function, and water quality of the Los Angeles River; Estolano LeSar Perez Advisors (ELP Advisors), land development advisors who outlined a land acquisition and interim development strategy aimed at accelerating momentum for the Conceptual Master Plan, and Mia Lehrer + Associates, who developed the urban design and landscape architectural components. Together, they developed the Vision Plan that meets the hydrologic, ecological, and economic goals of the Piggyback Yard redevelopment goals.

The Piggyback Yard’s potential redevelopment represents a unique design opportunity to allow the L.A. River to become revitalized in a way that is unique to the downtown stretch of the river. To this end, Geosyntec Consultants, in collaboration with Mia Lehrer + Associates, developed design concepts that allow for the river flows to access the Piggyback Yard in a manner that balances hydrologic, ecological, cultural and economic benefits. The hydrological program of the project provides additional flood storage to offset the risks of adjacent properties that are currently within the limits of the floodplain. **The hydrological program includes water quality improvement elements, such as runoff and water treatment, and habitat creation, such as enhanced vegetation along the River and soft-bottom conversion.** The flood storage, water quality and habitat enhancement components would establish a strong connection between Piggyback Yard and the L.A. River that enhances the ecological performance of the River, mitigates the site’s environmental risks, and creates a new destination on the L.A. River for people to live, work, and play.

The land acquisition and development portion of the Feasibility Study focused on two key analyses: firstly, assessing the current market, what can be reasonably supported today, recognizing that this is a long term planning effort; and secondly, what is the acquisition strategy for controlling the property. ELP Advisors conducted a market analysis and consulted with an expert panel of real estate developers to understand the feasibility of acquiring and developing the Piggyback Yard site as envisioned in the Conceptual Master Plan. **The developable area rings the site’s northern, eastern and southern edges maximizing the site’s potential for riverfront edge development while maintaining most of the site as a multi-purpose open space that engages the river.** The project would require acquisition of the Los Angeles Transportation Center (LATC), also known as the Piggyback Yard, as well as seven additional properties at the southwest and southeast corners of the main parcel.

The development program envisions mixed-use development along Mission Road, a series of campus-like settings that further promote adjoining uses that include the USC Health Sciences Campus and the Brewery Arts District, as well as spur on the entrepreneurial activity emanating from start-ups within the Cleantech Corridor. Situated within a mile from Union Station, the Piggyback Yard is positioned to foster a walkable, transit served community prompting a more active population on the River. With the potential for the new High Speed Rail Station to be located somewhere between the historic station and the River, the eventual transformation of the area could spark a dramatic development transformation bringing on a 24-7 level of activity. This new “River Park Campus” will signal the arrival of Los Angeles’ innovation economy, while simultaneously providing green and recreational space to support the River’s environmental revitalization efforts.

The major opportunity posed by having a large riverside property under a single owner also presented a major challenge in preparing a financial feasibility analysis of the ELP Development Scenario. Union Pacific is the current owner of the LATC and has expressed its lack of interest in selling the property. Thus, a significant issue that must be resolved to realize the Conceptual Master Plan is how to relocate Union Pacific’s operations at the Piggyback Yard. The Piggyback Yard, established in the early 1900s, is an inefficient and outdated intermodal facility as it is disproportionately sized to accommodate the length of the freight trains. **Understanding the role of the Piggyback Yard in the goods movement network and the ways in which those operations can be moved to accommodate the Conceptual Master Plan without causing disruption to the regional system is an essential next step in moving this project forward.**

Acquisition Recommendations

To move forward with the Feasibility Analysis and Acquisition Strategy of the Piggyback Yard, a relocation strategy for Union Pacific’s LATC must be developed. The potential relocation of the rail facilities will have dramatic effects on the rail network and goods movement activities of Union Pacific. It is recommended that a transportation and goods movement expert would make an integral addition to the project. In addition to the relocation strategy of the LATC, an environmental assessment of the Piggyback Yard site is recommended as it is likely that it will require significant remediation before it can be redeveloped and made ready for public use. At a later phase, it is recommended that a land consultant be hired to assist in the

zoning and entitlements analysis required for the redevelopment of the Piggyback Yard site and for the relocation of the LATC.

There is an opportunity to phase the acquisition strategy and begin to control properties surrounding LATC. Having an ownership role will signal to surrounding property owners that there is a sincere interest to develop this river destination. This a good time to pursue this approach while the real estate market is still recovering, values are below their peak and the political environment is supportive of the river’s transformation.

The increased focus and investment targeted for downtown Los Angeles and the L.A. River corridor represent new investment and development opportunities for the under-utilized Piggyback Yard site. Due to sheer lack of available land, the Conceptual Master Plan of the Piggyback Yard site offers a transformative opportunity to serve as the cornerstone of the River’s revitalization efforts. **This Plan’s vision of re-conceptualizing the Piggyback Yard into a “River Destination” creates value for both the River and downtown Los Angeles.** It provides an opportunity to improve the quality of life for residents, increase the attractiveness of Los Angeles as a place to live and work, and increases economic prosperity. Revitalization of the Piggyback Yard offers the opportunity for communities to engage in development that leads to an improved natural environment while also attracting investment that leads to new jobs, increased property values, more livable streets and sustainable growth.

Omar Brownson

Executive Director, L.A. River Revitalization Corporation (LARRC)

OVERVIEW

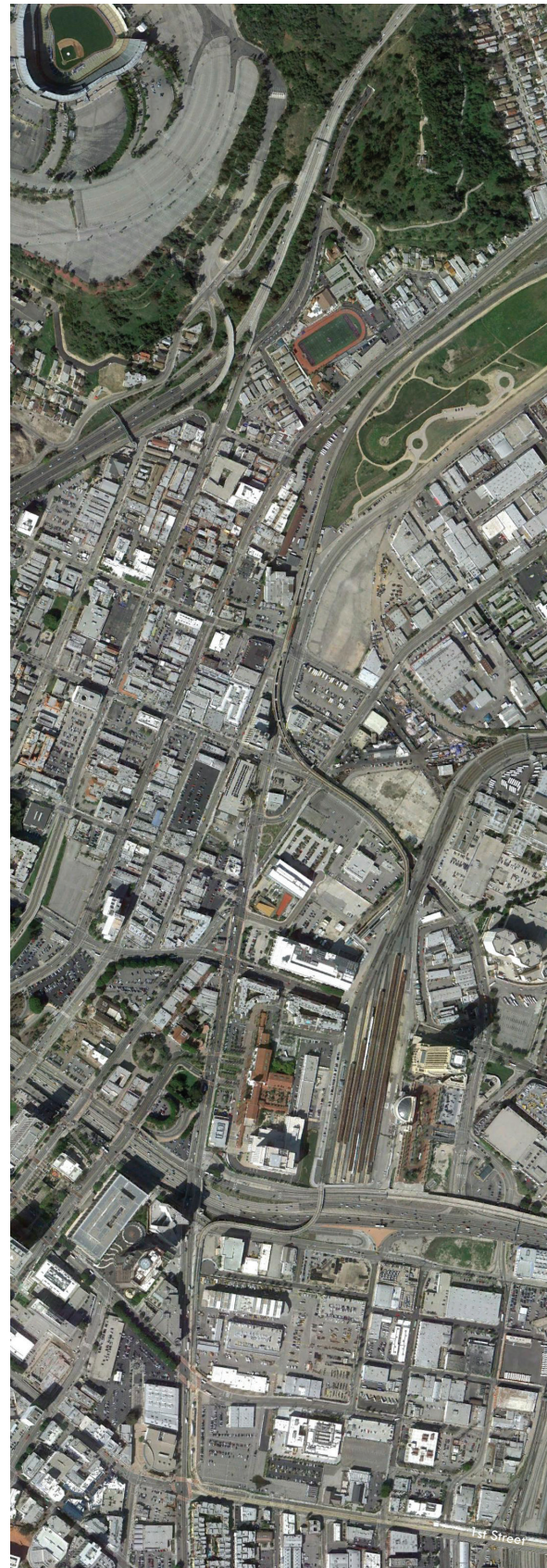
The purpose of the Piggyback Yard Feasibility Study is to further understand the project's scope and extent based upon the extensive work developed from the pro bono Piggyback Yard Conceptual Master Plan ¹. The study focuses on two topics critical to understanding the project's aspirations: 1) the effects of hydrology on the site and river, and 2) understanding the site's current market value and strategy for acquisition.

The project area includes the 125-acre rail yard known as the Piggyback Yard which is a Union Pacific owned site, technically referred to as the Los Angeles Transportation Center (LATC), as well as an assortment of adjoining smaller parcels of predominantly marginalized light industrial uses along Mission Road, comprising a total of 177 acres.

The composition of the overall team includes two consultants to provide an in-depth understanding of the aforementioned topics – Geosyntec Consultants, water resource engineers and ELP Advisors, land development strategists. In addition, Friends of the L.A. River (FoLAR) and the Los Angeles River Revitalization Corporation (LARRC) served as executive managers while Mia Lehrer + Associates provided the comprehensive background on the project's history and process to date as well as led the design development within this Feasibility Study.

The concluding design of the Feasibility Study resulted in the *Vision Plan*, and is described in more detail later in this report (page 24). This Vision Plan is a progression of design derived from the Hydrological and Market analysis focuses during this Feasibility Study. The plan represents a continuation of design progress, and as seen in this report, utilizes the frameworks established from the initial work created from the 2010 Piggyback Yard Master Plan to heighten the performative value of the hydrology and match the development program to its locale.

¹ | The results of the Piggyback Yard Collaborative Design Group included the launch of the Piggyback Yard website, www.piggyback-yard.org, and acknowledgment from local and national professional societies within design and development intuitions receiving numerous awards for its visionary and comprehensive approach to designing a highly complex urban site.





Aerial Context of the Piggyback Yard Site, Source: Google Maps Imagery

PLAN FRAMEWORK

PREFERRED ALTERNATE

Preliminary design concepts were produced using site evaluation criteria developed by Mia Lehrer + Associates and Geosyntec with the support and direction of the LARRC, FoLAR and ELP Advisors (the Project Team). Two sets of criteria were established, site evaluation criteria and hydraulic evaluation criteria. The site evaluation criteria focused on the social, financial and ecological impacts of each layout.

Hydraulic and site evaluation criteria were developed by the Project Team to evaluate the proposed alternatives. The hydraulic evaluation criteria were used to assess the performance of the layout based on the results of three-dimensional (3-D) Computational Fluid Dynamic (CFD) modeling of each alternative. Results of the hydraulic analysis shed additional light on the site evaluation criteria as well. For example, the velocity and shear stresses in the restoration area determined whether the area would be suitable for aquatic habitat.

After each of these conceptual layouts was analyzed, a matrix was prepared to compare between the different concepts based on the two sets of criteria. Reviewing these matrices, the **River Strand** concept was eliminated because of the low velocities that could lead to water quality issues, high shear stresses that would require significant channel reinforcement, and potential for deposition that would require additional maintenance. While the **Broadened River** concept showed a clear advantage over the other alternative in terms of the hydraulic criteria, the **Island Overflow** was assessed as more fully embodying the site selection criteria. Therefore the Project Team chose to further study the **Island Overflow** design by refining the shape, size, height and location of the islands to improve system hydraulics. This refinement process resulted in a single design alternative which balanced the site selection and hydraulic evaluation criteria.

Once the Island Overflow river layout was determined, a more comprehensive design for the site was developed, including treatment concepts for runoff generated both on-site and in the upper watershed.

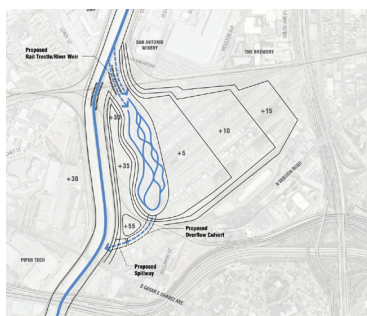
The design was then evaluated for flood attenuation, water quality and habitat benefits. These benefits can be summarized as follows:

- **Flood attenuation:** The recommended Alternative manages regulatory and the financial flood risks with equal care, while providing a net increase in floodplain storage volume that will remove greater than 100 acres of land.
- **Water quality:** On a land use conversion basis alone, the Piggyback Yard project is anticipated to reduce the volume of runoff from the project site by over 70% and the pollutant loading (for the pollutants evaluated) by 70% to 90%. Furthermore, the pollutant loading (for the pollutants evaluated) from the upper watershed is expected to be reduced by 50% to 100%. In combination, the water quality benefits of the project as a whole can be assumed to be greater (more beneficial) than the water quality benefits of each individual component. This is due to the effect of “treatment trains”, or consecutive stages of pollutant removal, which build upon one another. These combined benefits will contribute to enhanced ecological health within the site, the Los Angeles River adjacent to the, and to a limited extent downstream.
- **Habitat enhancement:** A significant portion of the existing industrial rail yard will be converted to open space, which will include new wetlands, meadow and riparian habitats.

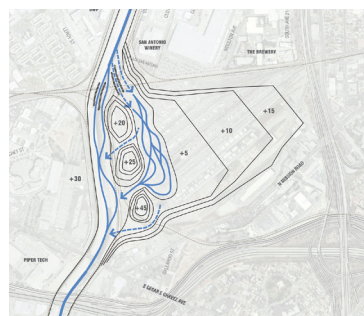
Three River Concepts

Note: Concepts A + C were based upon the 2010 Piggyback Yard Conceptual Master Plan.

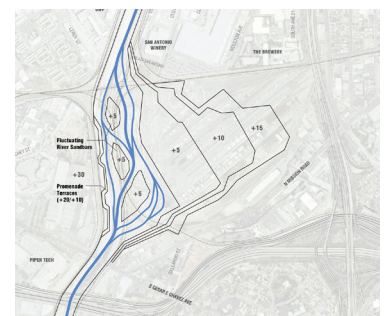
Diagrams, Source:PYFST



A) River Strand



B) Island Overflow



C) Broadened River

LAYOUT OPTIONS Criteria for Evaluation		1A River Strand	1B Island Overflow	1C Broadened River
IMAGES				
Flexibility	1 Flexibility in control and changing future conditions	High Potential	Med Potential	Med Potential
	2 Surface area of natural habitat	Med Potential	High Potential	High Potential
Habitat Restoration	2 Aquatic habitat function	Med Potential	High Potential	High Potential
	2 Bird habitat function	Med Potential	High Potential	High Potential
	3 Storage Volume	Med Potential	Med Potential	Med Potential
Detention	3 Harvesting Potential	High Potential	Med Potential	Med Potential
	3 Flow Attenuation	Low Potential	Med Potential	Med Potential
	4 Complexity of maintenance	Low Potential	Medium Potential	High Potential
O&M Costs	4 Complexity of maintenance	Low Potential	Medium Potential	High Potential
Downstream Effects	5 Improvement to downstream conditions	Low Potential	Med Potential	Med Potential
Working with Rail Corridor	6 Complements rail service corridor	High Potential	High Potential	High Potential
Psychological Factors	7 Perceived connection to River	Med Potential	High Potential	High Potential
	7 Direct connection to River	Med Potential	High Potential	High Potential
	7 Recreation opportunity	Med Potential	High Potential	High Potential

Hydraulic Evaluation Matrix, Source:PYFST

LAYOUT OPTIONS Criteria for Evaluation		1A River Strand	1B Island Overflow	1C Broadened River
IMAGES				
Velocity	1 Main Channel (40 cfs / 6K cfs / 104k cfs)	Low / Med / High	Low / Med / Med	Low / Low / Low
	1 Restoration Area (40 cfs / 6K cfs / 104k cfs)	Low / Low / Low	Low / Med / Med	Low / Low / Low
	1 Interchange Locations (Info & from main channel)	High	Med	LOW
Shear Stress	2 Main Channel (40 cfs / 6K cfs / 104k cfs)	Low / Med / High	Low / Med / Med	Low / Low / Low
	2 Restoration Area (40 cfs / 6K cfs / 104k cfs)	Low / Low / Low	Low / Med / Med	Low / Low / Low
	2 Interchange Locations (Info & from main channel)	High	Med	LOW
Volume	3 40 cfs - Riverine	LOW	LOW	LOW
	3 6K - Riverine	MED	MED	MED
	3 104K cfs - Riverine	HIGH	HIGH	HIGH
	3 Overbank Floodplain	HIGH	HIGH	HIGH

Site Evaluation Matrix, Source:PYFST

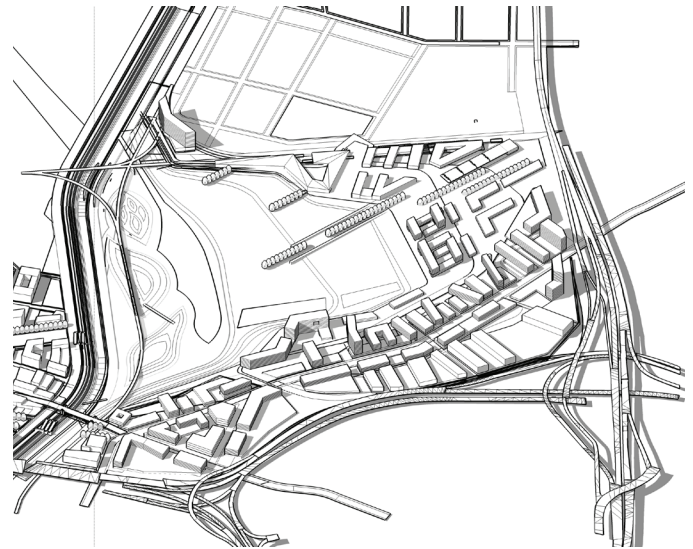
PLAN FRAMEWORK

OPEN SPACE / DEVELOPMENT BALANCE

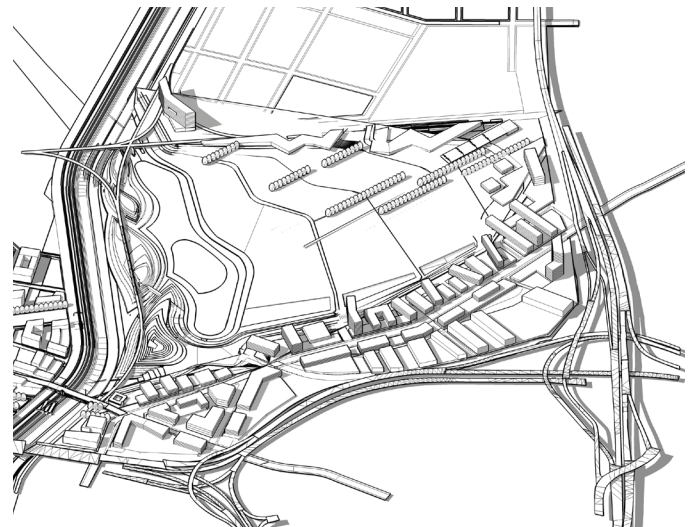
Using the hydraulic and site criteria, the team adopted the Island Overflow as the preferred alternative and developed two variations of this layout (Preferred Option A and Preferred Option B) by adjusting the site terrain to improve the hydraulic functioning of the design and accommodate different development scenarios for the site. Preferred Option A, allocates 40% of the site to be developed while the second scenario, Preferred Option B, allocates 25% of the site to be developed. Within both of these scenarios, the development mix and concept would be of a similar strategy, maximizing connections and adjacencies to existing streets and neighboring uses and follow a similar mixed use type of program established from the 2010 PBy Conceptual Master Plan.

Through team discussion and outreach to experts in the field, it was determined that the most appropriate use of the site, with respect for the constrained environment that the L.A. River traverses, would be the Option B scheme, enabling 25% of the site for development. The decision for this was based on the following reasons:

1. the availability of large sites adjacent to the river within the downtown reach are limited;
2. fulfillsthegreatneedforlargescaleopenspacethatis equipped to provide for passive and active recreation opportunities as well as provide space for variety of riparian habitats; and
3. the difference in the amount of developable area may not make a significant contribution to realizing the project.

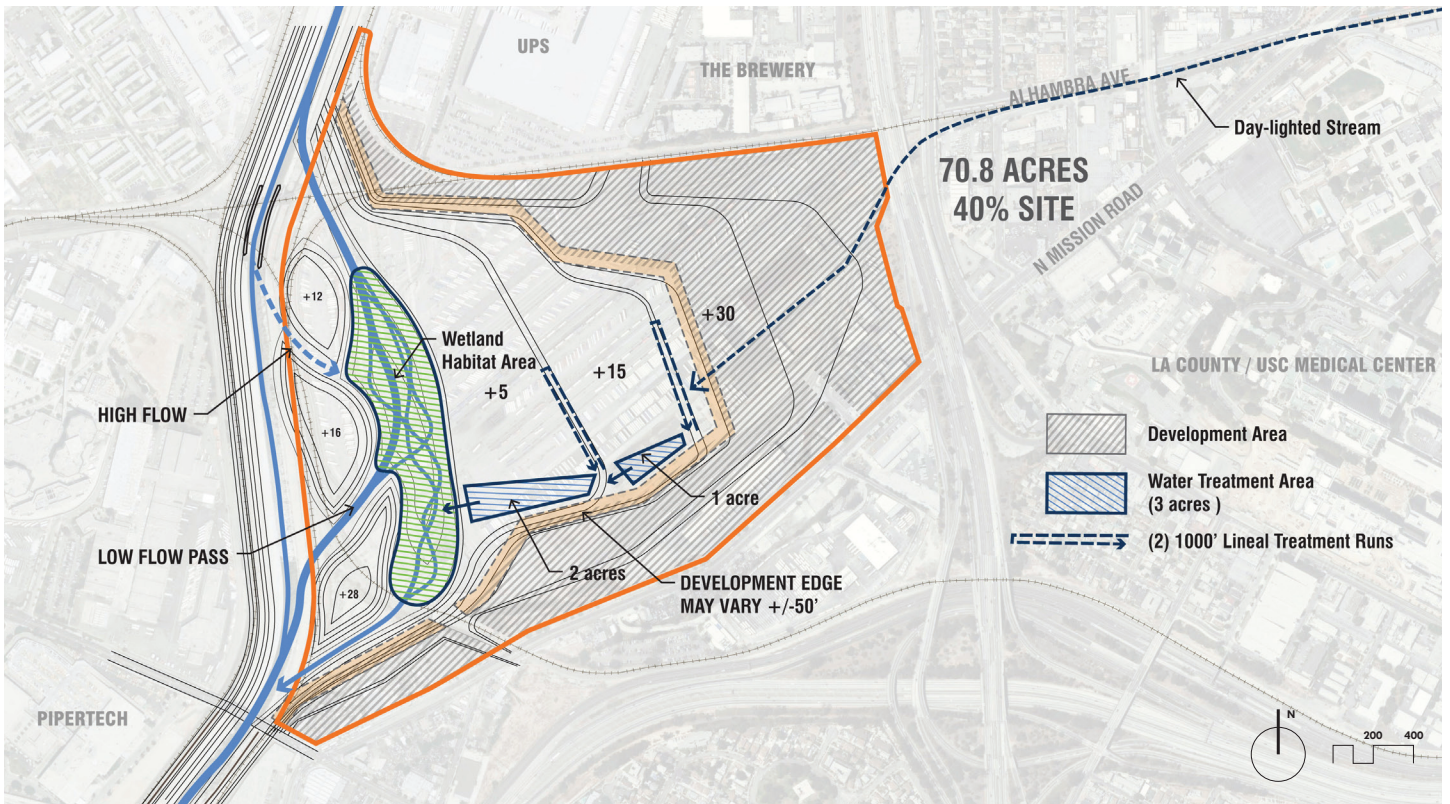


OPTION A : 40% Site - Development, Low Island Profile

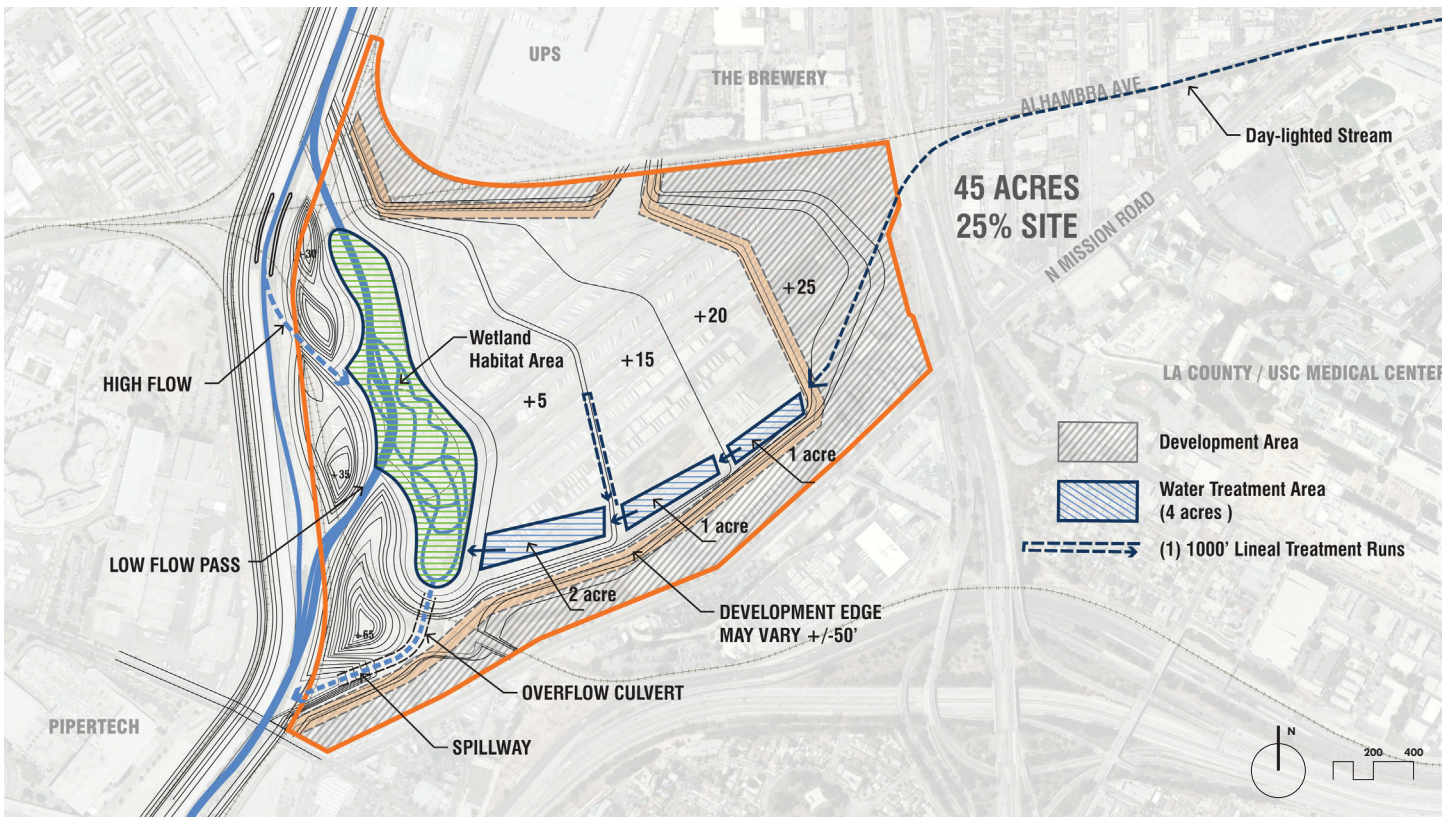


OPTION B : 25% Site - Development, High Island Profile

Diagrams, Source:PYFST



OPTION A : 40% Site - Development, Low Island Profile



OPTION B : 25% Site - Development, High Island Profile

HYDROLOGICAL ANALYSIS

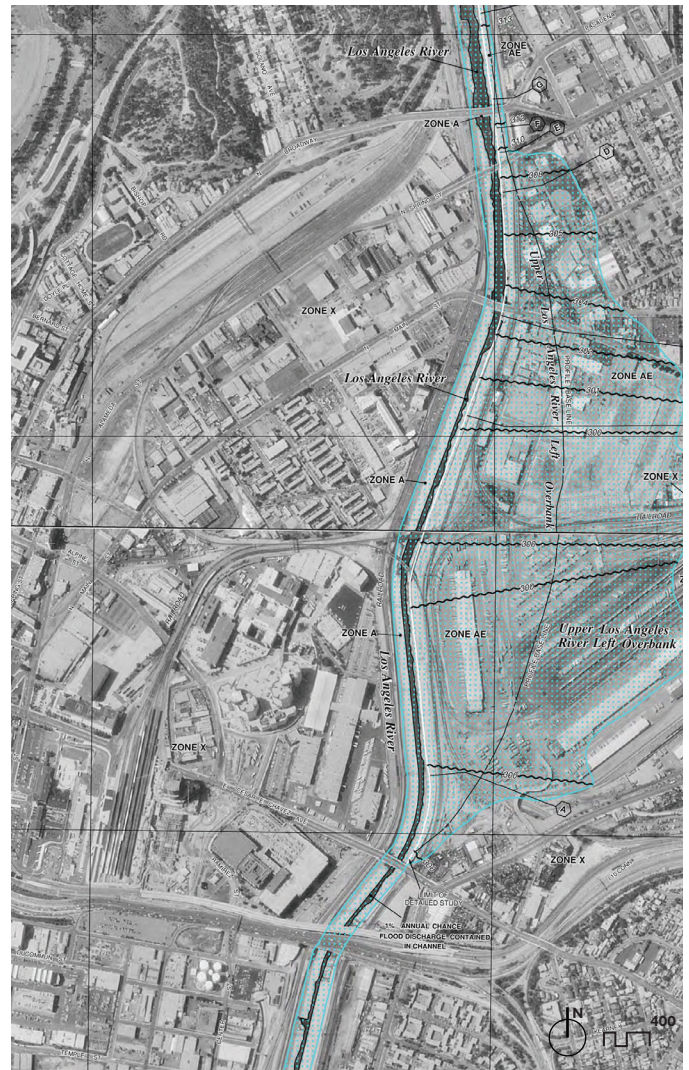
The primary contributor of water during dry weather to the L.A. River is the Tillman Water Treatment Plant (located over ten miles upstream in Van Nuys) which discharges high quality treated effluent directly to the L.A. River. During wet weather, the primary contributor of water and source of pollutants to the River is from urban runoff from adjacent neighborhoods. This stormwater reaches the River either by overland flow, or through the stormdrain system.

The design of the Piggyback Yard site will improve water quality through a number of mechanisms, including land use conversion of the site, improved ecological functioning of the L.A. River, and stormwater treatment technologies. The treatment technologies are proposed as a series of wetland treatment cells that will receive stormwater by day-lighting the drainage culvert that follows the Alhambra Road/Rail Easement.

The land use conversion alone is anticipated to reduce the volume of runoff from the project site by over 70% and the pollutant loading (for the pollutants evaluated) by 70% to 90%. Furthermore, the pollutant loading (for the pollutants evaluated) from the upper watershed is expected to be reduced by 50% to nearly 100% as a result of the treatment wetlands assuming 100% trash capture and 99.6% reduction in bacteria. In combination, the water quality benefits of the project as a whole can be assumed to be greater (more beneficial) than the water quality benefits of each individual component. This is due to the effect of “treatment trains”, or consecutive stages of pollutant removal, which build upon one another. These combined strategies will contribute to the enhanced ecological health within the site and provide improved water quality benefits to the Los Angeles River.

The PBy project, while of a visionary nature, is incredibly timely, as many forces are currently at work; including planning initiatives to improve the region’s water quality and secure its supply. Perhaps of most significance is the USACE *Los Angeles River Ecosystem Integrated Feasibility Report (ARBOR Study)*, which began in 2006 to assess opportunities to modify the channelized condition of the L.A. River to create space for improved flood attenuation and riparian habitat. The Draft Report, released September 2013, includes the Piggyback Yard in each of the four final alternatives indicating the LATC site as a vital location to improve the conditions of the River.

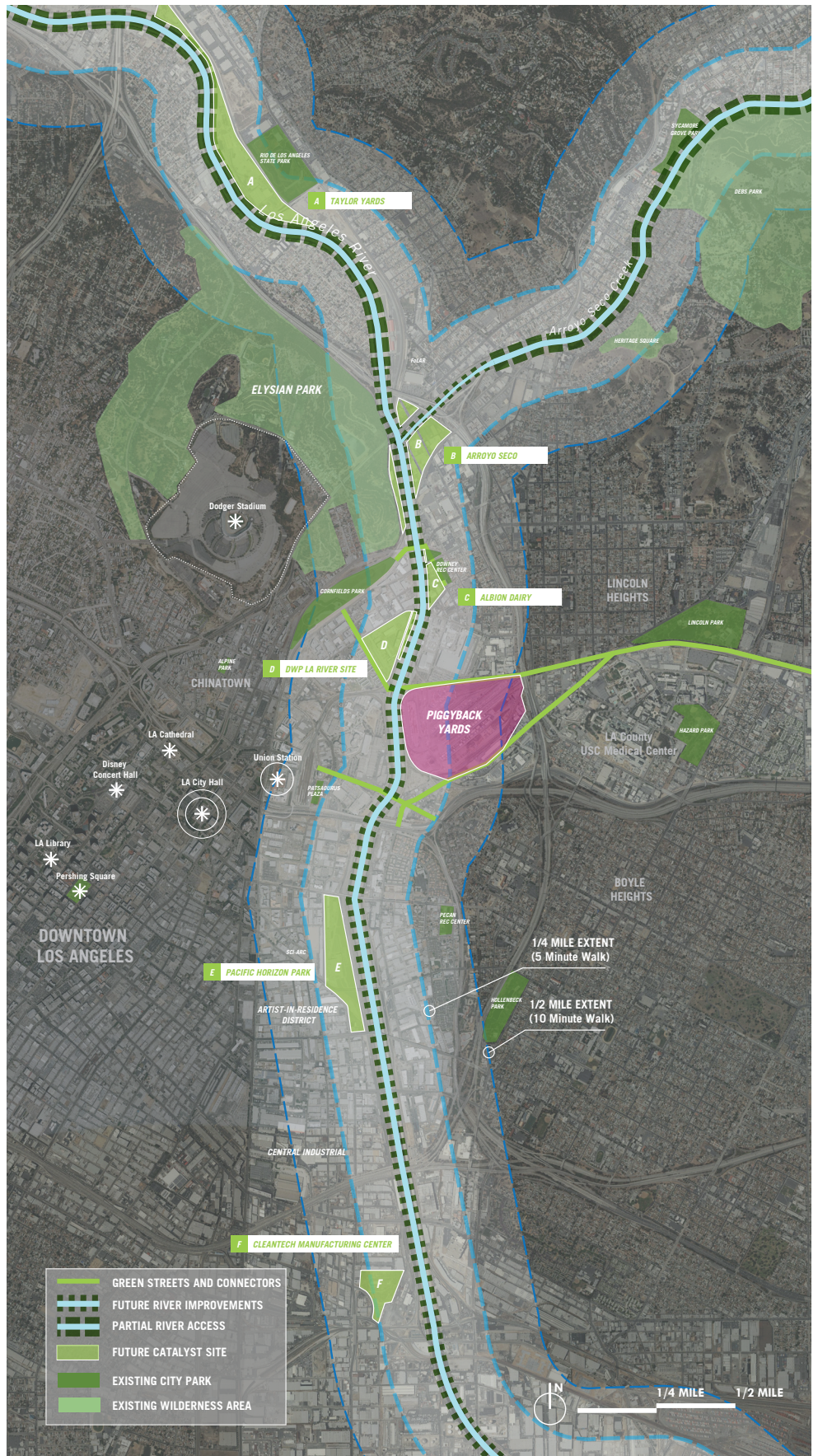
For more information on the ARBOR Study visit:
<http://www.spl.usace.army.mil>



FEMA FIRM Map, Source: Federal Emergency Management Agency



River Conditions After Seasonal Storm Event, Source:PYFST



LA River Catalytic Projects + Open Space, Source: Piggyback Yard Collaborative Design Group

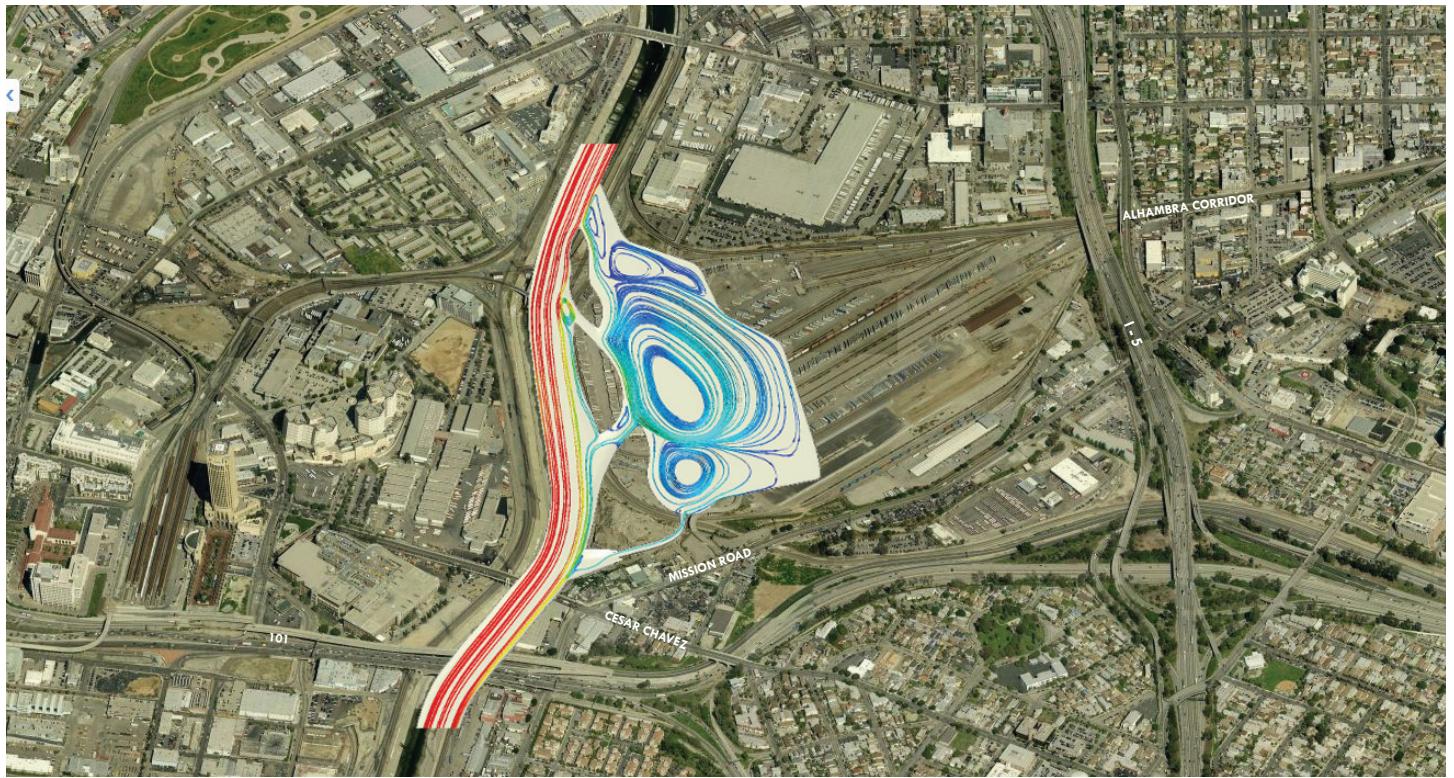
HYDROLOGICAL ANALYSIS

The analyses performed in this Feasibility Study were completed under a very specific scope. However, a driving consideration in selecting a full 3-D, CFD model was the accuracy the model afforded to evaluate detailed design features and the flexibility to initially analyze the general site landform and then evolve with the project as the elements of the site design become more detailed.

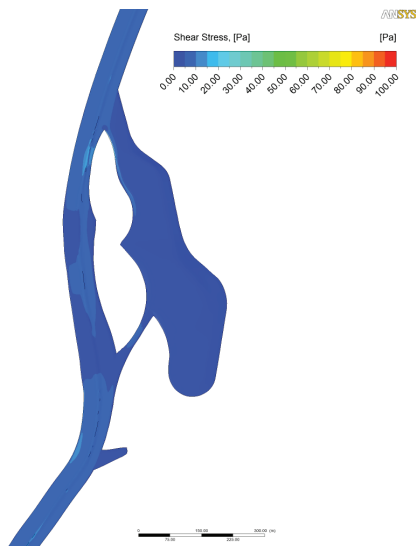
With this in mind, the Project Team identified several areas where additional analyses could be performed using the existing model as a foundation:

- Develop initial designs and quantify the performance of various armoring elements and techniques.
- Develop and quantify the performance of various detailed design elements: inlet and outlet channel transitions, bridge piers, trellises, saddle channels between islands, and channel control devices (inflatable dams)
- Quantify the effect of a range of surface roughness coefficients that corresponds to the placement of armoring material and vegetation across the entire site.
- Determine the limits of inundation and flow characteristics of the site for an array of low and medium flow conditions (e.g. 6,000 cfs to 80,000 cfs).
- Expand the extent of the hydraulic study upstream and downstream from the project site. Quantify the broader effect of the site improvements and evaluate opportunities to manage the limits of the adjacent floodplain.
- Develop a suite of specific armoring techniques for the range of armoring needs. The broad landscape of the proposed development requires a variety of stabilization techniques for the final design. The use of a wide palette of techniques will provide the ability to tailor the design to meet the proper level of armoring and present an opportunity to create a diverse riparian habitat.
- Evaluate potential grading configurations of the deep pool below normal water level in the open space enhancement area to ensure proper water circulation and edge stabilization.
- The initial hydraulic analyses were performed by investigating the behavior of the site and river flow at three discreet flow rates; 104,000 cfs, 6,000 cfs, and 80 cfs. Evaluating the hydraulic behavior and performance of the site at a range of flow conditions between 6,000 and 80,000 cfs will be an important step to refining the design. Understanding the extent and frequency of inundation is critical in designing the riparian habitat and selecting the appropriate vegetation material.
- The extent of the hydraulic model could be extended upstream and downstream of the project site to quantify the broader effect of the site improvements. The beneficial impacts on the limits of the regulatory floodplain on adjacent properties would be defined. Additionally, design opportunities and flood protection measures to remove adjacent properties from the limits of regulatory floodplain could be evaluated.
- Multiple configurations of the deep pool and the grading below the normal water level in open space enhancement area would be analyzed. The purpose would be to ensure proper circulation, limit sedimentation, and evaluate the opportunity to utilize the pond as a year-round supply of water to offset non-potable demands.

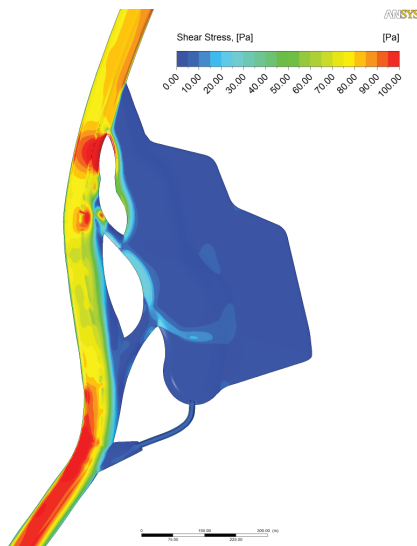
3D COMPUTATIONAL ANALYSIS VISUALIZATION OF PREFERRED ALTERNATE | OPTION B



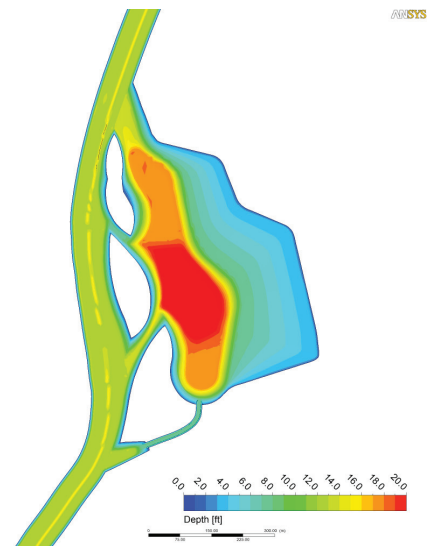
Vector Flow Lines, Source:PYFST



Shear Stress: 6,000 CFS



Shear Stress: 104,000 CFS



Water Depth

PRECEDENTS

To help frame and understand the successful implementation of the project, the team compiled a group of relevant case study projects that recalibrate infrastructure to serve as precedents. Of these projects, three were selected for their relevance and similarity of the conditions present at the Piggyback Yard. These three include: 1) Millennium Park, Chicago, IL, 2) South Platte River, Denver, CO, and 3) Guadalupe River, San Jose, CA.

The projects demonstrate how to successfully plan for the revitalization of urban place and promote both the ecological importance as naturalized infrastructure and create opportunities of urban revitalization. While the Millennium Park project does not feature a river, its ability to transform an existing rail yard into a new open space for the city of Chicago, thereby creating a new address for future development became an important aspect from which to learn.

Each precedent demonstrates the use of open space design as a catalyst for land development, successfully serving as a tool for viable urban regeneration and authentic means for place-making. These precedents also exemplify the notion of multi-beneficial open space that provides benefits that serve as a social-cultural destination, improved 'green' infrastructure solution and enhancement of the environment.

Each of these projects are representative of long-range planning efforts that are realized over a multi-phase implementation plan. These three examples demonstrate that through significant partnerships between civic leaders, community organizations, private and philanthropic investors, complex projects such as the Piggyback Yard are possible. They require ongoing commitment from all of these stakeholders to be successful.

MILLENNIUM PARK, CHICAGO, IL



Source: Landscape Architecture Foundation

Millennium Park is a 24.5-acre public space located at the northwest corner of Grant Park in Chicago. The project transformed 16.5 acres of commuter rail lines and surface parking lots, along with another 8 acres of underutilized park land into an outdoor cultural venue where residents and tourists can enjoy gardens, ice skating, concerts, restaurants, festivals, water features and interactive public art.

Opened in 2004, the Millennium Park project was a public/private partnership between the city of Chicago and several private entities. The city committed \$270 million that was used for infrastructure improvements. \$175 million of this came from construction bonds that will be retired by the fees paid by visitors who park in the Millennium Garage beneath the park, while \$95 million came from Tax Increment Financing (TIF) bonds by the Central Loop TIF.

On the private side, 105 individuals, foundations, and corporations donated a minimum of \$1 million each, generating \$160 million for park enhancements, and an additional \$60 million dedicated to the Harris Theater for Music and Dance. The combined \$220 million also included a maintenance endowment of over \$30 million.

Although Millennium Park opened in 2004, its impact on Chicago's economy was anticipated years before. In 2000, when the park was under construction, a Michigan Avenue commercial building was sold for \$90 per square foot, more than double what the seller purchased it for six years earlier. An impact study by URS and the Goodman Williams Group calculated that the impact between 2005 and 2015 on the adjacent real estate market that is directly attributable to Millennium Park totals \$1.4 billion.

SOUTH PLATTE RIVER, DENVER, CO



Source: Wally Gobetz

A devastating flood in 1965 caused \$325 million in damages. As part of the flood response, a \$635 million project to restore the South Platte was developed, but the plan was too expensive and too complex to implement. The South Platte River was dumped in, neglected, and cut off from Denver until a major clean-up effort began in June 1974.

Armed with an influx of state funding, Denver's then-Mayor, Democrat Bill McNichols, formed the Platte River Development Committee and asked Republican State Senator Joe Shoemaker to serve as its head. A model of efficiency, the committee divided into distinct teams, each assigned one section of riverfront. This method of "divide and conquer" quickly resulted in the creation of a number of distinct small parks or "nodes."

In 1977, with seed money from the Gates Foundation, the committee transformed itself into a tax-exempt, 501(c)(3) organization, the South Platte River Greenway Foundation, Inc. In seven years, the Foundation raised \$14 million, built 10.5 miles of concrete trails, four whitewater boat chutes, and 17 mini-parks out of dumps where public agencies and private businesses had been dumping trash for decades.

After a decade long lull, due primarily to the increasing regional population, and the redevelopment of downtown Denver, the 1990s saw a resurgence of the river's development and rehabilitation. \$35 million has been invested in six separate river park projects, and partnerships with Denver Public Schools led to 25 on-site and school-based educational programs. According to the Mayor's office, when combined with reinstated youth ranger and employment initiatives, these programs have helped bring over 17,000 youth to the river from 1995-1997.

GUADALUPE RIVER, SAN JOSE, CA



Source: City of San Jose

From 1846-1975, the largest mercury mine in North America operated in the Guadalupe River watershed. The river had severe flooding problems, which posed health problems to the surrounding communities. In the 1960s, two planning initiatives were proposed. One suggested revitalizing the river to provide park space and reduce flooding, while the other proposed concrete flood control structures, similar to those in the LA River. The city moved forward with the later proposal (1992-1996), but was forced to stop because the concrete structures were determined to be detrimental to local wildlife. In 2002, they began constructing a new, more environmentally friendly design.

The Guadalupe River revitalization process centered around three key challenges—1) the need to eliminate mercury contamination, 2) unplanned growth from a rural community to an urban residential industrial complex that led to storm water runoff and flooding, 3) poor water quality and loss of wildlife. Public demand for green space was another major factor. The city's response to the problems was to construct a 1.5-acre concrete canal. However, several community-based, advocacy organizations formed coalitions to stop the project.

There were significant partnerships developed as a result of the effort. Community based, park advocacy organizations formed the Guadalupe River Park and Gardens Corporation. Then, environmental groups, including the Guadalupe-Coyote Resource Conservation District, the Natural Heritage Institute, Trout Unlimited, along with the City of San Jose, Santa Clara Water Authority, and the USACE formed the Guadalupe River Flood Control Project Collaborative.

LAND DEVELOPMENT

The Piggyback Yard scheme proposes mixed-use development fronting along Mission Road and hosts a series of campus-like settings that further promotes adjoining institutions that include the USC Health Sciences Campus, the Brewery Arts District, as well as the entrepreneurial activity emanating from start-ups within the Cleantech Corridor.

Situated within a mile from Union Station, the Piggyback Yard is positioned to foster a walkable, transit served community, prompting a more active population on the river. With the potential for the California High Speed Rail Authority to locate the Los Angeles Terminal on the west bank between the existing historic station and the river, the new transportation infrastructure and improvements could spark a dramatic development transformation bringing on a heightened, 24-7 level of activity. This new “River Destination” will signal the arrival of Los Angeles’ innovation economy, while simultaneously providing green and recreational space to support the River’s environmental revitalization efforts.

Below is a summary of findings from the development analysis:

- Density of development expected to average 1.5-2.0 Floor-Area-Ratio (FAR)
- PBy Site is conducive for campus type development(s)
- Residential uses would be diverse, fulfilling demand for work-force, senior, multi-family, and affordable housing types.
- Catalytic type development to build site as a Nexus between both the Cleantech Corridor and Biotech Corridor. Focus light-industrial uses towards Cleantech, Creative Office, Research & Development, Biotech.
- Provision for community-serving retail amenities, social service/health facilities and cultural venues.



USC Health Sciences Campus, Source:PYFST



Brewery Arts District, Source:PYFST



LaKretz Cleantech Incubator, Source: LACI Website

MARKET ANALYSIS

1. Recent Property Transfers

A review of recent property sales that have occurred within a three-mile radius of the Piggyback Yard site over the past four years revealed 75 multi-family residences, 37 commercial buildings, and 37 industrial spaces have been sold. The average rate for these recent transfers was \$130 per square foot, \$220 per square foot, and \$125 per square foot, respectively. The residential (rental) vacancy rate in this three-mile radius is 4.5% and the homeowner vacancy rate is 6.6%.

It is important to note that many of the properties that have been sold are of an older stock. In the project area, over 35% of the housing stock was built prior to 1939. This along with the low vacancy rate is an indication of a potential market for new development in the area surrounding the Piggyback Yard.

2. Evaluation

Based on the analysis of the market demand in the area and comparables, the potential to develop a unique campus like community is strong. A campus community is intended to imply a combination of uses blended with a healthy compliment of open space and interesting public environs.

The assets of the Piggyback Yard indicate a burgeoning artist community and light industrial activity that has survived in this area for many years. A new “River Park Campus” development on the Piggyback Yard site has great potential to leverage the multiple assets of location, transit accessibility, low industrial vacancy, low inventory of affordable housing supply, and future development activity proposed for downtown and in the vicinity of the area.

3. Recommended Development Types

ELP Advisors recommends a development scheme that combines a blend of the following uses:

Light Industrial: According to the analysis, the inventory of light industrial facilities is chronically low in the Piggyback Yard project area. Given its current uses and the development projects that have proven to be viable, light industrial development that is appropriate with other uses is highly recommended in the early phases of the redevelopment of the site. The feasibility of these developments and the increasing demand for industrial in this area can introduce early investors into the site, which will spur additional development.

Workforce/Affordable Residential: Affordable, workforce housing has a very low vacancy rate in the project area. The potential to respond to the pent up demand for housing in this location is ripe. Given the size of the project area, the opportunity to phase residential development over many years affords new product type to be introduced over a long period of time. Early phases could introduce workforce housing and later phases could include higher end housing.

Medical Office Building: The close vicinity of the USC Health Sciences Campus provides a prime opportunity to develop medical office buildings and house related service providers. A partnership with USC to explore this concept could create a formidable alliance in redeveloping the site.

Creative Flex-Space: Key future industry sectors such as clean tech, healthcare and biomed are nested in the immediate vicinity of the Piggyback Yard site. These sectors will need facilities that provide creative space for startups and spinoffs. Allowing for creative flex space in future phases will position the Piggyback Yard or “River Park Campus” as a potential center for these employment establishments.

Other Potential Uses: Cultural – Brewery Expansion, Museum (Union Pacific); Higher Education – Residential, Class Space, Office; Hotel + Conference Center; Community Supportive Services-Employment, Clinic; Community Retail; and Live / Work

ACQUISITION STRATEGY

To move forward with the Feasibility Study Analysis and Acquisition Strategy of Piggyback Yard, a relocation strategy for Union Pacific's LATC must first be developed. The potential relocation of the rail facilities will have dramatic effects on the rail network and goods movement activities of Union Pacific. It is recommended that a Transportation and Goods Movement Expert would make an integral addition to the project. In addition to the relocation strategy of the LATC, an environmental assessment of the Piggyback Yard site is recommended as it is likely that it will require significant remediation before it can be redeveloped and made ready for public use. As much of the site will need to be excavated to create the designed landform, the remediation strategy will need to find a site for the existing soil to be relocated to as well a process for improving the remaining site that is both environmentally sensitive to the Los Angeles River and surrounding community while financially respectful to redevelopment.

There is an opportunity to phase the acquisition strategy and begin to control properties surrounding LATC. Having an ownership role will signal to surrounding property owners that there is a sincere interest to develop this *River Destination*. Now is a good real estate market while pricing is not based on over-speculation and the political environment is supportive of the river's transformation.

RECOMMENDED LAND ACQUISITION APPROACH

ELP Advisors conducted a market analysis and site evaluation to determine a feasible and strategic land acquisition approach that will allow the LARRC and FoLAR to begin assembling key parcels in the Piggyback Yard project area. The Project Team recommends a phased strategy that begins by organizing parcels along the edges of the site that are either for sale or underutilized.

Phase I - Acquisition of Parcels 4 and 8

These two parcels are contiguous and located at the south west corner of the project area. The opportunity to begin to control a portion of the site and grab a foothold in the project area will prove to be useful for many key reasons.

1. Site Control:

Control of any part of the site will increase the likelihood of state or federal funding. Many of the funding programs identified for the Piggyback Yard require some level of property ownership of the project.



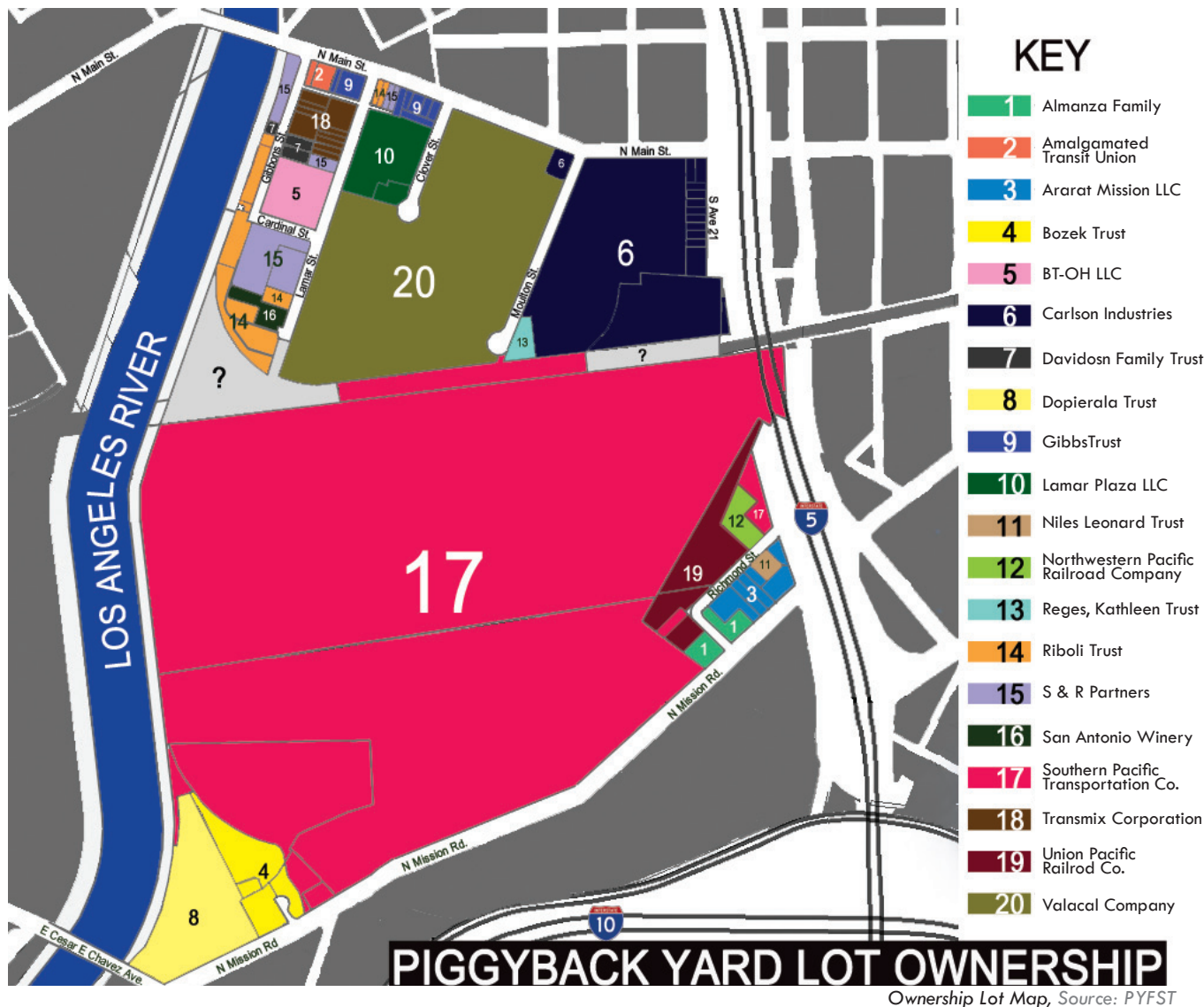
Union Pacific Regional Map, Source: Union Pacific Railroad Website

2. Message to Area Property Owners:

Having an ownership role in the project area will signal to other property owners an interested buyer, which may motivate an offer. The negative effect is that property owners inflate land prices due to the perceived interest by the LARRC and FoLAR in the area.

3. Favorable Land Prices and Terms:

The current real estate market is ideal for buyers. It is possible, given the underutilized and poor condition of these two parcels, to propose a lease with an option to buy in an effort to begin to control a portion of the project area and manage land assemblage costs. In addition, the analysis completed by The Pinyon Group provides a thorough evaluation of the potential land cost to acquire Parcels 4 and 8.



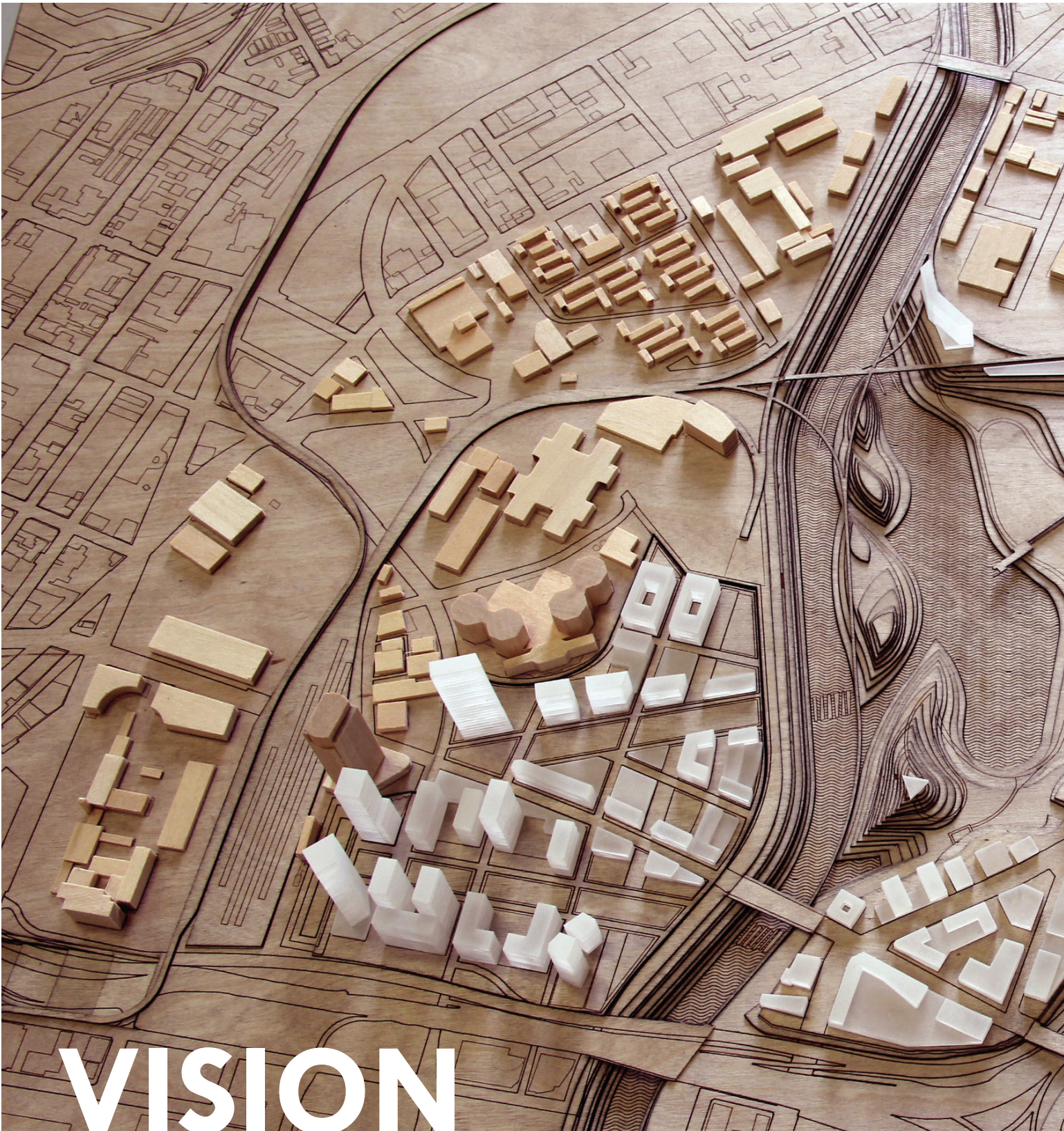
4. Positive Political Environment:

The current political support from federal, state and local officials for the revitalization efforts of the Los Angeles River will provide additional momentum and possibly accelerate acquisition of the parcels.

Phase II- Seek Additional Funding to Acquire Additional Parcels

The remaining parcels within the Piggyback Yard project area are less accessible, although as mentioned, if a movement is made to initiate discussions with other property owners, select parcels may become available. The next series of parcels are clustered and contiguous, have various property owners, and are in better condition than other parcels in the southwest section of

the project area. Because some of these parcels have buildings on them with active tenants, the cost to acquire them may be prohibitive and without redevelopment or subsidy assistance from the City of Los Angeles, acquisition of the next phase of parcels may prove too difficult. However, understanding the ownership structure and monitoring each parcel in this next section of the project area is achievable. With the assistance of a broker who is familiar with the activity in the area, the owners of these five properties – Parcels 1, 3, 11, 12, and 19 – should be approached to determine their level of interest in selling their land.



VISION



Piggyback Yard Feasibility Study Preferred Alternate Vision Model, Source:PYFST

VISION



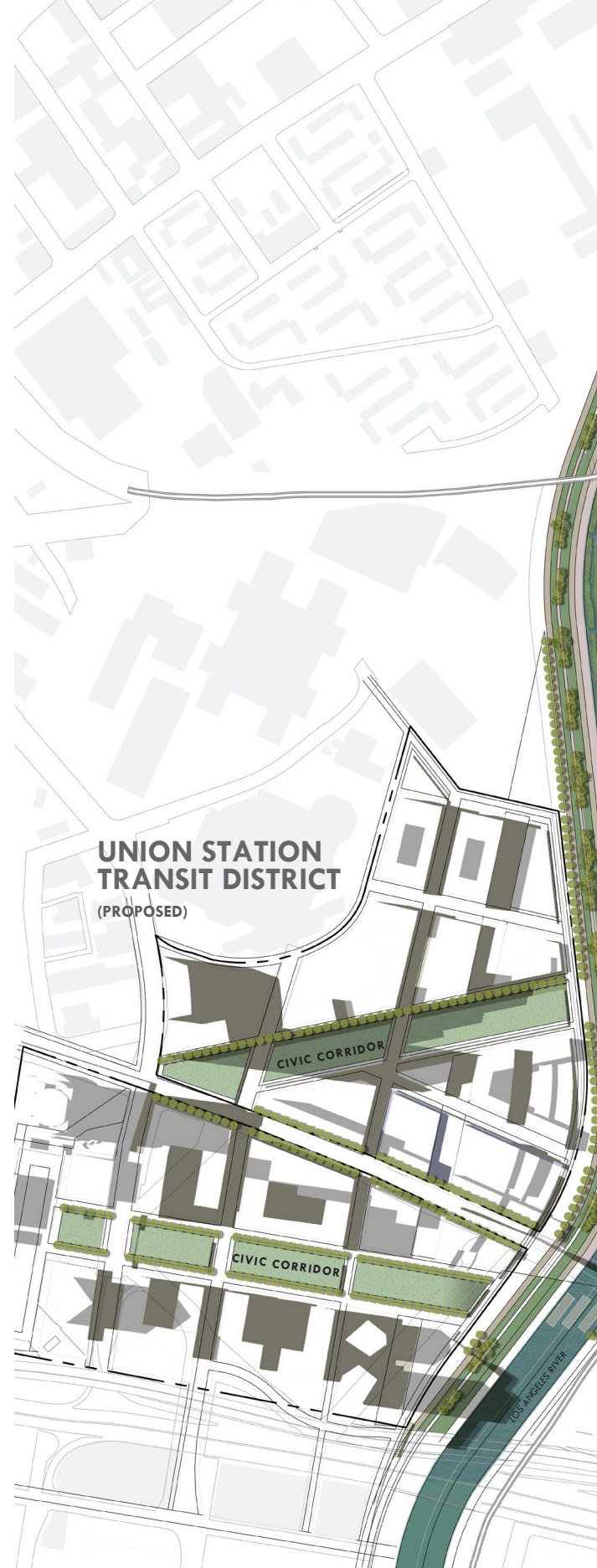
*Illustrative Rendering from the 2010 PBy Master Plan,
Source:PBy Collaborative Design Group*

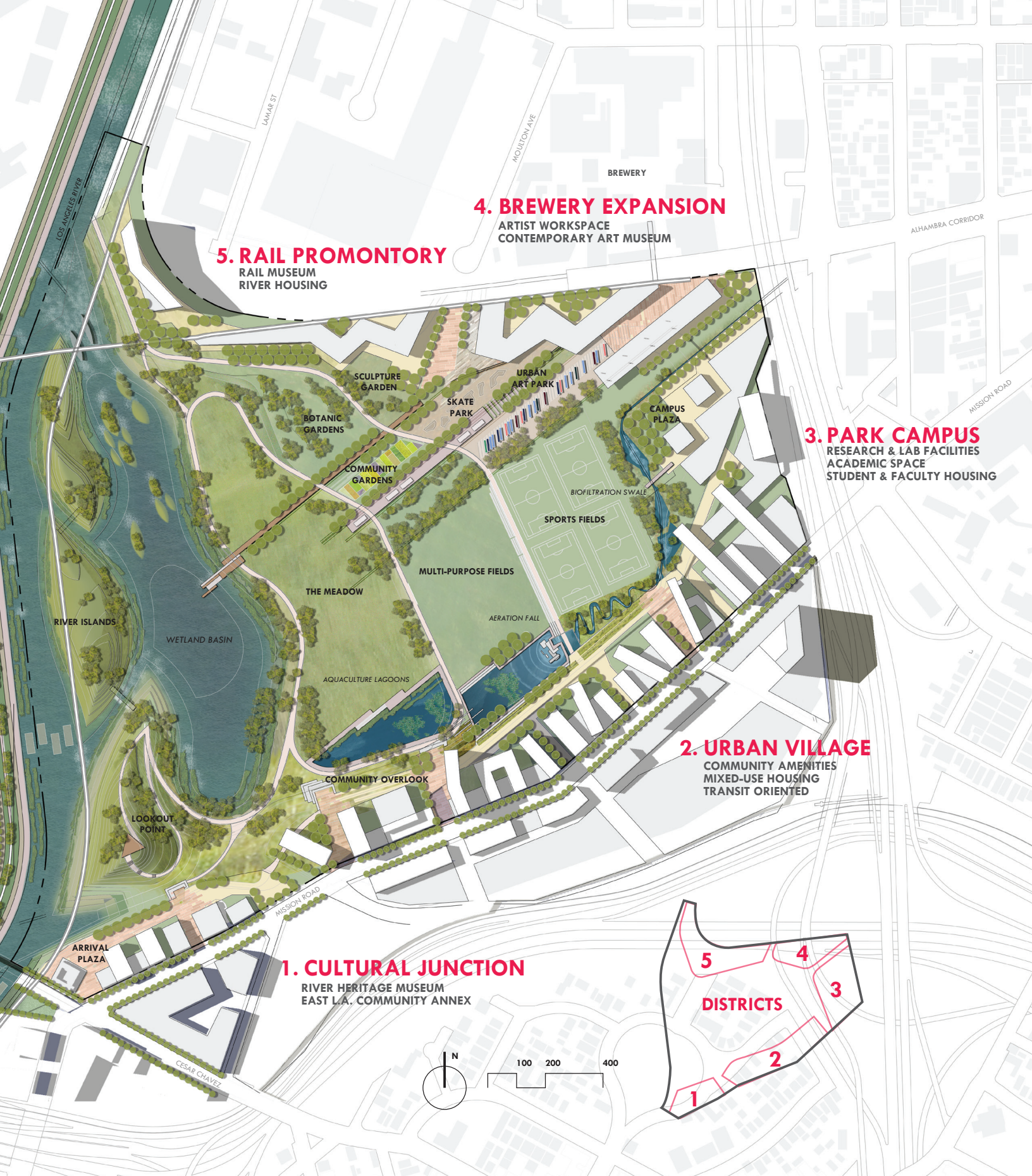
“The Piggyback Yard Conceptual Master Plan has been conceived with the goal of helping to transform Los Angeles for the symbiotic betterment of its community and its ecology, creating a significant opportunity for meaningful interaction between people and nature.

At its core is the specific goal of providing extensive public access to the Los Angeles River, populating, revitalizing its banks, and creating thriving possibilities surrounding its presence, the availability of land, connectivity to multiple transportation modes, and the strategic location of the Piggyback Yard at the heart of the city.”

~ The Piggyback Yard Collaborative Design Group
www.piggybackyard.org

The vision for the Feasibility Study follows the path laid out by the PBy Conceptual Master Plan – one that seeks to maximize investment for the revitalization of the L.A. River and creation of a new place within the landscape of Downtown Los Angeles. The Piggyback Yard exemplifies the notion of urban regeneration, serving as a catalytic type of project that employs a systems-based form of green infrastructure that maximizes the benefits of ecology for people and place. Presenting a multi-benefit solution to resolve the compounding effects of urbanization on the environment, the following narrative provides a description of the layering of benefits as a river revitalization project and its relevance to the City’s future.





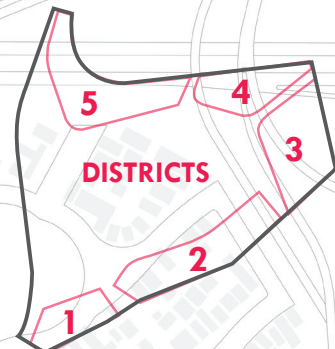
5. RAIL PROMONTORY
RAIL MUSEUM
RIVER HOUSING

4. BREWERY EXPANSION
ARTIST WORKSPACE
CONTEMPORARY ART MUSEUM

3. PARK CAMPUS
RESEARCH & LAB FACILITIES
ACADEMIC SPACE
STUDENT & FACULTY HOUSING

2. URBAN VILLAGE
COMMUNITY AMENITIES
MIXED-USE HOUSING
TRANSIT ORIENTED

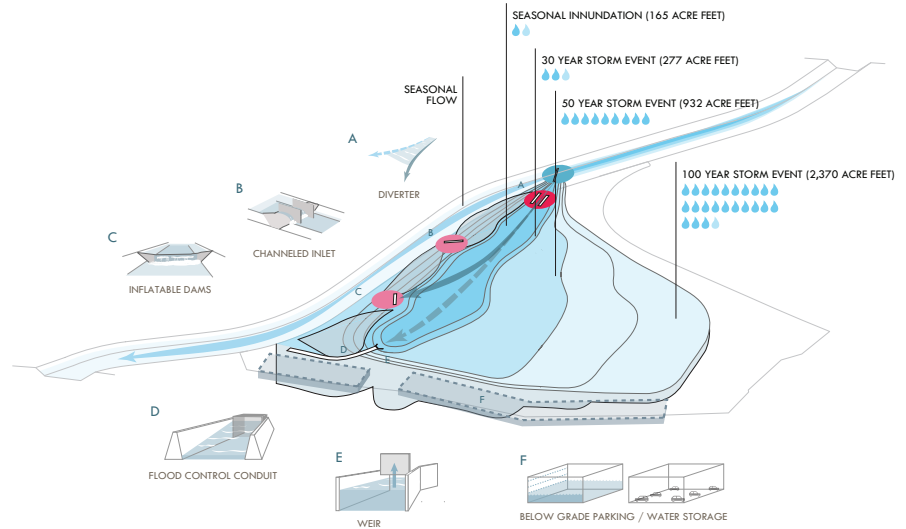
1. CULTURAL JUNCTION
RIVER HERITAGE MUSEUM
EAST L.A. COMMUNITY ANNEX



Feasibility Study Preferred Alternate | Option B, Illustrative Plan, Source:PYFST

STORM EVENT MANAGEMENT

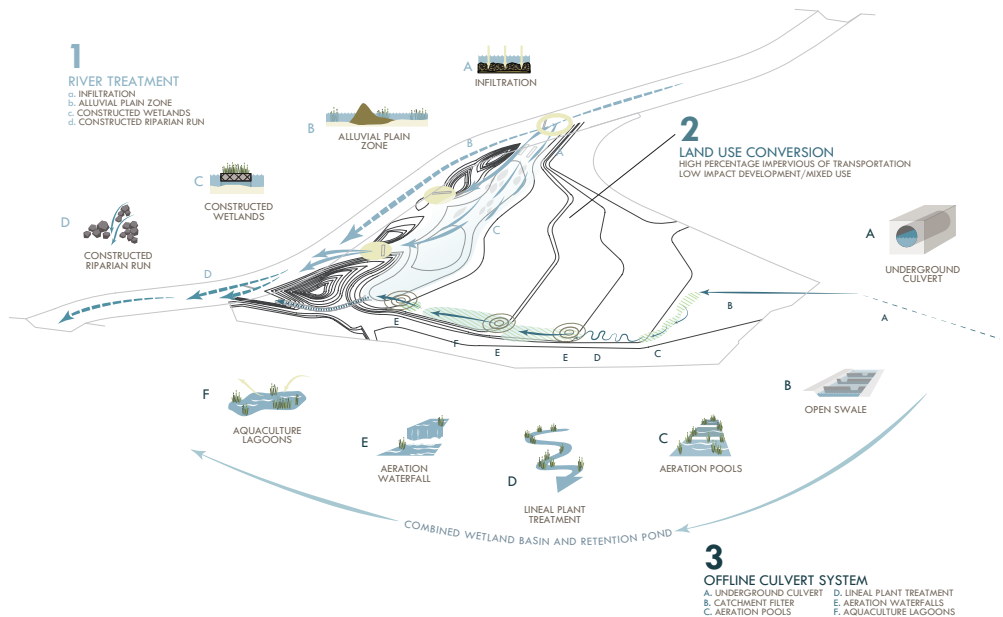
Utilizing the full extent of the property, the 125-acre parcel allows for the unique opportunity to significantly alter the river channel and create a new terrain that supports riparian habitat and provides public access while maintaining hydraulic performance during peak flows. This is achieved by removing the eastern portion of the trapezoidal channel and replacing the embankment with a series of islands, engineered to guide the primary flow of the river into the site. The heights and shape of the islands have been designed to attenuate the flows and create the opportunity to hold water through a system of inflatable dams located between the island forms. Within the site itself, a series of plateaus or benches have been established at elevations that relate to varying flood events and provide space for water to be held as a resource for reuse, percolate back into the local aquifer, as well as slowly release the water and return to the river's course.



Vision Diagram | Storm Event Management, Source:PYFST

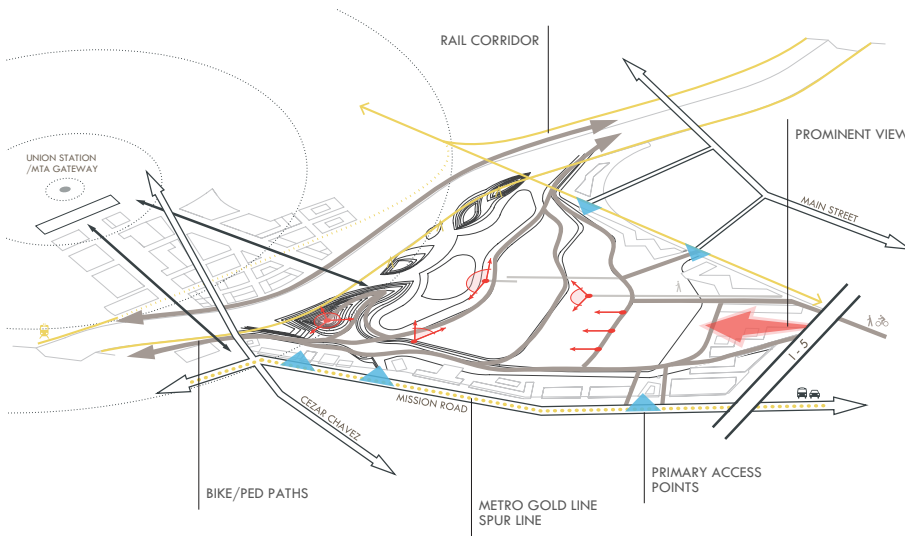
WATER QUALITY

The design of the Piggyback Yard site will improve water quality through a number of enhancements, including land use conversion of the site, improved ecological functioning of the L.A. River, and stormwater treatment technologies. The three primary treatment processes proposed include: 1) **River Treatment** - a combined strategy of infiltration, alluvial plains, constructed wetlands and a constructed riparian run to clean larger quantities of water during flood season, 2) **Land Use Conversion** - combining strategic grading generating a high percentage of land impervious of transportation with a low impact development area, and 3) **Offline Culvert System** - day-lighting an underground culvert through a lineal series of catchment filters, aeration pools and waterfalls, wetland treatment cells and aquaculture lagoons as a complete systematic treatment providing the ability to measure water quality processes.



Vision Diagram | Water Quality, Source:PYFST

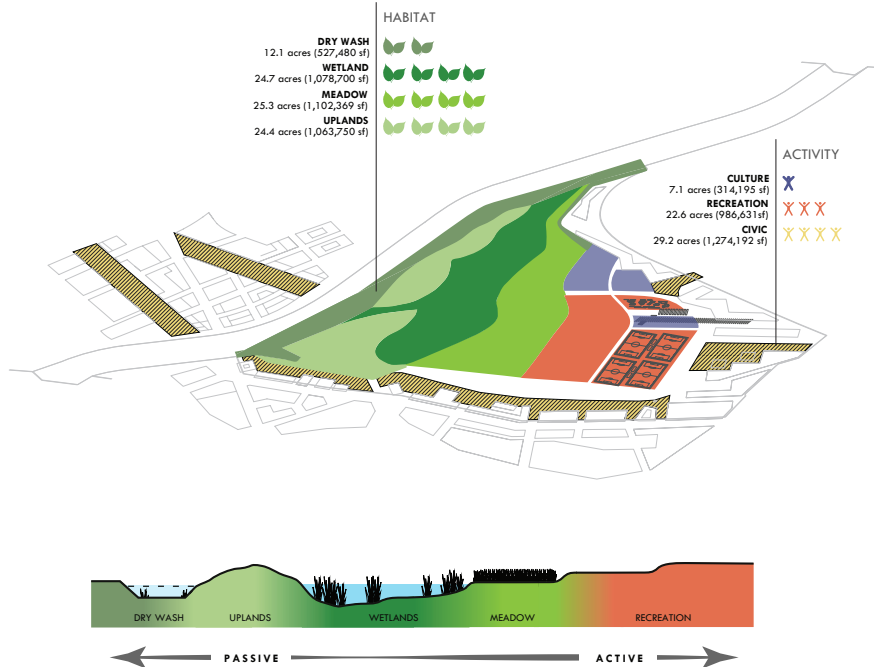
 **CONNECTIVITY**



Vision Diagram | Connectivity, Source:PYFST

The Piggyback Yard site is an incredible opportunity to improve connectivity between the neighborhoods of East LA and downtown. With respect to the lack of connections across the river, the streets that surround the site including Mission Road, Main Street, and Cesar Chavez, will serve a more vital role to connect pedestrians and cyclists. The site and river will afford new connections along and across the river's banks. In addition to physical connectivity, the importance of visual connectivity has also been considered as a valuable piece to tell the story of the river and formation of the city. Throughout the Piggyback Yard, a series of site specific areas take advantage of views back to downtown and give a sense for the dynamic forces of the river system and raising the level of environmental education. Combined the vision plan plays a significant role in continued improvements for mobility and opportunity for community oriented development.

 **HABITAT/ACTIVITY**



Vision Diagram | Habitat + Activity, Source:PYFST

Site programming is organized by elevation and proximity to the river; passive uses are located in the lower plateaus nearest to the river and increase in intensity moving up in elevation and away from the river helping orient people, ensure the sanctity of habitat areas, minimize maintenance, provide access, and heighten awareness of the site's relationship to the river. Each type of habitat represented is dependent on the diversion of the river flow and local runoff. Portions of the Upland area will be accessible to the public, while others will be dedicated wildlife areas. The Wetland area will receive the main flows from the river while the Dry Wash will remain predominantly dry throughout the year. The site anticipates water programming such as kayaking and canoeing during the wet seasons. The Meadow serves as a transitional space, creating a large habitat area that also offers passive programming and events. Higher elevations are reserved for more active recreation, cultural and civic spaces offering a diverse range of park type environments.

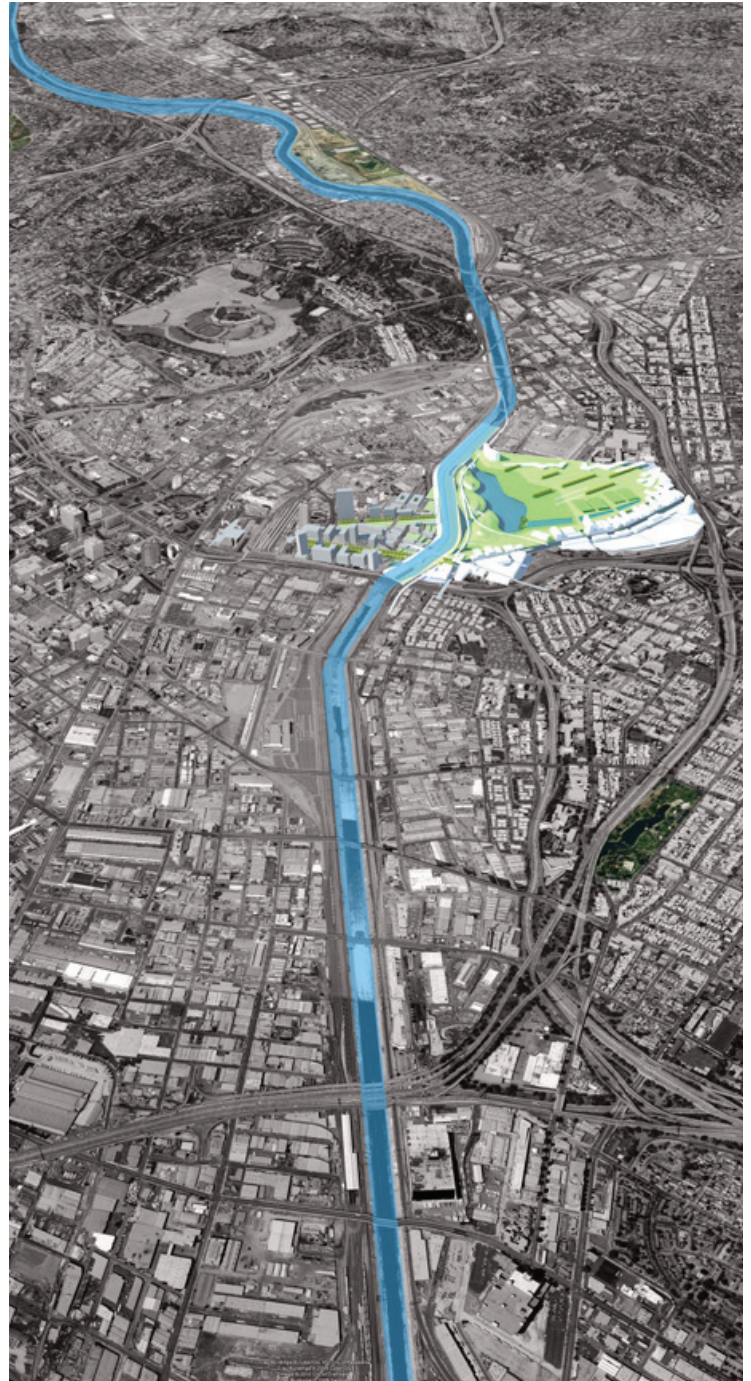
URBAN VITALITY + RESILIENCE

As a means to make our urban centers more vital, the transformation of central city industrial lands to accommodate metropolitan growth is simply a process of 21st century change. The significance of the nucleus of city's central space and ability to host significant populations within our cities urban centers will outweigh the burden of remediation of land and processes for unlocking historically controlled industrial properties. Los Angeles is actively recognizing the importance of the ability to accommodate for higher and better uses of derelict lands while preserving the industrial zoning. Through efforts like the Cleantech corridor the city is in the process of fostering a new industrial landscape that is compatible with urban residential growth and fosters an industrial sector that is cleaner, non-harmful, denser and more economically robust; sponsoring centers for technological advancement and sustainable/regenerative research.

Planning for the future, our cities must plan to recalibrate its infrastructural systems to handle the compounding effects of 20th Century urbanization combined with more frequent and severe storms as a result of climate change. Super Storm Sandy and Hurricane Katrina serve as tragic examples to the extent and severity of destruction that today's 21st Century Climatic events can bring. The Piggyback Yard represents the paradigm shift, signaling a departure from the region's 20th Century process of development (compromising land for the sake of ease of implementation and short-sighted planning) and signals the importance of large infrastructural change that provide long-lasting benefits for both the community and environment.

Recognizing that the L.A. River navigates through many conditions of urban places, neighborhoods, and naturalized areas, it should be stressed that the industrial corridor of Los Angeles is unique. Through the process of the Feasibility Study, the Piggyback Yard employs these urbanistic tenants towards the revitalization of the river and alignment of future redevelopment of sites along the downtown stretch:

- Increasing density within the Central City
- Creating livable places along the River
- Recalibrating infrastructure as "climate-ready"
- Reducing liability through environmental design
- Honoring the past while embracing our urban future



Overview of Piggyback Yard in Context of the LA River, Source:PYFST

CONCLUSION

The success of the Los Angeles River within downtown is contingent upon one factor – the presence of people. It is the call within this vision to make the river a livable green corridor for the city, one in which the engagement of people build a sense of pride, stewardship, and bond. As many of the lands around the river had been associated as industrial lands, the centrality of the city’s context will give way to higher land value and increase in density unimaginable to today’s market context.

The nature of the Piggyback Yard Project provides benefits that extend to environmental, social and economic realms. At its core service to the Los Angeles River and the City, the Piggyback Yard project will:

- Create extensive habitat area and publically accessible open space featuring a diverse array of passive and active programs,
- Develop a diverse redevelopment strategy to fulfill the needs of the community including housing, jobs, culture, safety, and identity,
- Enable access along the LA River that extends the LA River as a greenway along its course and surrounding neighborhoods,
- Provide a managed approach to hydrology for storm event attenuation and improve downstream water quality,
- Promote the City’s future economy with increased opportunities for research and development as the nexus of the Cleantech and Biotech Corridors.
- Establish a “River Destination” to host a vital place for Angelenos to live, work and play while demonstrating its commitment to ecology and the environment.

Beyond this Feasibility Study, the path forward to succeed with the successful implementation of the Piggyback Yard project will require the following:

- Finding a Regional Transportation Solution to negotiate the sale of the LATC
- Devise a Phasing Strategy that begins to assemble and realize the site development
- Determine an innovative finance strategy that leverages the environmental significance of the project and relationship to the LA River Revitalization efforts
- Structure a partnership from public and private sectors to implement, manage and govern the site that is supportive of community and stakeholder interests.

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PIGGYBACK YARD CONCEPTUAL MASTER PLAN (2010)

Piggyback Yard Collaborative Design Group

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Perkins+Will

Professional Awards

2012 LA Business Council, Design Concept Category
2011 SCA Development Forum, Un-built concept
2011 AIA California Council, Merit Award
2011 Westside Urban Forum, Open Space Award
2010 ASLA Southern California Chapter, Merit Award



CHANGE THE COURSE OF LA
LA RIVER REVITALIZATION CORPORATION



SANTA MONICA
MOUNTAINS CONSERVANCY

