LOS ANGELES COUNTY
METROPOLITAN TRANSPORTATION
AUTHORITY

LOS ANGELES RIVER BIKE PATH

TECHNICAL APPENDIX

MAY 31, 2016

Updated -July 12, 2017

KOA CORPORATION
PLANNING & ENGINEERING

Los Angeles River Bike Path

Feasibility Study

Technical Appendices

May 31, 2016

KOA CORPORATION
PLANNING & ENGINEERING

In association with:
Geosyntec Consultants
ICF International
Wagner Surveying & Engineering
W2 Design, Inc.

LIST OF APPENDICES

Appendix A

Draft Environmental Feasibility Technical Memorandum

DRAFT ENVIRONMENTAL FEASIBILITY TECHNICAL MEMORANDUM

LOS ANGELES RIVER BICYCLE PATH PROJECT

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ICF International. 2016. Los Angeles River Bicycle Path Project. Draft Environmental Feasibility Technical Memorandum. May (ICF 00401.15.) Los Angeles, CA. Prepared for KOA.

Purpose of Technical Memorandum

The purposes of this environmental feasibility technical memorandum are to determine the required National Environmental Policy Act (NEPA) and California Environmental Quality Act (CEQA) documentation for the Los Angeles River Bicycle Path Project (Project) and to identify whether there are potential environmental issues or constraints that could affect project design, alternatives, cost, schedule, or delivery of the Project.

Methodology

This memorandum uses a qualitative approach to identify potential environmental issues or constraints. No quantitative analysis including modeling has been conducted in the preparation of this analysis. To identify potential environmental issues or constraints, ICF technical specialists conducted desktop reviews, record searches, site visits and windshield surveys and consulted map resources.

Project Understanding

Background

Channelization of the Los Angeles River (LA River) began in the late 1930's for the primary purpose of proving flood protection. The Los Angeles River Revitalization Master Plan (LARRMP) incorporates active transportation infrastructure as a key element of accessibility and mobility for the Los Angeles River, and addresses the need to have a regionally connected bicycle path network. A key objective in the implementation of the LARRMP is closing a significant 8-mile gap in the Los Angeles River bicycle and pedestrian facilities, between Riverside Drive at Elysian Valley and Atlantic Blvd in the City of Vernon. The Project would include the construction of a bicycle path in this area and, therefore, would help meet this objective of the LARRMP.

Existing Setting

The Project area is located in the Cities of Los Angeles and Vernon in Los Angeles County. Specifically, the Project area includes a stretch of the Los Angeles River, which is characterized by a concrete channel surrounded by active train tracks and mostly industrial uses along each side of the channel. This stretch of the LA River is located east of downtown Los Angeles. Notable land uses in the surrounding area include Elysian Valley, which is located near this stretch of the LA River on the northern end of the Project area. Portions of the LA River contain areas of riparian vegetation.

Project

The Project would include the installation of a Class I Bicycle Path (Project) along the western bank of the Los Angeles River (River) between Riverside Drive and Atlantic Boulevard within downtown Los Angeles and the City of Vernon. The bicycle path could be located within the river channel, along the upper bank or a combination of both.

The Project alignment would include a standard 12-foot wide path, which would allow for two-directional travel. Under the three options, the proposed alignment would traverse properties owned or managed by private, state, and federal entities. Trail easements and/or public access

agreements will be required to cross properties owned or managed by Metro, Southern California Regional Rail Authority (SCRRA, Los Angeles Department of Water and Power (LADWP), Los Angeles Bureau of Engineering (BOE), and the United States Army Corp of Engineers (USACE). The easements will likely include considerations related to the construction and maintenance of the bike path and covenants to allow access to the general public for the purpose of walking, jogging, running, bicycling and like activities.

For the purposes of this memorandum, the Project alignment is described by reach.

Reach 1: Between Riverside Drive and SR-110

Reach 1 has mostly open space along the upper bank. There is a Union Pacific Railroad crossing the path just north of the Arroyo Seco Parkway (CA-110) overpass. This reach is approximately 0.5-miles long. At the north end, it would connect with the existing Class I bicycle path north of I-5.

Reach 2: Between SR-110 and Spring Street

Reach 2 has mostly open space except at five locations where there is an electrical tower obstructing the path. This reach is approximately 1-mile long.

Reach 3: Between Spring Street and Cesar Chavez Avenue

Reach 3 has limited space along the upper bank having obstructions with bridge abutments at Main Street, Cesar Chavez Avenue, and two railroad crossings. This reach is approximately 1-mile long.

Reach 4: Between Cesar Chavez Avenue and Bandini Boulevard

Reach 4 is heavily obstructed along the upper bank by numerous electrical towers, bridge abutments, and adjacent parallel running rail lines. This reach is approximately 3.5-miles long.

Reach 5: Between Bandini Boulevard and Atlantic Boulevard

Reach 5 has limited space along the upper bank having obstructions with two electrical towers and with bridge abutments at Downey Road, Atlantic Boulevard, and one railroad crossing. This reach is approximately 2.5 miles long.

Access Points

The table below identifies destinations and connectivity at each crossing point categorized by leisure/recreation, commuting (neighborhoods/schools), bicycle network connectivity, and transit network connectivity.

Table 1: Destinations and Connectivity of Project Access Points

	Destinations and Connectivity			
Access Point	**Leisure / Recreation**	**Commuting (Neighborhoods/ Jobs/Schools)**	**Bike Network Connectivity**	**Transit Network Connectivity**
Riverside Drive	Elysian Park Confluence Park Dodger Stadium River-Adjacent pocket parks (Marsh Street Nature Park, Elysian Valley Gateway Park, Steelhead Park, Oso Park, Egret Park) Rio de Los Angeles State Park /Taylor Yard (Future)	Near Elysian Valley neighborhood Industrial areas in Elysian Valley	LA River Bike Path Tier 2 bike lane (Future – LAMP, 2015)	Metro Local 96 on Riverside Drive
Broadway Bridge	Elysian Park Radio Hill Gardens Dodger Stadium Chavez Ravine Arboretum Downey Recreational Center	Chinatown Cathedral HS Lincoln Heights neighborhood (LH) Broadway commercial corridor (LH) LH Industrial (north of Broadway) Abraham Lincoln HS (LH)	Protected Bike Lanes on N. Broadway (Future – LAMP, 2015) Proposed Arroyo Seco Class I bike path (connect via Avenue 19 – Future)	Chinatown Gold Line Station Metro Local 45, 28, 83, 84/68 DASH Lincoln Heights/ Chinatown Moderate Plus Transit Enhanced Street (Future – LAMP, 2015)
Spring Street Bridge	Los Angeles State Historic Park Downey Recreational Center (LH)	Chinatown Lincoln Heights neighborhood (LH) Broadway commercial corridor (LH) LH Industrial (north of Broadway) Abraham Lincoln HS (LH)	Spring Street sharrows (Existing) Spring Street bike lanes (Future – LABP, 2010)	Chinatown Gold Line Station

	Destinations and Connectivity			
Access Point	**Leisure / Recreation**	**Commuting (Neighborhoods/ Jobs/Schools)**	**Bike Network Connectivity**	**Transit Network Connectivity**
Main Street Bridge	San Antonio Winery Lincoln Park Olvera Street and El Pueblo de Los Angeles	Chinatown LAC/USC Medical Center Lincoln Heights neighborhood William Mead Homes (Public Housing) Industrial and warehousing uses near Cornfields and Lincoln Heights DWP Main Street Center	Protected Bike Lanes on Main St. (Future – LABP, 2010)	LA Union Station Chinatown Gold Line Station Metro Local 76 DASH Lincoln Heights/Chinatown Moderate Transit Enhanced Street (Future – LAMP, 2015)
Cesar Chavez Avenue Bridge	Olvera Street and El Pueblo de Los Angeles Prospect Park Evergreen Cemetery	Chinatown Boyle Heights neighborhood (BH) White Memorial Medical Center Cesar Chavez commercial corridor (BH) School of Visual and Performing Arts	Bike Lanes on Cesar Chavez (Future – LABP, 2010)	LA Union Station Metro Local 68, 84 Moderate Plus Transit Enhanced Street (Future – LAMP, 2015)
1st Street Bridge	Little Tokyo/Arts District Grand Park Disney Concert Hall Cathedral of Our Lady of the Angels Music Center Mariachi Plaza (BH) Pecan Rec. Center (BH)	LA Civic Center LA County Superior Court & Courthouse Little Tokyo/Arts District BH neighborhood 1st St. commercial (BH) East LA HS (BH)	1st Street bike lanes (Existing) 1st Street protected bike lanes (Future – LAMP, 2015)	Little Tokyo/Arts District Station (Gold Line) Pico/Aliso Station (Gold Line) Metro Local 30/330

	Destinations and Connectivity			
Access Point	**Leisure / Recreation**	**Commuting (Neighborhoods/ Jobs/Schools)**	**Bike Network Connectivity**	**Transit Network Connectivity**
4th Street Bridge	Little Tokyo/Arts District Pershing Square Hollenbeck Park Aliso/Pico Recreation Center Evergreen Recreational Center	Downtown LA Central City District Historic Downtown Little Tokyo/Arts District Boyle Heights neighborhood Roosevelt High School Southern California Institute of Architecture (SciArch) LA Metro Red/Purple Line maintenance yards Boyle Heights industrial area		Montebello Bus Lines 40, 341/342 DASH Arts District
7th Street	Fashion District Jewelry District Macy's Plaza FIGat7th Boyle Heights Sports Center	Downtown LA Central City District Historic Downtown Arts District Boyle Heights Salesian High School (BH) Boyle Heights industrial area DTLA Warehouse District Fashion District DTLA Central Industrial District LA Metro Bus Maintenance Yard	7th Street bike lanes (Future – LABP, 2010)	7th Street/Metro Center Station Metro Local 62

	Destinations and Connectivity			
Access Point	**Leisure / Recreation**	**Commuting (Neighborhoods/ Jobs/Schools)**	**Bike Network Connectivity**	**Transit Network Connectivity**
Olympic Boulevard	LA LIVE Staples Center Los Angeles Convention Center Fashion District South Park district Sears Building (BH)	LA LIVE Fashion District DTLA Warehouse District DTLA Produce District DTLA Central Industrial District Boyle Heights industrial area Wyvernwood Public Housing (BH) Estrada Courts Public Housing (BH) Lou Costello Junior Youth Center (BH)	Olympic Boulevard bike lanes (Future – LABP, 2010)	Metro Local 66 Pico Station (Blue/Expo Lines) Moderate Plus Transit Enhanced Street (Future – LAMP, 2015)
Washington Boulevard	Maker City LA / LA Mart	DTLA Central Industrial District LA Trade Tech LA Traffic Court BNSF Hobart Railyard Frida Kahlo HS Santee Educational Complex South LA neighborhood	Washington Boulevard bike lane (Future – LABP, 2010)	Washington Station (Blue Line) Montebello Bus M50
26th Street Bridge		Vernon industrial area BNSF Hobart Railyard Santa Fe Art Colony South LA neighborhood		
Soto Street Bridge		Vernon industrial area Boyle Heights industrial area Huntington Park industrial and residential areas		Metro Local 251 Metro Rapid 751

Access Point	Destinations and Connectivity			
	Leisure / Recreation	**Commuting (Neighborhoods/ Jobs/Schools)**	**Bike Network Connectivity**	**Transit Network Connectivity**
Bandini Boulevard Bridge		Vernon industrial area Exxon Mobil FedEx Ground UPS Farmer John Vernon Civic Center South LA neighborhood Jefferson High School		Metro Local 251 Metro Rapid 751
Downey Road Bridge		Vernon industrial area UPS BNSF Hobart Railyard Maywood and Huntington Park		Metro Local 254
Atlantic Boulevard Bridge	Citadel Outlets	Vernon industrial area FedEx Freight Bell Industrial District BNSF Hobart Railyard Atlantic and Slauson Commercial Corridors City of Maywood, Commerce, and Bell residential areas		Metro Local 260 Metro Rapid 762

Sources: KOA, 2015.
Field observations and Google Earth/Maps
Los Angeles Bike Master Plan (LABP), 2010
Los Angeles Mobility Plan (LAMP), 2015
Downtown Center Business Improvement District, 2015
Los Angeles County Metropolitan Transportation Authority (Metro), 2015

Preliminary Environmental Analysis

Archaeological and Paleontological Resources

The analysis of potential archaeological and paleontological resources issues and constraints was conducted by ICF archaeology staff and included a review of available data for prehistoric and historical archaeology, paleontology, and Tribal Cultural Resources (TCR). TCRs are a new class of CEQA cultural resource, defined by the recent Assembly Bill 52 (AB 52). TCRs are defined as "sites, features, places, cultural landscapes, sacred places, and objects with a cultural value to a California Native American Tribe" that are included or eligible for inclusion in the California Register of Historical Resources, or in a local register of historical resources.

Section 106 compliance will also be required, including Native American consultation by the lead agency, the US Army Corps of Engineers.

For this review, sources consulted included:

- Conceptual exhibits and renderings illustrating the potential alignment(s) of the bike path.
- A draft of the KOA Corporation's report regarding the structural and financial feasibility for the project, dated November 23, 2015.
- Photographs from the proposed project vicinity.
- Google mapping data; Google Earth aerial photography, Street View, and Data.

Information and data gathered for previous projects adjacent to the proposed bike path also informed this analysis. A sample of these adjacent projects include:

- California High Speed Rail—Los Angeles to Anaheim segment
- Los Angeles Union Station Run-Through Project
- Metropolitan Water District of Southern California Headquarters Project
- Metro Goldline Project (various phases)
- Metro El Monte Busway Improvement Project
- Metro Division 13 Maintenance Facility Project
- LA River Waterwheel Installation Project
- Parker Center Replacement Project
- Caltrans District 7 Headquarters Replacement Project

Known Resources & Sensitivity Analysis

The 8-mile project path has been divided by into five reaches based on the upper bank conditions. The archaeological, Tribal, and paleontological setting for each reach is described below, and known archaeological and Tribal sites discussed.

Reach 1: Between Riverside Drive and SR-110

Reach 1, approximately 0.5-miles long, would be situated on the west bank of the Los Angeles River, where the river contacts the steep side slopes of the hills that form Elysian Park. In this location, the LA River runs between the Elysian Hills on the west and Mount Washington/the Montecito Heights to the east, a constriction of the river known as the "Narrows" (Gumprecht 1999)

For archaeological resources, this area is probably too steep to have been used prehistorically. It is unlikely to preserve any prehistoric or historical archaeological resources due to cutting and disturbance for the river channelization and for construction of the SR-110 onramp at the base of the hills. No Tribal Cultural Resources are known to be present in this reach. In this reach, bedrock is exposed at or near the modern surface, and paleontological resources may be encountered during shallow excavations or grading.

Reach 2: Between SR-110 and Spring Street

Reach 2, approximately 1-mile long, needs to be considered in two parts for archaeological and paleontological sensitivity.

North Part of Reach 2: The north part of this reach, from SR 110 to about the Broadway Bridge, is similar to Reach 1 in configuration and sensitivity, that is, being at the base of the steep slope of the Elysian Hills, with bedrock exposed at or near the surface. Archaeological resources are unlikely, paleontological resources may be encountered during shallow excavations or grading. No Tribal Cultural Resources are known to be present in this portion of Reach 2.

South Part of Reach 2: South of the Broadway Bridge to Spring Street, Reach 2 is situated on the broad expanse of alluvial deposits that are south of the Narrows of the LA River. This expanse of thick alluvial deposits left by the Los Angeles River increases in age at depth. Archaeological resources may be preserved within a few inches of the ground surface in undisturbed sediments, while paleontological resources are preserved only at depth, possibly as much as 10 to 15 feet below the modern ground surface, due to the age of the sediments.

Extensive amounts of archaeology have been done in the Los Angeles State Historic Park, also known as the Cornfield Yards, just west of the south portion of Reach 2. Historical archaeological materials related to railroad use of the Cornfield Yards have been recovered, and a portion of the Zanja Madre water feature is preserved in the Park (Gust and Pritchard Parker 2004). No prehistoric artifacts or features have been found. In this portion of Reach 2, archaeological features or artifacts may be present in undisturbed sediments. However, there is a low probability for buried archaeological features in this segment of the bike path due to the extent of previous disturbance for construction of the railroad tracks and channelization of the Los Angeles River. This is especially the case if the bike path is constructed in the LA River Channel—which is likely built in recent alluvial sediments not old enough to encompass prehistoric deposits or paleontological resources. No Tribal Cultural Resources are known to be present in this portion of Reach 2. In this portion of Reach 2, bedrock is deeply buried under alluvial sediments, probably at depths greater than 15 feet. However, paleontological resources may be preserved at depths greater than 5 feet in undisturbed older alluvial sediments.

Reach 3: Between Spring Street and Cesar Chavez Avenue

Reach 3 is approximately 1-mile long, and continues to run across the extensive alluvial flats deposited by the LA River in this area.

Archaeological and paleontological sensitivity in Reach 3 are the same as in the southern portion of Reach 2. It should be noted that extensive prehistoric and historical archaeological resources have been recovered during excavations at Los Angeles Union Station, approximately 2,100 feet west of the proposed bike path (Goldberg et al 1998; Greenwood 1996). This site may be the location of the prehistoric Native American village of Yaagn'a, and this might be considered a TCR. Prehistoric deposits in the Union Station area have included human remains, and there is a small possibility these deposits could extend into the bike path. Again, however, this is unlikely due to the extent of previous disturbance for construction of the railroad tracks and channelization of the Los Angeles River.

Reach 4: Between Cesar Chavez Avenue and Bandini Boulevard

Reach 4 is the longest reach, extending for approximately 3.5-miles. This reach has the same geological setting as Reach 3 and the south portion of Reach 2—that is, situated on a broad expanse of recent alluvial deposits, with an unknown, but probably low potential for both archaeological and paleontological resources to be preserved due to the age of the sediments and modern disturbances.

As noted above, the very northern end of this reach does pass adjacent to Union Station, where extensive prehistoric deposits have been found, and there is a small possibility these could deposits could extend into the bike path. This village site may be considered a TCR, however, whether this TCR extends into the bike path is unknown.

A scattering of small historical archaeological sites are recorded adjacent to Reach 4 in the streets near the Los Angeles River. However, the great majority of these cultural resources are not significant, consisting for example of granite curb stones, fragments of buried railroad tracks, or historical refuse deposits. This Reach does pass through one known cultural resource (Starzack 1994), the Atchison, Topeka and Santa Fe Railway Redondo Junction/Butte Street Railroad Yard District (19-174989). Although recorded as a built environment resource, this Yard has the potential to encompass historical archaeological resources. No TCRs are known to be present in this reach.

As in Reach 3 and the south portion of Reach 2, bedrock is deeply buried under alluvial sediments, probably at depths greater than 15 feet. However, older undisturbed alluvial sediments may preserve paleontological resources at depths greater than 5 feet.

Reach 5: Between Bandini Boulevard and Atlantic Boulevard

Reach 5 is approximately 2.5-miles long. This Reach is similar to Reach 3 and Reach 4 in setting and sensitivity.

Potential Archaeological & Paleontological Impacts/Constraints

The Project is governed by both federal law—NEPA and Section 106, and state law, CEQA. Section 106 of the National Historic Preservation Act (NHPA) of 1966, as amended, sets forth national policy and procedures for historic properties, defined as districts, sites, buildings, structures, and objects included in or eligible for listing in the National Register of Historic Places (National Register). Section 106 of the NHPA requires federal agencies to take into account the effects of their undertakings on historic properties. Section 106 and NEPA do not include TCRs or paleontological resources as required by CEQA. However, Native American Traditional Cultural Properties are encompassed by Section 106.

In accordance with Section 21084.1 of CEQA, the Project would have a significant adverse environmental impact if it causes a substantial or potentially substantial adverse change in the significance of a historical resource. CEQA includes paleontological resources in the historical resources analysis. As defined by CEQA (Public Resources Code [PRC] Section 21084.1), historical resources include any resource listed, or determined eligible for listing, in the California Register of Historical Resources (CRHR).

No archaeological, Tribal, or paleontological resources are known to be present in the footprint of the proposed project. However, during ground-disturbing construction activities (e.g., grading, trenching), there is the potential to disturb previously unknown subsurface archaeological, Tribal, and paleontological resources. This could result in a significant impact, and would require implementation of standard mitigation measures to reduce impacts to less-than-significant levels.

Operation of the bike path would have no impact on archaeological, Tribal, or paleontological resources.

Conclusions and Recommendations

As part of the CEQA and NEPA environmental documentation for the Project, a technical analysis should be prepared, including archaeological and paleontological record searches, and Native American consultation. Native American consultation, both for Section 106 and for the new AB 52 requirements, can be time consuming, and might take three months or more to complete.

Compliance with Section 106 of the National Historic Preservation Act would require preparation of a standalone technical study for archaeological resources to Section 106 standards, for submittal to USACOE. A standalone technical study for paleontological resources is probably not warranted.

Historical Resources

This feasibility study was carried out by ICF architectural historians based on a review of available data including:

- Conceptual exhibits and renderings illustrating the potential alignment(s) of the bike path.
- A draft of the KOA Corporation's report regarding the structural and financial feasibility for the project, dated November 23, 2015.
- Photographs from the Project vicinity.
- Google mapping data; Google Earth aerial photography, Street View, and Data.
- City of Los Angeles Office of Historic Resources website: preservation.lacity.org and HIstoricPlacesLA.org
- Caltrans Historic Bridge Inventory: http://www.dot.ca.gov/hq/structur/strmaint/historic.htm
- BridgeHunter: http://bridgehunter.com/category/waterway/los-angeles-river/
- The study focuses primarily on identifying known historical resources that could be affected by Project construction and/or operation.

Historical Resources

For discussion purposes, the project is broken into 5 reaches, Reach 1 through Reach 5. As noted in the Final Integrated Feasibility Report for the Los Angeles River Ecosystem Restoration (September 2015) the containment and flood risk management facilities on the Los Angeles River and its tributaries, maybe be eligible for listing in the National Register of Historic Places.

Reach 1: Between Riverside Drive and SR-110

The only historical resource located in Reach 1 was the Riverside-Figueroa Bridge. However, despite its designation as Los Angeles Historic Cultural Monument (LAHCM) 908, it is in the process of being demolished to make way for a new crossing at this location.

Reach 2: Between SR-110 and Spring Street

Two historical resources are located in Reach 2. The first is the North Broadway-Buena Vista Bridge, which is not only an LAHCM (907), but has been determined eligible for listing in the National Register of Historic Places (NRHP) through the Section 106 of the National Historic Preservation Act (NHPA) process. Properties determined eligible for listing on the NRHP are listed in the California Register of Historical Resources (CRHR) and are considered historical resources for the purposes of CEQA.

The second is the North Spring Street Bridge, LAHCM 900. It too has been recommended eligible for the NRHP.

Reach 3: Between Spring Street and Cesar Chavez Avenue

The only known historical resource located in Reach 3 is the North Main Street Bridge, LAHCM 901 and eligible for listing the NRHP.

Reach 4: Between Cesar Chavez Avenue and Bandini Boulevard

There are seven known historical resources located in Reach 4. All are LAHCMs; in addition, all have also been determined eligible for the NRHP.

a. Macy Street Viaduct, LAHCM 224
b. First Street Bridge, LAHCM 909
c. Fourth Street Bridge, LAHCM 906 and NRHP-eligible
d. Sixth Street Bridge, LAHCM 905 and NRHP-eligible
e. Seventh Street Bridge, LAHCM 904, and NRHP-eligible
f. Olympic Street Bridge/Ninth Street Bridge, LAHCM 902
g. Washington Boulevard Bridge, LAHCM 903 and NRHP-eligible.

The Sixth Street Bridge will be demolished in 2016 in anticipation of the construction of a replacement at the same location. In addition, the SurveyLA project, which is identifying and documenting significant historic resources in the City of Los Angeles and is being coordinated by the Office of Historic Resources, has surveyed an area along the west side of the Project. The Central City North survey was completed in 2015 and the results will be released in 2016. This survey may identify historic resources not yet listed on the local, state, or national registers.

Reach 5: Between Bandini Boulevard and Atlantic Boulevard

Reach 5 is outside the municipal boundary of the City of Los Angeles, in unincorporated Los Angeles County. Although the County recently approved a historic preservation ordinance, it does not maintain a register of historic resources. There are no known NRHP-eligible or listed historic properties within Reach 5.

Potential Historical Resources Impacts/Constraints

Impacts to historical resources occur when the significance of said resources is materially impaired. Project construction, that includes demolition, relocation, and/or rehabilitation or alteration that does not meet the Secretary of the Interior's Standards for Rehabilitation of or to historical resources may cause a substantial adverse change in the significance of a historical resource, resulting in an impact. Once the Project is completed, no impacts to historical resources are anticipated.

Conclusions

Additional study of the Project's potential impacts to historical resources will be required as part of the CEQA and NEPA documentation once more detailed project information is available. Construction-related modifications and alterations to any of the historic Los Angeles River bridges are potential environmental constraints that could affect project design or the viability of potential alternatives.

Biological Resources

The analysis of potential biological resources issues and constraints conducted for this study is based on the following:

- A desktop aerial photo review (December 6, 2015),
- Search of the California Department of Fish and Wildlife California Natural Diversity Database (CNDDB) (December 6, 2015),
- CNPS Online Inventory (December 6, 2015), and
- A vehicular survey of the project area.

Access was extremely limited during a reconnaissance-level site visit conducted on December 7, 2015 by ICF Senior Biologist James Hickman; however, every attempt was made to view the alignment.

The Project area is described as a developed urban setting. The Los Angeles River itself is concrete lined throughout the alignment. The surrounding area includes an active railway along the alignment parallel to the river, and dense urban development (industrial, commercial, and residential) surrounding the alignment. There are only a few small (up to 6 acres but typically less than 1 acre), isolated vacant lots within or adjacent to the alignment. Where vacant lots are found, most can be described as being lay-down yards or under construction; therefore, are highly disturbed in nature. All vacant lots that were found were either bare ground or supported only ruderal vegetation. No area of native vegetation was found within the alignment during the site visit; however, an area with small pockets of native vegetation was found west of the alignment, and across the railway, in Elysian Park. Numerous bridges cross the alignment at various locations throughout.

Database Review

A review of the CNDDB indicates mostly old reports (over 50 years old) of a variety of special-status plant and wildlife species that used the area prior to the extensive development of the area, including: Least Bell's Vireo (*Vireo bellii pusillus*; State and Federally Endangered), Southwestern Willow Flycatcher (*Empidonax traillii extimus*; State and Federally Endangered), Burrowing Owl (*Athene cunicularia*; California Species of Special Concern [CSC]), coast horned lizard (*Phrynosoma blainvillii*; CSC), and American badger (*Taxidea taxus*; CSC). A number of species (including Peregrine Falcon (*Falco peregrinus anatum*; State Fully Protected), big free-tailed bat (*Nyctinomops macrotis*; CSC), western mastiff bat (*Eumops perotis californicus*; CSC), and western yellow bat (*Lasiurus xanthinus*; CSC)) have also been recorded in the past 20 years.

Potential Biological Resources Impacts/Constraints

Due to the urban setting and the lack of connectivity to natural vegetation communities, the potential for special-status wildlife is generally low. There is, however, a low to moderate potential for some special-status species to use the project area, including Burrowing Owl (where burrows occur in vacant lots or along the river), Peregrine Falcon (may use nearby buildings and bridges), and several bat species (bridges and buildings). Impacts to these species could occur if the species are present and if habitat will be directly affected (i.e., impacts to a bridge or potential Burrowing owl burrows) or indirectly affected (i.e., increased levels of noise or vibrations below a colonial bat maternity roost).

In addition to the above species, the proposed alignment and surrounding area include suitable habitat for nesting migratory birds.

There is also a low potential for special status-plant species to occur in non-paved portions of the surveyed area; however, there is no reasonable potential for these species to occur within the paved/concrete portions, which appears to include all or nearly all of the alignment.

In order to properly evaluate the potential to impacts special-status species, the identification of disturbance limits is required and appropriate access would be needed to evaluate the habitat appropriately. Bridges within and within 100 feet of the disturbance limits should be evaluated to identify potential colonial bat roosts and for the potential use by nesting migratory birds (including burrowing owl). Due to a lack of suitable foraging habitat, there is a low potential for burrowing owl to occur in the surveyed area; however, the entire disturbance limits, plus a 300-foot buffer should be evaluated to identify potential Burrowing Owl burrows. An additional 200-foot buffer should be evaluated visually. If suitable burrows (i.e., California ground squirrel [Spermophilus beecheyi] burrows) are present, further analysis may be required to identify if the species is present (if required, focused surveys would be required to occur between February and July). If work occurs between February 15 and September 15, there is a potential for impacts to nesting birds. Nesting bird surveys would be required to avoid impacts to nesting birds. Further, any staging areas and/or other disturbance limits that include non-paved/concreted areas should be evaluated for the potential for special-status plants. If suitable habitat is found, focused surveys may be required (dates are species-dependent, but most likely to occur during the spring and/or summer).

Waters potentially subject to U.S. Clean Water Act Sections 401 and 404, and CDFG Code Section 1600 et. Seq. are found within the project alignment (i.e., the Los Angeles River). A formal jurisdictional delineation would be required to further identify, map, and classify these resources. Impacts to jurisdictional waters may require coverage under a CWA 404 Permit, 401 Certification, and a Streambed Alteration Agreement.

Conclusions/Recommendations

Additional study of the Project's potential biological impacts as part of the CEQA/NEPA documentation would be required once the Project area is accessible. Potential biological constraints may include seasonal restrictions and/or minimization measures to reduce potential impacts to bats and nesting birds if suitable habitat exists.

Air Quality

The analysis of potential air quality issues and constraints was conducted by ICF air quality staff based on a review of available data including:

- Conceptual exhibits and renderings illustrating the potential alignment(s) of the bike path.
- A draft of the KOA Corporation's report regarding the structural and financial feasibility for the project, dated November 23, 2015.
- Photographs from the Project vicinity.
- Google mapping data; Google Earth aerial photography, Street View, and Data.
- Air quality standards from the South Coast Air Quality Management District (SCAQMD)
- The study focuses primarily on identifying nearby sensitive receptors that could be affected by pollutants generated during project construction.

Sensitive Receptors

The closest sensitive receptors to the proposed bike path would be located approximately 250 feet away, and include the Buena Vista Meadow Picnic Area and the Los Angeles State Historic Park in Reach 2; and a portion of the William Mead Homes in Reach 3. All other sensitive receptors in the general vicinity of the proposed bike path, which includes additional residences and schools, are located at least 250 feet from the proposed alignment.

Potential Air Quality Impacts/Constraints

Emissions of air pollutants associated with the project would occur almost entirely within the construction period, which would require the use of diesel-powered equipment and machinery. Although project construction activities are not expected to result in significant impacts with respect to air quality, it is recommended that the quantification of the construction-period emissions be undertaken to demonstrate with substantial evidence that impacts would be less than significant under CEQA and not adverse under NEPA. The thresholds of significance that would be used would be the SCAQMD regional mass thresholds and the localized significance thresholds (see Table 2). For the localized significance thresholds, a one-acre site is assumed and the minimum distance of receptors from work sites (50 meters) in Source Receptor Area 1 is assumed.[1]

[1] Although 250 feet (76 meters) is the closest sensitive receptor to the proposed alignment, 50 meters is suggested as the receptor distance to be conservative.

Table 2. Air Quality Thresholds

	Regional Mass Emissions Thresholds		Localized Significance Thresholds	
Pollutant	**Construction**	**Operation**	**Construction**	**Operation**
			50 m	50 m
Nitrogen Oxides (NO_X)	100	55	74	74
Volatile Organic Compounds (VOC)	75	55	n/a	n/a
Suspended Particulate Matter (PM10)	150	150	15	4
Fine Particulate Matter (PM2.5)	55	55	5	2
Sulfur Oxides (SO_X)	150	150	n/a	n/a
Carbon Monoxide (CO)	550	550	882	882
Lead[b]	3	3	n/a	n/a

Source: South Coast Air Quality Management District 2015.

[a] Localized significance thresholds (LST) derived from SCAQMD's most recent LST tables are based on the project location (SRA 1, Central Los Angeles), the project area disturbed in any given day (1 acre), and the distance to the nearest sensitive receptor (50 meters). SCAQMD has not developed LSTs for VOC, SO_X, or lead emissions.

[b] The Project would result in no lead emissions sources during the construction or operations period. As such, lead emissions are not evaluated herein.

LST = Localized Significance Threshold; m = meters; n/a = not available; SCAQMD = South Coast Air Quality Management District; SRA = Source Receptor Area

Once constructed, the bike path would generate negligible emissions of air pollutants, nearly all of which would occur as a result of the use of vehicles and other machinery needed to maintain the path. Such maintenance would be intermittent and impacts would likely be less than significant. Furthermore, to the extent that trips along the bike path would displace vehicle trips, there would be a corresponding reduction in pollutants and a net benefit to air quality. Consequently, a quantitative analysis of operational air quality impacts resulting from bike path implementation would not be necessary.

Based on the available data and the location of the proposed bike path along a right of way that functions primarily as a flood control channel with adjacent rail uses, it is not likely that the project would have a meaningful impact on auto traffic patterns in the study area. This is based on the assumption that the Project would not affect roadway capacities. However, if future analysis includes a traffic study for the project, then the traffic study would be evaluated to assess whether the project effects could cause noticeable changes in pollutant emissions.

It is assumed that pedestrians and cyclists would primarily be using the proposed bike path to reach other destinations and would not remain in any particular location for extended periods of time, and therefore, the path itself would not be considered a sensitive receptor. Although the path would bring pedestrians and cyclists in closer proximity to industrial, roadway, and rail uses than at present, the nature of the bike path as a pedestrian and cycling thoroughfare indicates that exposure of bike path users to pollutant emissions from neighboring uses would be brief and would not have a substantial effect on human health. Consequently, a quantified health risk assessment would not be necessary.

As a bicycle and pedestrian facility, the Project would not be subject to the requirement to determine air quality conformity at either the regional or project levels, as specified in Table 2 of 40 CFR § 93.126. The project documentation would reflect that the Project is not subject to the conformity determination requirement.

Greenhouse gases (GHGs) would be generated throughout the course of construction as a result of the use of construction vehicles and equipment. Although it is unlikely that project construction activities would generate substantial amounts of GHGs, it is recommended that effects be quantified to demonstrate with substantial evidence that impacts would be less than significant under CEQA and not adverse under NEPA. Operational impacts would be negligible or would result in GHG reductions to the extent that the bike path is able to displace trips in automobiles. Only intermittent maintenance activities would generate GHGs and operational effects could be analyzed briefly in a qualitative manner.

Conclusions/Recommendations

Additional study of the Project's potential air quality impacts would be required as part of the CEQA and NEPA documentation once more detailed project information becomes available. However, the Project's air quality impacts are not expected to pose a constraint on implementation or the design of the Project.

Noise

The analysis of potential noise issues and constraints was conducted by ICF noise staff based on a review of available data including:

- Conceptual exhibits and renderings illustrating the potential alignment(s) of the bike path.
- A draft of the KOA Corporation's report regarding the structural and financial feasibility for the project, dated November 23, 2015.
- Photographs from the Project vicinity.
- Google mapping data; Google Earth aerial photography, Street View, and Data.
- Noise standards of the potentially-affected municipalities (County of Los Angeles, City of Los Angeles, City of Vernon, and City of Maywood).

The analysis focuses primarily on identifying nearby noise-sensitive receptors that could be affected by noise and vibration generated during project construction.

Noise-Sensitive Receptors

For discussion purposes, the project is broken into 5 reaches, Reach 1 through Reach 5. The noise-sensitive receptors adjacent to each Reach are described in the following sections.

Reach 1: Between Riverside Drive and SR-110

Reach 1 has mostly open space along the western bank. This area does not appear to be noise-sensitive, because it does not contain areas of frequent human use. Confluence Park, located on the east side of the River would be considered noise-sensitive, but it is noted that this park is over 500 feet from the proposed bike path.

Reach 2: Between SR-110 and Spring Street

Reach 2 has open space to the west with limited areas of frequent human use that would be considered noise-sensitive. Sensitive areas, which include Buena Vista Meadow Picnic Area and Los Angeles State Historic Park, appear to be at least 250 feet from the proposed bike path alignment. Noise-sensitive land uses on the east side of the river are two churches, Young Nak Celebration Church and YoungNak Presbyterian Church of L.A., and the Downey Recreation Center; these land uses are approximately 300 to 700 feet from the proposed bike path.

Reach 3: Between Spring Street and Cesar Chavez Avenue

Reach 3 is bordered on both sides of the river by industrial and commercial land uses that are not noise-sensitive. The closest noise-sensitive receptors are homes at the William Mead Homes public housing development, which is located approximately mid-way along the Reach on the west side of the river; the closest of these homes are approximately 250 feet from the proposed bike path. The closest noise-sensitive receptors on the east side of the river are located toward the north end of the Reach; these are the Downey Recreation Center and homes located approximately 500 and 700 feet, respectively, from the proposed bike path.

Reach 4: Between Cesar Chavez Avenue and Bandini Boulevard

Reach 4 is bordered on both sides of the river by industrial and commercial land uses that are not noise-sensitive. The closest noise-sensitive receptors are condominiums located on the west side of the river between East 7th Street and East 7th Place, approximately 300 feet from the proposed bike path. The next closest noise-sensitive receptors are apartments on the west side of the river along South Santa Fe Avenue between East 1st Street and East 4th Street, approximately 400 feet from the proposed bike path. Other noise-sensitive residences are located on either side of the river, but are separated from the proposed bike path by intervening buildings and by distances of 500 to 800 feet.

Reach 5: Between Bandini Boulevard and Atlantic Boulevard

Reach 5 is bordered on both sides of the river by industrial and commercial land uses that are not noise-sensitive. For the majority of this Reach there are no noise-sensitive receptors in the vicinity of the bike path. The exception is at the south end of the Reach on the west side of the river, where the closest noise-sensitive receptors are single-family residences and Maywood Elementary School, located in the City of Maywood; these receptors are approximately 400 to 500 feet from the proposed bike path.

Potential Noise and Vibration Impacts/Constraints

The primary source of noise and vibration associated with the project would be construction, which would be temporary. Precise thresholds of significance for the project have not been determined, but various guidelines and standards that could be applied to the project include restrictions on noise and vibration from construction activity. Such standards and guidelines include the City of Los Angeles CEQA Thresholds Guide, and the municipal codes of the City of Los Angeles, the County of Los Angeles, the City of Maywood, and the City of Vernon. The details of project construction are currently unknown, but the project would clearly require noise-generating construction equipment. Based on previous experience with similar construction activities, if construction is conducted during daytime hours and does not require high-impact methods such as pile driving, blasting, or crack-and-seat operations, then there would likely be few, if any, significant impacts for the following reasons:

The identified sensitive receptors are sparsely located along the length of the project and are hundreds of feet from the anticipated construction areas.

Many of the identified sensitive receptors are shielded from the project alignment by intervening buildings.

The existing background noise levels in the project vicinity are generally expected to be relatively high due to the presence of various notable noise sources, including railroads, streets, freeways and industrial operations. As such, thresholds related to significant temporary noise increases would tend to be less restrictive than if the project was located in quieter residential or suburban neighborhoods.

If construction is conducted during nighttime hours and/or includes high-impact methods such as pile driving, blasting, or crack-and-seat operations, then the potential for significant impacts would increase.

An analysis of construction noise and vibration would be required as part of the CEQA and NEPA environmental documentation when additional details of the project construction schedule are available.

Once constructed, the bike path would not generate notable noise or vibration levels into the surrounding community and the impacts would not be significant. As such, a quantitative analysis of operational noise and vibration levels from the bike path would not be necessary.

Based on the available data, it is not clear whether the project would have a meaningful impact on traffic patterns in the study area. For the purposes of this analysis, it is assumed that the Project would not affect roadway capacities. However, if future analysis includes a traffic study for the project, then the traffic study should be evaluated to assess whether the project effects could cause noticeable changes in traffic noise levels.

The bike path itself would be a transient use and would not typically be considered noise-sensitive. As such, there would not be any significant noise impacts on the project itself once it is operational.

It is important to note that, in the event that the bike path is considered by the lead agency to be noise-sensitive, there would likely be significant impacts along large sections of the project due to the close proximity of various notable noise sources, including railroads, streets, freeways and industrial operations.

Conclusions and Recommendations

Additional study of the project's potential noise and vibration impacts would be conducted as part of the CEQA and NEPA documentation once more detailed project information is available. Of primary concern are construction-generated noise and vibration. The potential for traffic-related noise impacts should also be evaluated once there is a better understanding of what effects, if any, the project is expected to have on local traffic patterns.

The level of environmental documentation may depend on whether the lead agency considers the bike path to be a noise-sensitive receptor. If it is, there is a potential for significant and unavoidable noise impacts as a result of the project's proximity to various notable noise sources, including railroads, streets, freeways and industrial operations.

The noise and vibration analyses could likely be provided directly within the project's environmental document. However, at the lead agency's discretion, or if the analysis of construction activity proves to be particularly complex, it may be preferable to analyze noise and vibration levels in a standalone technical noise study.

Water Quality and Floodplains

The analysis of potential hydrology and water quality issues or constraints was conducted by ICF staff based on a review of available data including:

- Conceptual exhibits and renderings illustrating the potential alignment(s) of the bike path.
- A draft of the KOA Corporation's report regarding the structural and financial feasibility for the project, dated November 23, 2015.
- Photographs from the Project vicinity.
- Google Earth aerial photography.
- FEMA/National Flood Insurance Program flood maps.
- State Water Resources Control Board (State Water Board) Clean Water Act Section 303(d)-listed impairments and other water quality considerations.

The analysis focuses on water quality and floodplain issues and includes a brief discussion of potential water quality impacts of the LA River in the context of federal and state regulations, such as beneficial uses, water quality objectives, and CWA 303(d)-listed impairments, as well as local grading and stormwater requirements.

Existing Sensitive Hydrology, Floodplain, and Water Quality Resources

This discussion describes the project setting in terms of hydrology and floodplain issues and identifies any bodies of water, drainages, rivers, and streams that might be affected by the project. The LA River is the primary sensitive resource, and it is located throughout the entire alignment. However, additional potentially sensitive hydrology and water quality resource areas include those with existing storm drain locations, bridges, in channel paths, and riparian areas.[2]

Hydrology/Flooding

The Los Angeles River was constructed in the 1930's for the primary purpose of proving flood protection. The Project area is located within the following FEMA flood zones:

- **Zone A** – 100-year Floodplain Zone. No depths or base flood elevations are shown within these zones.
- **Zone AE** – 100-year Floodplain Zone. Base flood elevations are provided.
- **Zone X (unshaded)** – Area of minimal flood hazard, usually depicted on FIRMs as above the 500-year flood level. Zone C may have ponding and local drainage problems that don't warrant a detailed study or designation as base floodplain. Zone X is the area determined to be outside the 500‐year flood and protected by levee from 100‐year flood.

[2] Riparian areas will only be discussed regarding how they affect water quality (i.e., shade and water temperature, erosion control). More information on other aspects of riparian areas (i.e., species habitat) will be discussed in the Biological Resources memo.

Water Quality

The Project would fill in an 8-mile gap in a bike path along Los Angeles River banks that mostly contain electrical powerlines, rail maintenance yards and tracks, and warehousing and logistics-oriented land uses. The Project alignment is located within the following reaches of the Los Angeles River as designated by the State Water Board's 303(d) list and with the following impairments (State Water Board 2011):

- Los Angeles River Reach 2: ammonia, coliform, copper, lead, nutrients (algae), oil, trash
- Los Angeles River Reach 3: ammonia, copper, lead, nutrients (algae), trash

Potential Hydrology and Water Quality Impacts/Constraints

This section provides an assessment of potential impacts of the Project on floodplain management, drainage and water quality.

Hydrology/Flooding

Hydrological conditions may be present that could affect the project design, scheduling, or construction techniques. The following are examples of potential design constraints.

The new bike path would be located partly in the river channel and partly on top of the west channel bank. The portions of the path that are in the channel may be exposed to future flooding given the future USACE's plans to restore the Los Angeles River [Los Angeles River Ecosystem Feasibility Study (ARBOR Study)]. Should that occur, portions of the in-channel bike paths may need to be removed, This may have implications on which design option to choose, since the more portions of the path that are located within the channel, the more will need to be moved upland in the future.

In Reach 2, the future Water Wheel Project would introduce a rubber dam into the Los Angeles River inundating the channel bottom beginning just north of Broadway. However, the channel wall could be reconstructed to create a path within the trapezoidal section of the channel wall. Another option is to construct a floating bridge. Any in-channel design structure may impede existing flows, which could contribute to potential future flooding. This structure would need to be designed so as to not cause downstream flooding as a result of a 100-year storm event.

Flooding could be particularly compromised at bridge locations along the alignment. Portions of the bike path near bridges should be designed with flood management considerations.

Increased impervious area due to the bike path could increase the volume and rate of stormwater runoff. New or modified storm drains would be required to maintain flood system capacity.

The following issues are recommended for further analysis as part of subsequent engineering efforts and the CEQA and NEPA environmental documentation:

- The number and location of bridges along the alignment, as well as whether their design heights are adequate for a 100-year flood event.
- The area (in square feet/acres) of new impervious surfaces.

Water Quality

The primary sources of hydrology and water quality impacts during construction would be temporary and related to land disturbance and other activities in or near the river channel. The details of project construction are currently unknown, but the project would clearly require compliance with the Construction General Permit, local grading and stormwater regulations, and potentially dewatering requirements. Potential significant impacts during construction could be related to:

- Placement of construction staging areas or stockpiles in or near the river channel
- Channel modifications
- Placement of the path within the river channel
- Storm drain obstructions

The following issues should be considered in the analysis conducted for the CEQA and NEPA environmental documentation:

- The location and areas (in square feet or acres) of riparian vegetation
- The location and areas (in square feet or acres) of land disturbance during construction
- The location of staging areas would be required for this analysis.

Potential water quality impacts during operation would primarily be related to an increased number of recreational users along the river, which could result in increased trash, oil, and other constituents. The maintenance of landscape vegetation along the alignment may require the use of herbicides or pesticides. All of these constituents could directly enter the Los Angeles River (particularly along the in-channel portions of the path), and indirectly enter the river through storm drains along the above channel portions of the path during a rain event.

The following issues should be considered in the analysis conducted for the CEQA and NEPA environmental documentation:

- The projected increase in recreational users per day
- Any new activities that would result from project operation (new areas of landscape maintenance, new storage areas, increased bridge maintenance)

Conclusions/Recommendations

Future studies conducted for the Project should include the following:

- Geotechnical study – to determine the type of soil and erosion potential
- Phase I/II Evaluation – to determine if there are any existing soil contaminants
- Hydrology and Hydraulics (H&H)/Drainage study – to describe existing drainage patterns vs. proposed drainage patterns, as well as the existing and proposed storm drain runoff volumes and system capacity
- Floodplain analysis – to determine how areas within existing floodplains will be designed with flood management considerations

Hazardous Waste

The analysis of potential hazardous waste issues or constraints was conducted by ICF staff based on a review of available data including:

- Conceptual exhibits and renderings illustrating the potential alignment(s) of the bike path.
- A draft of the KOA Corporation's report regarding the structural and financial feasibility for the project, dated November 23, 2015.
- Google Earth aerial photography, Street View, and Data.
- State Water Resources Control Board's Geotracker and Department of Toxic Substances Control's Envirostor web databases. A cursory review was conducted via the Geotracker and Envirostor databases to get a general view of the types of hazardous materials sites located near the proposed project footprint. Several Leaking Underground Storage Tank, Cleanup Program sites, and sites under DTSC oversight were identified near the project footprint.

Existing Sources of Hazardous Waste

Potential Contamination Associated with Commercial and Industrial Land Uses

Because much of Los Angeles County is heavily urbanized and also contains sparsely populated unincorporated land, the Project would encounter a variety of land uses including industrial, commercial, residential and mixed land uses. This variation in land uses can potentially lead to hazardous materials impacts.

Industrial land use can encompass a wide range of business operations that have the potential to create hazardous materials impacts. Industrial facilities store hazardous materials in underground storage tanks (USTs) and/or above ground storage tanks, and in designated storage locations. Age and improper maintenance of storage tanks have been common causes for soil and groundwater contamination. Improper handling and storage of hazardous material containers can lead to hazardous material incidents.

Commercial locations can include vehicle repair sites, gasoline fueling stations and dry cleaning facilities. Like industrial facilities, some commercial sites often store hazardous materials in storage tanks and in designated areas within the facility. Hazardous materials spills and leaks in vehicle repair and fueling locations can lead to hydrocarbon contaminated soil and groundwater. Improper storage and use of hazardous materials in dry cleaning facilities can lead to contaminated soil and groundwater.

Reach 1: Between Riverside Drive and SR-110

Reach 1 consists of open space along the western/upper bank (on the eastern side of Dodger Stadium). As such, this area would appear less likely to contain contaminated media as described above. However, one DTSC military evaluation site was noted in the Geotracker database as being located in this area.

Reach 2: Between SR-110 and Spring Street

Similar to Reach 1, Reach 2 consists of mostly open space to the west. However, there are industrial land uses where the bike path intersects N Spring Street. As such, it is possible that construction activities associated with the proposed project could encounter contaminated media associated with industrial land uses in this area.

Reach 3: Between Spring Street and Cesar Chavez Avenue

Reach 3 is bordered on both sides of the river by industrial and commercial land uses. Thus, it is possible that construction activities associated with the proposed project could encounter contaminated media associated with commercial and industrial land uses in this area

Reach 4: Between Cesar Chavez Avenue and Bandini Boulevard

Reach 4 is bordered on both sides of the river by industrial and commercial land uses. Thus, it is possible that construction activities associated with the proposed project could encounter contaminated media associated with commercial and industrial land uses in this area.

Reach 5: Between Bandini Boulevard and Atlantic Boulevard

Reach 5 is bordered on both sides of the river by industrial and commercial land uses. Thus, it is possible that construction activities associated with the proposed project could encounter contaminated media associated with commercial and industrial land uses in this area.

Potential Hazardous Materials Impacts/Constraints

If hazardous materials are encountered or mishandled during implementation of the Project, they could have a deleterious effect on construction crews working on the project, nearby residents, and/or the surrounding environment.

Construction of the Project would involve handling of hazardous materials such as fuel, solvents, paints, oils, etc. typical of construction projects. The materials if improperly handled can cause potential impacts to the sensitive receptors mentioned.

Because only surficial soils are expected to be disturbed during grading activities, groundwater contamination impacts are not anticipated.

Once constructed, bike path activities would not result in the storage, handling, or exposure to hazardous materials and the impacts would not be significant.

Conclusions/Recommendations

A customized search for environmental-related information present in publicly accessible databases using Environmental Data Resources, Inc. should be conducted in support of the CEQA and NEPA environmental documentation for the Project. The database search would involve a detailed analysis of the bike pathway footprint and surrounding properties to identify and evaluate potential environmental issues associated with past and/or present operations on the bike pathway and adjacent properties. The primary concern associated with hazardous materials would be the exposure of construction personnel, nearby residents, and the local environment to potentially contaminated surficial soils.

Visual/Scenic Resources

The analysis of scenic/visual resources issues and constraints was conducted by ICF staff based on a review of available data including:

- Conceptual exhibits and renderings illustrating the potential alignment(s) of the bike path.
- A draft of the KOA Corporation's report regarding the structural and financial feasibility for the project, dated November 23, 2015.

- Photographs from the Project vicinity.
- Google mapping data; Google Earth aerial photography, Street View, and Data.
- California Department of Transportation, Office of Landscape Architecture Scenic Highway Program, List of Eligible and Officially Designated State Scenic Highways

The analysis focuses primarily on establishing the visual setting, identifying visual resources in the project area(s), and identifying potential visual intrusions that could occur as a result of construction and operation of the Project.

Existing Visual Setting

For discussion purposes, the Project is broken into 5 reaches, Reach 1 through Reach 5. The visual resources and overall visual setting in each Reach are described in the following sections.

Reach 1: Between Riverside Drive and SR-110

Reach 1 is the shortest reach and has mostly open space along the western bank. Viewer sensitivity in these areas would be relatively low, because they do not contain areas of frequent human use. Confluence Park is located on the east side of the River, over 500 feet from the proposed bike path. Other commercial and retail businesses are located in the project areas near Reach 1, such as Home Depot, but they are also located outside the direct vicinity of the proposed alignment. There are no officially designated scenic highways located within the vicinity of Reach 1.[3] The only historical resource located in Reach 1 is the Riverside-Figueroa Bridge, which is in the process of being demolished and replaced with a new crossing. Other high-quality visual resources are limited. Foreground views throughout the area mostly consist of the river itself and supporting channel infrastructure. Line patterns are mostly horizontal with some keystoning, depending on the position and angle of the viewer and amount of riverbed undulation. Viewsheds are fairly limited in terms of color and texture, and other visual elements common to the project alignment, based on a review of Google Earth, include electric utility towers, lampposts, bridge crossings and supporting structures, open space/undeveloped land, and adjacent properties, mostly consisting of commercial and industrial land uses. Depending on the position and angle of the viewer, views to downtown Los Angeles and/or Mt. Washington may be had.

Reach 2: Between SR-110 and Spring Street

Reach 2 also has open space to the west with limited areas of frequent human use. Buena Vista Meadow Picnic Area and Los Angeles State Historic Park are located near the alignment, but appear to be at least 250 feet from the proposed bike path. On the east side of the river are two churches, Young Nak Celebration Church and YoungNak Presbyterian Church of L.A., and the Downey Recreation Center; these land uses are approximately 300 to 700 feet from the proposed bike path and are located outside the direct vicinity of the proposed alignment. There are no officially designated scenic highways located within the vicinity of Reach 2.[4] Two historical resources are located in Reach 2. In terms of visual analysis, and for the purposes of CEQA and of this feasibility study, properties determined eligible for listing on the NRHP are considered visual resources. The

[3] California Department of Transportation. 2011. *Scenic Highways and Eligible Scenic Highways List, Los Angeles County, California*. Available: <http://www.dot.ca.gov/hq/LandArch/sceniccahisys4.htm>. Accessed: December 2015.
[4] Op. cit. 3.

first is the North Broadway-Buena Vista Bridge, which has been determined eligible for listing in the National Register of Historic Places (NRHP) through the Section 106 of the National Historic Preservation Act (NHPA) process. The second is the North Spring Street Bridge, which has also been recommended eligible for the NRHP. Other high-quality visual resources are limited. As in Reach 1, foreground views throughout Reach 2 mostly consist of the river itself and supporting channel infrastructure. Line patterns are mostly horizontal with some keystoning, depending on the position and angle of the viewer and amount of riverbed undulation. Other visual elements common to the project alignment, based on a review of Google Earth, include electric utility towers, lampposts, bridge crossings and supporting structures, open space/undeveloped land, and adjacent properties, mostly consisting of commercial and industrial land uses. Depending on the position and angle of the viewer, views to downtown Los Angeles may be had.

Reach 3: Between Spring Street and Cesar Chavez Avenue

Reach 3 is bordered on both sides of the river by industrial and commercial land uses. The closest homes are approximately 250 feet from the proposed bike path. Other properties that are relatively close include the Downey Recreation Center, which is approximately 500 from the proposed bike path. There are no officially designated scenic highways located within the vicinity of Reach 3.[5] The only known historical resource located in Reach 3 is the North Main Street Bridge, which is eligible for listing the in NRHP. Other high-quality visual resources are limited. Views throughout Reach 3 are similar to those described above in Reaches 1 and 2.

Reach 4: Between Cesar Chavez Avenue and Bandini Boulevard

Reach 4 is also bordered on both sides of the river by industrial and commercial land uses. The closest viewer group would be from condominiums located on the west side of the river between East 7th Street and East 7th Place, approximately 300 feet from the proposed bike path. The next closest viewer group would be from apartments on the west side of the river along South Santa Fe Avenue between East 1st Street and East 4th Street, approximately 400 feet from the proposed bike path. Other residences and properties are located on either side of the river, but are separated from the proposed bike path by intervening buildings and by distances of 500 to 800 feet. There are no officially designated scenic highways located within the vicinity of Reach 4.[6] There are seven known historical resources located in Reach 4, all of which have been determined eligible for the NRHP – Macy Street Viaduct, First Street Bridge, Fourth Street Bridge, Sixth Street Bridge, Seventh Street Bridge, Olympic Street Bridge/Ninth Street Bridge, and Washington Boulevard Bridge. For the visual analysis under CEQA, as with the other identified historical resources, these properties would be considered visual resources. Other high-quality visual resources are limited. Views throughout Reach 4 are similar to those described above in Reaches 1 and 2.

Reach 5: Between Bandini Boulevard and Atlantic Boulevard

Reach 5 is also bordered on both sides of the river by industrial and commercial land uses. The majority of this Reach does not contain areas of frequent human use. Similarly, there are buildings with a variety of land uses throughout this reach that are located outside the direct vicinity of the proposed alignment and/or are separated from the proposed bike path by intervening buildings and larger distances. These include, but are not limited to, single-family residences, commercial and

[5] Op. cit. 3.
[6] Op. cit. 3.

industrial buildings, schools, parks, and other open space areas. There are no officially designated scenic highways located within the vicinity of Reach 5.[7] There are no known NRHP-eligible or listed historic properties within Reach 5. Other high-quality visual resources are limited. Views throughout Reach 5 are similar to those described above in Reaches 1 and 2.

Potential Visual/Aesthetic Impacts

The details of project construction are currently unknown, but general construction activities, construction staging/stockpiling, building materials, the presence of construction equipment and temporary signage/barricades would result in temporary construction impacts by altering the composition of the viewsheds throughout the project corridor. Due to the temporary nature of construction, the low volume of exposed viewers, the proximity of adjacent residences and other sensitive visual receptors, obstructed viewing angles, and generally low viewer sensitivity, it is unlikely that significant impacts would occur due to the Project. An analysis of construction impacts on the visual environment would be conducted as part of the CEQA and NEPA documentation when additional details of project construction and its schedule are available.

As mentioned, various alignment options for the proposed bike path were considered. The resulting impacts related to operation of the bicycle path would depend on the alignment, or combination of alignments, that is selected. In-channel improvements and the installation of the bike path would be located entirely within the river channel. Thus, views to the river and of the proposed Project elements would be largely obstructed, particularly from those properties that fall outside the direct alignment of the bike path. Thus, the proposed bike path and support elements are unlikely to cause a visual intrusion or substantially alter the viewsheds throughout the proposed alignment. However, conditions of the upper bank of the Los Angeles River vary from areas with open-space suitable for a bicycle path to areas that are heavily obstructed by electrical towers, bridge structures, and/or adjacent rail lines. At electrical tower, bridge abutment, and railroad obstructions, the bicycle path would need to be constructed on elevated bridge structures or cantilevered structures that protrude from the bank. Due to the relative size of the proposed improvements (the standard 12 foot-wide path and supporting fence/wall), the low volume of exposed viewers, the distance and angles of the exposed viewer groups (i.e., residences, parks and recreationists, commercial businesses and patrons, etc.), and the transient use of the bike path itself, it's unlikely the elevated structures would result in significant impacts. Upon implementation, particularly with the project's adherence to the relevant guidelines, plans and policies governing the aesthetic environment, very minor changes to the overall visual character and quality throughout the proposed alignment would occur. Since no officially designated scenic highways are found within the vicinity of the proposed Project, it would not impact a scenic vista.

Conclusions/Recommendations

Additional study of the project's potential aesthetics impacts would be required as part of the CEQA and NEPA documentation once more project information is available, though it appears unlikely that potential visual impacts would pose a constraint to implementation of the Project.

[7] Op. cit. 3.

Findings and Conclusions

Environmental Constraints

Potential environmental constraints that could affect Project schedule or cost, project design, and the viability of alternatives include potential impacts to Native American TCRs; potential construction-related modifications and alterations to historic LA River bridges; seasonal restrictions on biological studies and /or minimization measures to reduce potential impacts to roosting bats and nesting birds; hydrological conditions that could affect project design, scheduling, or construction techniques; and the potential contamination of surficial soils in the industrial and commercial portions of the Project alignment. Additionally, the level of environmental documentation required for the project may depend on whether the lead agency considers the proposed bike path to be a noise-sensitive receptor.

Environmental Documentation

CEQA

Once Project plans have been developed, it is recommended that the lead agency prepare an Initial Study (IS) pursuant to the requirements of the CEQA to determine whether the Project has the potential to result in significant impacts on the environment and whether a categorical exemption, negative declaration (ND), mitigated ND (MND), or environmental impact report (EIR) would be the appropriate CEQA document. However, it is likely that further technical studies and analyses will be required to confirm the significance of potential impacts. These studies and analyses could include:

- Jurisdictional Delineation;
- Biological Resources Survey and Evaluation including nesting bird surveys, burrowing owl surveys, and emergent bat surveys;
- Historical Properties and Archeologic Resource Survey and Evaluation, Consultation;
- Hydrologic and Hydraulic Evaluation and Modeling;
- Geologic Resource Study and Evaluation, and
- Hazardous Materials Environmental Site Assessment.

CEQA Statutory and Categorical Exemptions

Statutory exemptions are exemptions from CEQA granted by the legislature. Public Resources Code (CEQA Statutes) Section 21080.20.5 provides a statutory exemption for restriping of streets and highways for bicycle lanes in urbanized areas and Section 21080.20 statutorily exempts bicycle transportation plans in urbanized areas. Because the Project would not involve restriping of streets and highways for bicycles, Section 21080.20.5 would not apply. The Project would implement portions of the County of Los Angeles 2012 Bicycle Master Plan and the 2010 City of Los Angeles Bicycle Plan (a component of the Mobility Plan 2035), but the Project itself is not a bicycle transportation plan or an identified project under a statutorily exempted bicycle transportation plan; therefore, it would not qualify for a statutory exemption from CEQA under Section 21080.20. Both of these exemptions expire on January 1, 2018.

Under CEQA, categorical exemptions are classes of projects, which have been determined not to have a significant effect on the environment, and are therefore, exempt from the provisions of CEQA. Under Section 15301 of the CEQA Guidelines, Class 4 categorical exemptions include "the creation of bicycle lanes on existing rights-of-way." The Project may qualify for that Class 4 categorical exemption. However, it should be noted that in accordance with CEQA regulations, a categorical exemption shall not be used where there is a reasonable possibility that the project would have a significant effect on the environment due to unusual circumstances.

Negative Declaration/Environmental Impact Report

Pursuant to CEQA, an ND is a document that states, upon completion of an initial study, that there is no substantial evidence that the project may have a significant effect on the environment. If the Project would have significant effects on the environment but those effects can be mitigated to a less-than-significant level, then an MND would be the appropriate environmental document. If the Project's significant effects can't be mitigated to a less-than-significant level, then an EIR would be required. An EIR informs the public agency decision-makers and the public generally of the significant environmental effects of a project, possible ways to minimize significant effects, and reasonable alternatives to the project.

CEQA Tiering

CEQA tiering refers to the coverage of general environmental matters in broad, program-level EIRs, with subsequent focused environmental documents for individual projects that implement the program. The project environmental document incorporates by reference the broader discussions in the Program EIR and concentrates on project-specific issues. An EIR was prepared for the City of Los Angeles Mobility Plan 2035 and a program EIR was prepared for the 2012 County of Los Angeles Bicycle Master Plan. The Project is identified in both the City of Los Angeles Mobility Plan 2035 and the 2012 County of Los Angeles Bicycle Master Plan. If the Project is considered to be a subsequent activity of the city and county bicycle plans, the Project may be able tier off these environmental documents, and focus the CEQA documentation for the Project on any new effects not considered in those documents.

NEPA

If a Section 408 Permit or other federal action is required for the Project, compliance with NEPA regulations will be necessary. Under federal regulations, 23 CFR 771.117 (c), the "construction of bicycle and pedestrian lanes, paths and facilities" are categorically excluded from the requirement to prepare an environmental assessment (EA) or an environmental impact statement (EIS). However, the determination of whether the Project qualifies for a categorical exclusion under 771.117 (c) is contingent upon whether there are unusual circumstances including significant environmental impacts, substantial controversy on environmental grounds, significant impacts on section 4(f) or section 106 properties, or "inconsistencies with any federal, state, or local law, requirement, or administrative determination relating to the environmental aspects of the action." Based on the results of the preliminary environmental review described above, it is possible that the Project could qualify for a categorical exclusion. However, further analysis will likely be required, including preparation of the technical studies identified above, in order for the federal lead agency to make that determination.

If the Project does not qualify for a categorical exclusion, an EA may be appropriate. An EA is prepared when the significance of an environmental impact is not clearly established and an EA is

required to determine the appropriate NEPA environmental document. If the federal lead agency determines, based on the results of the EA, that the Project (i.e., federal action) would not have significant environmental impacts, the agency will issue a Finding of No Significant Impact. If it's determined that the Project would significantly affect the quality of the human environment, then an EIS would be required.

Resources

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The Los Angeles River Ecosystem Restoration Integrated Feasibility Study, September 2015, US Army Corps of Engineers Los Angeles District.

Appendix A-2

Planned Restoration and Greening

Planned Restoration and Greening

As a result of the Los Angeles River Ecosystem Feasibility Study (ARBOR Study), the Army Corp of Engineers (Corps) is moving forward with developing design plans to restore approximately 11 miles of the Los Angeles River from Griffith Park to downtown Los Angeles. Restoration will include reestablishing riparian strand, freshwater marsh, and aquatic habitat communities and reconnecting the Los Angeles River to major tributaries and its historic floodplain, while maintaining existing levels of flood risk management.

In addition to the ARBOR study, recent trends of stormwater management in the state and county to treat stormwater discharge may lead to additional restoration efforts along the river.

There are 7.2 total acres of green space per thousand residents along the River corridor, compared to 89.8 within Los Angeles County as a whole and 1,344 for the state as a whole. Adding green space to the river is a high priority for the region, and some elements can be added to the river with the proposed Project.

The proposed LA River Bike Path will accommodate opportunities for greening adjacent to the bike path by terracing above and/or below the bike path (for path sections on the riverbank) and other techniques. Greening within the riverbed adjacent to a bike path will not likely be feasible, as partially modifying the riverbed and potentially obstructing river flows could be prohibited by the Corps. Greening of the riverbanks, whether or not the proposed bike path is built on the riverbank, should be the priority for project greening elements. Spot additions of green elements could be accomplished in a cost-effective manner.

Some issues to consider for greening, as designs are finalized for the proposed Project, include the following:

- How to provide greening improvements that do not conflict with River revitalization plans.
- How a bike path located on the riverbank will conflict less with revitalization, then a Path located within the riverbed. If concrete is removed from the river bottom by future greening efforts, a bike path in the riverbed could be in conflict with these efforts.
- How to avoid conflicts with stormwater management. Direct conflicts with potential retention projects would occur, for a bike path located within the riverbed.
- A bike path located on the riverbank would not likely conflict with stormwater retention projects/areas, if placed above the expected waterline.
- Initial (compared to the larger river revitalization efforts) greening elements provided by the proposed Project can be integrated into future large-scale greening.

Providing greening elements as part of the proposed Project will mitigate heat island effects, to some extent, of the concrete river surface. They will also provide visual improvements to the general environment of the river for views into the river from surrounding uses and passers-by, and will provide human-scale elements for users of the bike path. The experience of using the bike path will be improved by greening efforts.

The implementation and operation of the Arroyo Seco bike path provides some insight into potential conflicts between a river bottom path and greening efforts. In the 1980s the County of Los Angeles built a two-mile long path in the bottom of the cement-lined Arroyo Seco stream. A plan to continue that bike path, proposed by the County of Los Angeles in 2005, has now been withdrawn because of community concerns about safety and the related increase in concrete additions to the riverbed. The Arroyo Seco Greenway Project proposes to include a new bike path and landscaping appropriate to the riparian character of the Arroyo Seco riverbed.

Appendix B

Proposed Metro Bike Path Permitting Requirements

Los Angeles River Bike Path

Feasibility Study

Appendix B

Proposed Metro Bike Path Permitting Requirements

May 25, 2016

Document Details

Task: 2.9	
Version	**Completed**
Internal Review Draft	
Draft	
Draft Final	1/8/2016
Final	5/25/2016

engineers | scientists | innovators

In association with:

KOA Corporation
ICF International
Wagner Surveying & Engineering
W2 Design, Inc.

Table of Contents

Abbreviations/Acronyms

BOE	Bureau of Engineering
BPW	LA Board of Public Works
CEQA	California Environmental Quality Act
CDFW	California Department of Fish and Wildlife
Corps	US Army Corps of Engineers
CWA	Clean Water Act
DPH	Los Angeles County Department of Public Health
EA	Environmental Assessment
EIR	Environmental Impact Report
ESA	Endangered Species Act
FONSI	Finding of No Significant Impact
FWS	Fish and Wildlife Service
HEC-RAS	Hydrologic Engineering Center- River Analysis System
IS	Initial Study
LADBS	Los Angeles Department of Building and Safety

LABSS	Los Angeles Bureau of Street Services
LADCP	Los Angeles Department of City Planning
LADWP	Los Angeles Department of Water and Power
LAFCD	Los Angeles County Flood Control District
LAPARKS	Los Angeles Department of Recreation and Parks
LAPD	Los Angeles Police Department
LA RWQCB	Los Angeles Regional Water Quality Control Board
LASAN	Los Angeles Bureau of Sanitation
Metro	Los Angeles County Metropolitan Transportation Authority
MND	Mitigated Negative Declaration
ND	Negative Declaration
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NOI	Notice of Intent
NPDES	National Pollutant Discharge Elimination System
NWP	Nationwide Permit
PCN	Pre-Construction Notice
SCRAA	Southern California Rail Road Authority
SHPO	State Historic Preservation Office
USACE	US Army Corps of Engineers
USC	United States Code
USFW	United States Fish and Wildlife
WOUS	Waters of the United States
WQC	Waters Quality Certification

1. INTRODUCTION

This appendix summarizes our understanding of the access easements, permits and environmental documents that will likely be required to construct the proposed Los Angeles Metropolitan Transit Authority (Metro) Bike Path Project located in the vicinity of the Los Angeles River, in Los Angeles California.

2. PROJECT UNDERSTANDING

The proposed Metro Bike Path Project will consist of an approximately 8-mile long 12-foot wide paved bike path constructed along the Los Angeles River channel between Riverside Drive and Atlantic Boulevard in Los Angeles, California. The bike path will be located partly in the river channel and partly on top of the west channel bank. The entire length of the river channel within the proposed bike path footprint is a concrete-lined channel. Multiple ingress /egress ramps will be constructed in the west channel bank along the length of the bike path to provide access. The bike path will connect an approximately 8-mile gap in an existing bike path system and will extend upstream and downstream of the proposed Metabolic Studio Water Wheel Project. The proposed bike path is consistent with the goals of the Los Angeles River Revitalization Master Plan as it will increase public accessibility and recreational opportunities in the Los Angeles River. The LA River Real-Time Pilot Monitoring and Reporting network under development by the Arts District Community Council Los Angeles is informing the project.

3. ENVIRONMENTAL PERMITTING

The proposed bike path will be partially located in and on top of the concrete-lined Los Angeles River channel. The proposed project will modify/alter a small area of a U.S. Army Corps of Engineers (Corps or USACE) built facility, the Los Angeles River, and will result in disturbance (dredging or filling) within federal and state jurisdictional waters. It is anticipated the proposed project will require easements, approvals, environmental permits, consultation and documents from state, federal and local agencies including:

- Easements and Access Agreements - Metro, Southern California Rail Road Authority (SCRRA), Los Angeles Department of Water and Power (LADWP), Bureau of Engineering (BOE), USACE;
- Regional, County and City Approvals - Los Angeles River Cooperation Committee, Los Angeles County Department of Public Health (DPH), Los Angeles County Flood Control District (LAFCD), BOE, Los Angeles Bureau of Sanitation (LASAN), Los Angeles Department of General Services, Los Angeles Bureau of Street Services (LABSS), Los Angeles Department of Recreation & Parks (LAPARKS), City Council,

Mayor's Office, Board of Public Works (BPW), Los Angeles Department of City Planning (LADCP), Los Angeles Fire Department Swift Water Rescue, Los Angeles Police Department (LAPD), and Los Angeles County Sheriff;

- California Environmental Quality Act (CEQA) - Initial Study (IS) /Mitigated Negative Declaration (MND)
- 33 USC 48 -Section 408 Permit – Los Angeles USACE;
- National Environmental Policy Act (NEPA) – Environmental Assessment (EA) / Finding of No Significant Impact (FONSI)
- CWA Section 401 Water Quality Certification (WQC) - Los Angeles Regional Water Quality Control Board (LA RWQCB);
- CWA Section 404 Nationwide Permit - Los Angeles USACE;
  - Native American consultation;
  - State Historic Preservation Office (SHPO) consultation; and
  - Section 7 U.S. Fish & Wildlife (USFW) consultation
- Fish and Game Code Section 1602 Lake and Streambed Alteration Agreement - California Department of Fish and Wildlife (CDFW);
- National Pollutant Discharge Elimination System (NPDES) Construction General Permit – Los Angeles RWQCB
- Demolition Permit – City of Los Angeles Department of Building and Safety (LADBS)
- Grading Permit – LADBS

It is recommended that permit scoping meetings be conducted with each of the applicable regulatory agencies to solicit comments, discuss regulatory requirements and identify issues of concern to gain preliminary approval prior to environmental document and permit submittal.

4. EASEMENTS

The proposed bike path project will traverse properties owned or managed by private, state and federal entities. Trail easements and/or public access agreements will be required to cross properties owned or managed by Metro, SCRRA, LADWP, BOE, and USACE. The easements will likely include construction and maintenance standards of the bike path and covenants to allow access to the general public for the purpose of walking, jogging, running, bicycling and like activities.

5. APPROVALS

Environmental permits and documents will need to be prepared and submitted for approval prior to construction of the proposed bike path. The permits and documents will include supporting studies and plans that evaluate if the proposed project would result in potential

environmental impacts and to assess whether it meets federal, state, and local environmental standards.

As the project proponent, it is assumed that Metro will be the lead city agency for the proposed project. The City of Los Angeles Engineer's Environmental Management Group will be responsible for environment review of the proposed project to determine if it is in compliance with CEQA. The RWQCB, USACE and CDFW are responsible for approving permits authorizing projects that result in the dredge or fill within jurisdictional waters of the U.S. (WOUS). The USACOE is responsible for approving projects that modify a Corps constructed flood control structure. Additional approving agencies will likely include Metro, SCRRA, LADWP, Los Angeles River Cooperation Committee, DPH, LACFCD, LASAN, Los Angeles Department of General Services, LABSS, LAPARKS, City Council, Mayor's Office, Board of Public Works, Department of City Planning, Los Angeles Fire Department Swift Water Rescue, Los Angeles Police Department, and Los Angeles County Sheriff Department.

6. PERMITS/ENVIRONMENTAL REVIEW

6.1 California Environmental Quality Act (CEQA)

It is anticipated that the proposed project will be subject to the CEQA and will require preparation of an Initial Study (IS) in accordance with CEQA (Public Resources Code Section 21000 et seq.), the State CEQA Guidelines (Title 14, California Code of Regulations, Section 15000 et seq.) and the City of Los Angeles CEQA Guidelines (1981, amended July 31, 2002). An initial study is a preliminary analysis to determine if there is substantial evidence that a project may have a significant effect on the environment. If the IS concludes that the proposed project, with implementation of mitigation measures may still have a significant effect on the environment, an Environmental Impact Report (EIR) will be required. If the IS concludes that the proposed project will not have a significant effect on the environment, or if identified effects can be mitigated to less than significant, the lead agency may adopt a negative declaration (ND) or a mitigated negative declaration (MND). It is anticipated the lead agency for the proposed project will be the Metro.

The IS will evaluate potential environmental effects of the proposed project on the environment including: aesthetics, agriculture and forestry resources, air quality, biological resources, historic, cultural resources, geology / soils, greenhouse gas emissions, hazardous and hazardous materials, hydrology/water quality, land use/planning, mineral resources, noise, population/housing, public services, recreation, transportation/traffic, utilities/service systems, and mandatory findings of significance.

Supporting reports and studies will be required to evaluate potential impacts and will likely include the following:

- Preliminary Jurisdictional Delineation;
- Biological Resources Survey and Evaluation including nesting bird surveys, and emergent bat surveys;
- Historical Properties and Archeologic Resource Survey and Evaluation;
- Hydrologic and Hydraulic Evaluation and Modeling;
- Geologic Resource Study and Evaluation;
- Paleontological Resource Evaluation; and
- Transportation and Traffic

The IS will identify resources that have the potential for significant impacts under CEQA, and will identify mitigation measures, that if implemented, would reduce these impacts to less than significant. The IS will include a recommendation for a ND, MND, or the need for an EIR, if the identified significant impacts could not be reduced to less than significant through the implementation of mitigation measures. It is anticipated the proposed project will qualify for a MND.

6.2 33 USC 48 (Section 408) Permit - U.S. Army Corps of Engineers

The proposed project will modify/alter a small area of a USACE built facility, the Los Angeles River, and will require Corps 408 permit authorization pursuant to Title 33, United States Code (33 USC) Section 408, and the Rivers and Harbors Act of 1899. There are two approval levels of 408 permits; Major and Minor permits. Minor Permit approvals require the approval of a District Engineer and include projects such as bike trails. It is anticipated the proposed project will be subject to Minor 408 permit approval. The submittal package for the 408 Permit application must demonstrate the modification will not alter the Los Angeles river channel or the hydraulics of the Los Angeles River in a manner that would adversely affect the operation or integrity of the flood control structure or system.

Supporting reports and studies will be required to evaluate potential impacts and will likely include the following:

- Hydraulic Modeling to evaluate the effect of the proposed project on surface water elevations at critical points for the regulatory design flow, including:
  - Hydrologic Engineering Center - River Analysis System (HEC-RAS) to evaluate the entire 8-mile section
  - Multi-dimensional models (e.g., AdH) to evaluate access ramps (particularly in super-critical reaches)
- Design Engineering Drawings (approximately 60% complete)
  - Ingress/Egress Ramps
  - Bike Path Paths

- Geotechnical Report
- Soils Report
- Construction Schedule

A Section 408 Permit Process Application Letter will be submitted to the LA USACOE Chief of Engineering to request initiation of the Section 408 permit process review prior to permit submittal. The 408 Permit Application will be developed in accordance with the USACE's July 2014 Policy and Procedural Guidance for Processing Requests To Alter US Army Corps of Engineers Civil Works Projects Pursuant to 33 USC 408, EC No. 1165-2-216. The 408 Permit Application will include the following topics:

- Project Location
- Purpose and Need for Modification
- Description of Proposed Modification
- Construction Components of Proposed Modification
- Design Engineering Drawings
- Construction Elements and Avoidance of Damage to Existing Infrastructure
- Geotechnical Evaluation - including assessment of proposed project on channel stability, seismic evaluation, liquefaction assessment, erosion control, evaluation impacts to vegetation associated with construction, evaluation of material usage, borrow, waste, transport and hauling; and description of depth to groundwater and effect on proposed project.
- Hydraulic and Hydrology Evaluation – including an evaluation of potential hydraulic effects or the proposed channel alterations.
- Environmental Hazards – including an assessment of contaminated soil and groundwater management.
- Real Estate Analysis – identification of ownership of proposed project footprint
- Operations and Maintenance – identification of responsibility of operation and maintenance of all project components. Development of an Operation & Maintenance Plan and an Emergency Evacuation Plan.
- Residual Risk Assessment – Identification of potential residual risk on flood control structure and public health & safety as a result of proposed project,
- Administrative Record – Summary of related documents listed in the Administrative Record (e.g. CEQA IS/MND, NEPA FONSI).
- Floodplain Management – Assessment of potential impacts of proposed project to floodplain management.
- Environmental Protection Compliance – Summary of CEQA and NEPA findings
- Related Actions, Programs and Planning Efforts – Overview of other flood management activities that comprise regional planning context.

6.3 National Environmental Protection Act (NEPA)

Section 408 Permits require compliance with NEPA. Based on our recent experience with preparation of a 408 permit for the Metabolic Water Wheel Project, it is anticipated that the Corps will review the CEQA document and make a determination if the IS/MND is adequate for their use for the topics addressed. The Corp will likely require preparation of an Environmental Assessment (EA) Compliance Addendum to supplement the CEQA IS/MND to address identified resources not evaluated, or not part of the IS/MND. The NEPA document will be prepared in compliance with applicable Federal laws, Executive Orders, and regulations and policies of the Corps. It is anticipated that a Finding of No Significant Impact (FONSI) will be prepared. Completion of NEPA is necessary prior to the District Engineering making a decision on the 408 Permit application.

6.4 CWA Section 401 Water Quality Certification (WQC) – Los Angeles Regional Water Quality Control Board

The proposed project will require a Section 401 WQC issued by the LA RWQCB. Approval of the 408 Permit is required prior to approval of the 401 WQC. The 401 WQC application will include the following:

- Project Description
- Project Need
- Avoidance of Impacts
- Minimization of Impacts
- Protection of Water Quality – Construction and Post-Construction
- Fill and Dredge Information
- Identification of Impacted State or Federally Threatened or Endangered Species by Project
- Jurisdictional Water Delineation
- Identification of Required Licenses, Permits, Agreements
- Compensatory Mitigation
- CEQA
- Past/Future Impacts and Cumulative Impacts

6.5 CWA Section 404 Nationwide Permit – Los Angeles U.S. Army Corps of Engineers

The proposed project will require coverage under a USACE Section 404 Permit. It is anticipated Nationwide Permit (NWP) 42 Recreational Facilities will be applicable. A written waiver from the District Engineer is required for projects that would cause a loss of greater than ½ acre of non-tidal waters of the U.S., or result in the loss of greater than 300 linear feet, if applicable. NWP 42 requires a Pre-Construction Notice (PCN) be submitted as early as possible in the permitting process to the District Engineer. Approval of the 408 Permit and the 401 WQC is required prior to the approval of the 404 NWP. The 404 NWP application will include the following:

- Project Description
- Directions to Site
- Nature of Activity
- Project Purpose
- Reasons for Discharge
- Type(s) and Amounts of Material Being Discharged
- Surface Area of Wetlands or Other Waters Filled
- Description of Avoidance, Minimization and Compensation
- Addresses of Adjoining Properties
- List of other State, Federal or Local Agency Certifications or Approval/Denials

Form ENG 4345 will be used for the PCN. The acres/linear feet of impacts to waters of the U.S. will be developed based on the preliminary jurisdictional delineation prepared as part of the CEQA IS.

It is not anticipated the proposed project will result in a loss of greater than one tenth of an acre of wetlands; therefore a mitigation proposal is not required to be submitted with the PCN. The PCN shall include documentation identifying if listed species or critical habitat might be affected in the vicinity of the project, or if the project may have the potential to cause effects to historic properties. Written notification is required from the USACE that there is "no effect" on listed species or "no potential to cause effects" on historic properties, or that any consultation is required under Section 7 of the Endangered Species Act (ESA) and/or Section 106 of the National Historic Preservation Act (NHPA) has been completed prior to starting construction. The Corps will require notification from the Fish & Wildlife Service (FWS) stating the proposed project is in compliance with Section 7 of the ESA and from the State Historic Preservation Office (SHPO) indicating that the proposed project complies with the provisions of 33 CFR 325, Appendix C, and the requirements of Section 106 of the NHPA prior to NWP approval.

6.6 Fish and Game Code Section 1602 Streambed Alternation Agreement – California Department of Fish and Wildlife

The proposed project will require a 1602 Streambed Alteration Agreement issued by the California Department of Fish & Wildlife (CDFW). The 1602 Streambed Alteration Agreement will be submitted. The 1602 Notification of Streambed Alteration application will address the following:

- Project Description
- Property Ownership
- Agreement Term
- Agreement Type
- Project Location and Driving Directions
- Water Affected by Project
- Identification of Receiving Water
- Project Category and Work Type
- Project Description
- Project Equipment
- Project Impacts to bed, channel, and bank, and associated riparian habitat
- Description of Impacted Vegetation
- Identification of special status animal or plant species, or habitat that could support such species on or near project
- Copy of Biological Resource Report and Hydrologic Study
- Description of techniques to prevent sediment from entering watercourse during and after construction,
- Description of project avoidance and/or minimization measures to protect fish, wildlife, and plant resources
- Description of project mitigation and/or compensation measures to protect fish, wildlife and plant resources.
- List/copy of required local, state and federal permits
- Requirements and status of environmental review (CEQA, NEPA)

6.7 NPDES General Construction Permit

The Proposed Project will disturbed greater than one acre of land and required coverage under NPDES General Permit for Storm Water Discharges Associated with Construction and Land Disturbance Activities, Order Number 2009-0009 (DWQ), NPDES No. 000002 (CGP). A notice of intent (NOI) will need to be submitted to obtain coverage under the CGP. A project-specific Storm Water Pollution Prevention Plan (SWPPP) will be required that identifies the facilities risk level based on both sediment transport and receiving water risk. The SWPPP

will also identify project-specific best management practices, sampling, monitoring and reporting requirements, and post-construction BMPs.

6.8 City of Los Angeles Grading and Demolition Permits

Grading and Demolition Permits will be required to construct the proposed project through the LADBS. Supporting documents including geological and geotechnical reports such as soil reports, geology reports, compaction reports, liquefaction studies, and seismology reports will be required to support the permit applications. The permit applications will also need to include haul routes and disposal locations.

6.9 City of Vernon – Public Right of Way Permit

Permits for work in the public right of way will be required from the City of Vernon Public Works, Water and Development Services Department.

6.10 County of Los Angeles – Public Right of Way Permit

Permits for work in the public right of way for connection to the existing Los Angeles River Bike Path at Atlantic Boulevard will be required from the County of Los Angeles Public Works Department.

Appendix C

Opinion of Probable Cost of Construction

OPINION OF PROBABLE COST OF CONSTRUCTION
FOR
METRO LOS ANGELES RIVER
BIKE PATH FEASIBILITY STUDY

PRELIMINARY ENGINEERING
COST ESTIMATE
Updated
JULY 12, 2017

Prime Engineer:

KOA Corporation
1100 Corporate Center Drive
Suite 201
Monterey Park, CA 91754
Tel: (323) 260-4703
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Cost Consultants:

W2 Design, Inc.
50 S. De Lacey Ave.
Suite 100
Pasadena, CA 91105
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50 S. De Lacey Ave.
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Pasadena, CA 91208
Tel: (626) 396-9855
w2designinc.com

Engineer: T. Wong
Checked By: P. Wong
Reach:

Date: 05/19/2016
Date: 05/19/2016

Metro LA River Bike Path Feasibility Study

NOTES & BASIS OF COST ESTIMATE:

SPECIFIC EXCLUSIONS

1 HAZARDOUS MATERIAL ABATEMENT OR CONTAMINATED SOIL REMEDIATION
2 OFF SITE ROAD WIDENING/TRAFFIC SIGNALING
4 LAND ACQUISITION COSTS
4 UNIT COST EXTENSIONS
5 ALLOWANCES
6 INFLATIONARY COST AND ESCALATION
7 GREEN CONSTRUCTION POLICY SPECIFICATIONS
8 BONDS
9 GENERAL CONDITIONS OVERHEAD & FEE
10 SPECIAL MARKET CONDITIONS
11 SITE WORK BEYOND WHAT IS INCLUDED IN THE COST ESTIMATE
12 PROFESSIONAL FEES. LEGAL FEES, MANAGEMENT FEES, PERMIT FEES AND OTHER AGENCIES FEES
13 OWNER'S INTERNAL MANAGEMENT COSTS
14 PHASING OF THE PROJECT
15 SPECIAL EQUIPMENT ALLOWANCE
16 TELEPHONE, CCTV, DATA, SECURITY & LIGHTING

SPECIFIC INCLUSIONS

1 CONSTRUCTION CONTINGENCY COST
2 PROJECT SOFT COSTS
3 LABOR WAGES ARE BASED ON PREVAILING WAGE LABOR FOR SOUTHERN CALIFORNIA. WORK WILL BE PERFORMED DURING NORMAL WORKING HOURS
4 MATERIAL PRICES INCLUDE RELATED LOCAL FREIGHT, SALES TAXES AND WASTE
5 THE CONSTRUCTION COST MODEL IS BASED ON CURRENT CONSTRUCTION MARKET CONDITION BASED ON THE DATE OF THIS REPORT
6 THE CONTRACTOR WILL BE PROVIDED WITH ADEQUATE STAGING SPACE AND PARKING FOR HIS WORKERS
7 PAVEMENT UNIT PRICING INCLUDE AN ASSUMED 12" OF OVER EXCAVATION AND RECOMPACTION, SURFACE TREATMENTS, DEMOLITION AND STRIPING
8 RETAINING WALL INCLUDES REINFORCEMENT, PIPING FOR DRAINAGE, AND DEMOLITION, EXCAVATION, AND REMOVAL OF MATERIALS
9 KEYWAY ASSUMES BRIDGE STRUCTURE 12' LENGTH X 8" DEPTH AND 32 PILES PER 100 LF (3' DIAMETER EACH). THIS RESULTS AN ADDITIONAL 36 SF REQUIREMENT OF KEYWAY TO ADEQUATELY DRAIN BIKE PATH.

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Engineer: T. Wong
Checked By: P. Wong
Reach:

Date: 05/19/2016
Date: 05/19/2016

GENERAL NOTES

1 THIS DRAFT ESTIMATE IS DERIVED FROM PRELIMINARY SUBMITTAL DOCUMENTATION TRANSFERRED FROM PRIME ENGINEER DATED 8/19/2015.

2 COSTS ARE ARRANGED ON A PER SECTION TYPE.

3 THE ESTIMATE ASSUMES CONTRACTOR AND SUB-CONTRACTORS WILL HAVE UNRESTRICTED ACCESS TO THE WORK SCOPE AREA DURING NORMAL CONSTRUCTION HOURS.

4 THIS COST ESTIMATE IS A PROFESSIONAL ESTIMATOR'S OPINION OF THE FAIR MARKET VALUE OF THE PROJECT.

5 LABOR RATES: PRICES ARE BASED ON PREVAILING WAGES IN THE AREA OF THE PROJECT.

6 TAXES: SALES TAXES ARE INCLUDED IN THE MATERIAL AND EQUIPMENT COMPONENT OF THE UNIT COST.

7 QUANTITY CALCULATION: THE QUANTITIES ARE ESTABLISHED BY ENGINEERS AND QUANTITY SURVEYING STAFF BASED ON DRAWINGS PROVIDED BY THE PRIME ENGINEER AS REFERENCED ABOVE.
THE DETAIL IN THE ESTIMATE IS NOT INTENDED BY THE ESTIMATOR TO BE AN "ORDERING LIST" FOR ANY OF THE ISSUES COVERED IN THIS DOCUMENT, NOR IS IT A GUARANTEE OF WHAT THE BID PRICE WOULD BE, DUE TO THE ESTIMATOR NOT HAVING CONTROL OF THE MARKET OR BIDDING CONDITIONS NOR PRICE SOLICITATION FROM SUB-BIDDERS. CONTRACTOR SHALL VERIFY QUANTITIES.

8 UNIT COSTS: UNIT COSTS ARE PRESENTED AS APPROPRIATE FOR LABOR, MATERIAL & EQUIPMENT COMPONENTS & BASED ON THE FOLLOWING REFERENCES:
-CALTRANS '2014 CONTRACT COST DATA; A SUMMARY OF COST BY ITEMS FOR HIGHWAY CONSTRUCTION PROJECTS.'
-RSMEANS '2015 SITE WORK & LANDSCAPE COST DATA; EARTHWORK, UNDERGROUND UTILITIES, SITE IMPROVEMENTS, AND DEMOLITION'
-ENGINEERING AND DESIGN STRUCTURAL DESIGN OF CONCRETE LINED FLOOD CONTROL CHANNELS MANUAL (EM 1110-2-2007; 30 APR 95)

BASIS OF ESTIMATE

1 LINE-ITEM DESCRIPTIONS HAVE BEEN GENERATED FROM THE REFERENCED PRELIMINARY DESIGN DOCUMENTS, EACH WITH AN ASSOCIATED QUANTITY AND UNIT OF MEASURE COMMONLY ACCEPTED IN THE INDUSTRY. THESE ITEMS ARE ARRANGED IN MAJOR UNI FORMAT.

2 A UNIT COST IS ASSOCIATED WITH EACH UNIT QUANTITY THAT REPRESENTS THE FAIR MARKET VALUE FOR THE ITEM TO BE PERFORMED BY A COMPETENT & QUALIFIED SUB-CONTRACTOR.

3 THE MATHEMATICAL EXTENSION OF EACH LINE-ITEM AND UNIT COST ARE CAST INTO THE TOTAL FOR EACH UNIFORMAT CATEGORY. THE TOTALS OF EACH OF THESE UNIFORMAT SECTIONS REPORTS TO THE SUMMARY FOR EACH FACIILITY, WHERE IT IS SUBJECTED TO PRORATED (MARKUPS) VIA PERCENTAGES COMMONLY ACCEPTABLE IN THE INDUSTRY.

- DESIGN CONTINGENCY - FOR DESIGN REFINEMENT BETWEEN THE PRELIMINARY DRAWINGS USED FOR THE ESTIMATE AND THE FINAL BID SET AND TO SERVE AS ESTIMATE CONTINGENCY. (THIS PERCENTAGE IS DIRECTED BY METRO AND MAY BE HIGH FOR THE LEVEL OF THIS ESTIMATE)

- MARKET FACTOR - THE ESTIMATOR'S OPINION FOR THE MARKET FACTOR RATE IS BASED ON THE FOLLOWING:

a. BID RESULTS SEEN ON PROJECTS ESTIMATED WITHIN OUR OFFICE

b. BID RESULTS & TRENDS REPORTED BY CALTRANS & METRO

c. GENERAL MARKET FEEDBACK IN SOUTHERN CALIFORNIA

PLEASE NOTE THAT IT IS COMMON FOR ESTIMATORS TO UTILIZE MARKET FACTORS TO BRING THE BOTTOM-LINE COST FOR THE PROJECT INTO A REASONABLE RANGE TO REFLECT THE PREVAILING MARKET, BASED ON THE ESTIMATORS UNDERSTANDING OF THE MARKET AT THE TIME OF THE ESTIMATE. THIS FACTOR SHALL BE EVALUATED AT EACH ESTIMATE MILESTONE AND ANTICIPATES A FACTOR APPROPRIATE TO WHEN THE PROJECT WILL BE BUILT. IT IS FURTHERMORE VERY TYPICAL TO SHOW A MARKET FACTOR ADJUSTMENT AT EVERY ESTIMATE PUBLICATION.

- GC H.O. OVERHEAD & FEE - REPRESENTS A PERCENTAGE OF DIRECT COST PLUS COMMULATIVE PRORATES AS ABOVE, THAT FALL WITHIN THE RANGE OF FEES THE GC MAY INCLUDE IN THEIR BOTTOM LINE FOR A PROJECT OF THIS KIND.

4 SOURCES OF PRICING ARE NOT LIMITED TO, BUT MAY BE FROM ANY ONE OF THE FOLLOWING:

a. AVAILABLE R.S. MEANS COSTS

b. PUBLISHED FROM SOURCES SUCH AS SWEETS UNIT COST GUIDE, CALTRANS '2014 CONTRACT COST DATA; A SUMMARY OF COST BY ITEMS FOR HIGHWAY CONSTRUCTION PROJECTS,' AND THE LIKE

c. EMPIRICAL COSTS DRAWN FROM OTHER ESTIMATES, SUPLLEMENTED BY ESTIMATOR'S EXPERIENCE

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ESTIMATE OF COST

AN ESTIMATE OF COST IS PREPARED FROM A SURVEY OF THE QUANTITIES OF WORK-ITEMS PREPARED FROM WRITTEN OR DRAWN INFORMATION PROVIDED AT THE PRELIMINARY DESIGN STAGE OF THE DESIGN. HISTORICAL COSTS, INFORMATION PROVIDED BY CONTRACTORS AND SUPPLIERS, PLUS JUDGMENTAL EVALUATION BY THE ESTIMATOR ARE USED AS APPROPRIATE AS THE BASIS FOR PRICING.

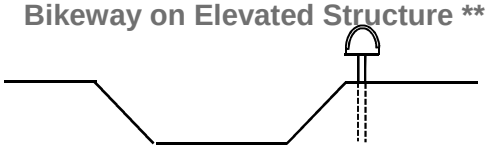
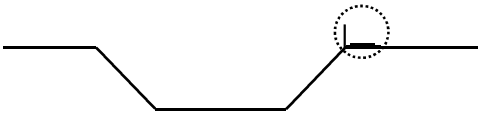
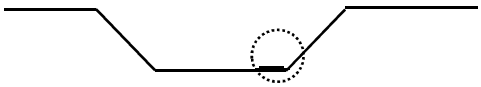
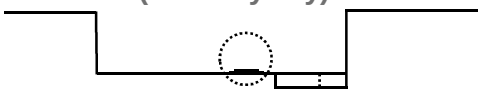
ALLOWANCES AS APPROPRIATE WILL BE INCLUDED FOR ITEMS OF WORK WHICH ARE NOT INDICATED ON THE DESIGN DOCUMENTS, PROVIDED THAT THE ESTIMATOR IS MADE AWARE OF THEM, OR WHICH, IN THE JUDGMENT OF THE ESTIMATOR, ARE REQUIRED FOR COMPLETION OF THE WORK. W2 DESIGN CANNOT, HOWEVER, BE RESPONSIBLE FOR ITEMS OR WORK OF AN UNUSUAL NATURE OF WHICH WE HAVE NOT BEEN INFORMED, OR ARE NOT CLEARLY INFERRED ON THE BASELINE DOCUMENTATION UTILIZED FOR THE ESTIMATE.

LIMITATIONS

SINCE WE HAVE NO CONTROL OVER THE COST OF LABOR, MATERIAL AND EQUIPMENT, OR THE CONTRACTOR'S METHOD OF CARRYING OUT THE WORK AND DETERMINING THE PRICE, OR OVER COMPETITIVE BIDDING OR MARKET CONDITIONS, THIS OPINION OF PROBABLE CONSTRUCTION COST PROVIDED IS MADE ON THE BASIS OF GENERALLY ACCEPTED INDUSTRY DATA, EXPERIENCE AND QUALIFICATIONS. THIS OPINION REPRESENTS OUR BEST JUDGMENT AS PROFESSIONAL CONSTRUCTION CONSULTANTS WITH THE CONSTRUCTION INDUSTRY. HOWEVER, WE CANNOT AND DO NOT GUARANTEE THAT PROPOSALS, BIDS OR THE CONSTRUCTION COST WILL NOT VARY FROM OPINIONS OF PROBABLE COST IN THE COST MODEL.

Metro LA River Bike Path Feasibility Study

Items in Cost Estimate Per Section Type

	SECTION DESCRIPTION	ITEMS INCLUDED
A1	**Bikeway on Elevated Structure **** 	12'x8" Concrete Structure Pavement Bridge Deck Bridge Column Chain Link Cover at Bridge Overhead *** Estimated Project Cost per linear foot: $13,070**
A2	**Bikeway with Cantilever **** 	12'x8" Concrete Structure Pavement Bridge Deck 6' High Chain Link Fence 8 Piles per Cantilever - 4 Cantilevers Per Station *** Estimated Project Cost per linear foot: $13,120**
B	**Bikeway at Top of Bank** 	12'x4" Asphalt Concrete Pavement 6' High Chain Link Fence *** Estimated Project Cost per linear foot: $420**
C	**Bikeway at Channel Bottom** 	12'x6" PCC Concrete Pavement Subgrade Prep. & Channel Removal *** Estimated Project cost per linear foot: $460**
D	**Bikeway at Channel Cut** 	12'x6" PCC Concrete Pavement Subgrade Prep. & Channel Removal Structural Retaining Wall with Drainage *** Estimated Project Cost per linear foot: $3,720**
E	**Bikeway at Channel Bottom (with keyway)***** 	12'x6" PCC Concrete Pavement Subgrade Prep. & Channel Removal Modified Channel Keyway (36 SF estimated additional section) *** Estimated Project cost per linear foot: $2,730**

* Project costs include 35% contingency and 51% for soft costs including 15% Preliminary Engineering and Environmental Clearance, 10% Final Design, 15% Right-of-Way, and 11% Construction Engineering.

** An average unit cost of $13,100for aerial structure (elevated structure and cantilever) was used while generate the rough order of magnitude (ROM) cost estimate. This was due to the similar unit cost of the structures and to make design options flexible during future phases of the project.

*** Modified area is assumed to mitigate hydraulic impact due to structures constructed within the channel.

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Metro LA River Bike Path Feasibility Study
Item Unit Price

Note:
1.) 1 Station (Sta) = 100 ft.
2.) Soft costs estimated by applying similar percentages from 6th St. Viaduct Project except less ROW costs are assumed since the majority of the bike path will be constructed on existing ROW.

Elevated Structure

ITEM NO.	DESCRIPTION	ESTIMATED QUANTITY	UNIT	UNIT PRICE	ITEM COST
1	12' x 6" Concrete (PCC) Pavement	0	Sta	$ 20,304	$0
2	12' x 4" Asphaltic Conc. (AC) Pavement	0	Sta	$ 16,920	$0
3	Subgrade Prep. & Channel Removal	0	Sta	$ 2,000	$0
4	6' High Chain Link Fence	0	LF	$ 35	$0
5	Structural Retaining Wall w/ Drainage	0	LF	$ 1,600	$0
6	12' x 8" Concrete Str. Pav't Bridge Deck	1,200	SF	$ 500	$600,000
7	Bridge Column	4	EA	$ 6,500	$26,000
8	8 Piles - Cantilever - 4 Per Station	0	EA	$ 10,000	$0
9	Chain Link Cover Bridge Overhead	100	LF	$ 150	$15,000
				Sub-Total	**$641,000**
				Contingency (35%)	$224,350
				Construction Total	**$865,350**
				Preliminary Engineering and Environmental Clearance (15%)	$129,803
				Final Design (10%)	$86,535
				Right-of-Way (private land owner, utility and railroad coordination) (15%)	$129,803
				Construction Engineering (11%)	$95,189
				Grand Total (Cost per 100 feet)	**$1,306,679**
				Grand Total (Cost per foot)	**$13,066.79**

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Metro LA River Bike Path Feasibility Study
Item Unit Price

Note:
1.) 1 Station (Sta) = 100 ft.
2.) Soft costs estimated by applying similar percentages from 6th St. Viaduct Project except less ROW costs are assumed since the majority of the bike path will be constructed on existing ROW.

Cantilever

ITEM NO.	DESCRIPTION	ESTIMATED QUANTITY	UNIT	UNIT PRICE	ITEM COST
1	12' x 6" Concrete (PCC) Pavement	0	Sta	$ 20,304	$0
2	12' x 4" Asphaltic Conc. (AC) Pavement	0	Sta	$ 16,920	$0
3	Subgrade Prep. & Channel Wall Removal	0	Sta	$ 2,000	$0
4	6' High Chain Link Fence	100	LF	$ 35	$3,500
5	Structural Retaining Wall w/ Drainage	0	LF	$ 1,600	$0
6	12' x 8" Concrete Str. Pav't Bridge Deck	1,200	SF	$ 500	$600,000
7	Bridge Column	0	EA	$ 6,500	$0
8	8 Piles - Cantilever - 4 Per Station	4	EA	$ 10,000	$40,000
9	Chain Link Cover Bridge Overhead	0	LF	$ 150	$0
				Sub-Total	**$643,500**
				Contingency (35%)	$225,225
				Construction Total	**$868,725**
				Preliminary Engineering and Environmental Clearance (15%)	$130,309
				Final Design (10%)	$86,873
				Right-of-Way (private land owner, utility and railroad coordination) (15%)	$130,309
				Construction Engineering (11%)	$95,560
				Grand Total (Cost per 100 feet)	**$1,311,775**
				Grand Total (Cost per foot)	**$13,117.75**

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Metro LA River Bike Path Feasibility Study
Item Unit Price

Note:
1.) 1 Station (Sta) = 100 ft.
2.) Soft costs estimated by applying similar percentages from 6th St. Viaduct Project except less ROW costs are assumed since the majority of the bike path will be constructed on existing ROW.

Top o Bank

ITEM NO.	DESCRIPTION	ESTIMATED QUANTITY	UNIT	UNIT PRICE	ITEM COST
1	12' x 6" Concrete (PCC) Pavement	0	Sta	$ 20,304	$0
2	12' x 4" Asphaltic Conc. (AC) Pavement	1	Sta	$ 16,920	$16,920
3	Subgrade Prep. & Channel Removal	0	Sta	$ 2,000	$0
4	6' High Chain Link Fence	100	LF	$ 35	$3,500
5	Structural Retaining Wall w/ Drainage	0	LF	$ 1,600	$0
6	12' x 8" Concrete Str. Pav't Bridge Deck	0	SF	$ 500	$0
7	Bridge Column	0	EA	$ 6,500	$0
8	8 Piles - Cantilever - 4 Per Station	0	EA	$ 10,000	$0
9	Chain Link Cover Bridge Overhead	0	LF	$ 150	$0
				Sub-Total	**$20,420**
				Contingency (35%)	$7,147
				Construction Total	**$27,567**
				Preliminary Engineering and Environmental Clearance (15%)	$4,135
				Final Design (10%)	$2,757
				Right-of-Way (private land owner, utility and railroad coordination) (15%)	$4,135
				Construction Engineering (11%)	$3,032
				Grand Total (Cost per 100 feet)	**$41,626**
				Grand Total (Cost per foot)	**$416.26**

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Metro LA River Bike Path Feasibility Study
Item Unit Price

Note:
1.) 1 Station (Sta) = 100 ft.
2.) Soft costs estimated by applying similar percentages from 6th St. Viaduct Project except less ROW costs are assumed since the majority of the bike path will be constructed on existing ROW.

Channel Bottom

ITEM NO.	DESCRIPTION	ESTIMATED QUANTITY	UNIT	UNIT PRICE	ITEM COST
1	12' x 6" Concrete (PCC) Pavement	1	Sta	$ 20,304	$20,304
2	12' x 4" Asphaltic Conc. (AC) Pavement	0	Sta	$ 16,920	$0
3	Subgrade Prep. & Channel Removal	1	Sta	$ 2,000	$2,000
4	6' High Chain Link Fence	0	LF	$ 35	$0
5	Structural Retaining Wall w/ Drainage	0	LF	$ 1,600	$0
6	12' x 8" Concrete Str. Pav't Bridge Deck	0	SF	$ 500	$0
7	Bridge Column	0	EA	$ 6,500	$0
8	8 Piles - Cantilever - 4 Per Station	0	EA	$ 10,000	$0
9	Chain Link Cover Bridge Overhead	0	LF	$ 150	$0
				Sub-Total	**$22,304**
				Contingency (35%)	$7,806
				Construction Total	**$30,110**
				Preliminary Engineering and Environmental Clearance (15%)	$4,517
				Final Design (10%)	$3,011
				Right-of-Way (private land owner, utility and railroad coordination) (15%)	$4,517
				Construction Engineering (11%)	$3,312
				Grand Total (Cost per 100 feet)	**$45,467**
				Grand Total (Cost per foot)	**$454.67**

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Metro LA River Bike Path Feasibility Study
Item Unit Price

Note:
1.) 1 Station (Sta) = 100 ft.
2.) Soft costs estimated by applying similar percentages from 6th St. Viaduct Project except less ROW costs are assumed since the majority of the bike path will be constructed on existing ROW.

Channel Cut

ITEM NO.	DESCRIPTION	ESTIMATED QUANTITY	UNIT	UNIT PRICE	ITEM COST
1	12' x 6" Concrete (PCC) Pavement	1	Sta	$ 20,304	$20,304
2	12' x 4" Asphaltic Conc. (AC) Pavement	0	Sta	$ 16,920	$0
3	Subgrade Prep. & Channel Removal	1	Sta	$ 2,000	$2,000
4	6' High Chain Link Fence	0	LF	$ 35	$0
5	Structural Retaining Wall w/ Drainage	100	LF	$ 1,600	$160,000
6	12' x 8" Concrete Str. Pav't Bridge Deck	0	SF	$ 500	$0
7	Bridge Column	0	EA	$ 6,500	$0
8	8 Piles - Cantilever - 4 Per Station	0	EA	$ 10,000	$0
9	Chain Link Cover Bridge Overhead	0	LF	$ 150	$0
	Sub-Total				**$182,304**
	Contingency (35%)				$63,806
	Construction Total				**$246,110**
	Preliminary Engineering and Environmental Clearance (15%)				$36,917
	Final Design (10%)				$24,611
	Right-of-Way (private land owner, utility and railroad coordination) (15%)				$36,917
	Construction Engineering (11%)				$27,072
	Grand Total (Cost per 100 feet)				**$371,627**
	Grand Total (Cost per foot)				**$3,716.27**

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Metro LA River Bike Path Feasibility Study
Item Unit Price

Note:
1.) 1 Station (Sta) = 100 ft.
2.) Soft costs estimated by applying similar percentages from 6th St. Viaduct Project except less ROW costs are assumed since the majority of the bike path will be constructed on existing ROW.

Channel Bottom (with keyway)

ITEM NO.	DESCRIPTION	ESTIMATED QUANTITY	UNIT	UNIT PRICE	ITEM COST
1	12' x 6" Concrete (PCC) Pavement	1	Sta	$ 121,900	$121,900
2	12' x 4" Asphaltic Conc. (AC) Pavement	0	Sta	$ 16,920	$0
3	Subgrade Prep. & Channel Removal	1	Sta	$ 12,000	$12,000
4	6' High Chain Link Fence	0	LF	$ 35	$0
5	Structural Retaining Wall w/ Drainage	0	LF	$ 1,600	$0
6	12' x 8" Concrete Str. Pav't Bridge Deck	0	SF	$ 500	$0
7	Bridge Column	0	EA	$ 6,500	$0
8	8 Piles - Cantilever - 4 Per Station	0	EA	$ 10,000	$0
9	Chain Link Cover Bridge Overhead	0	LF	$ 150	$0
	Sub-Total				**$133,900**
	Contingency (35%)				$46,865
	Construction Total				**$180,765**
	Preliminary Engineering and Environmental Clearance (15%)				$27,115
	Final Design (10%)				$18,077
	Right-of-Way (private land owner, utility and railroad coordination) (15%)				$27,115
	Construction Engineering (11%)				$19,884
	Grand Total (Cost per 100 feet)				**$272,955**
	Grand Total (Cost per foot)				**$2,729.55**

LEGEND		
	SECTION TYPE	$/FT
A	AERIAL STRUCTURE	$ 13,100
B	TOP OF BANK	$ 420
C	CHANNEL BOTTOM	$ 460
D	CHANNEL CUTS	$ 3,720

Estimate Quantity Parameters

Transition length out of channel(D)	600 ft	One access; most access only requires one channel cut access. Assume average 30-ft channel with access path at 5% grade.
Transition to top of bridge(A)	1000 ft	Two access connections. Assume average 25-ft from top of channel to elevated bridge at 5% grade
Transition at grade(B)	500 ft	One access. Assume average at-grade transition of 500-ft to connect to access point.

ACCESS FROM TOP OF BANK

RIVERSIDE, DOWNEY & ATLANTIC

Case #	SECTION	DISTANCE	$/FT	TOTAL COST
1	A	0	13100	0
	B	500	420	210000
	C	0	460	0
	D	0	3720	0
			TOTAL:	$ 210,000

BROADWAY, SPRING, CEASAR CHAVEZ, 1ST, 4TH, 7TH & OLYMPIC

Case #	SECTION	DISTANCE	$/FT	TOTAL COST
3	A	1000	13100	13100000
	B	0	420	0
	C	0	460	0
	D	600	3720	2232000
			TOTAL:	$ 15,332,000

Assumption: Segment is channel cut under bridge and needs additional channel cut to get to upper bank before need for aerial structure.

MAIN ST

Case #	SECTION	DISTANCE	$/FT	TOTAL COST
5	A	0	13100	0
	B	500	420	210000
	C	0	460	0
	D	160 *	3720	595200
			TOTAL:	$ 805,200

Assumption: Parking lot south of Main Street is has approximately an 8' difference (160' cut) between lot to top of bank.

WHITTIER BLVD (6TH STREET)

Case #	SECTION	DISTANCE	$/FT	TOTAL COST
7	A	0	13100	0
	B	0	420	0
	C	0	460	0
	D	600	3720	2232000
			TOTAL:	$ 2,232,000

WASHINGTON

Case #	SECTION	DISTANCE	$/FT	TOTAL COST
9	A	500 *	13100	6550000
	B	500	420	210000
	C	0	460	0
	D	0	3720	0
			TOTAL:	$ 6,760,000

Assumption: From North Upper bank path access(500') and from south channel aerial structure access(500')

26TH ST, SOTO & BANDINI

Case #	SECTION	DISTANCE	$/FT	TOTAL COST
11	A	1000	13100	13100000
	B	0	420	0
	C	0	460	0
	D	0	3720	0
			TOTAL:	$ 13,100,000

ACCESS FROM CHANNEL BOTTOM

RIVERSIDE, DOWNEY & ATLANTIC

Case #	SECTION	DISTANCE	$/FT	TOTAL COST
2	A	0	13100	0
	B	0	420	0
	C	0	460	0
	D	600	3720	2232000
			TOTAL:	$ 2,232,000

BROADWAY, SPRING, CEASAR CHAVEZ, 1ST, 4TH, 7TH & OLYMPIC

Case #	SECTION	DISTANCE	$/FT	TOTAL COST
4	A	1000	13100	13100000
	B	0	420	0
	C	0	460	0
	D	1200	3720	4464000
			TOTAL:	$ 17,564,000

Assumption: Transition from bottom of the channel each way 600' (1200 total) are needed to cut to the top of bank into the aerial structure.

MAIN ST

Case #	SECTION	DISTANCE	$/FT	TOTAL COST
6	A	0	13100	0
	B	500	420	210000
	C	0	460	0
	D	760 *	3720	2827200
			TOTAL:	$ 3,037,200

Assumption: Parking lot south of Main Street has approximately an 8' difference (160' cut) between lot to top of bank. Channel cut (600') at south of Main Street from channel bottom.

WHITTIER BLVD (6TH STREET)

Case #	SECTION	DISTANCE	$/FT	TOTAL COST
8	A	0	13100	0
	B	0	420	0
	C	0	460	0
	D	0	3720	0
			TOTAL:	$ -

Assumption: Access already exists to channel bottom

WASHINGTON

Case #	SECTION	DISTANCE	$/FT	TOTAL COST
10	A	1000	13100	13100000
	B	500	420	210000
	C	0	460	0
	D	600	3720	2232000
			TOTAL:	$ 15,542,000

26TH ST, SOTO & BANDINI

Case #	SECTION	DISTANCE	$/FT	TOTAL COST
12	A	1000	13100	13100000
	B	0	420	0
	C	0	460	0
	D	0	3720	0
			TOTAL:	$ 13,100,000

*Distance varies from parameters for site specific situations.

TOP OF BANK OPTION PRELIMINARY COST ESTIMATE

Reach	Section Type	Unit Cost ($/FT)	Length(FT)	Cost	Assumptions	Access point		Cost of reach
1	Aerial Structure	$13,100	951	$ 12,458,100	Top of bank path is (1159') from existing path to aerial structure (951') over R/R tracks and under CA-101 FWY.	5 Fwy		$ 13,154,880
	Top of Bank	$420	1159	$ 486,780		Riverside Drive	$ 210,000	
	Channel Cuts	$3,720		$ -		110 Fwy		
2	Aerial Structure	$13,100		$ -	Top of bank path(881') until second electric tower/rubber dam ends where tracks narrow. Channel cut (2237') for narrow area from rubber dam to end of reach.	R/R crossing		$ 39,355,660
	Top of Bank	$420	881	$ 370,020		Broadway	$ 15,332,000	
	Channel Cuts	$3,720	2237	$ 8,321,640		Spring Street	$ 15,332,000	
3	Aerial Structure	$13,100		$ -	Channel cut: up to Main St bridge (893'), DWP LOT to after Metro tracks(594'), 2nd electric tower after Metro tracks where area narrows until end of reach(1390'). Top of bank path: after Main St to Metro tracks(DWP LOT)(1622'), Metro tracks to 2nd electric tower(1060').	Main St	$ 805,200	$ 27,966,080
	Top of Bank	$420	2682	$ 1,126,440		R/R crossing		
	Channel Cuts	$3,720	2877	$ 10,702,440		Cesar Chavez	$ 15,332,000	
4	Aerial Structure	$13,100	4672	$ 61,203,200	Channel Cut up to Olympic Blvd (11344'). Top of Bank path from Olympic Blvd to 800' North of Washington Blvd (1858'). Aerial structure from 800' North of Washington Blvd to Bandini Blvd (4672').	101 Fwy		$ 213,803,240
	Top of Bank	$420	1858	$ 780,360		1st St	$ 15,332,000	
	Channel Cuts	$3,720	11344	$ 42,199,680		4th St	$ 15,332,000	
						Whittier Blvd	$ 2,232,000	
						7th St	$ 15,332,000	
						10 Fwy		
						Olympic Blvd	$ 15,332,000	
						R/R crossing		
						Washington Blvd	$ 6,760,000	
						26th St	$ 13,100,000	
						Soto St	$ 13,100,000	
						Bandini Blvd	$ 13,100,000	
5	Aerial Structure	$13,100		$ -	Channel cut all of Reach 5 (12769').	Downey Rd	$ 210,000	$ 47,920,680
	Top of Bank	$420		$ -		R/R crossing		
	Channel Cuts	$3,720	12769	$ 47,500,680		Atlantic Blvd	$ 210,000	
TOP OF BANK OPTION TOTAL								**$ 342,200,540**

CHANNEL BOTTOM OPTION PRELIMINARY COST ESTIMATE

Reach	Section Type	Unit Cost ($/FT)	Length(FT)	Cost	Assumptions	Access point		Cost of reach
1	Aerial Structure	$13,100	0	$ -	Channel cut from existing path to bottom of channel (600'). Channel bottom path until the end of reach (2110'). Difference in Reach 1 distance between top of bank is due to the channel cut before rectangular channel portion. No standing water in this reach most of the year.	5 Fwy		$ 5,434,600
	Channel Bottom	$460	2110	$ 970,600		Riverside Drive	$ 2,232,000	
	Channel Cuts	$3,720	600	$ 2,232,000		110 Fwy		
	Channel Bottom (with Keyway)	$2,730		$ -				
2	Aerial Structure	$13,100	0	$ -	Remain on channel bottom path (881') until second electric tower/rubber dam. Channel cut (2237') from rubber dam to end of reach.	R/R crossing		$ 43,854,900
	Channel Bottom	$460	881	$ 405,260		Broadway	$ 17,564,000	
	Channel Cuts	$3,720	2237	$ 8,321,640		Spring Street	$ 17,564,000	
	Channel Bottom (with Keyway)	$2,730		$ -				
3	Aerial Structure	$13,100	0	$ -	Channel cut until after Main St bridge (1881'). Channel bottom path for the rest of reach (3682').	Main St	$ 3,037,200	$ 29,292,240
	Channel Bottom	$460	3682	$ 1,693,720		R/R crossing		
	Channel Cuts	$3,720	1881	$ 6,997,320		Cesar Chavez	$ 17,564,000	
	Channel Bottom (with Keyway)	$2,730		$ -				
4	Aerial Structure	$13,100	165	$ 2,161,500	Between Washington Blvd and Bandini Blvd the low flow is diverted to the outer walls by concrete curbs, at which point the path can be moved from the channel edge towards the center. At locations where water is being diverted, elevated structures are needed to go over obstructions (165'). An elevated path within the channel is feasible given the available hydraulic data and design parameter, but has higher permitting risks. Channel cut around 3 inlets at channel bottom (390' to go around each, 1170 total). Channel bottom path for the rest of reach (16539'). Due to elevated and access structures installed within the channel flow, an assumed channel bottom modification is necessary between 1000' north of Washington Blvd and Bandini Blvd (4690').	101 Fwy		$ 152,023,540
	Channel Bottom	$460	16539	$ 7,607,940		1st St	$ 17,564,000	
	Channel Cuts	$3,720	1170	$ 4,352,400		4th St	$ 17,564,000	
	Channel Bottom (with Keyway)	$2,730	4690	$ 12,803,700		Whittier Blvd		
						7th St	$ 17,564,000	
						10 Fwy		
						Olympic Blvd	$ 17,564,000	
						R/R crossing		
						Washington Blvd	$ 15,542,000	
						26th St	$ 13,100,000	
						Soto St	$ 13,100,000	
						Bandini Blvd	$ 13,100,000	
5	Aerial Structure	$13,100	165	$ 2,161,500	Where water is diverted, elevated structure within the channel is needed to go over obstruction (165'). Due to elevated and access structures installed within the channel flow path, an assumed channel bottom modification is necessary for 1000' south of Bandini Blvd (1000').Channel cut at end of the reach to existing path at Atlantic (1000').Channel bottom path for the rest of reach (11604').	Downey Rd	$ 2,232,000	$ 18,413,340
	Channel Bottom	$460	11604	$ 5,337,840		R/R crossing		
	Channel Cuts	$3,720	1000	$ 3,720,000		Atlantic Blvd	$ 2,232,000	
	Channel Bottom (with Keyway)	$2,730	1000	$ 2,730,000				
CHANNEL BOTTOM OPTION TOTAL								**$ 249,018,620**

Appendix D

Site Assessment Summary

SITE ASSESSMENT SUMMARY

		REACH 1			REACH 2							REACH 3							REACH 4																					REACH 5		
		I-5 FWY	Riverside Dr	R/R(UPRR) / CA-110 FWY	Electrical Tower(4)	R/R(LACMTA)	Electrical Tower	Broadway	Electrical Tower	Rubber Dam	Spring St	Electrical Tower(3)	Main St	DWP Parking Lot	Electrical Tower	R/R(LACMTA)	R/R(LACMTA)	Electrical Tower	Cesar Chavez Ave	Electrical Tower	El Monte Busway / US-101 FWY	Electrical Tower(2)	1st St	Electrical Tower (4)	4th St	Electrical Tower	Whittier Blvd(6th St)	Electrical Tower (3)	7th St	Electrical Tower (3)	I-10 FWY	Electrical Tower(2)	Olympic Blvd	Electrical Tower(3)	R/R(ACTA)	Electrical Tower	Washington Blvd / R/R(AMTRAK)	Electrical Tower	R/R(BNSF)	26th St	Soto St	Bandini Blvd	Downey Rd / R/R(LA & SL)	R/R	Atlantic Blvd
UPPER BANK	*Condition*	Mostly Clear		Obstructed	Mostly Clear							Obstructed							Highly Obstructed																Mostly Clear			Highly Obstructed				Obstructed		
	Obstruction			RX															RR																RX			IL				RR		
	Bike Path Options	B		A	ET		ET		ET			ET	S		ET	S	S	ET	S	ET	S	ET	S	ET	S	ET	S	ET	S	ET	S	ET	S	ET	S	ET	S	ET	S	S	S	S	S		
					A, B, D							A, B, D							A, D																A, B			A				A, D		
CHANNEL WALL*	*Condition*	Sloped		Vertical	Sloped							Sloped							Sloped																			Vertical					Sloped		
CHANNEL BOTTOM	*Condition*	Clear			Obstructed							Clear							Clear																									
	Obstruction				Rubber Dam																																	Water Divergence							
	Bike Path Options	D		C	C		D				D	C,D							C,D															A*			E					E	A*	C	D

**Path within sloped channel wall can vary from closer to the bottom or top of channel to either avoid obstructions or to provide for better access point opportunities.*

Condition Legend

Green = Mostly Clear/Sloped Walls

Orange = Obstructed

RED = Highly Obstructed/Vertical Walls

Obstruction Legend

RX = R/R Crossing

IL = Industrial Land Use

RR = R/R Horizontal Clearance

S = Bridge Structure

ET = Electrical Tower

Bike Path Options Legend

A = Aerial Structure

A* = Elevated structure within the channel to go over water divergence

B = Upper Bank Path

C = Channel Bottom Path

D = Channel Cuts

E = Channel Bottom Modification

Appendix E

Hydraulic Analysis (Modeling)

Los Angeles River Bike Path

Feasibility Study

Appendix E

Hydraulic Modeling

May 25, 2016

Document Details

Tasks 2.6 and 4.1	
Version	**Completed**
Internal Review Draft	1/6/16
Draft	1/8/16
Draft Final	
Final	5/25/16

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In association with:

KOA Corporation
ICF International
Wagner Surveying & Engineering
W2 Design, Inc.

Table of Contents

Abbreviations/Acronyms

cfs cubic feet per second
Corps U.S. Army Corps of Engineers
fps feet per second
ft feet
HEC-RAS Hydrologic Engineering Centers – River Analysis System
LACFCD Los Angeles County Flood Control District
Metro Los Angeles County Metropolitan Transportation Authority
MFR Memorandum for Record
USACE U.S. Army Corps of Engineers
WSE Water surface elevation

1. INTRODUCTION

This appendix describes the preliminary hydraulic analysis that was performed to assess the effect of an in-channel bike path on the overall flood carrying capacity of the Los Angeles River. The analysis used the US Army Corps of Engineers (USACE or Corps) one-dimensional Hydrologic Engineering Centers – River Analysis System (HEC-RAS) model for the Los Angeles River to assess the effect of the "channel bottom / in-channel" alignment, where the path enters the channel upstream of Main Street and exits downstream of Atlantic Boulevard (see Section 7 of the main report). This alignment was analyzed since it represents the largest hydraulic impact on the river (i.e., it is the alignment that maximizes the length of in-channel bike path) with approximately 7.9 miles of bike path in the river channel.

It is anticipated the proposed project will require Corps 408 permit authorization pursuant to Title 33, United States Code (33 USC) Section 408, and the Rivers and Harbors Act of 1899. The submittal package for the 408 Permit application must demonstrate the modification will not alter the Los Angeles River channel or the hydraulics of the Los Angeles River in a manner that would adversely affect the operation or integrity of the flood control structure or system. The modeling presented herein provides an initial hydraulic analysis using a one-dimensional model to evaluate the overall flood carrying capacity of the channel. It is noted that the Corps will also require multi-dimensional models to be used to assess effects of individual access ramps in order to satisfy the permitting requirements.

2. MODEL REPRESENTATION

Reach 1 of the Corps HEC-RAS model for the Los Angeles River [USACE, 2005] extending from River Station 1420+55.6 (near Fletcher Drive) to River Station 633+00 (near the Rio Hondo Confluence) was obtained from the Corps and used for this study. Modifications to the model were made for simulations both without and with the bike path, as described in following sections.

All model runs in this study used the steady-state USACE design flow, in order to assess the effect of the bike path on the hydraulics during this critical condition. Model flow rates ranged from 83,700 cubic feet per second (cfs) at River Station 1289+81 (near the Golden State Freeway Bridge), 104,000 cfs at River Station 1232+50.1 (Main Street Bridge), and up to 109,500 cfs at River Station 884+36.7 (Atlantic Boulevard Bridge).

2.1 HEC-RAS Model without Bike Path

The existing Reach 1 model was modified to include proposed changes to the 6th Street Bridge [Sixth Street Viaduct Replacement, 2015] at River Station 1122+17.3. The modifications involved the addition of a retaining wall on the west side-slope of the river at stations 1122+54.7 and 1121+80.3, and removal of the central bridge pier. Two new cross-sections were also added upstream and downstream of the bridge, at 1122+55.7 and 1121+79.3, respectively, to better resolve any hydraulic changes.

Prior to the modifications the flow at 6th Street Bridge was subcritical, with a hydraulic jump forming approximately 220 feet (ft) upstream of the bridge. The removal of the central bridge pier resulted in flow remaining supercritical through the bridge section, resulting in substantially lower critical water surface elevation (WSE) and increased minimum freeboard (i.e., distance between the WSE and the lowest river bank elevation).

2.2 HEC-RAS Model with Bike Path

The in-channel portion of the bike path alignment that was analyzed enters the channel upstream of Main Street and exits downstream of Atlantic Boulevard. As discussed prior, this potential alignment represents the largest hydraulic impact on the river (i.e., it is the alignment that maximizes the length of in-channel bike path) with approximately 7.9 miles of bike path in the river channel.

The bike path was represented in the model as a 12-ft wide, 6-inch raised concrete path with a 4H:1V side-slope at the toe-end and a 2% cross-slope, as indicated in Figure 1. The bike path was assumed to consist of a brushed concrete finish that was represented by a Manning's n value of 0.016, which is an upper estimate value (Clark County Regional Flood Control District, 1999) and therefore a conservative assumption. Other Manning's n values within the model were not modified from the original values used by the Corps.

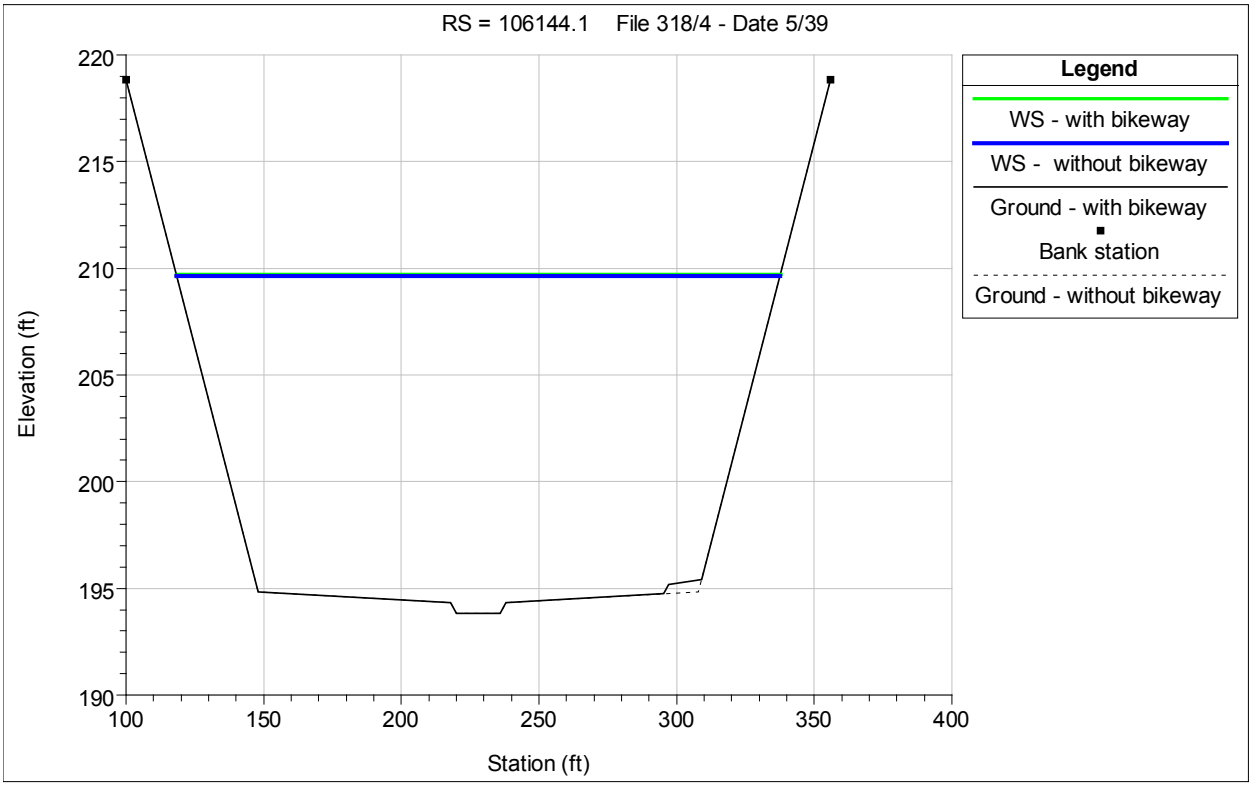


Figure 1: Typical cross-section of bike path located on channel bottom at toe of right bank, shown here at River Station 1061+44.10

Most of the proposed bike path is located directly on the channel bottom adjacent to the right[1] bank. However, access ramps were added at either end of the in-channel portion (i.e., at Main Street and Atlantic Boulevard). These ramps were assumed to be excavated out of the river channel wall, such that the overall area available to the flow is slightly increased (see Section 3.4). Based upon recommendations from the technical advisory committee (TAC) the cut-slope (i.e., the slope of the bank adjacent to the bike path) was not vertical, but rather set at 1H:2V (see Figure 2) in order to allow adequate shoulder room for people on bicycles.

In addition to the access ramps small "bridges" were implemented to cross over the low-flow channel near Washington Boulevard and Bandini Boulevard. Additional description of the ramps and bridges are provided in the following sections. Visual representations of all sections of the model are provided as an animation (Appendix_E_HEC-RAS_animation.avi).

[1] Defined while facing downstream.

Main Street Ramp

Approximately 950 ft upstream of Main Street (just upstream of River Station 1240+73), the bike path begins to descend from the river bank through excavation of the existing river bank. The path descends at approximately 2% grade for about 400 ft, before transitioning to a near horizontal grade near River Station 1237+91. At this point the bike path is elevated approximately 10 ft above the channel bottom (see Figure 2), and the horizontal grade[2] continues for another 800 ft until just downstream of Main Street (River Station 1232+50.1). The bike path then begins descending at approximately 2.75% grade, until it reaches the channel floor at the west bank near River Station 1225+00, about 750 ft downstream of the Main Street Bridge. The bike path then continues on the channel floor.

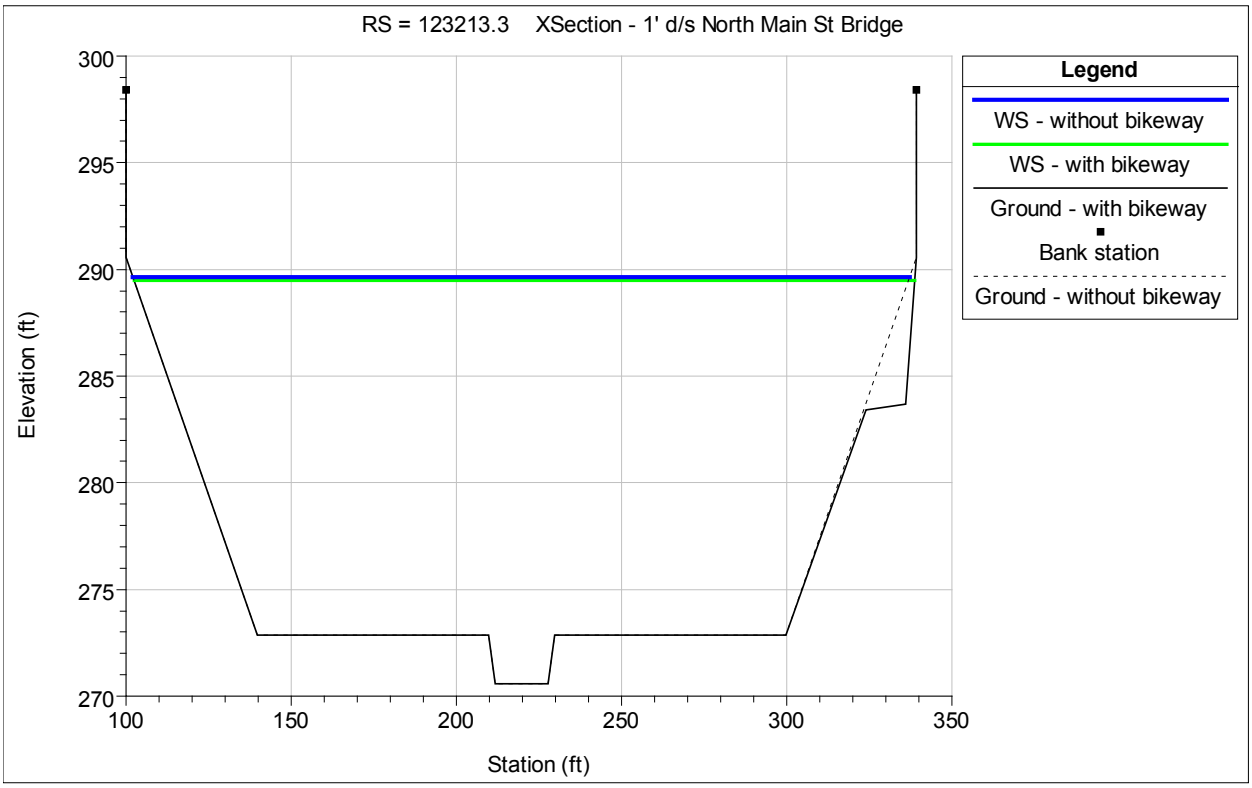


Figure 2. Typical horizontal cross-section showing excavated bike path (River Station 1232+13.3), just downstream of Main Street

[2] The horizontal portion of the bike path was designed to allow for an additional access ramp to exit back up to the downstream side of Main Street in an efficient manner (i.e., without having to ascend all the way from the channel bottom). This additional access ramp was not implemented into the HEC-RAS model, since it was assumed to be recessed into the channel wall and be an "ineffective flow area" in the one-dimensional model.

Low-Flow Channel "Bridges"

Approximately 300 ft upstream of Washington St. Bridge the trapezoidal channel has transitioned to a rectangular channel, and the low-flow channel splits from a single channel near the river center into two channels alongside each of the vertical channel walls. These low flow channels are separated from the rest of the channel by retaining curbs. The bike path is assumed to shift from the right bank (which is now immediately adjacent to the right split of the low-flow channel) into the central portion of the channel. In order to cross the low flow channel a "bridge" needs to be constructed. The bridge (and bike path) between River Stations 1047+00.3 and 1044+27.2 is assumed to ascend and descend at approximately 5% grades over the retaining curb and low-flow channel. The crest of the "bridge" is assumed to be elevated approximately 2 ft above the channel bottom as indicated in Figure 3.

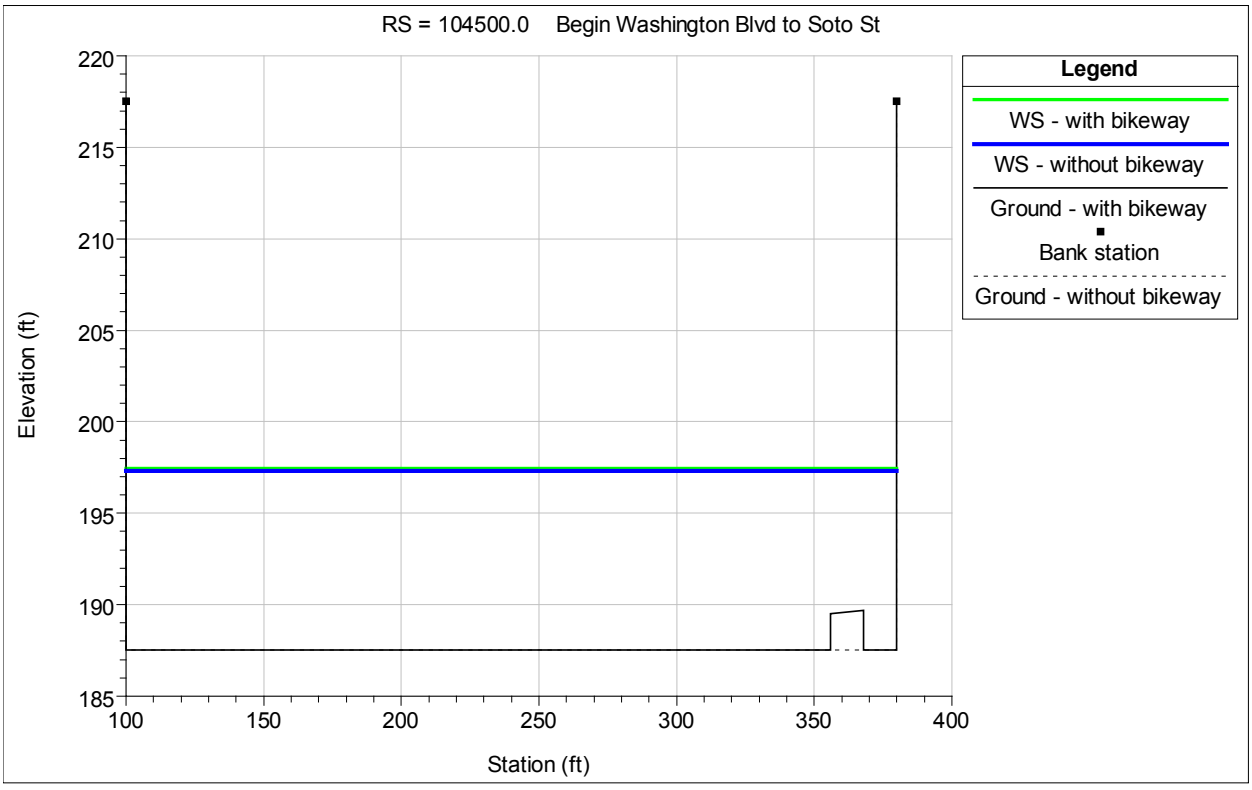


Figure 3: Bikeway cross-section during transition over the retaining curb and low-flow channel, shown here at River Station 1045+00

The bike path then continues near the center of the channel on the flat-bottomed portion, at a distance of approximately 100 ft from the right bank, from River Station 1044+27.2

(just upstream of Washington Boulevard) until River Station 1003+10.8 (just downstream of Bandini Boulevard). Figure 4 shows the bike path geometry near the center of the channel.

Approximately 300 ft downstream of Bandini Boulevard the split low-flow channels move from the channel walls and rejoin at the channel center as the channel transitions from rectangular back to trapezoidal. A similar "mirror-image" of the geometry at the upstream "bridge" is assumed in order to cross the split low-flow channel and move the path from near the channel center back to the right bank. Specifically, between River Stations 1009+41.3 and 1004+07.8, the bike path ascends and descends at approximately 5% grades over the retaining curb and split low-flow channel, with the crest of the "bridge" elevated at approximately 2 ft above the channel bottom. The path then continues along the channel floor near the sloped right bank.

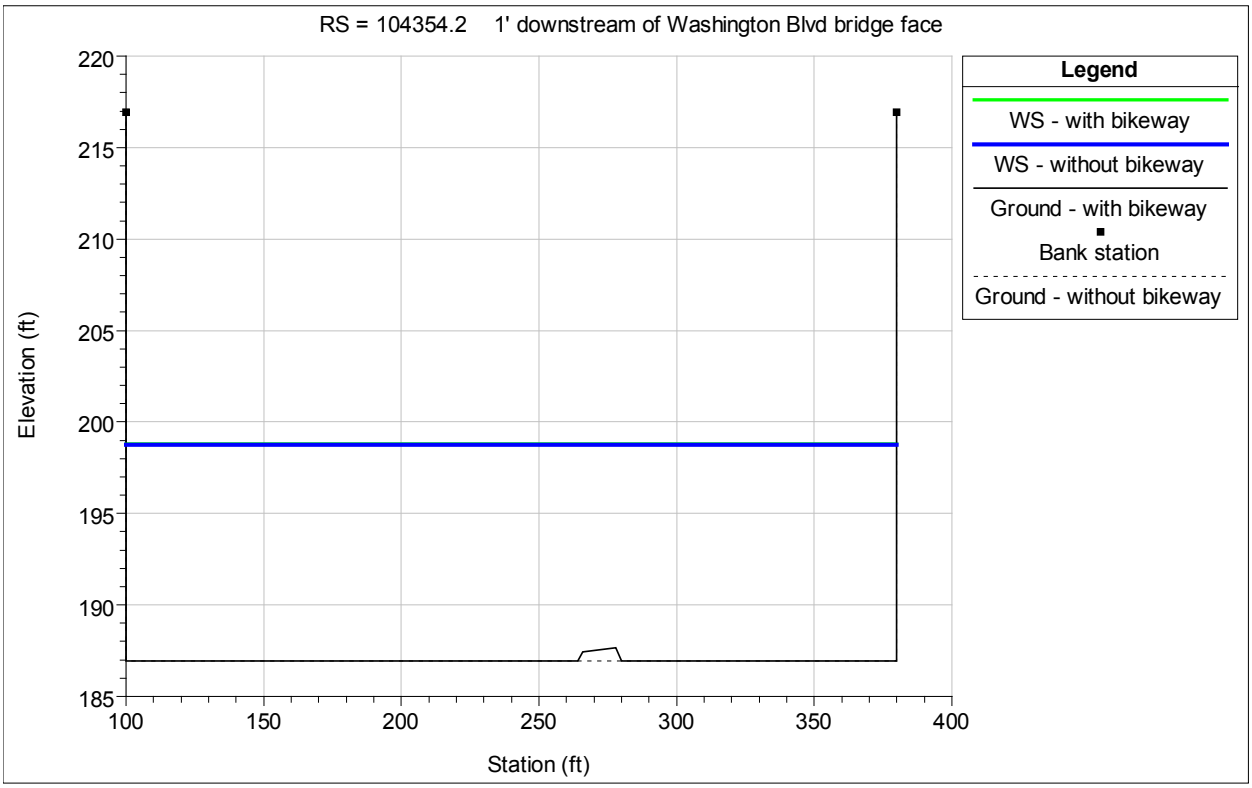


Figure 4: Typical bike path cross-section at center of channel, shown here just downstream of Washington Boulevard at River Station 1043+54.2

Atlantic Ramp

Just downstream of Atlantic Boulevard (River Station 884+36.7) the bike path ascends from the channel bottom at approximately 1.6% grade, while maintaining a 1H:2V cut-slope, to join the existing bike path on the river bank about 1200 ft downstream of Atlantic Boulevard.

3. MODEL RESULTS AND DISCUSSION

The HEC-RAS model results both with and without the bike path are presented in Figures 5a through 5f. Each of the six plots covers an approximately 1.3 mile section of the river and consists of the following four frames;

1. calculated WSE (in ft) along the channel bottom and top of bank[3] elevations,
2. calculated minimum freeboard[4] (in ft),
3. calculated average channel velocity (in ft per second [fps]),
4. calculated Froude number (dimensionless) with shaded regions indicating values of Froude number outside of recommended ranges[5].

Additionally, visual representations of the calculated WSE with the bike path are provided as an animation (Appendix_E_HEC-RAS_animation.avi) for all sections of the model.

Discussion of the effect of the bike path is provided in the following sections in terms of general changes, specific localized regions of potential concern, hydraulic jump locations, and hydraulic design of ramps.

3.1 General Changes

Figures 5a through 5f indicate minimal differences between the simulations with and without the bike path, with the plotted lines being largely indistinguishable from each other over many regions. The average WSE increases by less than 0.2 inches when the bike

[3] The minimum of the left and right top of bank elevations is plotted.
[4] Minimum freeboard is calculated as the difference between the minimum top of bank elevation and the WSE.
[5] Since flows near critical depth are unstable it is recommended that all channels be designed with Froude numbers either less than 0.86 (sub-critical) or greater than 1.13 (super-critical) (Clark County Regional Flood Control District, 1999). Additionally, instabilities due to roll waves can occur when Froude numbers are greater than 2.0, and as such supercritical channels should ideally avoid Froude numbers greater than 2.0 [Stockstill, 2006].

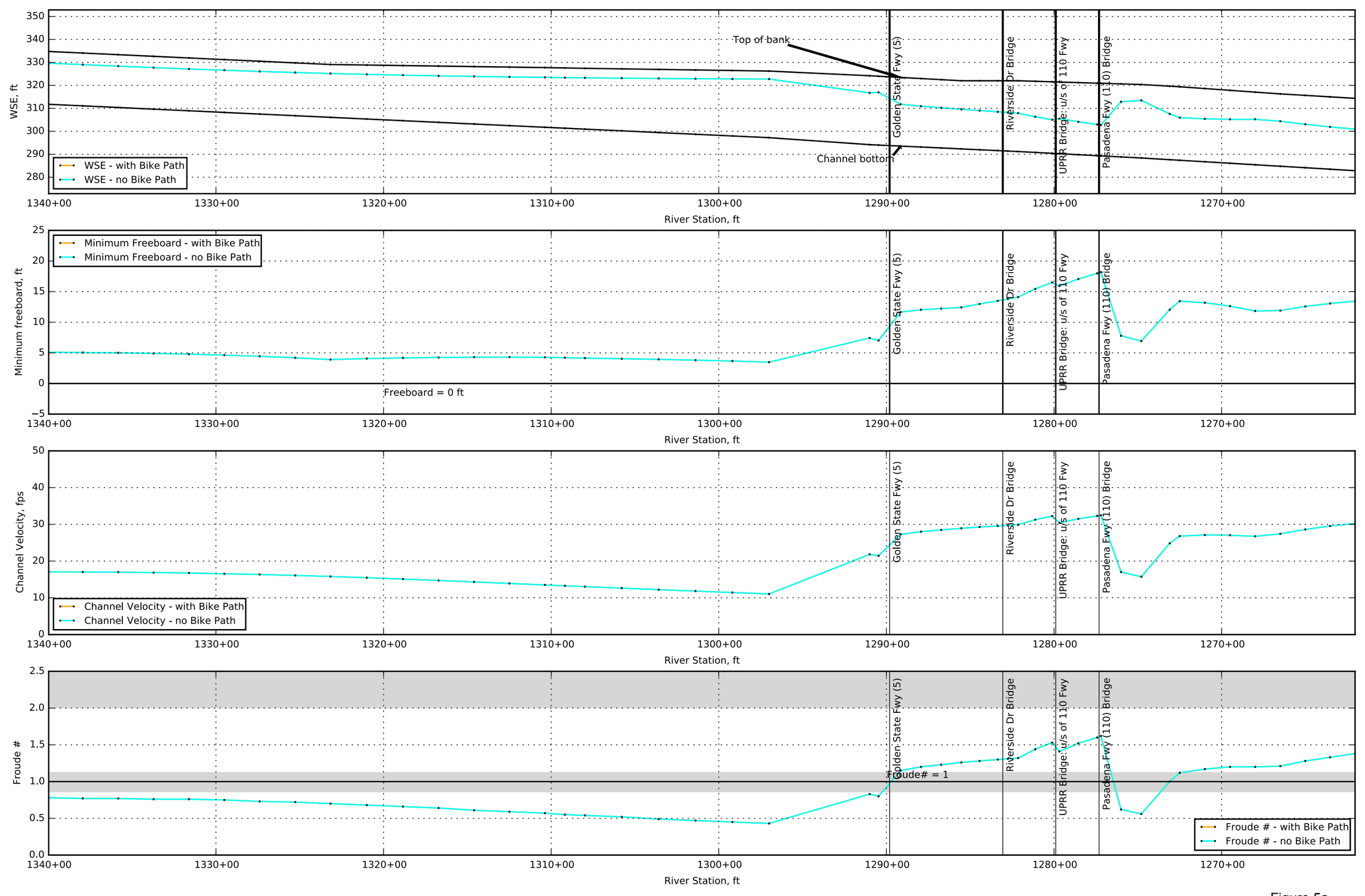
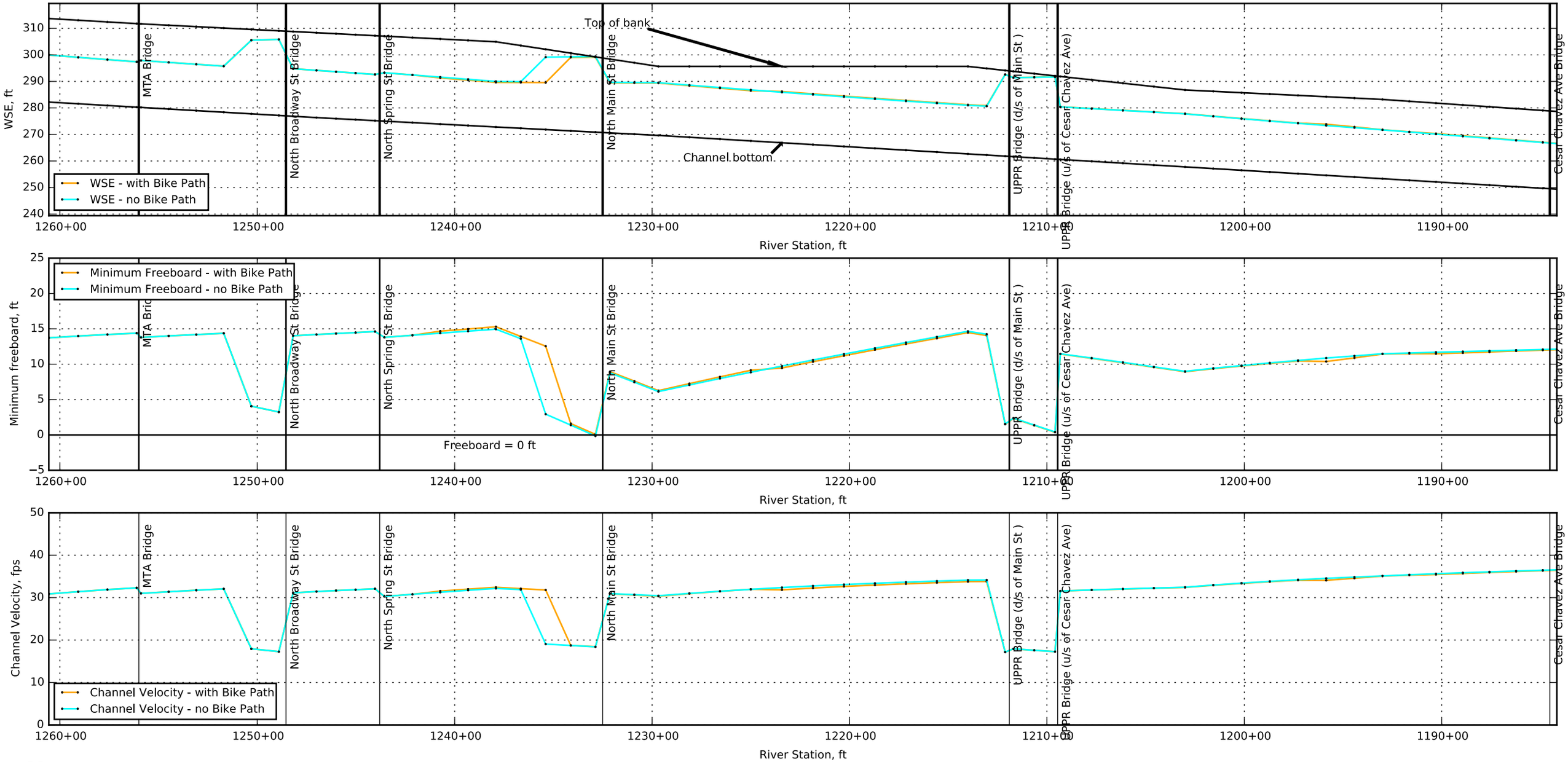
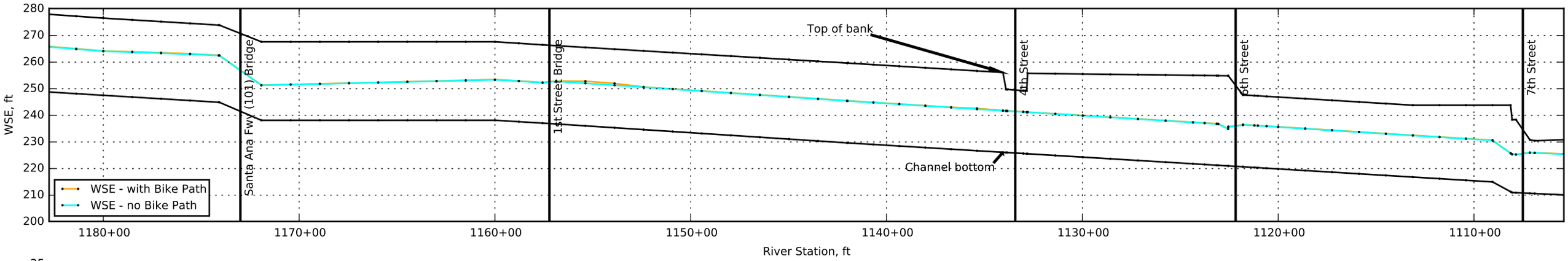
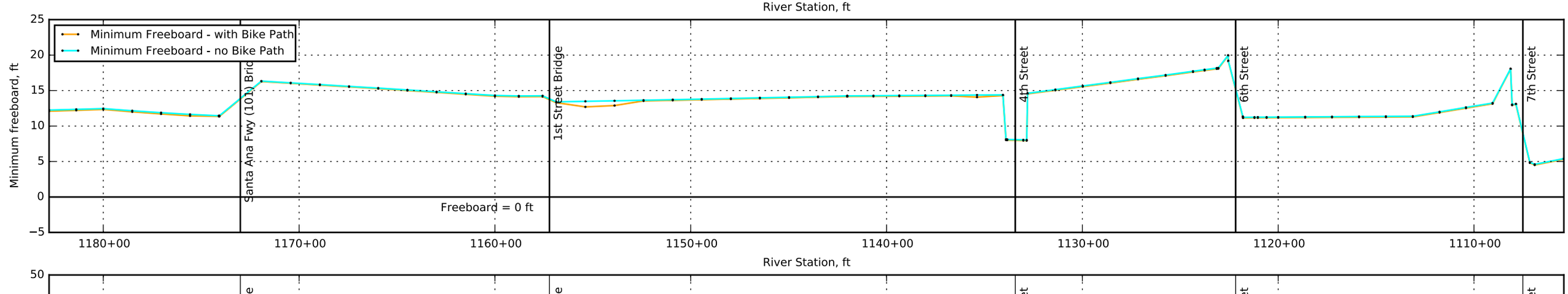
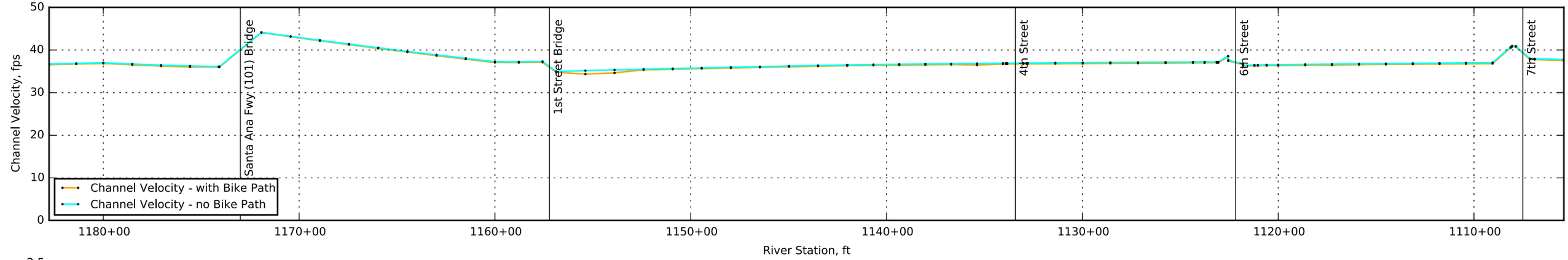

WSE, ft
WSE - with Bike Path
WSE - no Bike Path
Top of bank
Channel bottom
Golden State Fwy (5)
Riverside Dr Bridge
UPRR Bridge: u/s of 110 Fwy
Pasadena Fwy (110) Bridge
River Station, ft
Minimum freeboard, ft
Minimum Freeboard - with Bike Path
Minimum Freeboard - no Bike Path
Freeboard = 0 ft
Channel Velocity, fps
Channel Velocity - with Bike Path
Channel Velocity - no Bike Path
Froude #
Froude # - with Bike Path
Froude # - no Bike Path
Froude# = 1

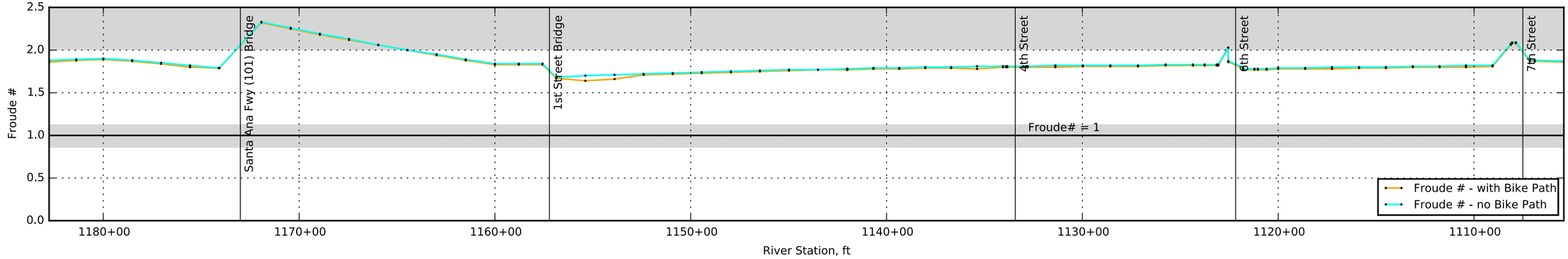
Figure 5a

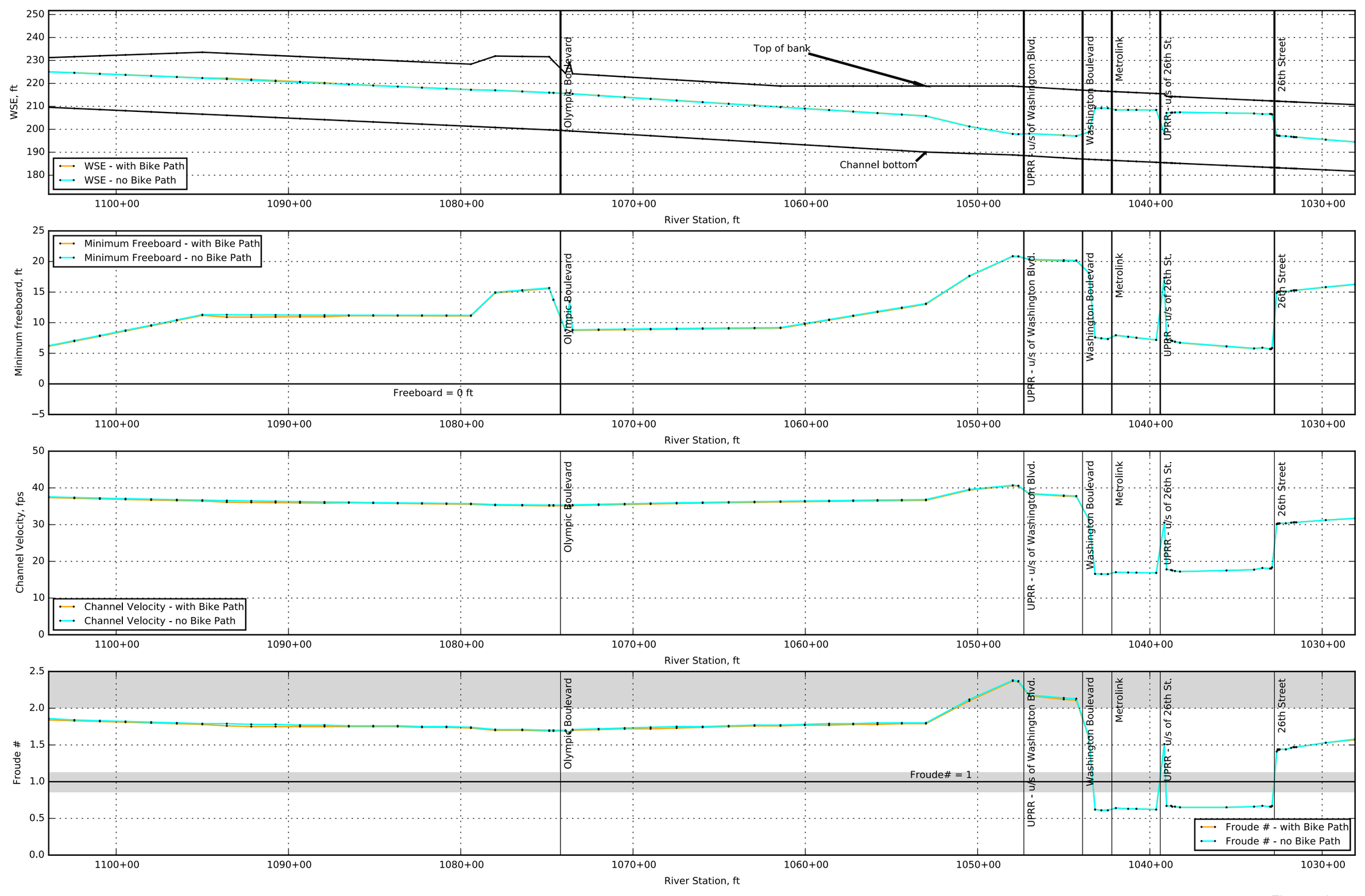

WSE, ft
River Station, ft
WSE - with Bike Path
WSE - no Bike Path
Top of bank
Channel bottom
MTA Bridge
North Broadway St Bridge
North Spring St Bridge
North Main St Bridge
UPPR Bridge (d/s of Main St)
UPPR Bridge (u/s of Cesar Chavez Ave)
Cesar Chavez Ave Bridge
Minimum freeboard, ft
Minimum Freeboard - with Bike Path
Minimum Freeboard - no Bike Path
Freeboard = 0 ft
Channel Velocity, fps
Channel Velocity - with Bike Path
Channel Velocity - no Bike Path
Froude #
Froude # - with Bike Path
Froude # - no Bike Path
Froude# = 1

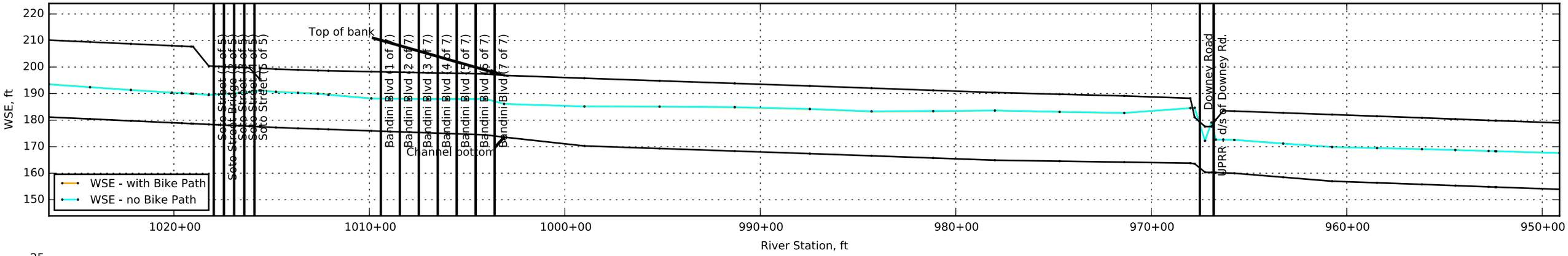

WSE, ft
WSE - with Bike Path
WSE - no Bike Path
Top of bank
Channel bottom
Santa Ana Fwy (101) Bridge
1st Street Bridge
4th Street
6th Street
7th Street
River Station, ft

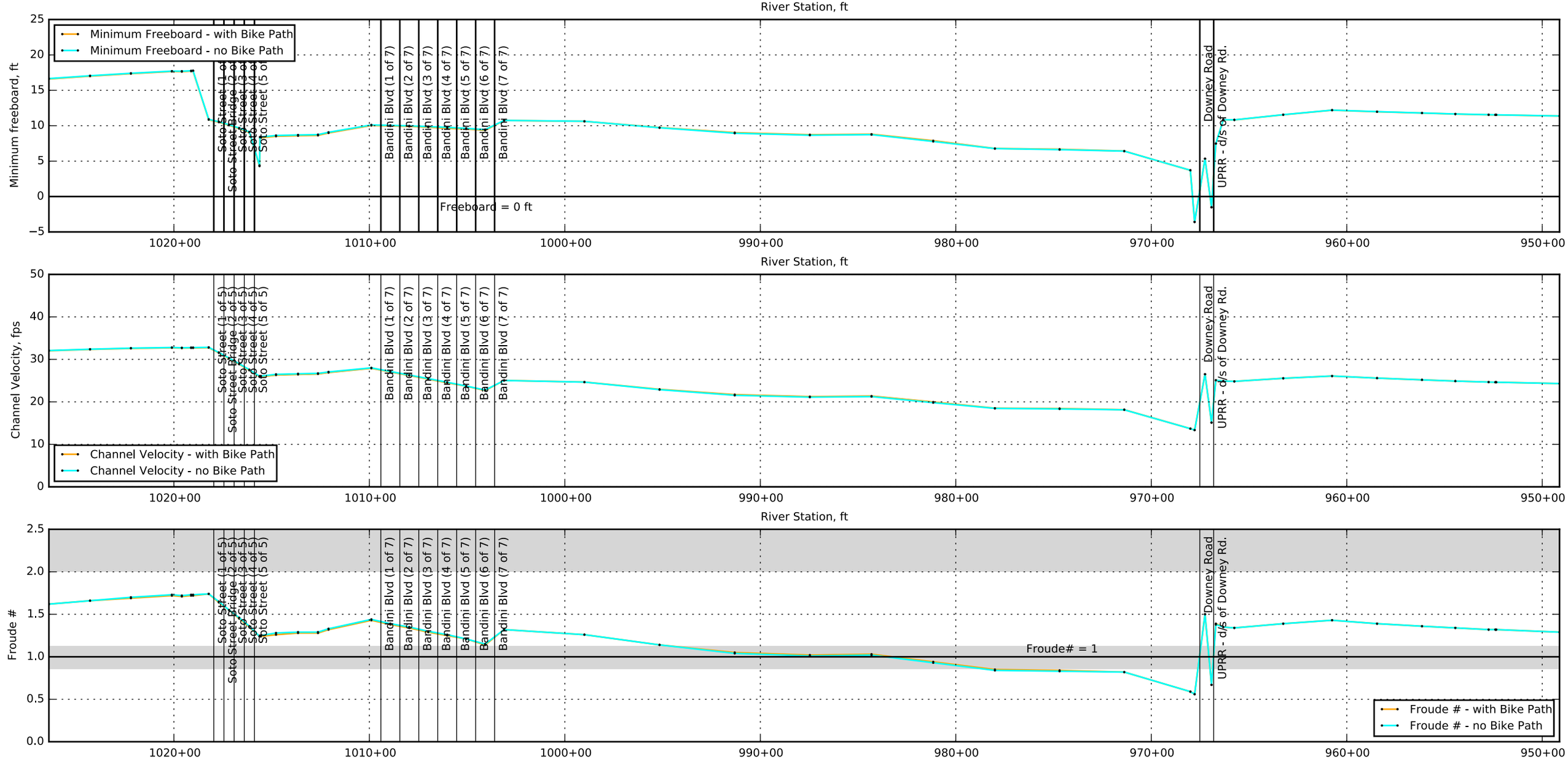

Minimum freeboard, ft
Minimum Freeboard - with Bike Path
Minimum Freeboard - no Bike Path
Freeboard = 0 ft
Santa Ana Fwy (101) Bridge
1st Street Bridge
4th Street
6th Street
7th Street
River Station, ft


Channel Velocity, fps
Channel Velocity - with Bike Path
Channel Velocity - no Bike Path
Santa Ana Fwy (101) Bridge
1st Street Bridge
4th Street
6th Street
7th Street
River Station, ft


Froude #
Froude # - with Bike Path
Froude # - no Bike Path
Froude# = 1
Santa Ana Fwy (101) Bridge
1st Street Bridge
4th Street
6th Street
7th Street
River Station, ft

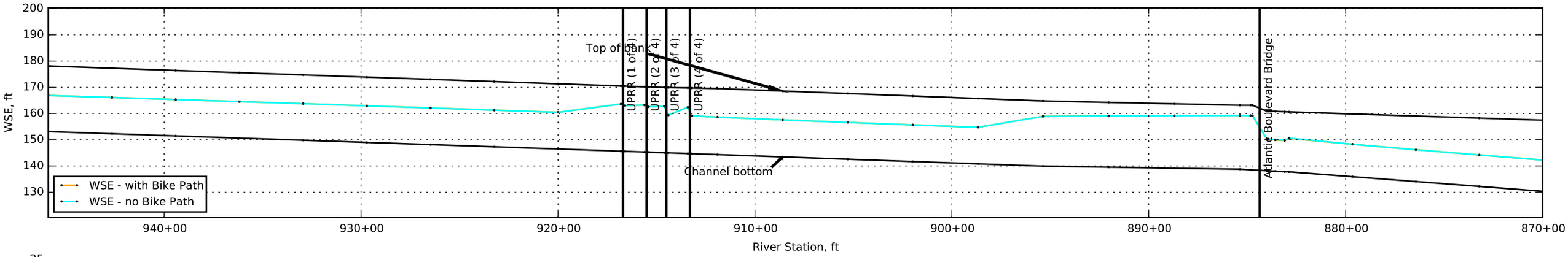

WSE, ft
WSE - with Bike Path
WSE - no Bike Path
Top of bank
Channel bottom
Olympic Boulevard
UPRR - u/s of Washington Blvd.
Washington Boulevard
Metrolink
UPRR - u/s of 26th St.
26th Street
River Station, ft
Minimum freeboard, ft
Minimum Freeboard - with Bike Path
Minimum Freeboard - no Bike Path
Freeboard = 0 ft
Channel Velocity, fps
Channel Velocity - with Bike Path
Channel Velocity - no Bike Path
Froude #
Froude # - with Bike Path
Froude # - no Bike Path
Froude# = 1

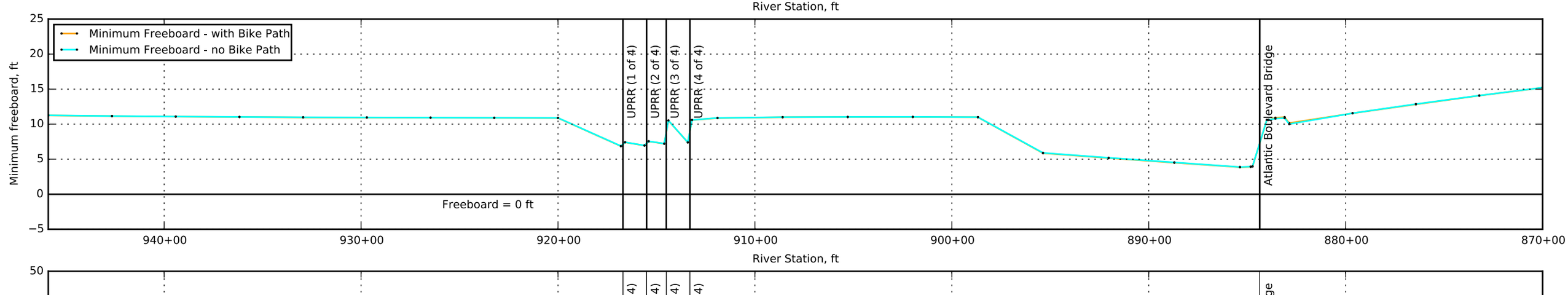

WSE, ft
River Station, ft
WSE - with Bike Path
WSE - no Bike Path
Top of bank
Channel bottom
Soto Street (1 of 5)
Soto Street Bridge (2 of 5)
Soto Street (3 of 5)
Soto Street (4 of 5)
Soto Street (5 of 5)
Bandini Blvd (1 of 7)
Bandini Blvd (2 of 7)
Bandini Blvd (3 of 7)
Bandini Blvd (4 of 7)
Bandini Blvd (5 of 7)
Bandini Blvd (6 of 7)
Bandini Blvd (7 of 7)
Downey Road
UPRR - d/s of Downey Rd.

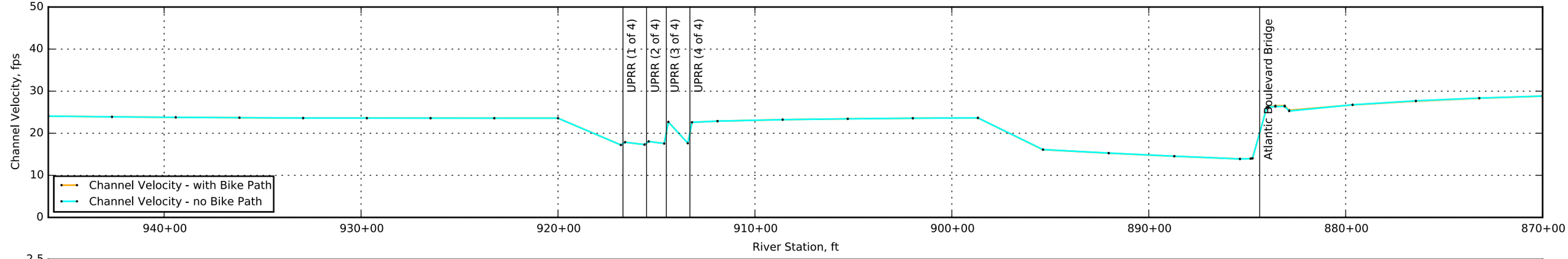

Minimum freeboard, ft
River Station, ft
Minimum Freeboard - with Bike Path
Minimum Freeboard - no Bike Path
Freeboard = 0 ft
Soto Street (1 of 5)
Soto Street Bridge (2 of 5)
Soto Street (3 of 5)
Soto Street (4 of 5)
Soto Street (5 of 5)
Bandini Blvd (1 of 7)
Bandini Blvd (2 of 7)
Bandini Blvd (3 of 7)
Bandini Blvd (4 of 7)
Bandini Blvd (5 of 7)
Bandini Blvd (6 of 7)
Bandini Blvd (7 of 7)
Downey Road
UPRR - d/s of Downey Rd.

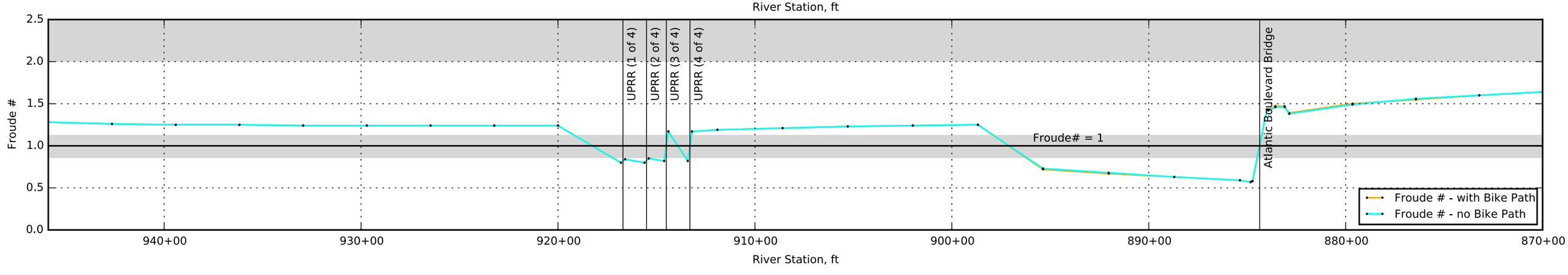
Channel Velocity, fps
River Station, ft
Channel Velocity - with Bike Path
Channel Velocity - no Bike Path
Soto Street (1 of 5)
Soto Street Bridge (2 of 5)
Soto Street (3 of 5)
Soto Street (4 of 5)
Soto Street (5 of 5)
Bandini Blvd (1 of 7)
Bandini Blvd (2 of 7)
Bandini Blvd (3 of 7)
Bandini Blvd (4 of 7)
Bandini Blvd (5 of 7)
Bandini Blvd (6 of 7)
Bandini Blvd (7 of 7)
Downey Road
UPRR - d/s of Downey Rd.

Froude #
River Station, ft
Froude # - with Bike Path
Froude # - no Bike Path
Froude# = 1
Soto Street (1 of 5)
Soto Street Bridge (2 of 5)
Soto Street (3 of 5)
Soto Street (4 of 5)
Soto Street (5 of 5)
Bandini Blvd (1 of 7)
Bandini Blvd (2 of 7)
Bandini Blvd (3 of 7)
Bandini Blvd (4 of 7)
Bandini Blvd (5 of 7)
Bandini Blvd (6 of 7)
Bandini Blvd (7 of 7)
Downey Road
UPRR - d/s of Downey Rd.


WSE, ft
River Station, ft
WSE - with Bike Path
WSE - no Bike Path
Top of Bank
Channel bottom
UPRR (1 of 4)
UPRR (2 of 4)
UPRR (3 of 4)
UPRR (4 of 4)
Atlantic Boulevard Bridge


Minimum freeboard, ft
River Station, ft
Minimum Freeboard - with Bike Path
Minimum Freeboard - no Bike Path
Freeboard = 0 ft
UPRR (1 of 4)
UPRR (2 of 4)
UPRR (3 of 4)
UPRR (4 of 4)
Atlantic Boulevard Bridge


Channel Velocity, fps
River Station, ft
Channel Velocity - with Bike Path
Channel Velocity - no Bike Path
UPRR (1 of 4)
UPRR (2 of 4)
UPRR (3 of 4)
UPRR (4 of 4)
Atlantic Boulevard Bridge


Froude #
River Station, ft
Froude # - with Bike Path
Froude # - no Bike Path
Froude# = 1
UPRR (1 of 4)
UPRR (2 of 4)
UPRR (3 of 4)
UPRR (4 of 4)
Atlantic Boulevard Bridge

path is added, which is consistent with work from a previous study that evaluated a 1.6-mile section of the channel [Geosyntec, 2013]. These minimal changes in the critical WSE are also visible in Figures 1 through 4 that plot the calculated WSE for both with and without the path at selected sections.

This increase in average WSE of less than 0.2 inches is within the anticipated accuracy of the HEC-RAS model and in particular the Manning's n parameterization. For example, Manning's n values for finished concrete may vary by $\pm$0.002, or more (e.g., Chow, 1959, Table 5-6, Section B-2.a). A cursory sensitivity analysis of the HEC-RAS model indicated that a small increase of 0.001 in the Manning's n used for the channel and bike path results in an increase in average WSE of more than 6 inches – more than 30 times greater than the change caused by the implementation of the bike path.

Thus, in general terms, it can be concluded that the bike path has minimal effect on the overall hydraulic capacity of the Los Angeles River channel.

3.2 Regions of Potential Concern

Despite the small increase in average WSE there are some localized regions with larger increases that can be seen on Figures 5a through 5f. If these larger increases in WSE occur in regions with existing low minimum freeboard and/or in regions of flow instability then it is possible that the bike path may adversely affect the hydraulic capacity and flood risk management of the river channel.

The largest increase in WSE due to the addition of the bike path is 9.5 inches at River Station 1155+38, approximately 100 ft downstream of 1st Street Bridge. Importantly, this localized increase occurs in a region with substantial freeboard, with the minimum freeboard in this location (after the addition of the bike path) exceeding 12 ft (see second frame of Figure 5c). Additionally, the Froude number in this region is approximately 1.7 (see fourth frame of Figure 5c), well within the recommended ranges to minimize flow instability.

Other regions where changes in WSE may be a potential cause for concern were analyzed in the following systematic manner. All locations with a predicted increase in WSE exceeding 2 inches were analyzed to check for potential flow instability and a minimum freeboard. The Froude numbers in these locations ranged from 1.5 to 1.84 – well within the recommended design ranges to minimize flow instability. Minimum freeboard at all locations where the WSE increased by more than 2 inches exceeded 9 ft after the addition of the bike path, which is more than three times greater than the recommended freeboard allowances of 2 ft (rectangular) to 2.5 ft (trapezoidal) for concrete-lined channels [USACE, 1994].

Given the substantial remaining freeboard and minimal flow instability in these localized regions of potential concern (i.e., where the bike path was predicted to increase the WSE by more than 2 inches), the one-dimensional HEC-RAS modeling indicates that the bike path would not substantially affect the flood risk management of the channel.

3.3 Hydraulic Jump Locations

One of the most notable changes due to the implementation of the bike path occurs immediately upstream of the Main Street Bridge, where the addition of the bike path resulted in the location of the hydraulic jump moving downstream by approximately 100 ft (see Figure 5b). This shift was caused by the implementation of the ramp upstream and under Main Street, which was excavated into the existing channel wall, thereby slightly increasing flow area and flow capacity in this region (see discussion of ramps in Section 3.4). However, it is noted that the locations of hydraulic jumps are typically sensitive to small changes in the channel geometry and/or roughness [USACE, 1994] and as such additional sensitivity analysis (e.g., varying Manning's n) would be required to determine realistic ranges for the locations of hydraulic jumps.

3.4 Hydraulic Design Considerations of Ramps

The ramp at Main Street faces downstream, which is the preferred orientation in order to reduce potential run-up problems (i.e., water running up the ramp and out of the channel). The ramp at Atlantic Boulevard faces upstream, since that avoids the need for a switch-back that is inconvenient for path users and adds cost to the project. Importantly, the HEC-RAS model indicates that the energy grade line is below the elevation of the channel banks at the Atlantic Boulevard location, and as such run-up out of the channel will not occur.

It is recommended that ramps do not encroach into the flow area since that may create a choked flow condition [Stockstill, 2006]. Acceptable ramp designs should not reduce the capacity of the channel or significantly raise the local water-surface elevation. These requirements have been accounted for in the design for the ramps at Main Street and Atlantic Boulevard by excavating the ramp into the channel wall thereby slightly increasing flow area and flow capacity in these regions. Results of the HEC-RAS modeling indicate that the WSE will decrease slightly at the locations of these ramps (see Figures 2 and 5b for Main Street, and Figure 5f for Atlantic Boulevard).

The Corps hydraulic design criteria related to ramp slopes, cut-slopes, channel side-slopes, and flare ratios from the Corps H&H Memorandum for Record (MFR) [USACE, 2014] were followed during implementation of the bike path underpasses and access ramps into the

model as summarized in Table 1. At all locations the modeled flare ratio is greater than the minimum recommended flare ratio as specified by the Corps.

Location	Bike path ramp slope	Cut-slope of ramp	Channel side slope[1]	Velocity[2] (fps)	Modeled flare ratio	Minimum recommended flare ratio[3]
Upstream of Main St.	2 %	1H:2V	1H:2V	33	1:25	1:15
Under Main St.	0 %	1H:2V	1H:2V	33	1:∞	1:15
Downstream of Main St.	2.75 %	1H:2V	1H:2V	33	1:18.2	1:15
Under and downstream of Atlantic Blvd.	1.6 %	1H:2V	1H:3V	27	1:20.8	1:12.5

1. Side slope of existing channel.
2. Velocity is from the HEC-RAS model results.
3. Minimum recommended flare ratio is a function of flow velocity, channel side slope, and cut-slope [Attachment 1 of USACE, 2014].

TABLE 1: RAMP SLOPES, CUT-SLOPES, AND FLARE RATIOS

While the recommended ramp flare ratios have been adhered to, the effects of the ramps under the 'supercritical' (i.e., fast-flow) condition requires more analyses. This is due to the ramps providing discontinuities in the flow boundaries that may generate standing waves in the supercritical flow environment. These waves can persist far downstream of the ramp, and potentially cause channel overtopping. As such, the Corps recommends that multi-dimensional (i.e., two or three-dimensional) modeling, and/or physical (i.e., in large-scale hydraulic laboratories) modeling to be used to assess the effect of individual access ramps in supercritical flow [USACE, 2014].

At the current feasibility phase the details of the ramp design and locations are not well enough defined to warrant these additional detailed and complex studies. Therefore, as more detailed ramp designs are assessed in future work, additional studies and multi-dimensional modeling will likely be required to accurately assess the effects of access ramps on the formation of oblique hydraulic jumps, instabilities, and standing/rolling wave heights relative to the channel banks.

4. CONCLUSIONS

The following specific conclusions were drawn from the one-dimensional HEC-RAS modeling;

- The WSE of the design flow increased on *average* by less than 0.2 inches when the bike path was added.
    - This change in WSE is considerably less than changes that may be caused by slight variations in channel roughness (i.e., Manning's "n"). That is, the change caused by the addition of the bike path is less than the anticipated accuracy of the hydraulic model.

- The *maximum* increase in WSE due to the bike path was 9.5 inches, but this occurs in a location with more than 12 ft of remaining freeboard and where flow instabilities are not anticipated.
    - Furthermore, analysis of locations where the addition of the bike path increased the WSE by more than 2 inches indicated that the remaining freeboard exceeded 9 ft (more than three times the minimum freeboard requirement) and that flow instabilities are not anticipated.

In summary, the one-dimensional HEC-RAS modeling indicated that the bike path had only minimal effects on the channel hydraulics and that the bike path is feasible from a hydraulic standpoint, although future detailed design of the access ramps and bridges will require additional multi-dimensional modeling.

5. REFERENCES

Chow, Ven Te, 1959. "Open-Channel Hydraulics", McGraw-Hill Book Company.

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Geosyntec, 2013. "Technical Memorandum: Preliminary Hydraulic Study for a Los Angeles River Bikeway". Geosyntec Consultants, Los Angeles.

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Stockstill, R.L., 2006. "Hydraulic Design of Channels Conveying Supercritical Flow", US Army Corps of Engineers, ERDC/CHL TR-06-5, July.

U.S. Army Corps of Engineers, 1994. "Hydraulic Design of Flood Control Channels", U.S. Army Corps of Engineers, Department of the Army, EM 110-2-1601 Change 1, June 30.

U.S. Army Corps of Engineers, 2005. "Final Report, Upper Los Angeles River and Tujunga Wash, HEC-RAS Hydraulic Models", U.S. Army Corps of Engineers, Los Angeles District Department of the Army.

U.S. Army Corps of Engineers, 2014. "H&H Policy Memorandum Number 3, Hydraulic Design and Criteria for Underpasses and Access Ramps", CESPL-ED-H, U.S. Army Corps of Engineers, Department of the Army, July 31.

Appendix F

Technical Advisory Committee Comments

Technical Advisory Committee Comments

8/11/2015

No.	Reach	Comments	Responses
1	1	East side linkage necessary.	We are taking a closer look at access and points of destination.
2		Security and safety features critical for tunnels: lighting, gates, closures, graffiti, homelessness, crime/theft?	An alternate method for providing access is being investigated in lieu of tunnel. We agree that tunnels will have numerous security and safety concerns that will need to be addressed to make this a practical option.
3		Think about "traffic calming" on both sides entering area b/ the meandering path, interrupted sight-lines, reduced light will be dangerous… may also reduce public safety.	We understand traffic calming is typically applied to motor vehicle traffic. We understand the comment is in regards to slowing cyclists where sight-lines could be an issue. We'll note this comment, but any sight-analysis would need to be planned for future phases of the project.
4	2	How close do we get to rail? Ok with all owners/operator reqt's?	We are using a minimum clearance of 8.5 feet to the center of the nearest rail per rail (CPUC) guidelines.
5	3	Are existing access ramps ADA compliant? Will improvement be required?	We are assuming ADA improvements will be necessary.
6		Main St access ramp: Current configuration does not work for exiting onto Main Street to DTLA. It puts you on the wrong side of the street.	We will be looking at connections on both sides of the street and if a single connection is provided, then we will look at options for cyclist to cross to the other side of the street.
7		DWP Parking: access point- bike/ped hub?	This could be an option.
8		Is High Speed Rail (HSR) considering changing any infrastructure that would change what we're looking at? Planning around?	Since the bike path is proposing to stay a minimum of 8.5 feet from the rail, the HSR plans should not affect the project.
9		Is there a possibility to bridge over R/R instead of going under?	A bridge is not being considered here because dipping under the bridge would likely be the lower cost option.
10		Coordinate this section with Arbor Restoration. (section described on map)	Noted
11		Make cantilever part of bike bridge structure, rather than doing both separately at extra cost.	This could be considered. The exact crossing point of the bridge will likely be determined based on cost and practicallity.
12		Need better/safe access to East L.A. not just downtown.	Agree. See response to comment 1.
13		Piggyback access point: Like it but keep your options open for larger community access, potential future development around Piggyback yard.	Agree. See response to comment 1.

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14		Cesar Chavez Ave access point: Union Station access-what is HSR doing?	It would be worthwhile to meet with the HSR authority to inquire on their plans for connecting Union Station and if any bike path infrastructure can be integrated into these plans.
15		What is the cost of tunnel VS other access method if path were higher up?	Preliminary costs are currently being determined.
16		Improvements in the Little Tokyo Tiger grant?	Requires further invsetigation
17		Greening opportunities for all options in reach 3 and 4?	Where the bike path is above the channel or near the top there could be areas for landscaping. Vegetation in the channel is not being considered at this time.
18		6th St Bridge: Must connect to bike paths included in the new project.	Connection is proposed
19		Can there be elevated access points rather than tunnels?	Yes. Elevated access points can be considered as another option. Cost will be developed for both.
20	**4**	Storm Drain outlet avoidance, access points cost, and diverting low flow.	These have been noted as issues for providing a in-channel bike path which may still translate to a lower cost than trying to continue the bike path above the channel. We will know for certain once cost estimates are completed.
21		What would it take to put a bike lane on the bridge and access the path from above?	An above channel option is being investigated. There are two at grade rail lines that require bridging over which is likely to result in a higher cost.
22		Is it okay to move the low flow?	Hydraulically should be okay. We are also investigating keeping the low flow as is, and having the bike path continue to wards the center of the channel. The concern is that a bridge in the channel is required to cross over the divergence in the low flow.
23		Asking USACE to realign the channel may a new level of political complexity. Are you ready?	The channel will not be realigned, just a curb within the channel that diverts water to the outer edges.
24		Between Washington Blvd and Soto St bridges: Emergency access points in-channel area?	Steps for emergency access and evacuation are being consdered throughout. We will identify points where there is existing access for emergency vehicles to enter the channel.
25		Verify ROW alignment? Room for path?	It seems possible that there could be a core bike path alignment that stays within the channel's ROW, whether this be an easement or ownership. Anticipated ROW can be identified for optional alignments and access points.

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26	**5**	Increase lighting at all hours. Transition from light to dark suddenly is dangerous.	Lighting may be considered when the bike path is above the channel, in tunnels, or on bridges.
27		Any potential for additional access points in reach 5?	Possibly. See response to comment 1.
28	**Gen.**	Look for opportunities to do protected bike lanes at roadway bridges.	We plan to note areas where bike facilities are planned for the future based on existing bicycle master plans.
29		Keep path straight and well lit through underpasses to prevent accidents and improve safety.	Noted
30		Angled walls would allow elbow room for bicyclists.	Agree.

Appendix G

Assessor's Parcel Ownership List and Maps

LOS ANGELES RIVER BIKE PATH FEASIBILITY STUDY

METRO RFP NO. PS4010-3041-XX-01-XX

ASSESSORS PARCELS OWNERSHIP LIST

Assessors Parcel Number	Owner
APN: 5415-002-904	Los Angeles County Metropolitan Transportation Authority (LACMTA)
APN: 5415-002-801	SOU PAC TRANS CO SBE 872-19-25 AM PAR 94 3 PTS
APN: 5415-002-900	L A CITY
APN: 5415-002-901	L A CITY
APN: 5415-002-902	L.A.C.F.C.D.
APN: 5415-002-903	Los Angeles County Metropolitan Transportation Authority (LACMTA)
APN: 5415-003-900	L A CITY
APN: 5415-003-901	L A CITY
APN: 5415-003-911, -912 & -913	L.A.C.T.C.
APN: 5415-003-915	L.A.C.T.C.
APN: 5415-003-908	L A CITY
APN: 5415-003-909	L A CITY
APN: 5415-003-906	L A CITY
APN: 5415-003-910	L A CITY
APN: 5447-001-902	L A CITY
APN: 5447-001-003	ANG II MULTI LLC LESSOR ANGELICA TEXTILE SVCS INC LESSEE
APN: 5447-004-001	ANG II MULTI LLC LESSOR ANGELICA TEXTILE SVCS INC LESSEE
APN: 5447-001-900	L A CITY
APN: 5447-001-901	L A CITY

APN: 5447-007-005	AMEZQUITA ROMAN FAMILY TRUST
APN: 5447-006-901	LACMTA
APN: 5447-017-901	L A CITY
APN: 5447-017-902	L A CITY
APN: 5447-019-003	METABOLIC STUDIO LLC
APN: 5447-019-004	METABOLIC STUDIO LLC
APN: 5447-019-005	METABOLIC STUDIO LLC
APN: 5447-019-007	METABOLIC STUDIO LLC
APN: 5447-019-008	YOUNG NAK PRESBYTERIAN CHURCH OF LOS ANGELES CORP
APN: 5447-019-009	PINE 18, LLC
APN: 5447-020-006	YOUNG NAK PRESBYTERIAN CHURCH OF LOS ANGELES CORP
APN: 5447-020-901	L A CITY
APN: 5447-027-901	CITY OF L.A. (L.A.C.F.C.D. PERMIT)
APN: 5447-027-903	LACMTA
APN: 5447-027-904	LACMTA
APN: 5447-027-906	L A CITY
APN: 5447-027-907	L A CITY
APN: 5447-027-910	L A CITY
APN: 5447-027-909	L A CITY
APN: 5447-027-908	L A CITY
APN: 5447-027-911	L A CITY
APN: 5447-028-012	HARRY W FRAZEE TE | MARY M FRAZEE TE | MACLEAN FRAZEE | MACLEAN J M M TRUST

APN: 5447-032-900	L A CITY
APN: 5447-032-901	LACMTA
APN: 5409-001-903	LACMTA
APN: 5409-001-010	NOT AVAILABLE
APN: 5409-001-005	METABOLIC STUDIO LLC
APN: 5409-001-009	LEE D H & CHU J L 2015 TRUST
APN: 5409-002-900	LACMTA
APN: 5414-027-901	LACMTA
APN: 5414-027-902	LACMTA
APN: 5414-027-903	LACMTA
APN: 5414-027-904	LACMTA
APN: 5414-016-901	LACMTA
APN: 5414-016-902	LACMTA
APN: 5409-002-029	DP-1726-1756 SPRING STREET LLC
APN: 5409-002-019	TAI CHUNG INV USA LTD & LEHMAN ANGELA
APN: 5409-002-901	LACMTA
APN: 5410-003-002	S & R PARTNERS
APN: 5410-003-003	NORTH MAIN OF RFT/SR, LLC
APN: 5410-003-004	NORTH MAIN OF RFT/SR, LLC
APN: 5410-003-005	NORTH MAIN OF RFT/SR, LLC
APN: 5410-003-006	WELLS FARGO BANK NA TR/DAVIDSON WADDELL (TE)
APN: 5410-003-900	LACMTA

APN: 5410-004-029	SANTO RIBOLI | STEVEN J RIBOLI
APN: 5410-004-270	CITY OF PASADENA
APN: 5410-004-900	LACMTA
APN: 5410-015-826	SOU PAC TRANS CO SBE 872-19-26AR PAR 31
APN: 5409-013-915	L A CITY
APN: 5409-013-909	LACMTA
APN: 5409-013-913	L A CITY DEPT OF WATER & POWER
APN: 5409-013-910	LACMTA
APN: 5409-013-905	L A CITY DEPT OF WATER & POWER
APN: 5409-013-906	L A CITY DEPT OF WATER & POWER
APN: 5409-013-908	L A CITY
APN: 5409-013-911	LACMTA
APN: 5409-013-912	LACMTA
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APN: 5409-020-910	LACMTA
APN: 5410-002-901	LACMTA
APN: 5409-020-907	LACMTA
APN: 5409-020-909	LACMTA
APN: 5410-002-900	CITY OF L.A. (L.A.C.F.C.D. PERMIT)

APN: 5410-002-901	LACMTA
APN: 5410-005-001	UNION PACIFIC RAILROAD CO
APN: 5409-021-902	LACMTA
APN: 5409-021-903	LACMTA
APN: 5410-006-900	CITY OF L.A.
APN: 5410-006-901	LACMTA
APN: 5410-006-902	LACMTA
APN: 5410-006-008	MKJD CO
APN: 5173-024-803	UNION PACIFIC R R CO S B E PAR 49 MAP 843-19-11 M
APN: 5173-024-900	CITY OF L.A.
APN: 5173-024-901	LACMTA
APN: 5173-024-804	UNION PACIFIC R R CO S B E PAR 51 MAP 843-19-11 M
APN: 5173-024-802	UNION PACIFIC R R CO S B E PAR 50 MAP 843-19-11 M
APN: 5173-019-904	LACMTA
APN: 5173-020-912	LACMTA
APN: 5173-021-904	LACMTA
APN: 5173-022-903	LACMTA
APN: 5173-023-902	LACMTA
APN: 5173-023-805	AT & SF RY CO SBE 804-19-4Q PAR 60
APN: 5173-023-901	LACMTA
APN: 5173-023-900	LACMTA
APN: 5173-023-903	CITY OF L.A.

APN: 5172-013-008	BOYLE HEIGHTS PROPERTIES LLC
APN: 5172-013-010	BOYLE HEIGHTS PROPERTIES LLC
APN: 5172-013-803	UNION PACIFIC R R CO SBE MAP 843-19-51, PAR 46
APN: 5172-013-900	CITY OF L.A.
APN: 5172-013-901	LACMTA
APN: 5172-014-900	CITY OF L.A.
APN: 5172-014-901	LACMTA
APN: 5172-014-807	NOT AVAILABLE (2016)
APN: 5163-017-902	LACMTA
APN: 5163-017-806	AT & SF RY CO SBE 804 19 4P PAR 56
APN: 5171-014-808	UNION PACIFIC R R CO SBE PAR 32 MAP 843-19-52D
APN: 5171-014-900	CITY OF L.A.
APN: 5171-014-901	LACMTA
APN: 5164-004-901	LACMTA
APN: 5164-004-804	AT & SF RY CO SBE 804-19-4P PAR 58
APN: 5171-015-900	CITY OF L.A.
APN: 5171-015-901	LACMTA
APN: 5171-015-902	CITY OF L.A.
APN: 5171-015-025	NOT AVAILABLE
APN: 5164-016-009	GALLO FRANK/GALLO BECKY
APN: 5164-016-010	GALLO FRANK/GALLO BECKY
APN: 5164-016-900	CITY OF L.A., DEPT. OF WATER AND POWER

APN: 5164-016-906	LACMTA
APN: 5164-016-907	NATIONAL R R PASSENGER CORP AMTRAK
APN: 5164-016-908	LACMTA
APN: 5164-016-909	LACMTA
APN: 5164-016-803	GALLO FRANK & BECKY / GALLO VINCE
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APN: 5171-024-007	BF ASSOCIATES
APN: 5171-024-901	CITY OF L.A.
APN: 5171-024-912	LA CO METROPOLITAN TRANSPORTATION AUTHORITY
APN: 5171-024-909	LACMTA
APN: 5166-001-901	LACMTA
APN: 5166-001-900	NATIONAL R R PASSENGER CORP AMTRAK
APN: 5166-001-802	AT & SF RY CO SBE PAR 17 804-19-2H
APN: 5170-010-900	CITY OF L.A.

APN: 5170-010-901	LACMTA
APN: 5168-027-814	AT & SF RY CO SBE PAR 30 MAP 804-19-1N 2 PTS
APN: 5168-027-818	AT & SF RY CO SBE 804-19-1U PAR 60
APN: 5168-027-902	LACMTA
APN: 5168-027-900	NATL R R PASSENGER CORP AMTRAK
APN: 5168-028-008	BLOOM INVESTMENT CO.
APN: 5168-028-900	NATL R R PASSENGER CORP AMTRAK
APN: 5170-011-003	STAR OLYMPIC REAL ESTATE
APN: 5169-015-007	2550 OLYMPIC LLC
APN: 5169-015-901	CITY OF L.A. (L.A.C.F.C.D. EASEMENT)
APN: 5169-015-903	LACMTA
APN: 5168-011-907	LACMTA
APN: 5168-011-810	A T & S F RY CO SBE 804-19-1U PAR 59
APN: 5168-011-900 THRU -905	NATL R R PASSENGER CORP AMTRAK
APN: 5169-015-900	L A CITY DEPT OF WATER & POWER
APN: 5169-015-008	SAM J PERRINO | FRANK PERRINO
APN: 5169-015-011	SAM J PERRINO | FRANK PERRINO
APN: 5169-015-014	MXF PERRINO LLC
APN: 5169-016-903 & -905	L A CITY
APN: 5169-016-907	L A CITY
APN: 5169-016-908	LONG BEACH CITY
APN: 5169-016-018	ROBERSON CRAIG R (TE) PERRINO BESSIE J

APN: 5169-016-902	L A CITY DEPT OF WATER & POWER
APN: 5169-016-011	CALMAT CO
APN: 5168-011-906	NATL R R PASSENGER CORP AMTRAK
APN: 5168-015-800	SO CAL GAS CO (L.A.C.F.C.D. EASEMENT AND U.S.A. F.C. EASEMENT)
APN: 5168-015-903	L A CITY
APN: 5168-015-904	LONG BEACH CITY
APN: 5168-015-902	L A CITY
APN: 5168-016-002	FARMERS & MERCHANTS TR CURTISS (U.S.A. F.C . EASEMENT)
APN: 5168-016-903	CITY OF LA, WATER & POWER (L.A.C.F.C.D. EASEMENT)
APN: 5168-016-904 AND -905	CITY OF L.A., CITY OF LONG BEACH (L.A.C.F.C.D. EASEMENT AND U.S.A. F.C. EASEMENT)
APN: 5168-017-010	FARMERS & MERCHANT (TE) (U.S.A. F.C . EASEMENT)
APN: 5168-017-011	FARMERS & MERCHANT (TE) (U.S.A. F.C . EASEMENT)
APN: 5168-017-012	WASHINGTON STREET PRODUCE
APN: 5168-017-900	L.A.C.F.C.D. (U.S.A. F.C . EASEMENT)
APN: 5168-022-006	DARLING DELAWARE CO. INC
APN: 5168-023-001	DARLING INTERNATIONAL INC
APN: 5168-023-018	DARLING DELAWARE CO. INC
APN: 5168-023-009	DARLING DELAWARE CO. INC
APN: 5168-023-015	DARLING INTERNATIONAL INC
APN: 5168-023-800	AT&SF RY CO (L.A.C.F.C.D. EASEMENT)
APN: 5168-023-902	L.A.C.F.C.D.
APN: 5169-028-017	LEBATA INC (U.S.A. F.C . EASEMENT)

APN: 5169-029-800	A T & S F RY CO S B OF E PAR 1 MAP 804-19-35
APN: 5169-029-010	HAMPSTEAD PROPERTIES (L.A.C.F.C.D. EASEMENT)
APN: 5169-029-012	THE ALPERT CO (L.A.C.F.C.D. EASEMENT)
APN: 5169-029-013	15211 FRIENDS ST INC (U.S.A. F.C . EASEMENT)
APN: 5169-029-021	HAMPSTEAD PROPERTIES (U.S.A. F.C . EASEMENT)
APN: 5169-029-272	CITY OF LA, WATER & POWER (U.S.A. F.C . EASEMENT)
APN: 5169-029-902	CITY OF LA, WATER & POWER (L.A.C.F.C.D. EASEMENT)
APN: 5192-025-902 & -903	CITY OF L.A. / CITY OF LONG BEACH
APN: 5192-029-805	A T & S F Ry Co / Sbe Par 5 Map 804-19-37 2 Pts
APN: 5192-029-900	CITY OF L.A.
APN: 5192-029-901	CITY OF L.A.
APN: 6302-001-016	SQUARE H BRANDS INC
APN: 6302-001-033	KEVIN NGUYEN (U.S.A. F.C . EASEMENT)
APN: 6302-001-034	PAVLOVIC LOUISE A (TE) PAVLOVIC PAVLOVIC B TRUST (U.S.A. F.C . EASEMENT)
APN: 6302-001-036	MOBIL OIL CORPORATION
APN: 6302-001-037	MOBIL OIL CORPORATION
APN: 6302-001-038	MOBIL OIL CORPORATION
APN: 6302-001-042	HERCULES FORWARDING INC
APN: 6302-001-043	HERCULES FORWARDING INC (U.S.A. F.C . EASEMENT)
APN: 6302-001-044	SQUARE H BRANDS INC
APN: 6302-001-045	SQUARE H BRANDS INC (U.S.A. F.C . EASEMENT)
APN: 6302-001-046	MARK QUESADA | CECILIA QUESADA (L.A.C.F.C.D. EASEMENT)

APN: 6302-001-028	2640 VERNON LLC
APN: 6302-001-029	DEDEAUZ PROPERTIES LLC
APN: 6302-001-039	MOBIL OIL CORPORATION
APN: 6302-001-273	CITY OF LA, WATER & POWER
APN: 6302-001-274	CITY OF LA, WATER & POWER
APN: 6302-001-900	LA CO FLOOD CONTROL DIST (L.A.C.F.C.D. EASEMENT)
APN: 6303-002-020	HERBERT HORVITZ TE | LOUISE HORVITZ | HORVITZ TRUST
APN: 6303-002-031	MOBIL OIL CORP. (USA F.C. EASEMENT)
APN: 6303-004-025	STANDARD CONCRETE PRODUCTS INC
APN: 6303-004-029	AMERICAN POTASH & CHEMICAL CORP (U.S.A. F.C . EASEMENT)
APN: 6303-004-032	BERDAN HOLDINGS LLC (U.S.A. F.C . EASEMENT)
APN: 6303-004-033	BERDAN HOLDINGS LLC
APN: 6303-004-034	STANDARD CONCRETE PRODUCTS INC
APN: 6303-004-035	STANDARD CONCRETE PRODUCTS INC
APN: 6303-004-036	AMERICAN POTASH & CHEM CORP (L.A.C.F.C.D. EASEMENT)
APN: 6303-004-037	CHALMERS SOTO LLC
APN: 6303-004-038	EDWARD G VELKY (U.S.A. F.C . EASEMENT)
APN: 6303-004-039	BERDAN HOLDINGS LLC
APN: 6303-004-028	SEVEN UP RC BOTTLING CO OF SOUTHERN CALIFORNIA INC
APN: 6303-004-272	CITY OF LA, WATER & POWER (L.A.C.F.C.D. EASEMENT)
APN: 6303-004-273	CITY OF LA, WATER & POWER (L.A.C.F.C.D. EASEMENT)
APN: 6303-004-902	L.A.C.F.C.D. (U.S.A. F.C . EASEMENT)

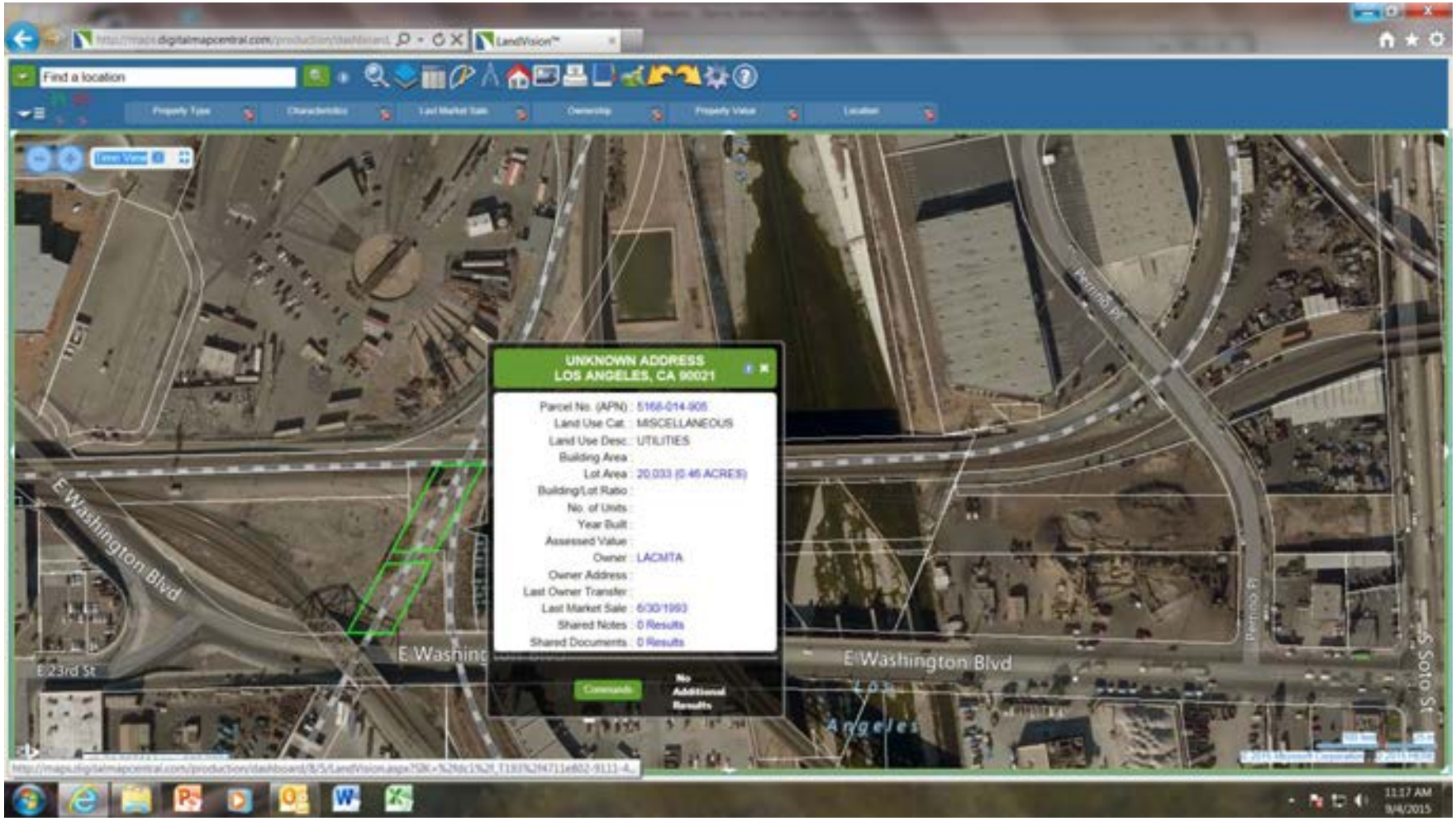
APN: 6302-002-031	MOBIL OIL CORP
APN: 6303-005-012	MOBIL OIL CORP (L.A.C.F.C.D. EASEMENT)
APN: 6303-005-014	FIBREBOARD CORP (U.S.A. F.C . EASEMENT)
APN: 6303-005-023	COAST PACKING CO
APN: 6303-005-028	COAST PACKING CO
APN: 6303-005-029	RONALD R GUSTAFSON | CRAIG R GUSTAFSON
APN: 6303-005-034	CLOUGHERTY PACKING COMPANY
APN: 6303-005-035	CLOGHERTY PACKING COMPANY
APN: 6303-005-036	CLOGHERTY PACKING COMPANY
APN: 6303-005-901	L.A.C.F.C.D.
APN: 6303-005-902	L.A.C.F.C.D.
APN: 6303-006-033	GRBAVAC FAMILY TRUST
APN: 6303-006-035	GRBAVAC FAMILY TRUST
APN: 6303-006-040	KHOSROW ABTAHI (U.S.A. F.C . EASEMENT)
APN: 6303-006-041	KHOSROW ABTAHI (U.S.A. F.C . EASEMENT)
APN: 6303-006-042	CARLOS OTORRES | MELVIN C TORRES
APN: 6303-006-043	ANNA M LEE
APN: 6303-006-044	ANNA M LEE (U.S.A. F.C . EASEMENT)
APN: 6303-006-049	VERNON PETEYCUSI LLC & DRESMAN FC DRESMAN TRUST (TE) (U.S.A. F.C . EASEMENT)
APN: 6303-006-047	HP-A VERNON LLC
APN: 6303-006-048	VERNON INDUSTRIAL BUILDING LLC & VERNON CLAREMONT LLC
APN: 6303-006-050	VERNON PETEYCUSI LLC & DRESMAN FC DRESMAN TRUST (TE)

APN: 6303-006-062	JPM INVESTMENT COMPANY LLC (U.S.A. F.C . EASEMENT)
APN: 6303-006-063	HUFF REAL ESTATE HOLDING LLC (U.S.A. F.C . EASEMENT)
APN: 6303-006-064	JPM INVESTMENT COMPANY LLC
APN: 6303-006-069	HUFF REAL ESTATE HOLDINGS LLC
APN: 6303-006-070	VERNON
APN: 6303-006-071	VERNON B LLC
APN: 6303-006-274	CITY OF L.A., W&P (L.A.C.F.C.D. EASEMENT AND U.S.A. F.C. EASEMENT)
APN: 6303-006-902	L.A.C.F.C.D.
APN: 6303-006-903	LA CO FLOOD CONTROL DIST SBYS (L.A.C.F.C.D. EASEMENT)
APN: 6303-006-904	L.A.C.F.C.D.
APN: 6303-007-021	LILLIAN J LARSEN
APN: 6303-007-022	VERNON PETEYCUSI & DRESMAN FC DRESMAN TRUST (TE) (U.S.A. F.C . EASEMENT)
APN: 6303-007-023	JOYCE LARSEN (U.S.A. F.C . EASEMENT)
APN: 6303-007-024	VERNON PETEYCUSI LLC & DRESMAN FC DRESMAN TRUST (TE) (L.A.C.F.C.D. EASEMENT)
APN: 6303-007-025	HP-A VERNON LLC
APN: 6303-007-026	HP-A VERNON LLC
APN: 6303-007-030	HP=A VERNON LLC
APN: 6303-007-032	MI J KIM | HI M PARK
APN: 6303-007-033	WEST SOTO STREET PARTNERS
APN: 6303-007-034	GOCO ENTERPRISES
APN: 6303-007-037	GOCO ENTERPRISES
APN: 6303-007-044	Q H SILK FLOWER INC

APN: 6303-007-046	MILLER DALE L (TE) MILLER TRUST
APN: 6303-007-047	DALES TRANSPORT - CITY OF L.A., W&P (L.A.C.F.C.D. EASEMENT)
APN: 6303-007-270	CITY OF L.A., W&P (L.A.C.F.C.D. EASEMENT)
APN: 6303-007-271	LA CITY DEPT OF WATER & POWER
APN: 6303-007-035	ART MORTGAGE BORROWER PROPCO 2010 5 LLC
APN: 6303-007-036	ART MORTGAGE BORROWER PROPCO 2010 5 LLC
APN: 6303-007-045	L.A.C.F.C.D. - VERNON INDUSTRIAL BUILDING LLC & VERNON CLAREMONT LLC
APN: 6303-007-904	LA CO FLOOD CONTROL DIST (U.S.A. F.C . EASEMENT)
APN: 6303-008-006	ARMEN KESHISHYAN | KARINE KESHISHYAN (U.S.A. F.C . EASEMENT)
APN: 6303-008-007	VERNON PROPERTIES LLC
APN: 6303-008-008	VERNON PROPERTIES LLC (U.S.A. F.C . EASEMENT)
APN: 6303-008-010	ANNA THURMAN (U.S.A. F.C . EASEMENT)
APN: 6303-008-012	ALICE B HARVEY
APN: 6303-008-013	VALACAL CO
APN: 6303-008-014	VALACAL CO
APN: 6303-008-015	CITY OF L.A., W&P (L.A.C.F.C.D. EASEMENT) - DAVID M SAMPANIS
APN: 6303-008-270	CITY OF L.A., W&P
APN: 6303-008-271	CITY OF L.A., W&P
APN: 6303-008-272	L.A.C.F.C.D.
APN: 6303-008-900	L.A.C.F.C.D.
APN: 6303-008-902	LA CO FLOOD CONTROL DIST
APN: 6303-009-008	TSAI CHIN ZONG (TE)

APN: 6303-009-009	TSAI CHIN ZONG (TE)
APN: 6303-009-013	YONEKYU USA INC - JOSHUA J RICHMAN | JR
APN: 6303-009-016	YONEKYU USA INC
APN: 6303-009-015	YONEKYU USA INC
APN: 6303-009-017	YI PROPERTIES INC (U.S.A. F.C . EASEMENT)
APN: 6303-009-019	HP-A VERNON LLC (U.S.A. F.C . EASEMENT)
APN: 6303-009-020	ACTINO Q CASTILLO
APN: 6303-009-021	CITY OF L.A., W&P - HP-A VERNON LLC
APN: 6303-009-270	DEDEAUX TERRY TRUST DEDEAUX JUSTIN TRUST ENGEMANN MICHELE D TRUST - LA CITY DEPT OF WATER & POWER
APN: 6304-006-004	DEDEAUX TERRY TRUST DEDEAUX JUSTIN TRUST ENGEMANN MICHELE D TRUST
APN: 6304-006-271	CITY OF L.A., W&P
APN: 6304-006-904	L.A.C.F.C.D.
APN: 6304-006-905	L.A.C.F.C.D. (U.S.A. F.C.D. EASEMENT)
APN: 6304-006-906 & -907	CITY OF L.A. & CITY OF LONG BEACH
APN: 6304-021-036	DEDEAUX TERRY TRUST DEDEAUX JUSTIN TRUST ENGEMANN MICHELE D TRUST
APN: 6304-021-037	DEDEAUX TERRY TRUST DEDEAUX JUSTIN TRUST ENGEMANN MICHELE D TRUST
APN: 6304-021-038	DEDEAUX TERRY TRUST DEDEAUX JUSTIN TRUST ENGEMANN MICHELE D TRUST
APN: 6304-021-039	DEDEAUX TERRY TRUST DEDEAUX JUSTIN TRUST ENGEMANN MICHELE D TRUST
APN: 6304-007-801 & -802	A T & S F RY CO S B OF E PAR 1 MAP 804-19-39
APN: 6304-007-274	L A CITY DEPT OF WATER & POWER
APN: 6304-033-271	L A JUNCTION RY CO S B OF E 844-19-8 K PAR 30
APN: 6304-007-800	L A JUNCTION RY CO S B OF E PAR 14 MAP 844-19-8

APN: 6304-007-900	L.A.C.F.C.D.
APN: 6304-009-800	L A JUNCTION RY CO SBE 844-19-8 K PAR 30 2 PTS
APN: 6304-009-802	L A JUNCTION RY CO S B OF E PAR 12 MAP 844-19-7E
APN: 6314-033-802	L A JUNCTION RY CO SB PF E PAR 15 MAP 844-19-8
APN: 6314-033-271	CITY OF L.A. DEPT OF WATER & POWER
APN: 6314-033-901	L.A.C.F.C.D.
APN: 6304-010-806	L A JUNCTION RY CO SBE 844-19-8 K PAR 30 2PTS
APN: 6304-010-015	HASAN HASSAN | IKBAL HASSAN
APN: 6313-001-007	KRYSTAL ENTERPRISES LLC - HASAN HASSAN | IKBAL HASSAN
APN: 6314-003-001	KRYSTAL ENTERPRISES LLC
APN: 6314-003-800	LA JUNCTION RY CO SB OF E PAR 4 MAP 844-19-8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Find a location
UNKNOWN ADDRESS
LOS ANGELES, CA 90021
Parcel No. (APN): 5168-014-905
Land Use Cat.: MISCELLANEOUS
Land Use Desc.: UTILITIES
Building Area:
Lot Area: 20,033 (0.46 ACRES)
Building/Lot Ratio:
No. of Units:
Year Built:
Assessed Value:
Owner: LACMTA
Owner Address:
Last Owner Transfer:
Last Market Sale: 6/30/1993
Shared Notes: 0 Results
Shared Documents: 0 Results
Comparable
No Additional Results
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E 23rd St
S Soto St
Pennino Pl
Los Angeles
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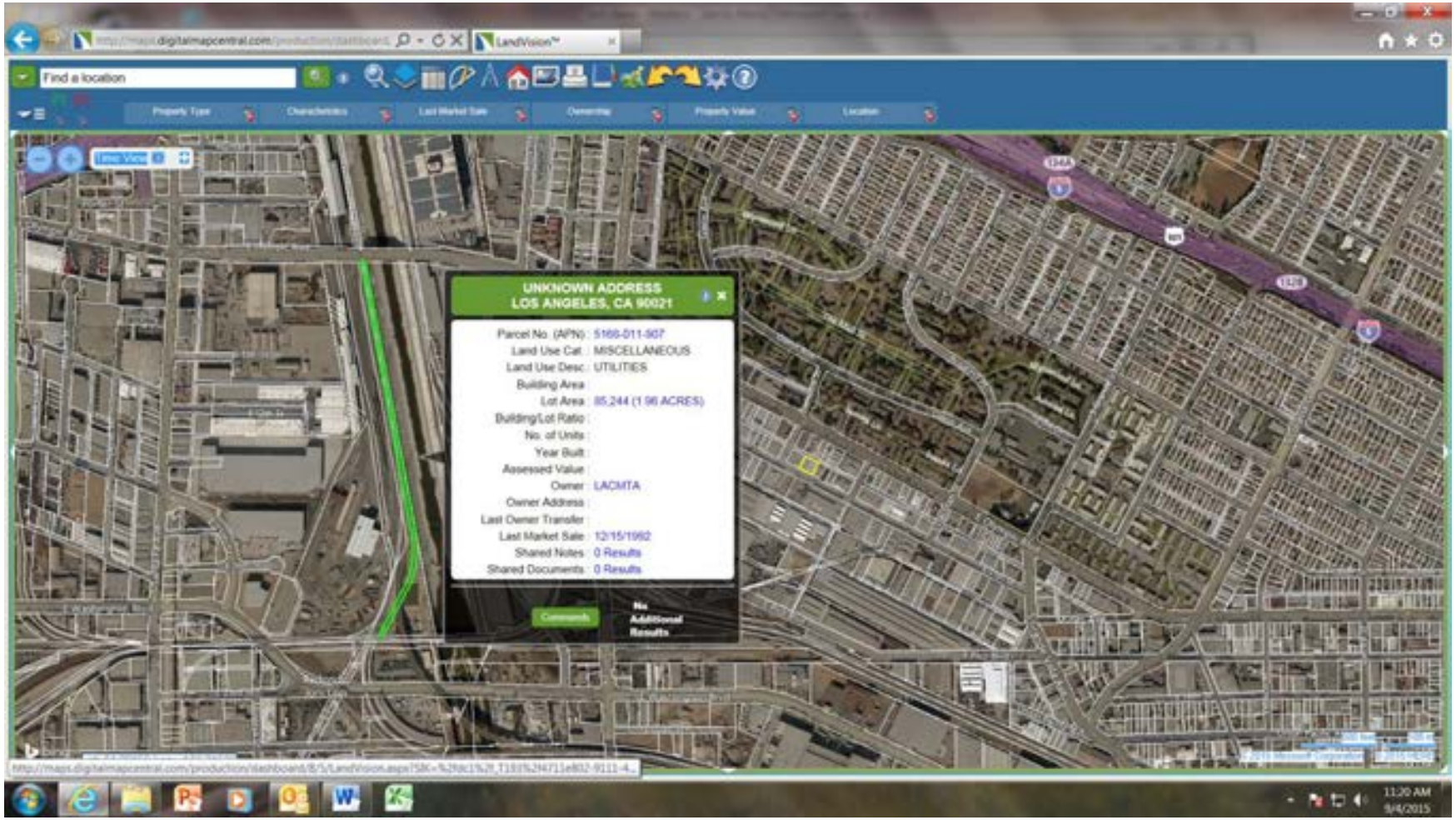
9/4/2015


LandVision™
Find a location
UNKNOWN ADDRESS
LOS ANGELES, CA 90021
Parcel No. (APN): 5166-011-907
Land Use Cat.: MISCELLANEOUS
Land Use Desc.: UTILITIES
Building Area:
Lot Area: 85,244 (1.96 ACRES)
Building/Lot Ratio:
No. of Units:
Year Built:
Assessed Value:
Owner: LACMTA
Owner Address:
Last Owner Transfer:
Last Market Sale: 12/15/1992
Shared Notes: 0 Results
Shared Documents: 0 Results
Comments
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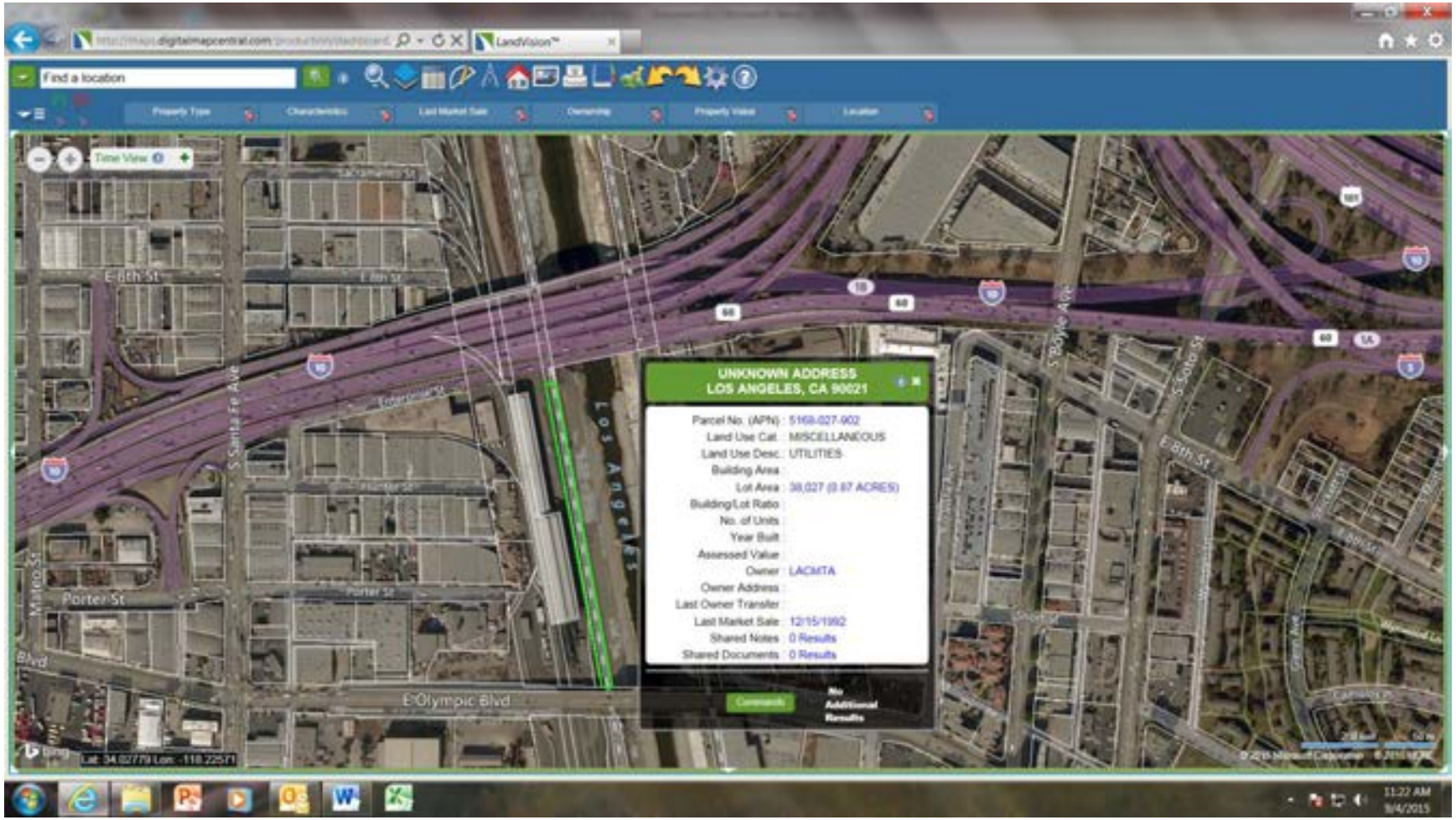
LandVision™
Find a location
Property Type
Characteristics
Last Market Sale
Ownership
Property Value
Location
Time View
E 8th St
E 8th St
S Santa Fe Ave
Los Angeles
S Boyle Ave
S Soto St
E 8th St
Porter St
Porter St
Mateo St
Blvd
E Olympic Blvd
UNKNOWN ADDRESS
LOS ANGELES, CA 90021
Parcel No. (APN) : 5168-027-902
Land Use Cat. : MISCELLANEOUS
Land Use Desc. : UTILITIES
Building Area :
Lot Area : 39,027 (0.87 ACRES)
Building/Lot Ratio :
No. of Units :
Year Built :
Assessed Value :
Owner : LACMTA
Owner Address :
Last Owner Transfer :
Last Market Sale : 12/15/1992
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Shared Documents : 0 Results
Comments
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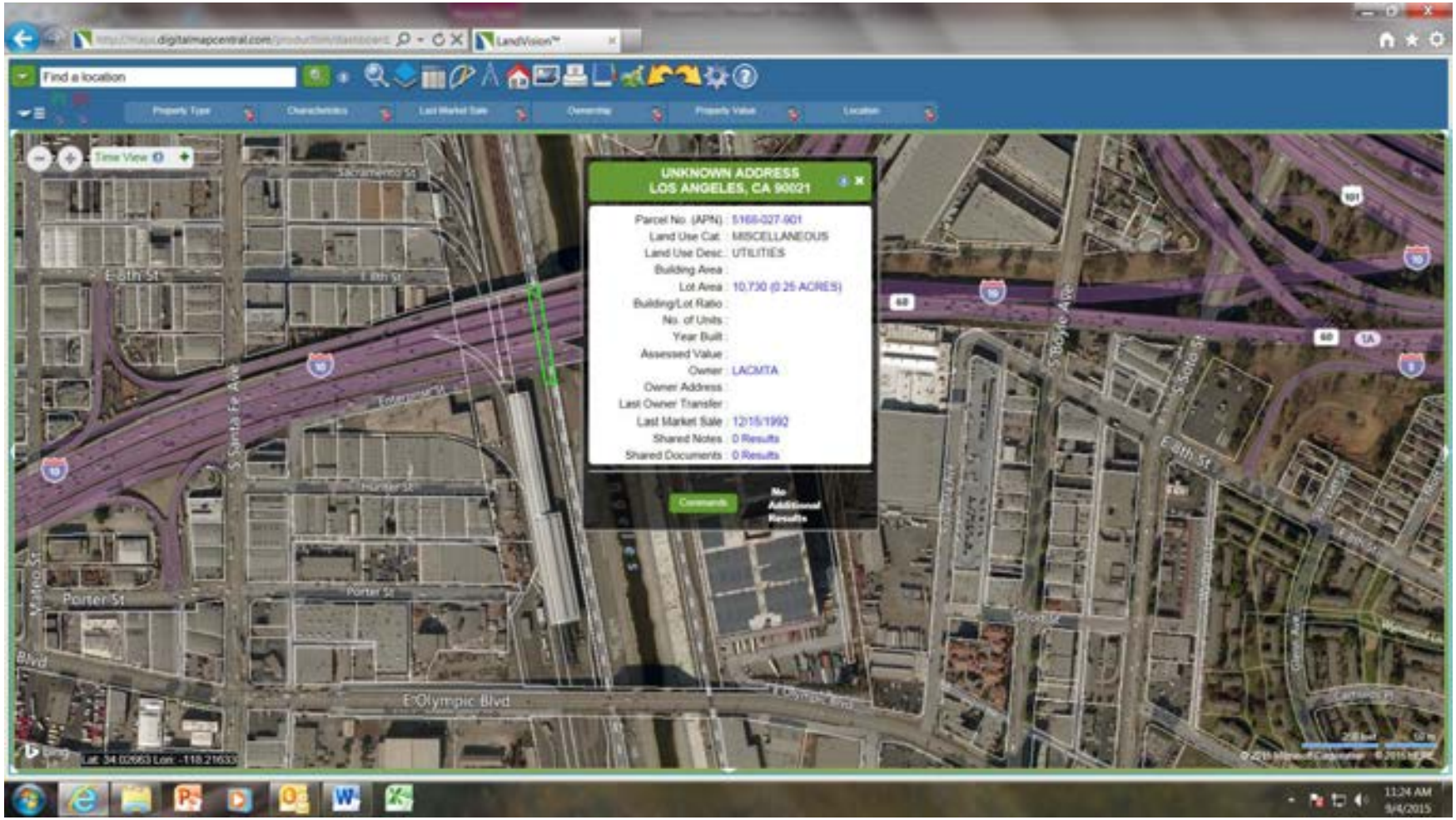
LandVision™
Find a location
Property Type
Characteristics
Last Market Sale
Ownership
Property Value
Location
Time View
UNKNOWN ADDRESS
LOS ANGELES, CA 90021
Parcel No. (APN): 5168-027-901
Land Use Cat.: MISCELLANEOUS
Land Use Desc.: UTILITIES
Building Area:
Lot Area: 10,730 (0.25 ACRES)
Building/Lot Ratio:
No. of Units:
Year Built:
Assessed Value:
Owner: LACMTA
Owner Address:
Last Owner Transfer:
Last Market Sale: 12/15/1992
Shared Notes: 0 Results
Shared Documents: 0 Results
Commands
No Additional Results
E 8th St
S Santa Fe Ave
Hunter St
Porter St
Mateo St
E Olympic Blvd
S Boyle Ave
S Soto St
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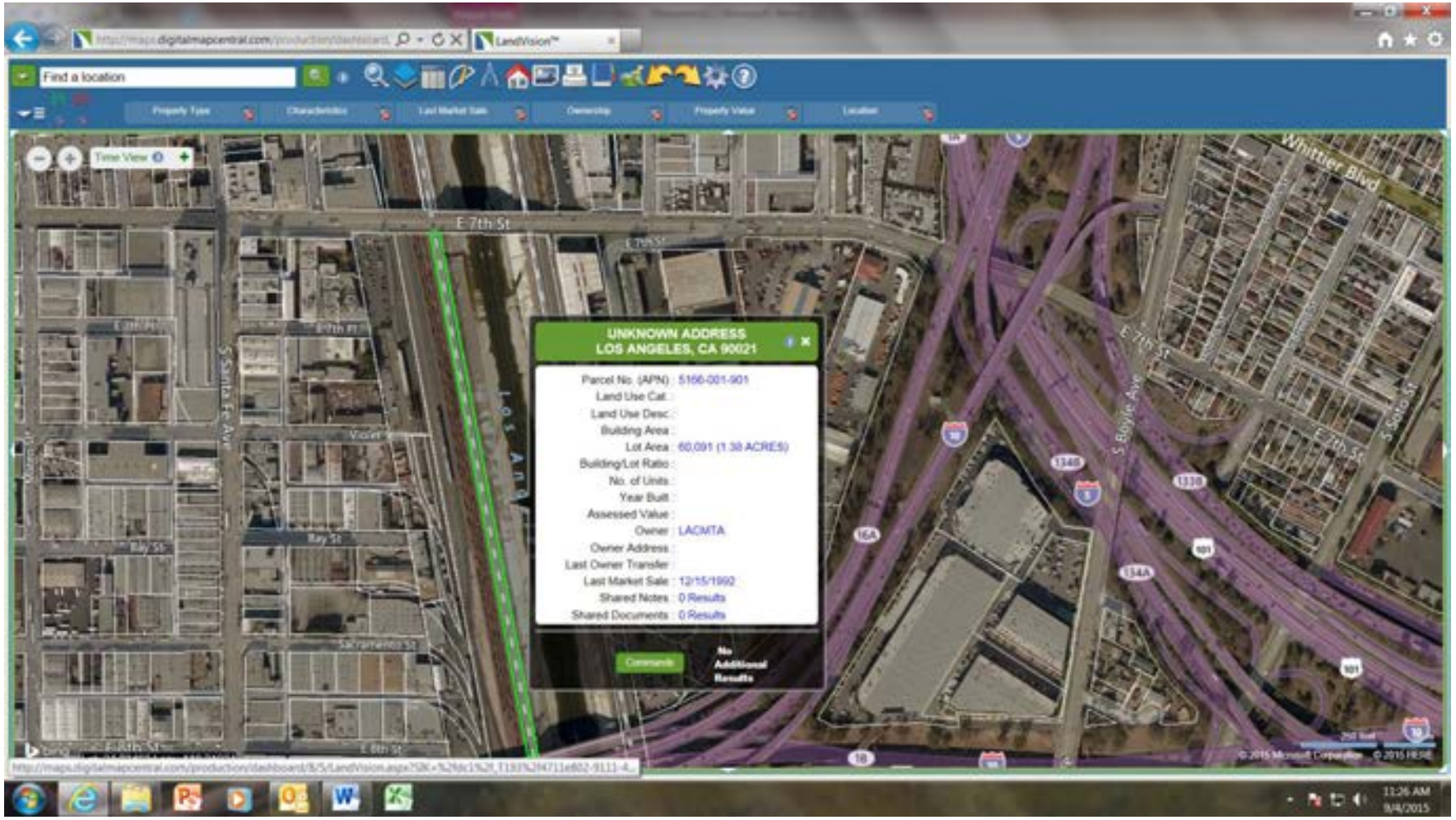
9/4/2015


Find a location
Property Type
Characteristics
Last Market Sale
Ownership
Property Value
Location
Time View
E 7th St
Whittier Blvd
S Santa Fe Ave
Los Angeles River
S Boyle Ave
Violet
Bay St
Sacramento St
E 8th St
UNKNOWN ADDRESS
LOS ANGELES, CA 90021
Parcel No. (APN): 5166-001-901
Land Use Cat.:
Land Use Desc.:
Building Area:
Lot Area: 60,091 (1.38 ACRES)
Building/Lot Ratio:
No. of Units:
Year Built:
Assessed Value:
Owner: LACMTA
Owner Address:
Last Owner Transfer:
Last Market Sale: 12/15/1992
Shared Notes: 0 Results
Shared Documents: 0 Results
Commands
No Additional Results
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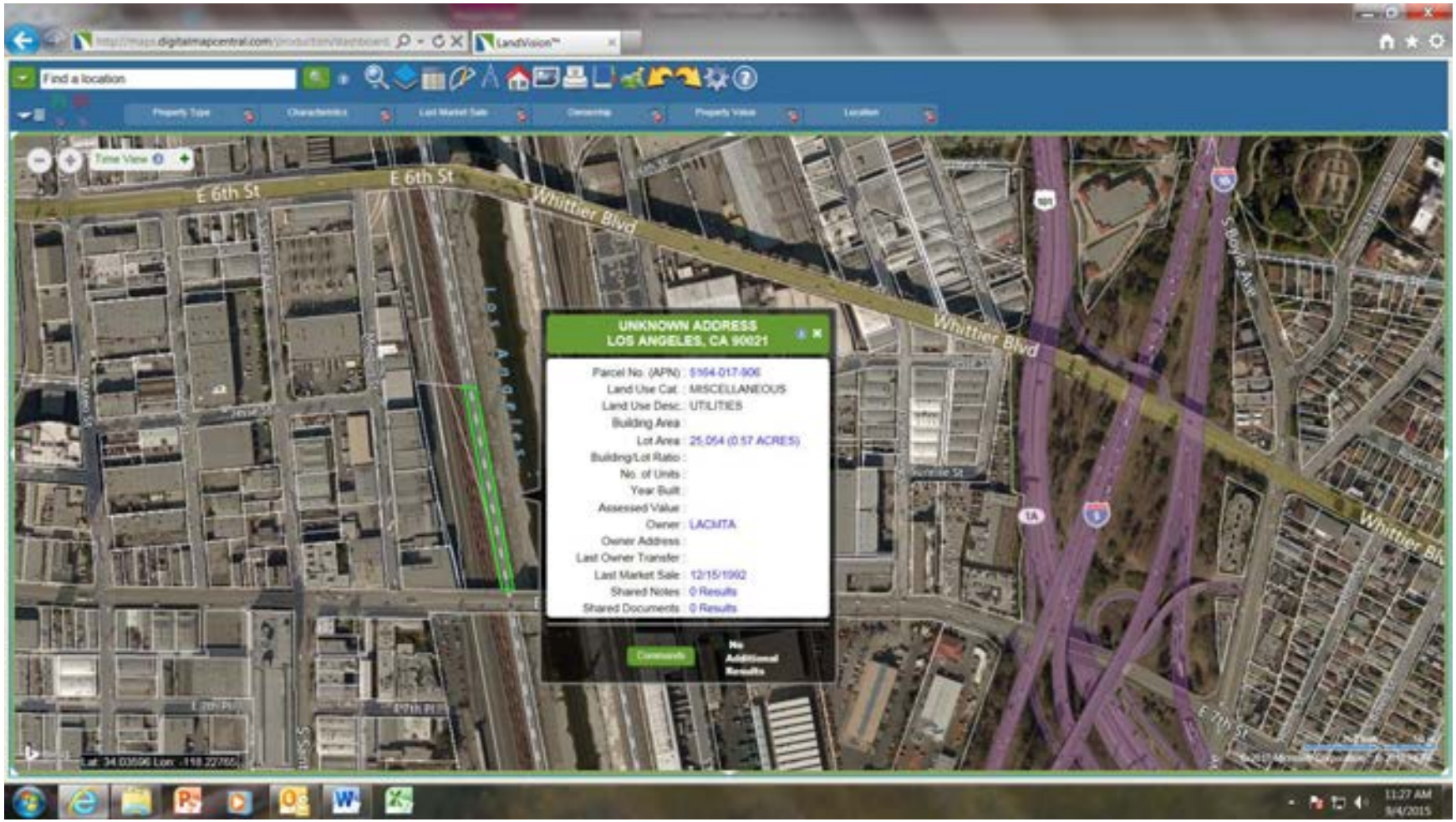
LandVision™
Find a location
E 6th St
E 6th St
Whittier Blvd
Whittier Blvd
Los Angeles
S Boyle Ave
UNKNOWN ADDRESS
LOS ANGELES, CA 90021
Parcel No. (APN): 5164-017-906
Land Use Cat.: MISCELLANEOUS
Land Use Desc.: UTILITIES
Building Area:
Lot Area: 25,054 (0.57 ACRES)
Building/Lot Ratio:
No. of Units:
Year Built:
Assessed Value:
Owner: LACMTA
Owner Address:
Last Owner Transfer:
Last Market Sale: 12/15/1992
Shared Notes: 0 Results
Shared Documents: 0 Results
Comments
No Additional Results
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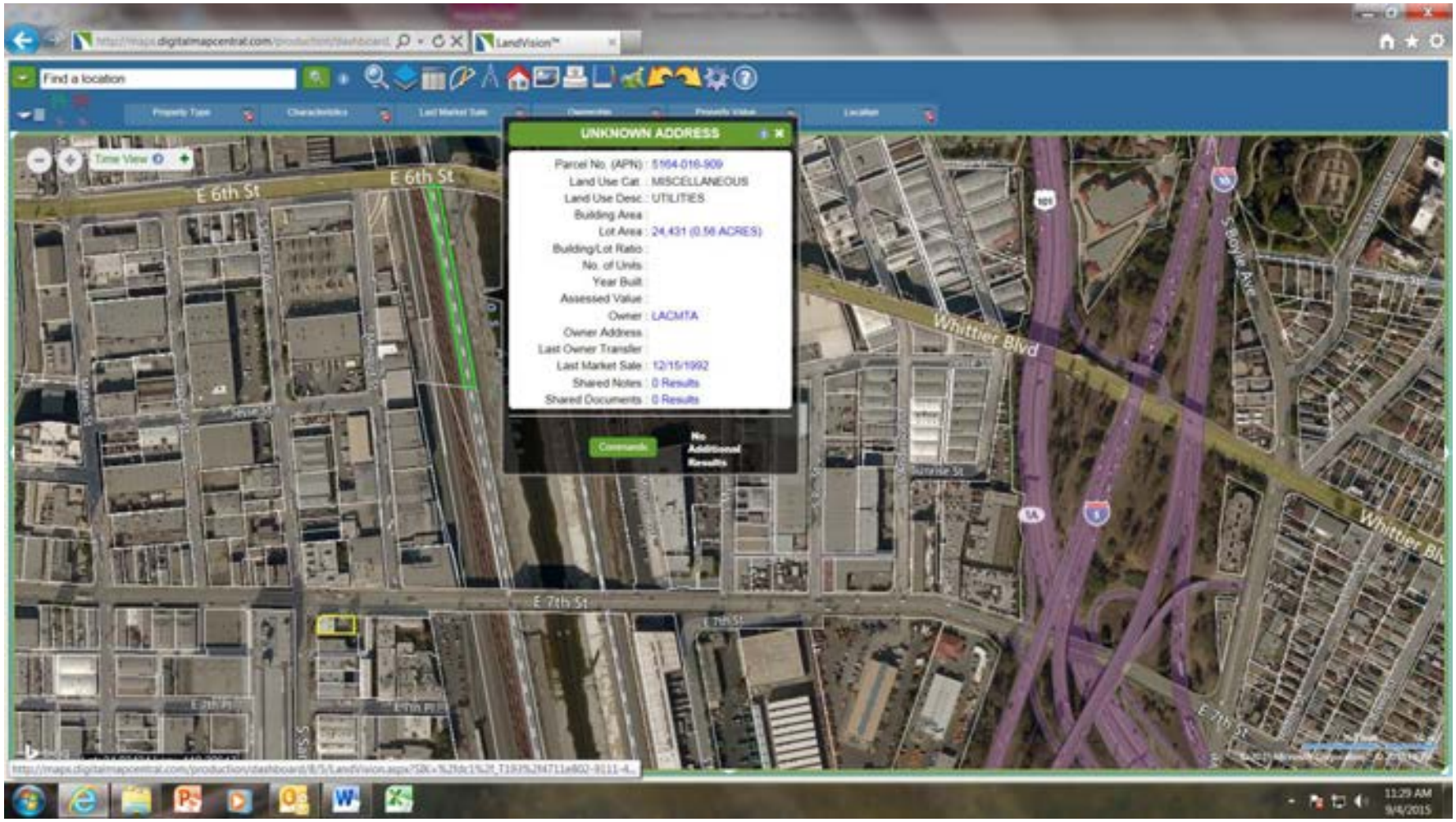
LandVision™
Find a location
UNKNOWN ADDRESS
Parcel No. (APN) : 5164-016-909
Land Use Cat. : MISCELLANEOUS
Land Use Desc : UTILITIES
Building Area :
Lot Area : 24,431 (0.56 ACRES)
Building/Lot Ratio :
No. of Units :
Year Built :
Assessed Value :
Owner : LACMTA
Owner Address :
Last Owner Transfer :
Last Market Sale : 12/15/1992
Shared Notes : 0 Results
Shared Documents : 0 Results
Commands
No Additional Results
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E 7th St
Whittier Blvd
S Boyle Ave
Time View
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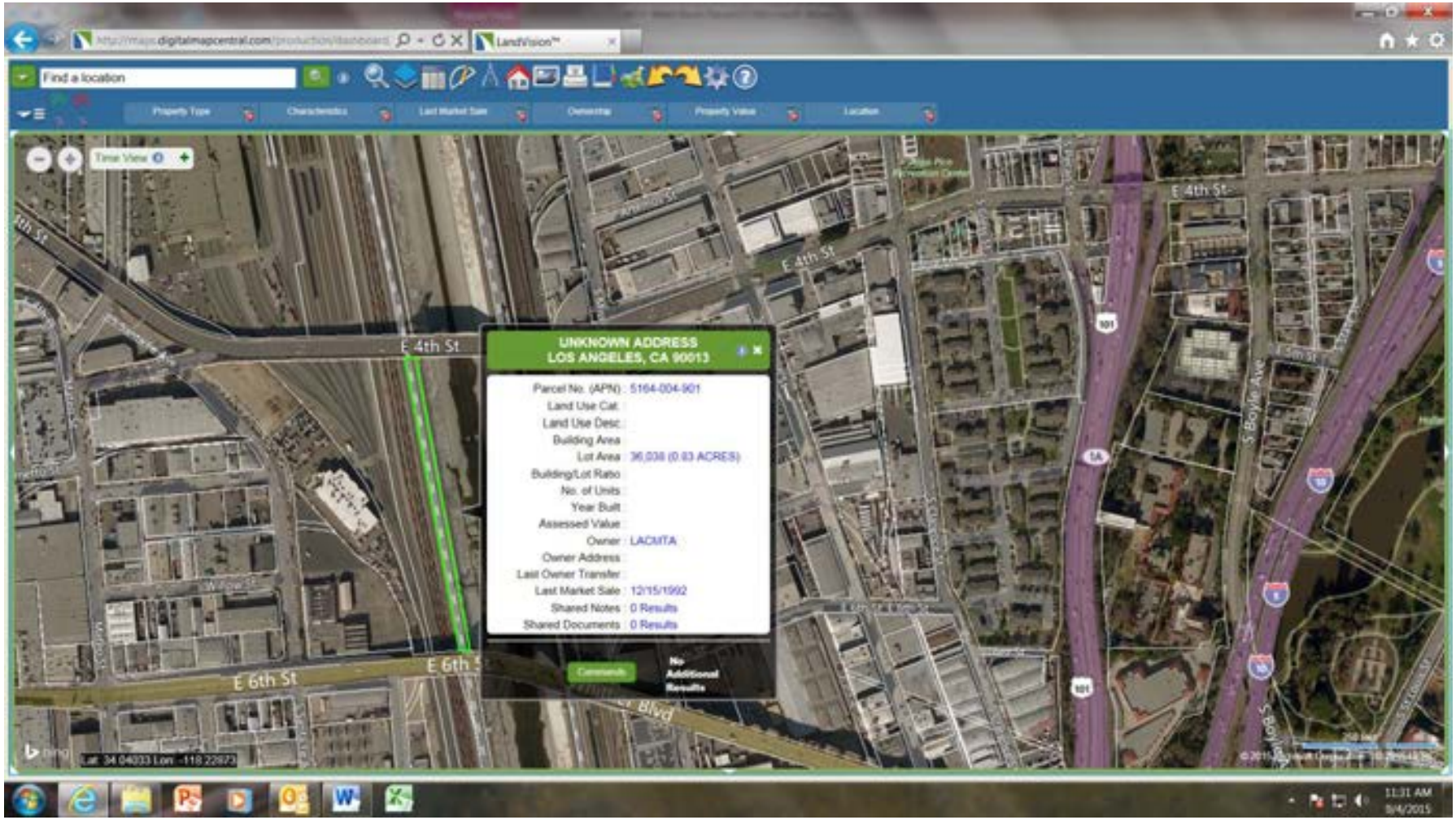
9/4/2015


LandVision™
Find a location
Property Type
Characteristics
Last Market Sale
Ownership
Property Value
Location
Time View
E 4th St
E 6th St
S Boyle Ave
UNKNOWN ADDRESS
LOS ANGELES, CA 90013
Parcel No. (APN) : 5164-004-901
Land Use Cat.
Land Use Desc.
Building Area
Lot Area : 36,036 (0.83 ACRES)
Building/Lot Ratio
No. of Units
Year Built
Assessed Value
Owner : LACMTA
Owner Address
Last Owner Transfer
Last Market Sale : 12/15/1992
Shared Notes : 0 Results
Shared Documents : 0 Results
Comments
No Additional Results
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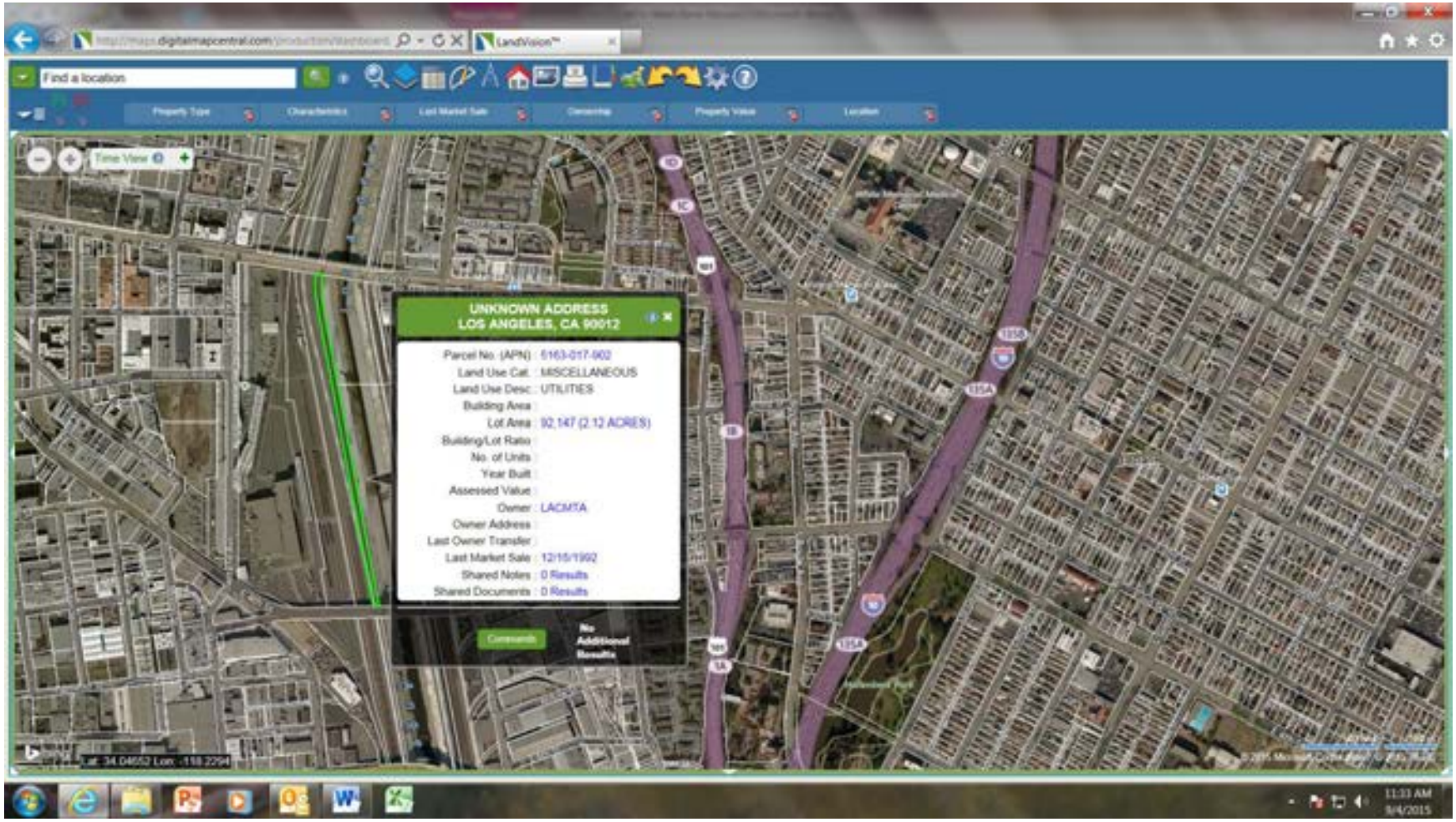
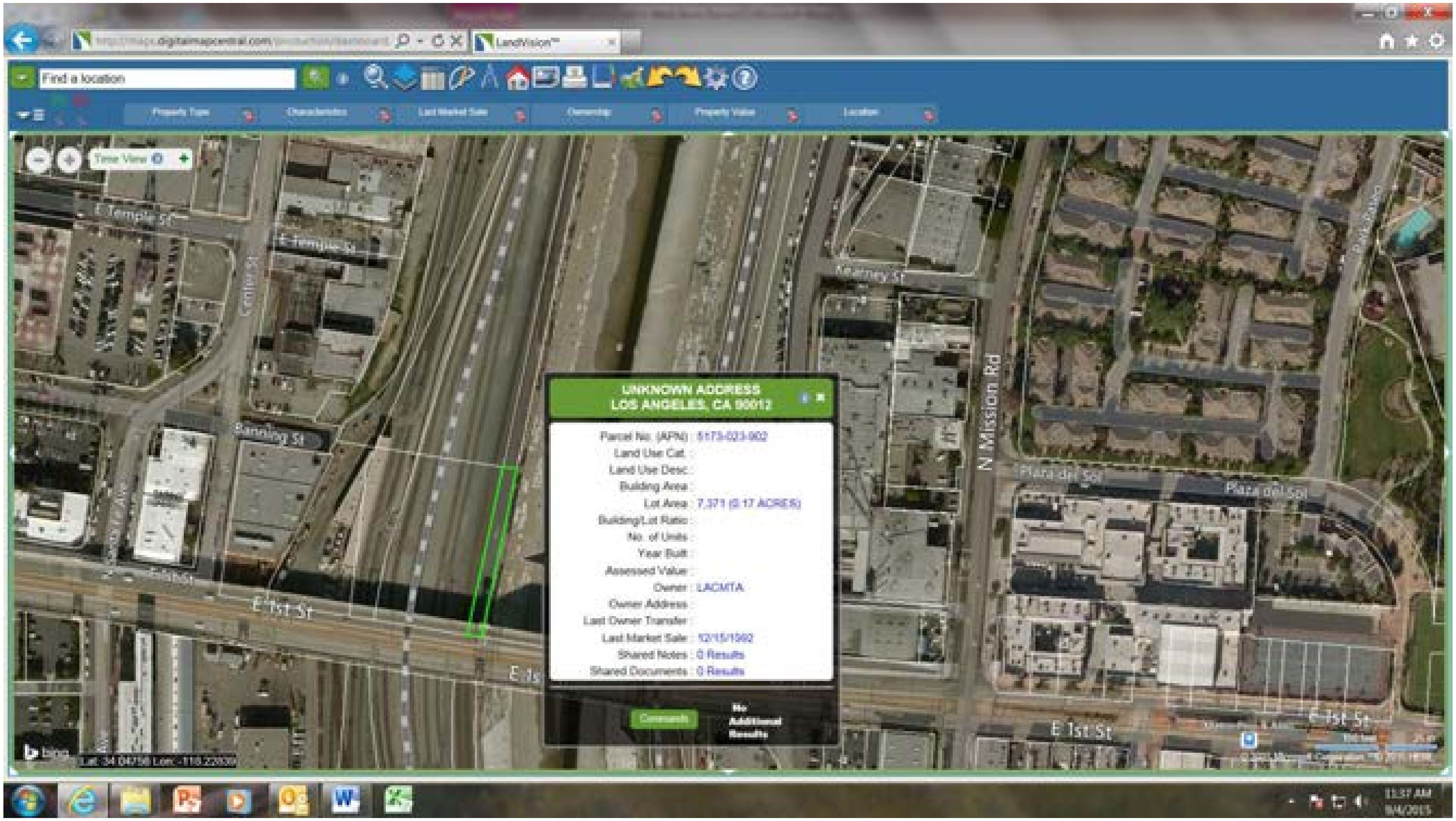
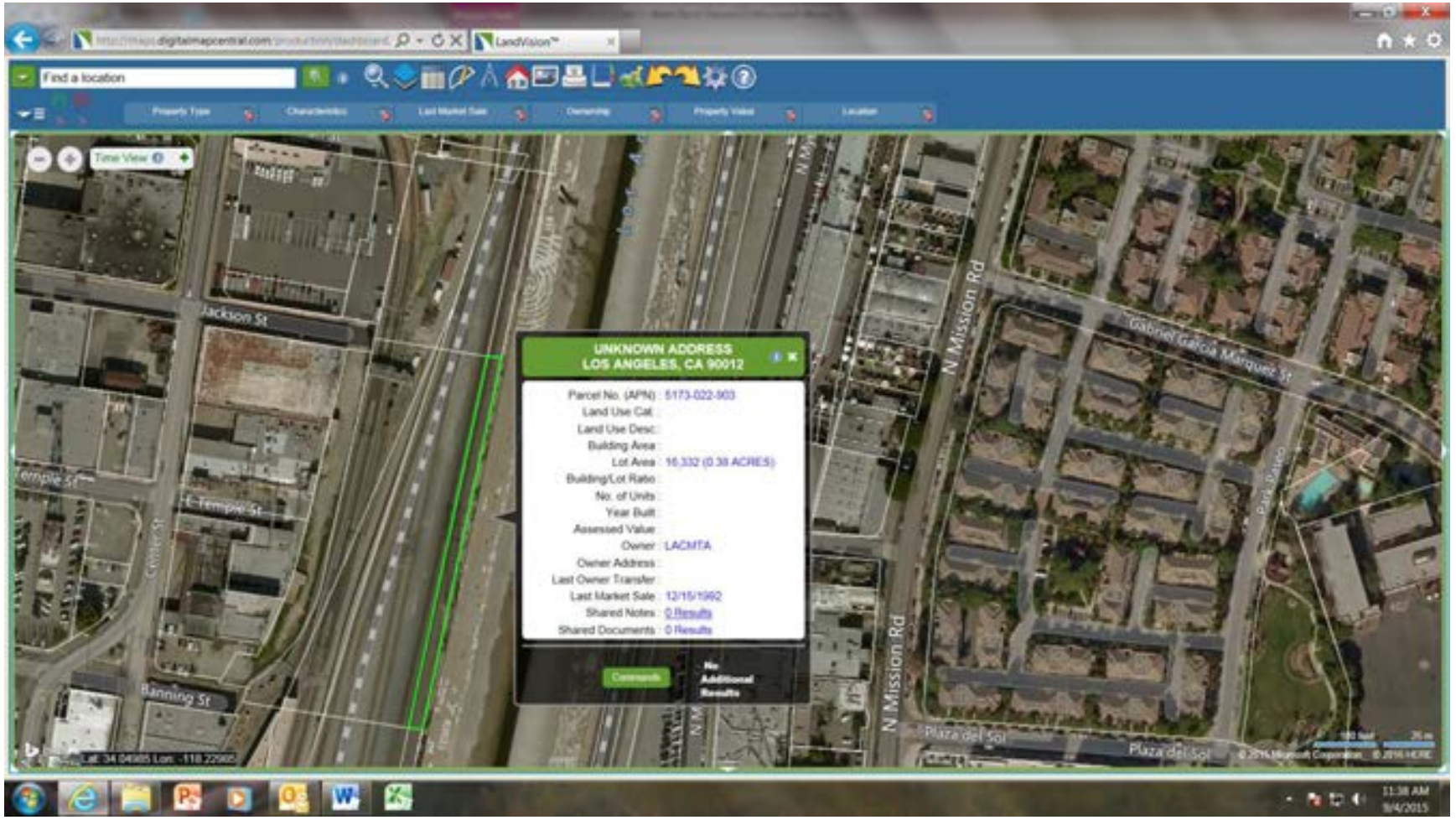
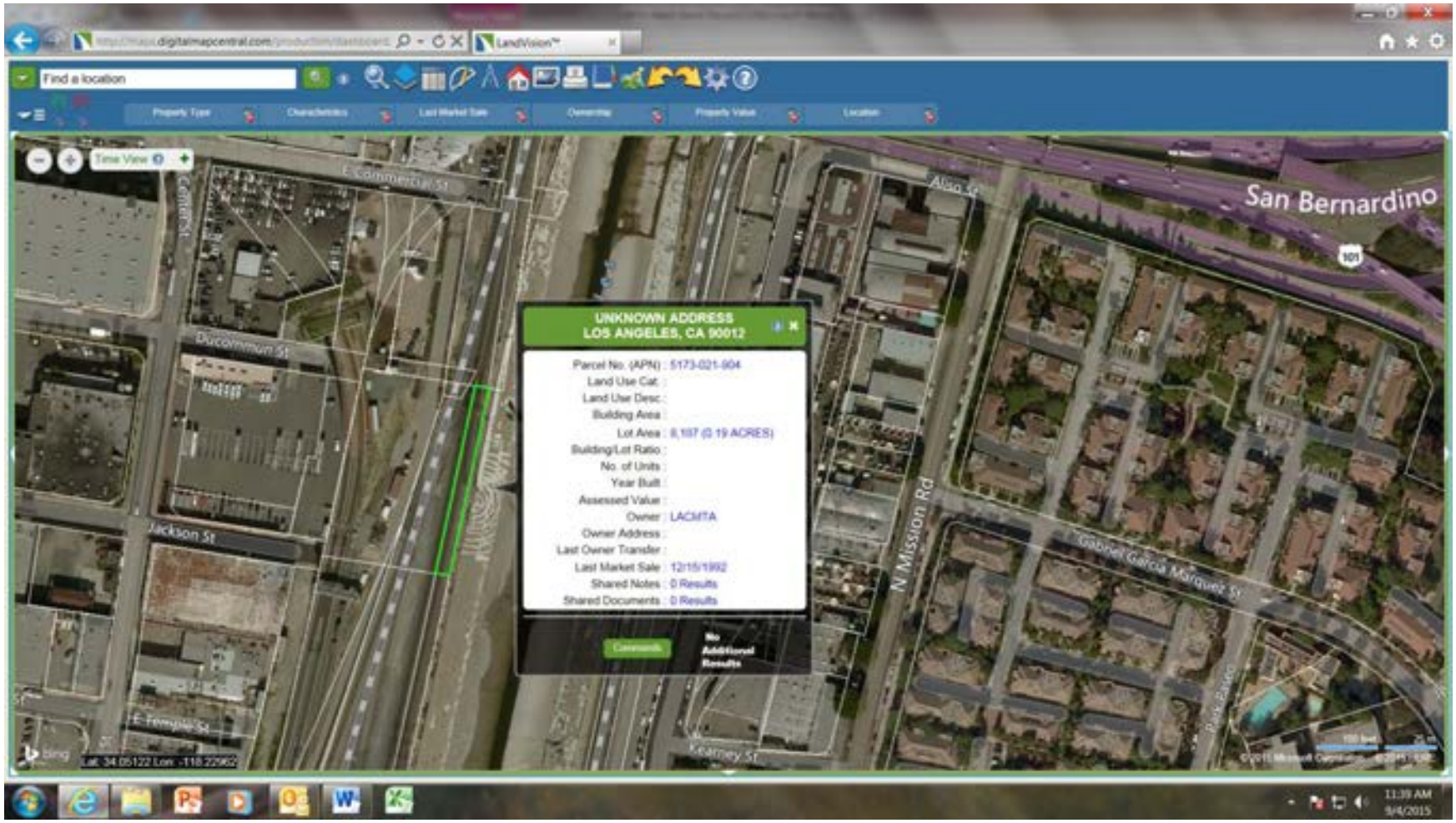
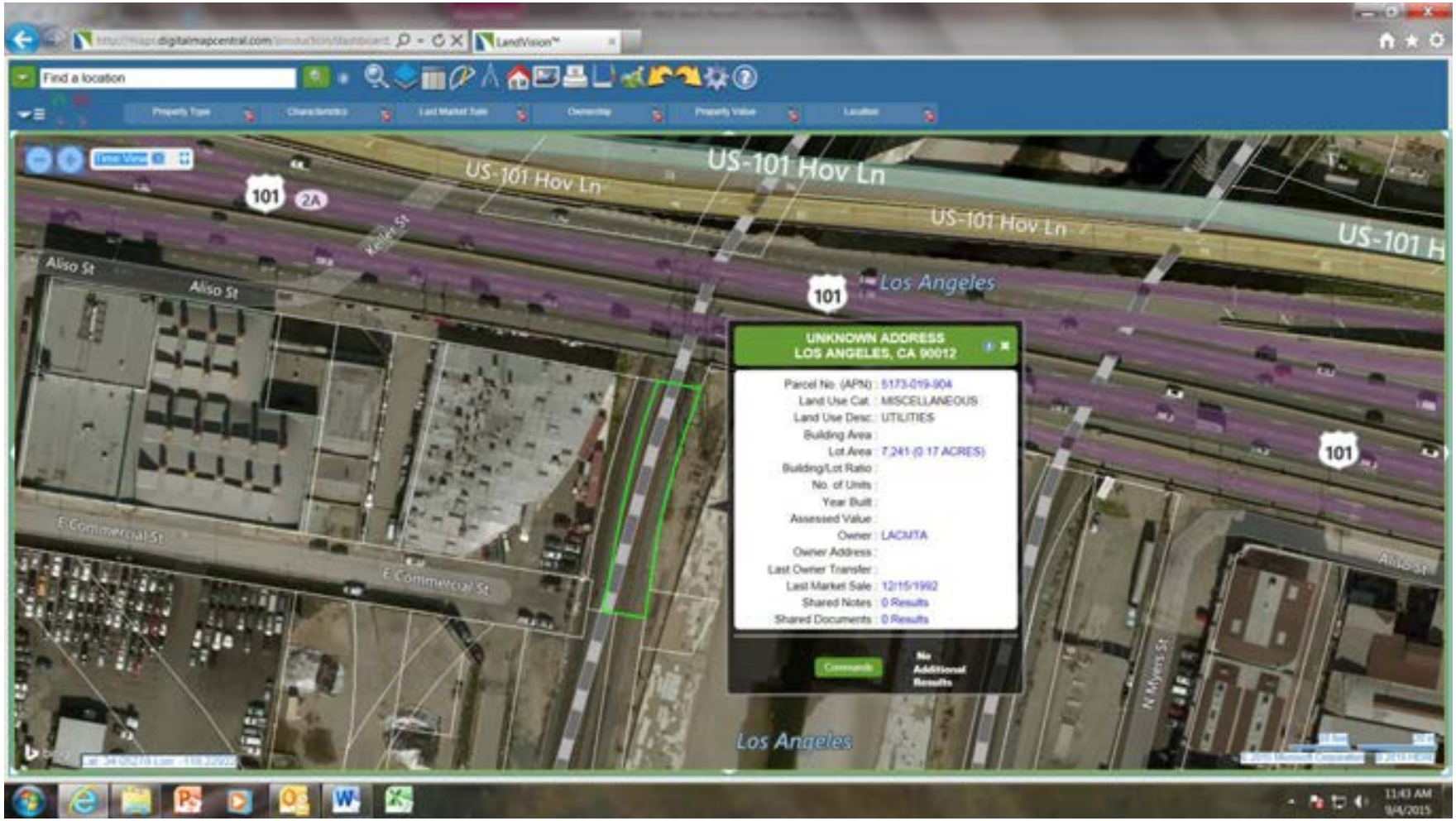
11:31 AM
9/4/2015

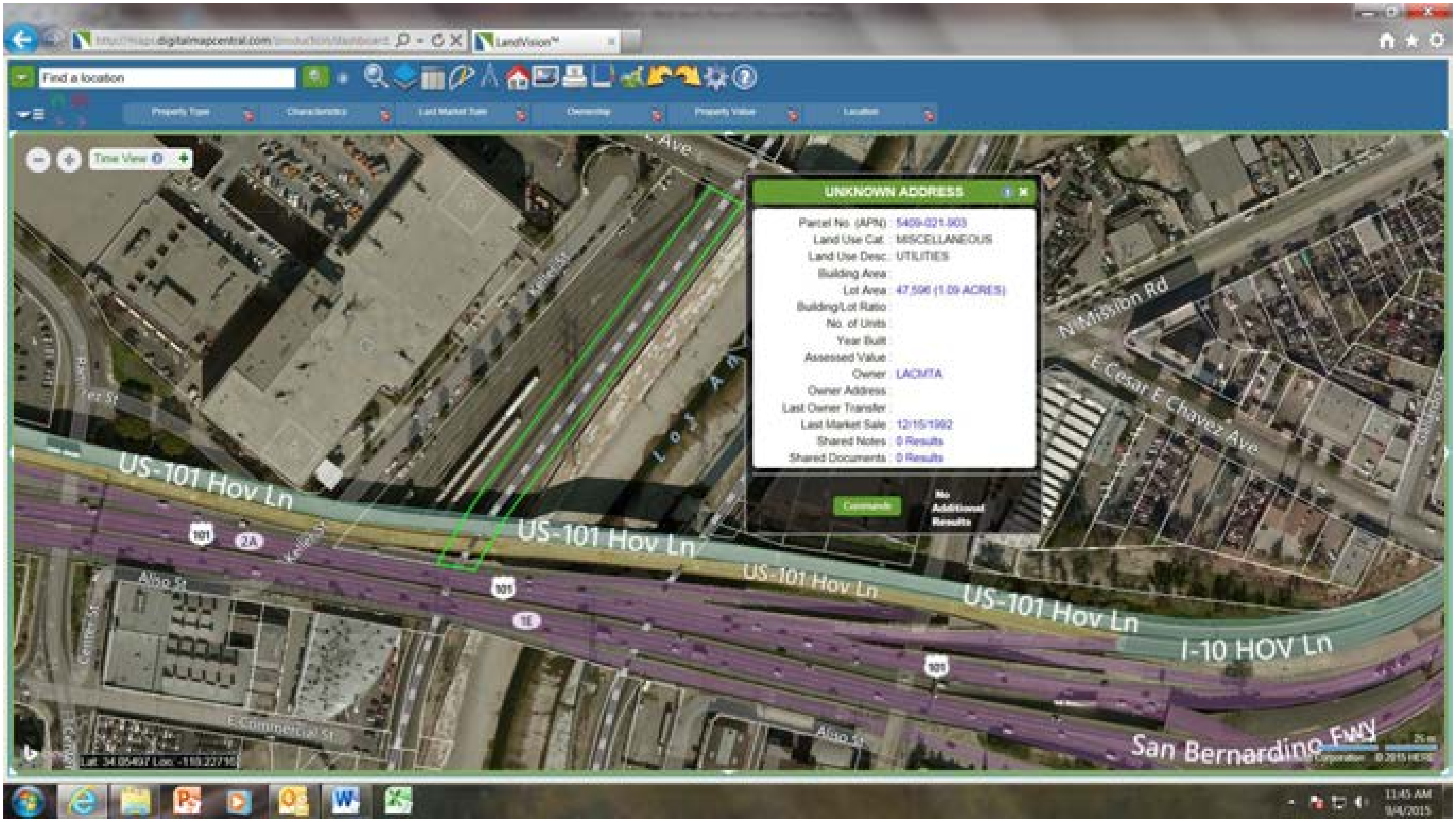

LandVision™
Find a location
Property Type
Characteristics
Last Market Sale
Ownership
Property Value
Location
Time View
UNKNOWN ADDRESS
LOS ANGELES, CA 90012
Parcel No. (APN) : 6163-017-902
Land Use Cat. : MISCELLANEOUS
Land Use Desc. : UTILITIES
Building Area :
Lot Area : 92,147 (2.12 ACRES)
Building/Lot Ratio :
No. of Units :
Year Built :
Assessed Value :
Owner : LACMTA
Owner Address :
Last Owner Transfer :
Last Market Sale : 12/15/1992
Shared Notes : 0 Results
Shared Documents : 0 Results
Comments
No Additional Results
Lat: 34.04652 Lon: -118.2294
11:33 AM
9/4/2015


Find a location
E Temple St
E Temple St
Center St
Kearney St
Banning St
N Mission Rd
Plaza del Sol
Plaza del Sol
E 1st St
E 1st St
E 1st St
UNKNOWN ADDRESS
LOS ANGELES, CA 90012
Parcel No. (APN) : 5173-023-902
Land Use Cat. :
Land Use Desc. :
Building Area :
Lot Area : 7,371 (0.17 ACRES)
Building/Lot Ratio :
No. of Units :
Year Built :
Assessed Value :
Owner : LACMTA
Owner Address :
Last Owner Transfer :
Last Market Sale : 12/15/1992
Shared Notes : 0 Results
Shared Documents : 0 Results
Comments
No Additional Results

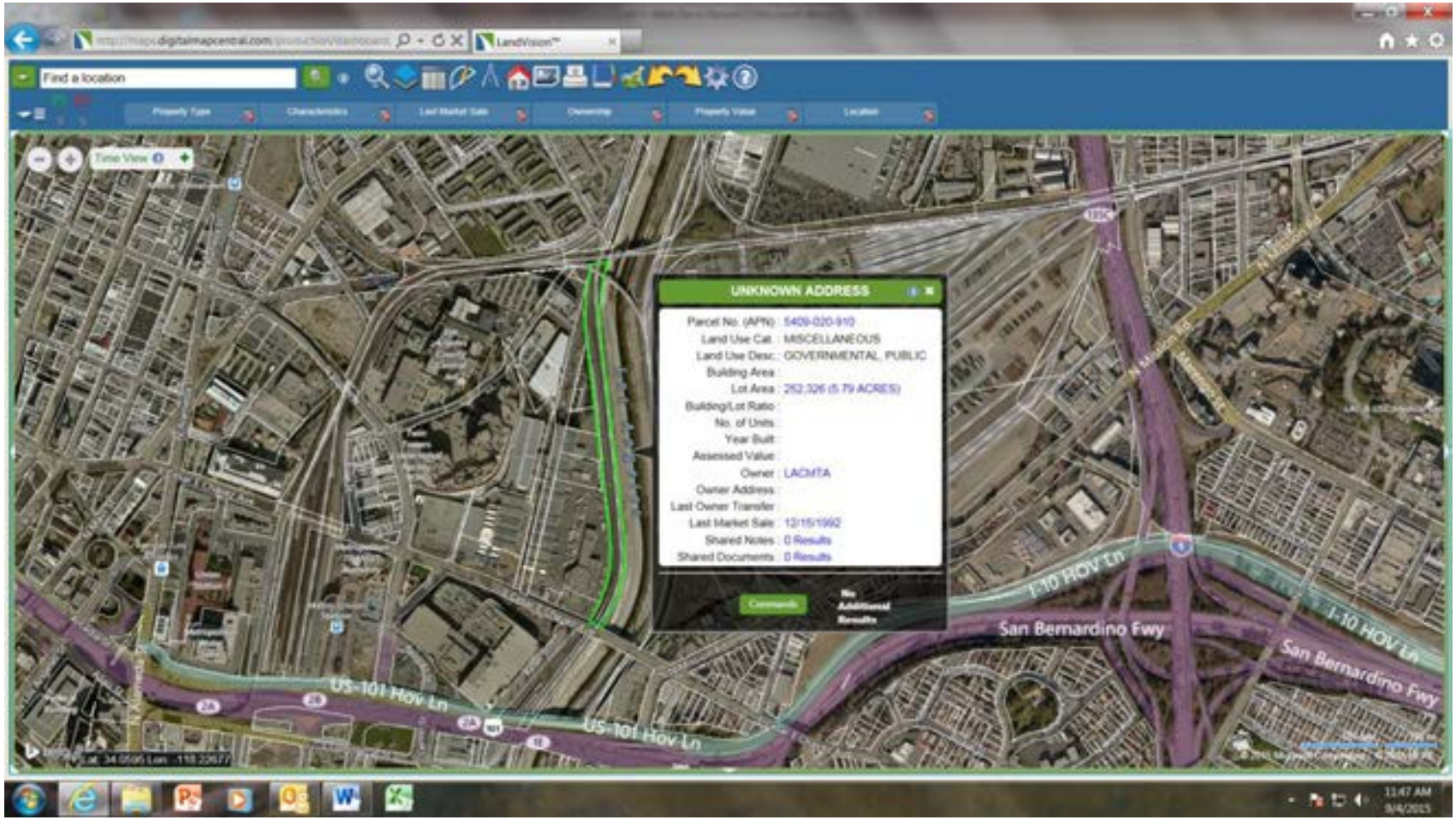

LandVision™
Find a location
Property Type
Characteristics
Last Market Sale
Ownership
Property Value
Location
Time View
UNKNOWN ADDRESS
LOS ANGELES, CA 90012
Parcel No. (APN) : 5173-022-903
Land Use Cat. :
Land Use Desc. :
Building Area :
Lot Area : 16,332 (0.38 ACRES)
Building/Lot Ratio :
No. of Units :
Year Built :
Assessed Value :
Owner : LACMTA
Owner Address :
Last Owner Transfer :
Last Market Sale : 12/15/1992
Shared Notes : 0 Results
Shared Documents : 0 Results
Comments
No Additional Results
Jackson St
Temple St
E Temple St
Center St
Banning St
N Mission Rd
Gabriel Garcia Marquez St
Plaza del Sol
Lat: 34.04805 Lon: -118.22962
11:38 AM
9/4/2015

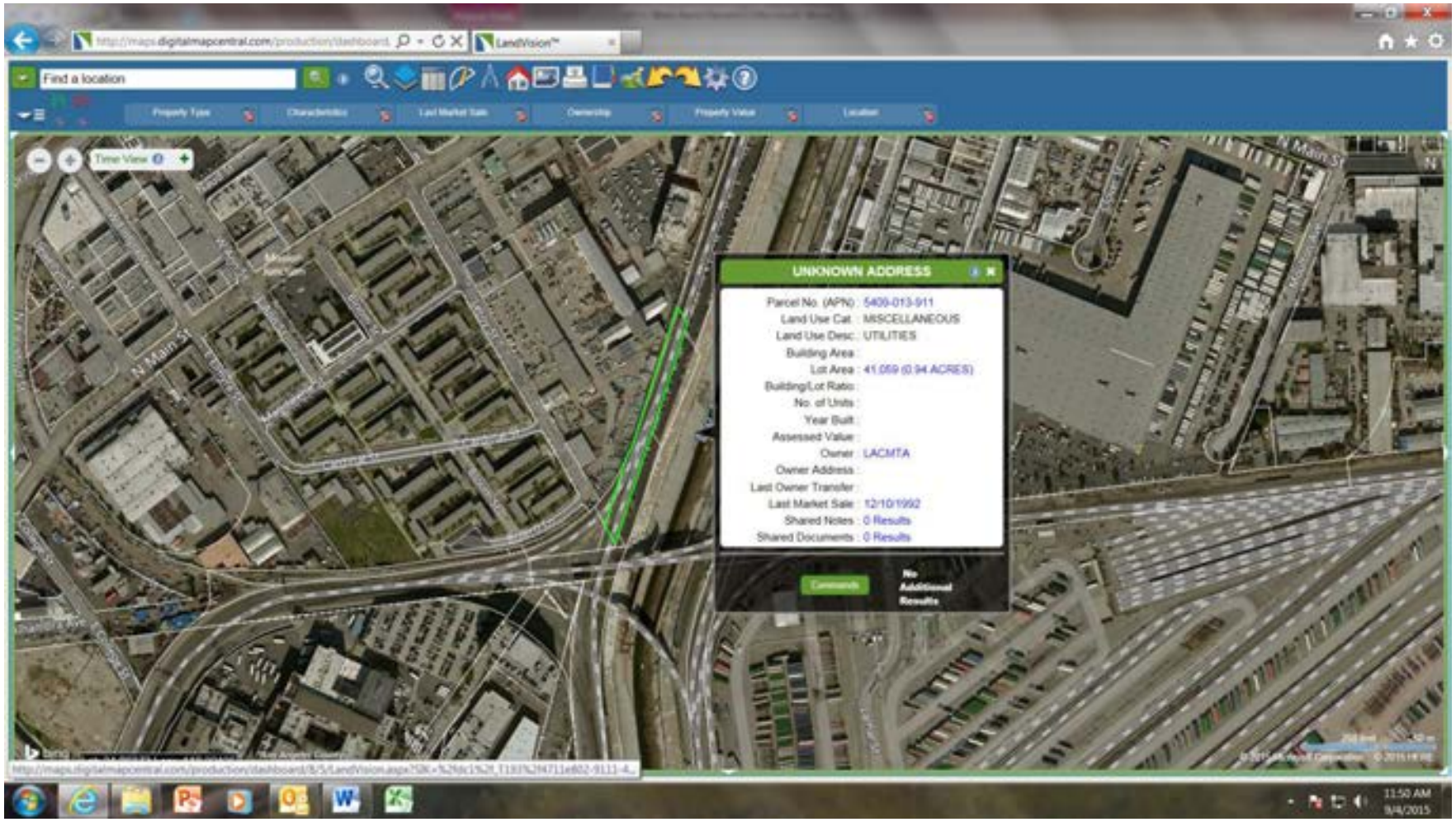

LandVision™
Find a location
Property Type
Characteristics
Last Market Sale
Ownership
Property Value
Location
Time View
E Commercial St
Alameda St
San Bernardino
101
Ducommun St
Jackson St
E Temple St
N Mission Rd
Gabriel García Márquez St
Kearney St
Lat: 34.05122 Lon: -118.22962
UNKNOWN ADDRESS
LOS ANGELES, CA 90012
Parcel No. (APN) : 5173-021-904
Land Use Cat. :
Land Use Desc. :
Building Area :
Lot Area : 8,197 (0.19 ACRES)
Building/Lot Ratio :
No. of Units :
Year Built :
Assessed Value :
Owner : LACMTA
Owner Address :
Last Owner Transfer :
Last Market Sale : 12/15/1992
Shared Notes : 0 Results
Shared Documents : 0 Results
Comments
No Additional Results
11:39 AM
9/4/2015

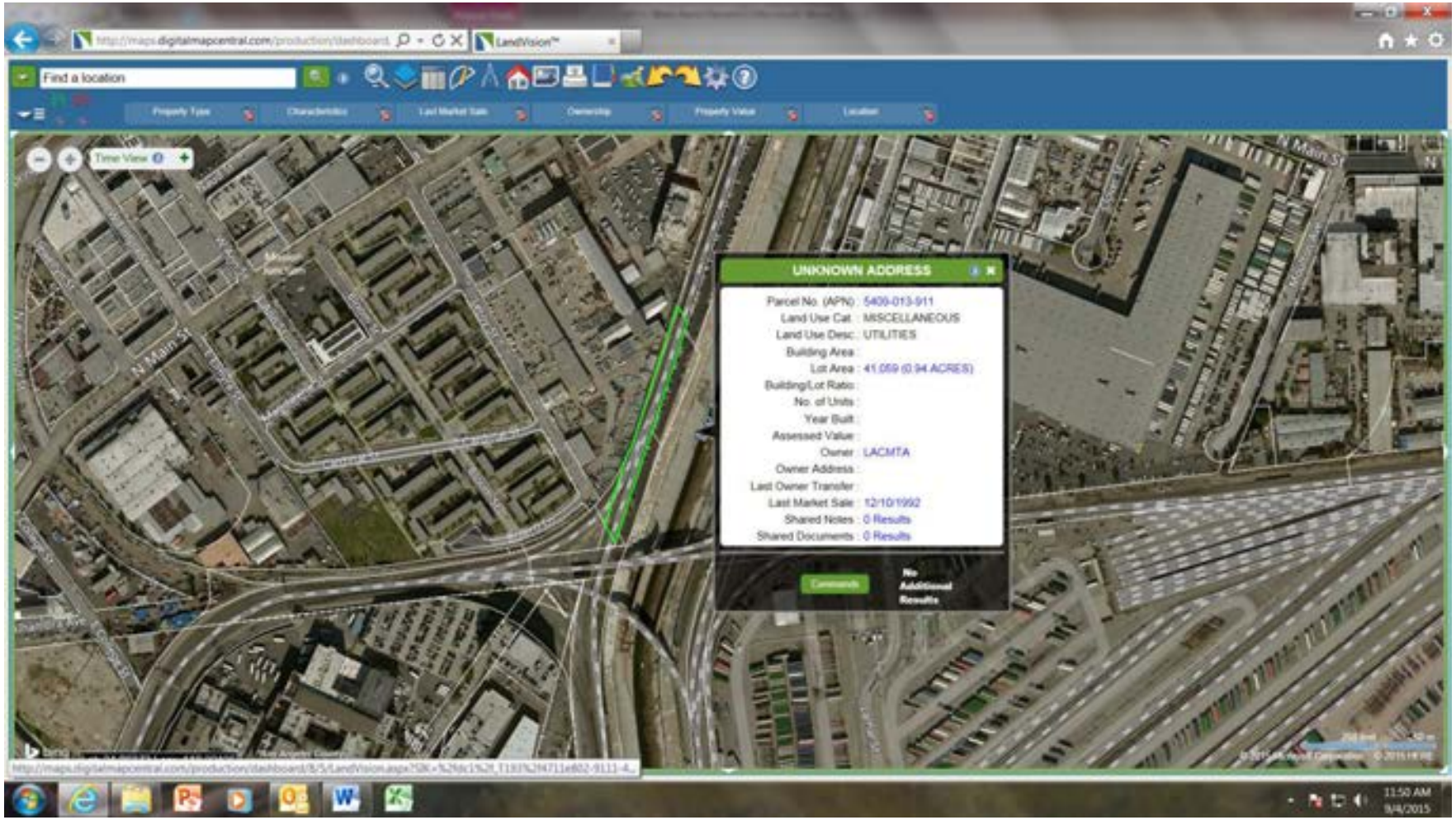

Find a location
US-101 Hov Ln
US-101 Hov Ln
US-101 Hov Ln
US-101 H
101
2A
Keller St
Aliso St
Aliso St
Los Angeles
101
UNKNOWN ADDRESS
LOS ANGELES, CA 90012
Parcel No. (APN) : 5173-019-904
Land Use Cat. : MISCELLANEOUS
Land Use Desc. : UTILITIES
Building Area :
Lot Area : 7,241 (0.17 ACRES)
Building/Lot Ratio :
No. of Units :
Year Built :
Assessed Value :
Owner : LACMTA
Owner Address :
Last Owner Transfer :
Last Market Sale : 12/15/1992
Shared Notes : 0 Results
Shared Documents : 0 Results
Commands
No Additional Results
E Commercial St
E Commercial St
101
N Myers St
Los Angeles
11:43 AM
9/4/2015

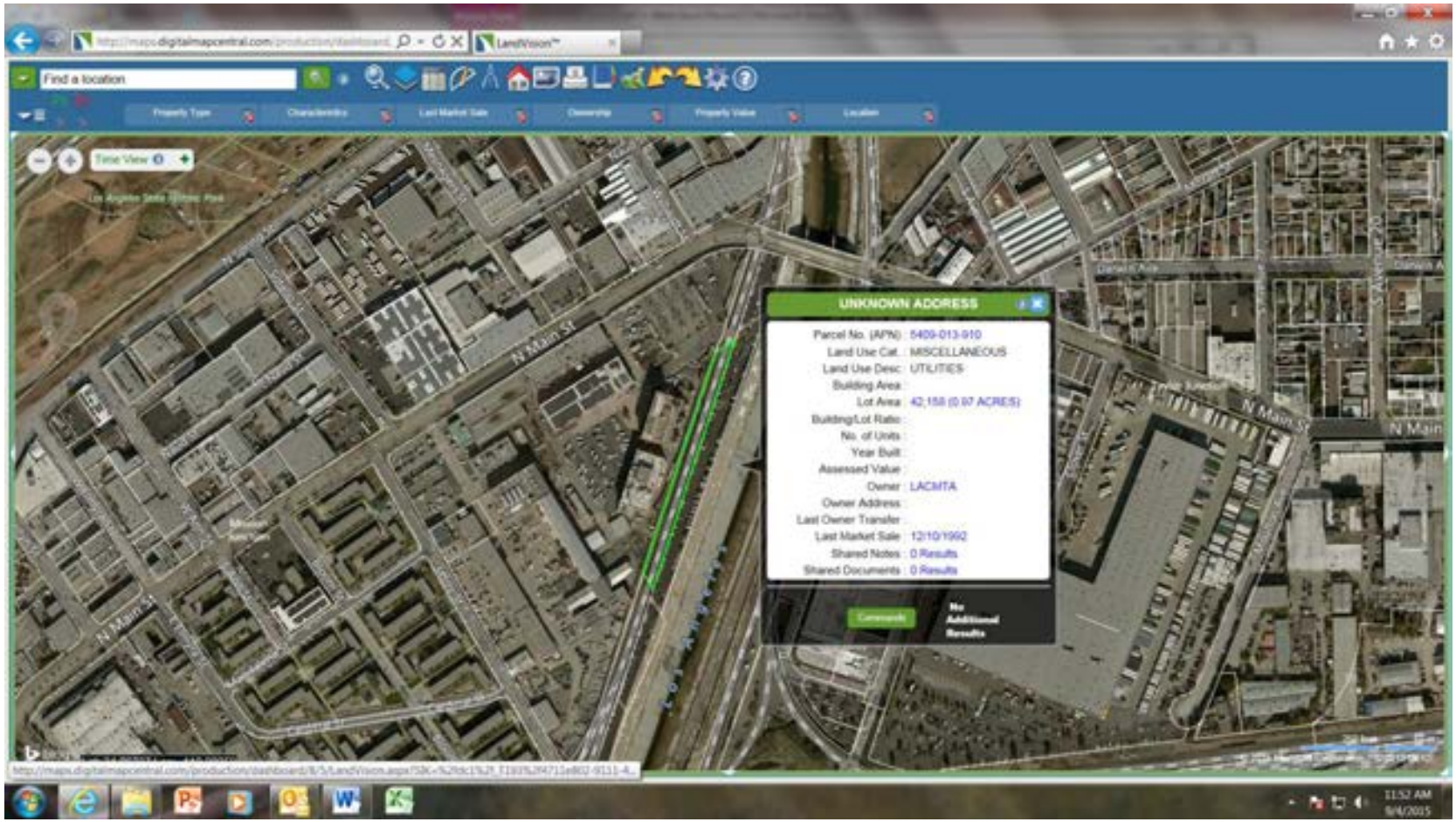


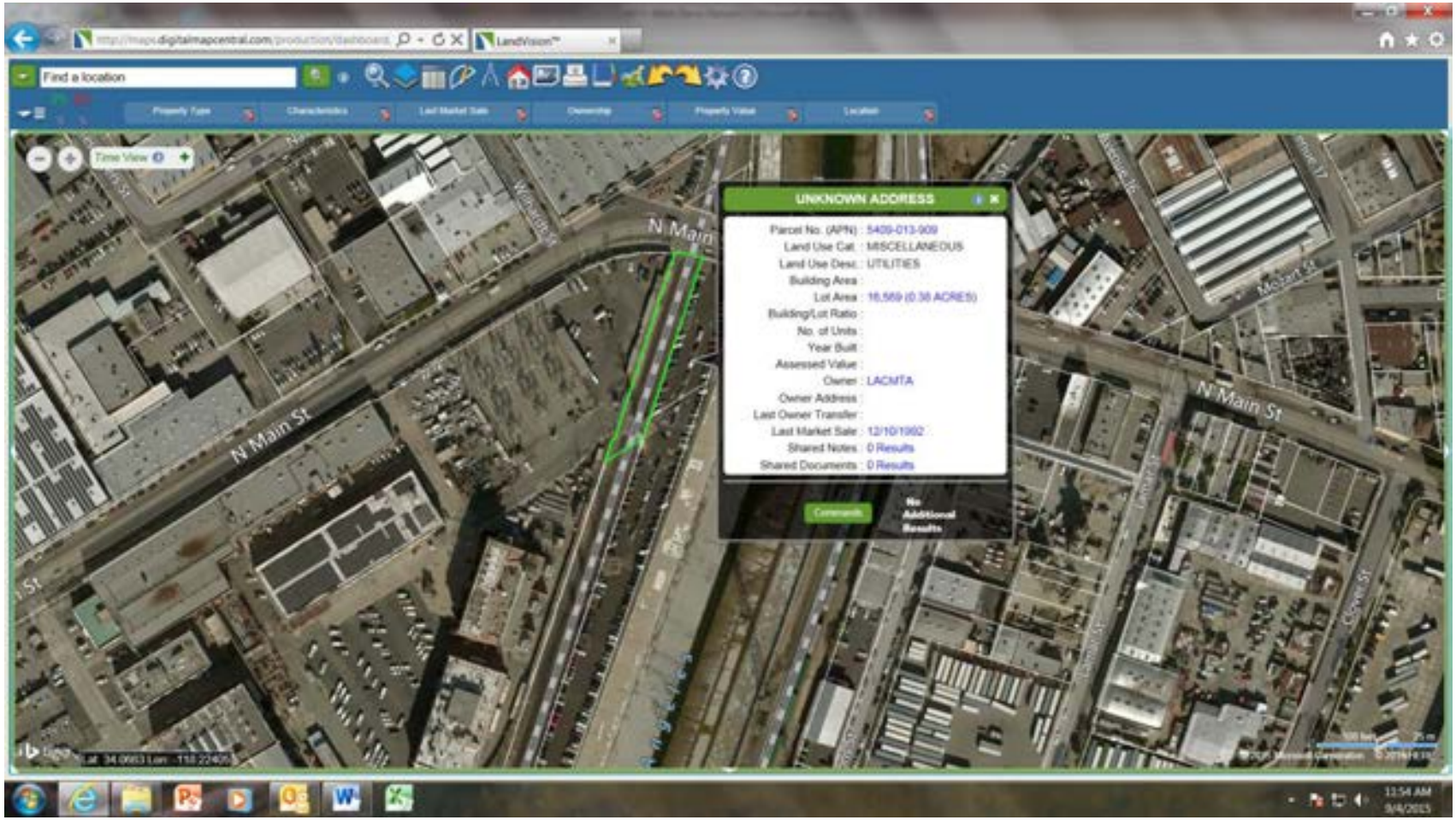
Find a location
UNKNOWN ADDRESS
Parcel No. (APN) :
Land Use Cat : MISCELLANEOUS
Land Use Desc : UTILITIES
Building Area :
Lot Area : 47,596 (1.09 ACRES)
Building/Lot Ratio :
No. of Units :
Year Built :
Assessed Value :
Owner : LACMTA
Owner Address :
Last Owner Transfer :
Last Market Sale : 12/15/1992
Shared Notes : 0 Results
Shared Documents : 0 Results
Commands
No Additional Results
US-101 Hov Ln
US-101 Hov Ln
US-101 Hov Ln
US-101 Hov Ln
I-10 HOV Ln
San Bernardino Fwy
N Mission Rd
E Cesar E Chavez Ave
Aliso St
E Commercial St
101

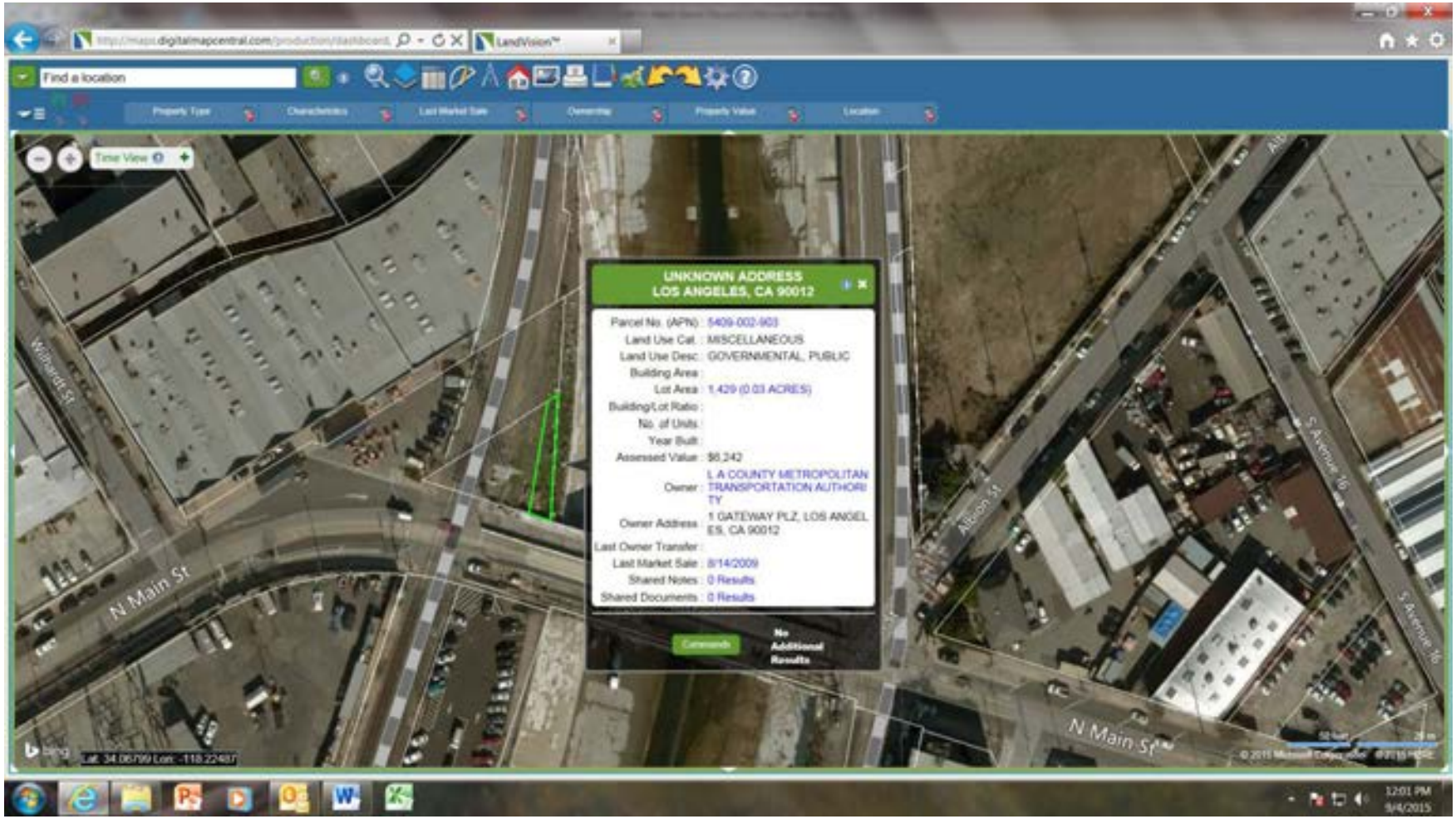

LandVision™
Find a location
Property Type
Characteristics
Last Market Sale
Ownership
Property Value
Location
Time View
UNKNOWN ADDRESS
Parcel No. (APN): 5409-020-910
Land Use Cat.: MISCELLANEOUS
Land Use Desc.: GOVERNMENTAL, PUBLIC
Building Area:
Lot Area: 252,326 (5.79 ACRES)
Building/Lot Ratio:
No. of Units:
Year Built:
Assessed Value:
Owner: LACMTA
Owner Address:
Last Owner Transfer:
Last Market Sale: 12/15/1992
Shared Notes: 0 Results
Shared Documents: 0 Results
Comparals
No Additional Results
US-101 Hov Ln
US-101 Hov Ln
I-10 HOV Ln
San Bernardino Fwy
I-10 HOV Ln
San Bernardino Fwy
11:47 AM

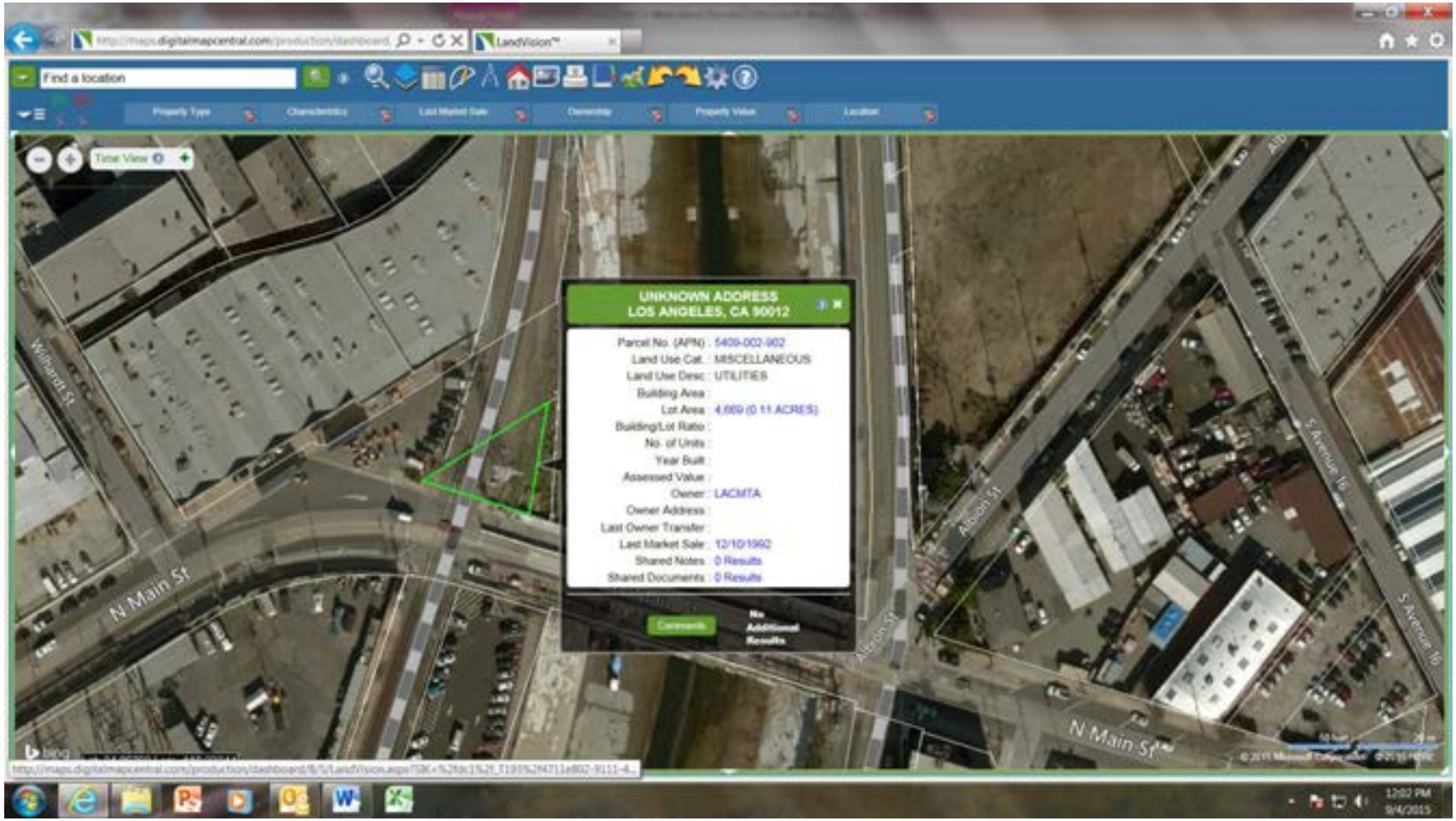

Find a location
Time View
UNKNOWN ADDRESS
Parcel No. (APN) : 5409-013-911
Land Use Cat. : MISCELLANEOUS
Land Use Desc : UTILITIES
Building Area :
Lot Area : 41,059 (0.94 ACRES)
Building/Lot Ratio :
No. of Units :
Year Built :
Assessed Value :
Owner : LACMTA
Owner Address :
Last Owner Transfer :
Last Market Sale : 12/10/1992
Shared Notes : 0 Results
Shared Documents : 0 Results
No Additional Results
N Main St

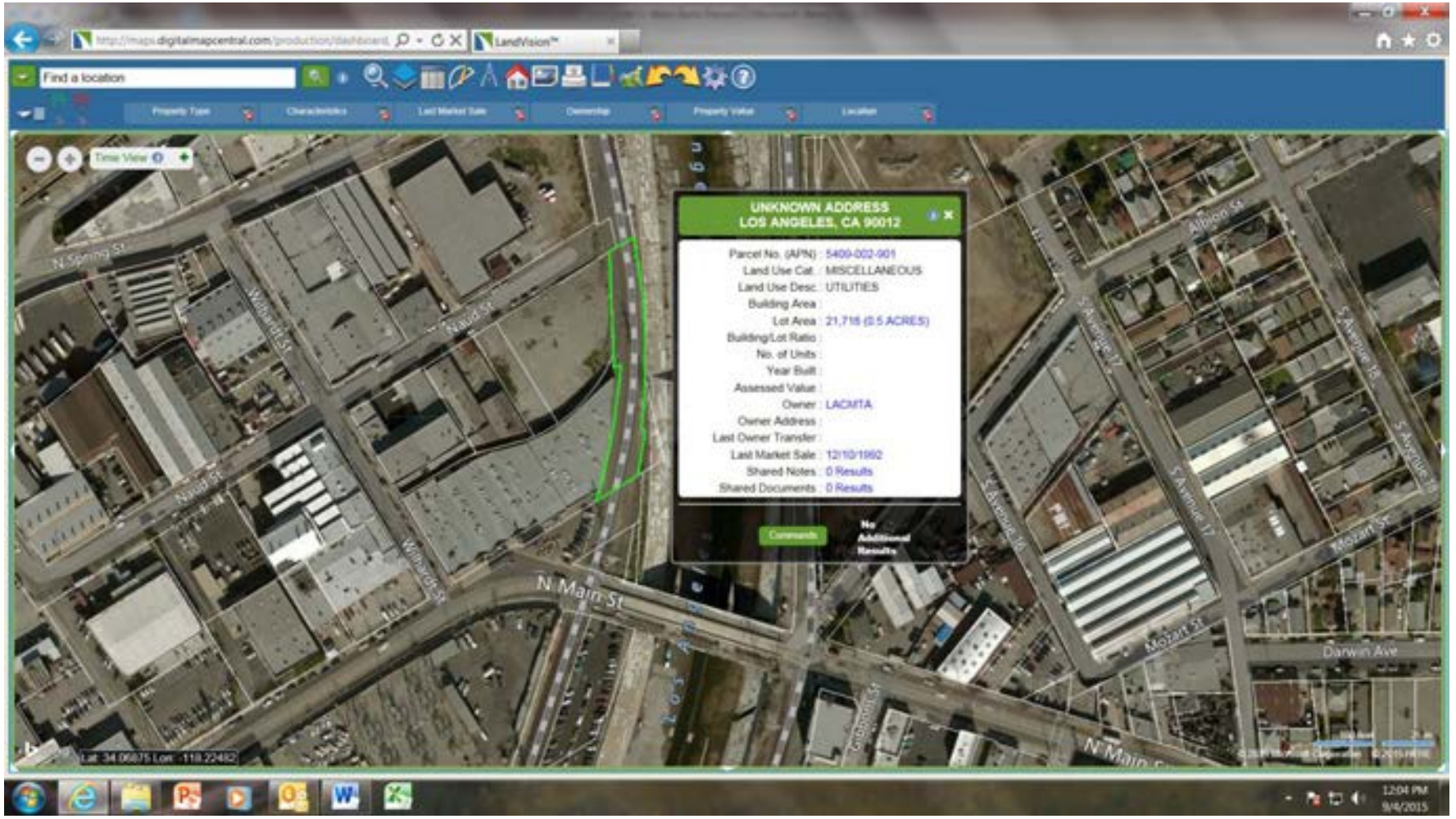

LandVision™
Find a location
Property Type
Characteristics
Last Market Sale
Ownership
Property Value
Location
Time View
N Main St
UNKNOWN ADDRESS
Parcel No. (APN) : 5409-013-911
Land Use Cat. : MISCELLANEOUS
Land Use Desc. : UTILITIES
Building Area :
Lot Area : 41,059 (0.94 ACRES)
Building/Lot Ratio :
No. of Units :
Year Built :
Assessed Value :
Owner : LACMTA
Owner Address :
Last Owner Transfer :
Last Market Sale : 12/10/1992
Shared Notes : 0 Results
Shared Documents : 0 Results
Comments
No Additional Results
11:50 AM
9/4/2015

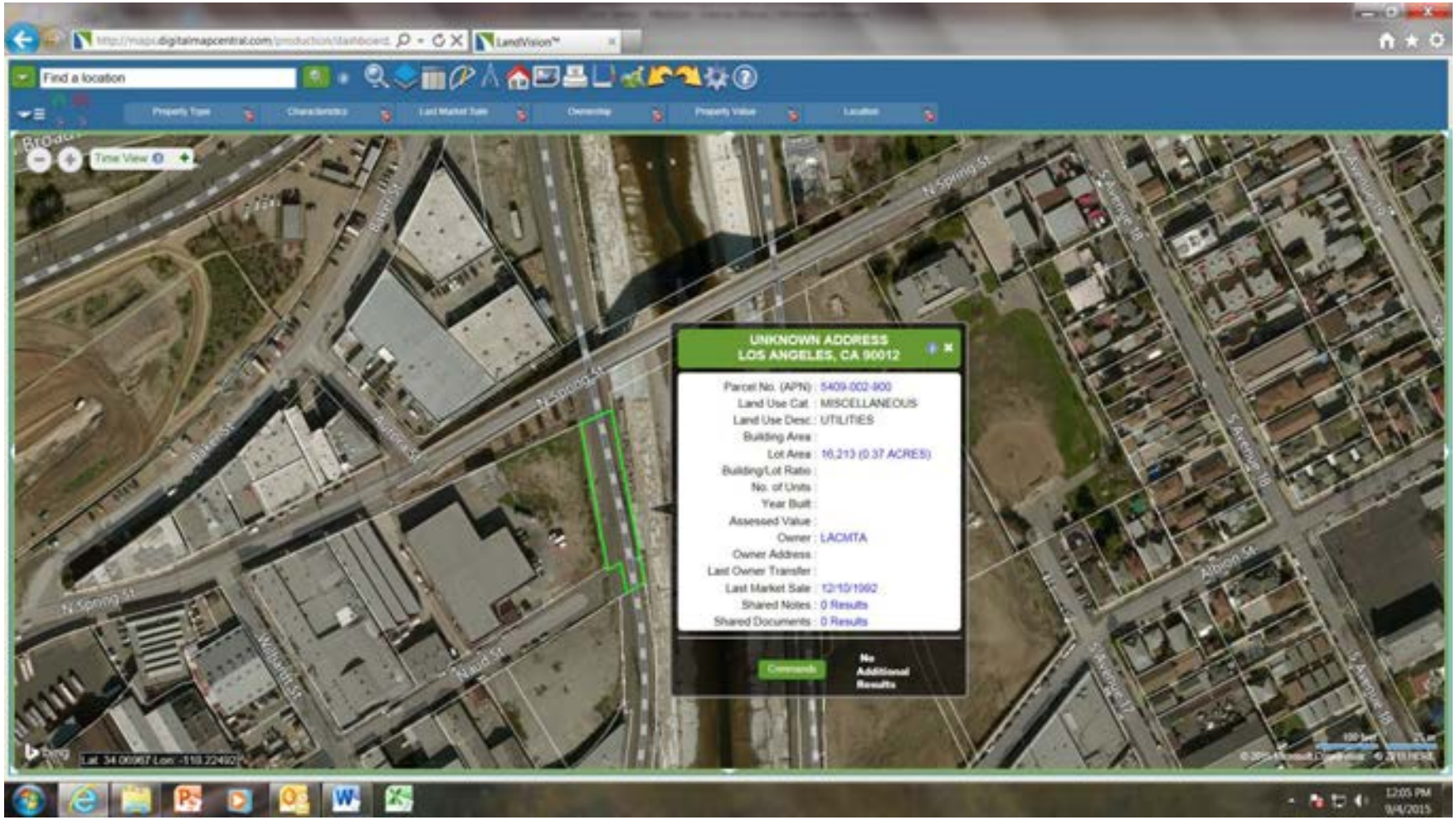

Find a location
Property Type
Characteristics
Last Market Sale
Ownership
Property Value
Location
Tilt View
N Main St
UNKNOWN ADDRESS
Parcel No. (APN): 5409-013-910
Land Use Cat.: MISCELLANEOUS
Land Use Desc: UTILITIES
Building Area:
Lot Area: 42,158 (0.97 ACRES)
Building/Lot Ratio:
No. of Units:
Year Built:
Assessed Value:
Owner: LACMTA
Owner Address:
Last Owner Transfer:
Last Market Sale: 12/10/1992
Shared Notes: 0 Results
Shared Documents: 0 Results
Commands
No Additional Results
11:52 AM
9/4/2015

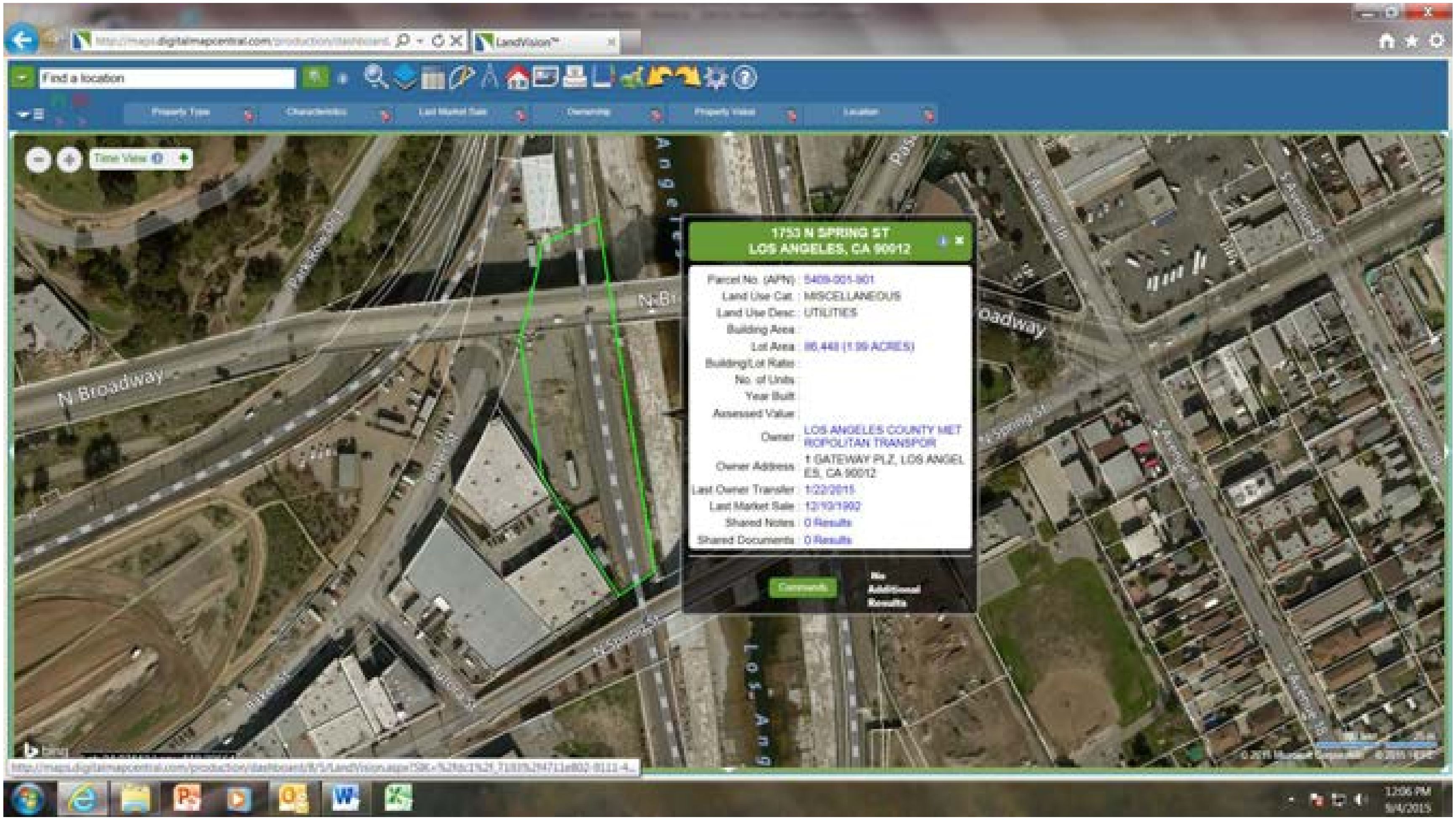

LandVision™
Find a location
Property Type
Characteristics
Last Market Sale
Ownership
Property Value
Location
Time View
UNKNOWN ADDRESS
Parcel No. (APN) : 5409-013-909
Land Use Cat. : MISCELLANEOUS
Land Use Desc. : UTILITIES
Building Area :
Lot Area : 16,569 (0.38 ACRES)
Building/Lot Ratio :
No. of Units :
Year Built :
Assessed Value :
Owner : LACMTA
Owner Address :
Last Owner Transfer :
Last Market Sale : 12/10/1992
Shared Notes : 0 Results
Shared Documents : 0 Results
Comments
No Additional Results
N Main St
Mozart St
Crowell St
11:54 AM
9/4/2015

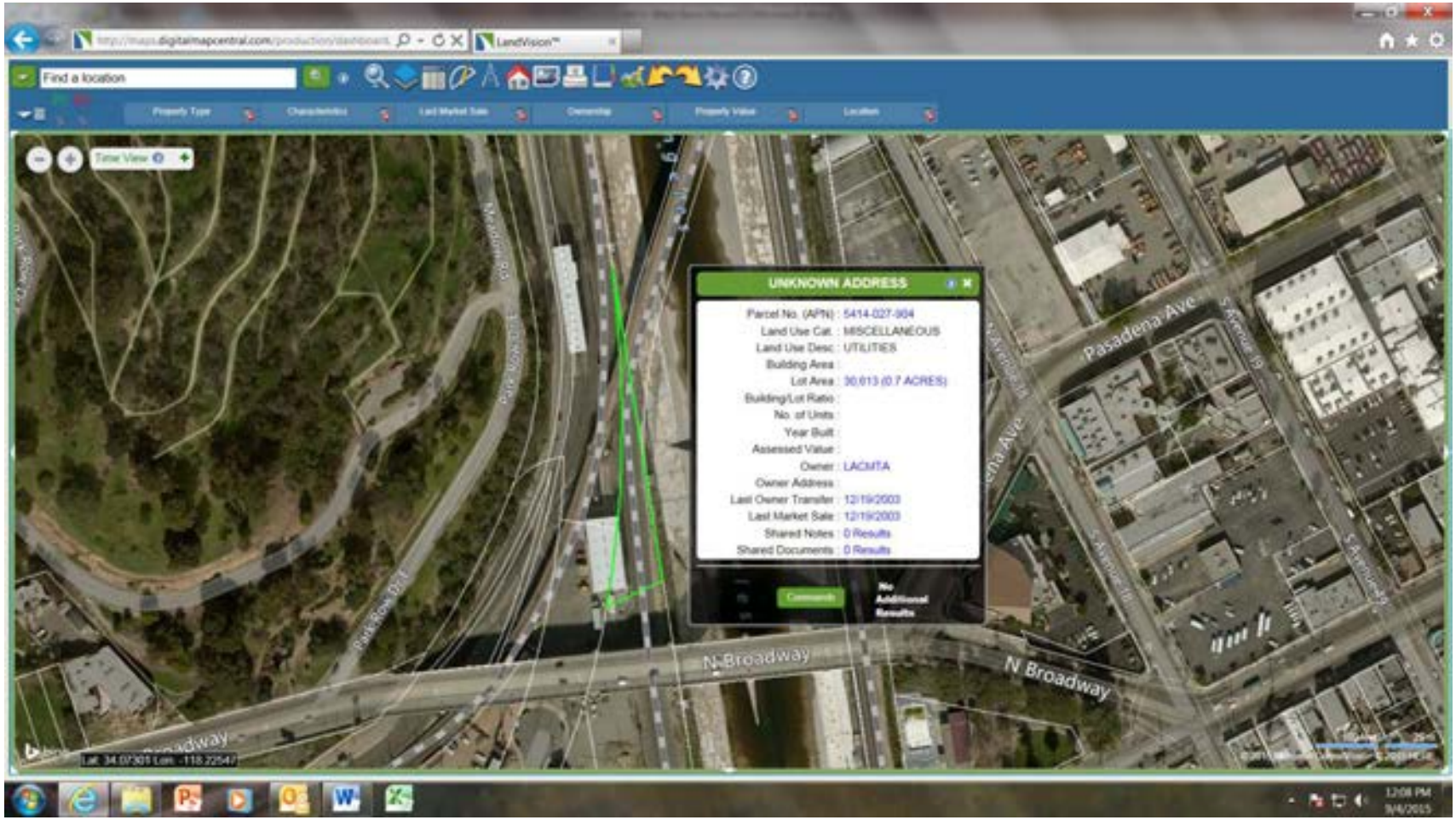

LandVision™
Find a location
Property Type
Characteristics
Last Market Sale
Ownership
Property Value
Location
Time View
UNKNOWN ADDRESS
LOS ANGELES, CA 90012
Parcel No. (APN): 5409-002-903
Land Use Cat.: MISCELLANEOUS
Land Use Desc: GOVERNMENTAL, PUBLIC
Building Area:
Lot Area: 1,429 (0.03 ACRES)
Building/Lot Ratio:
No. of Units:
Year Built:
Assessed Value: $6,242
Owner: L A COUNTY METROPOLITAN TRANSPORTATION AUTHORITY
Owner Address: 1 GATEWAY PLZ, LOS ANGELES, CA 90012
Last Owner Transfer:
Last Market Sale: 8/14/2009
Shared Notes: 0 Results
Shared Documents: 0 Results
Comments
No Additional Results
N Main St
Wilhardt St
Albion St
S Avenue 16
Lat: 34.06799 Lon: -118.22487
12:01 PM
9/4/2015

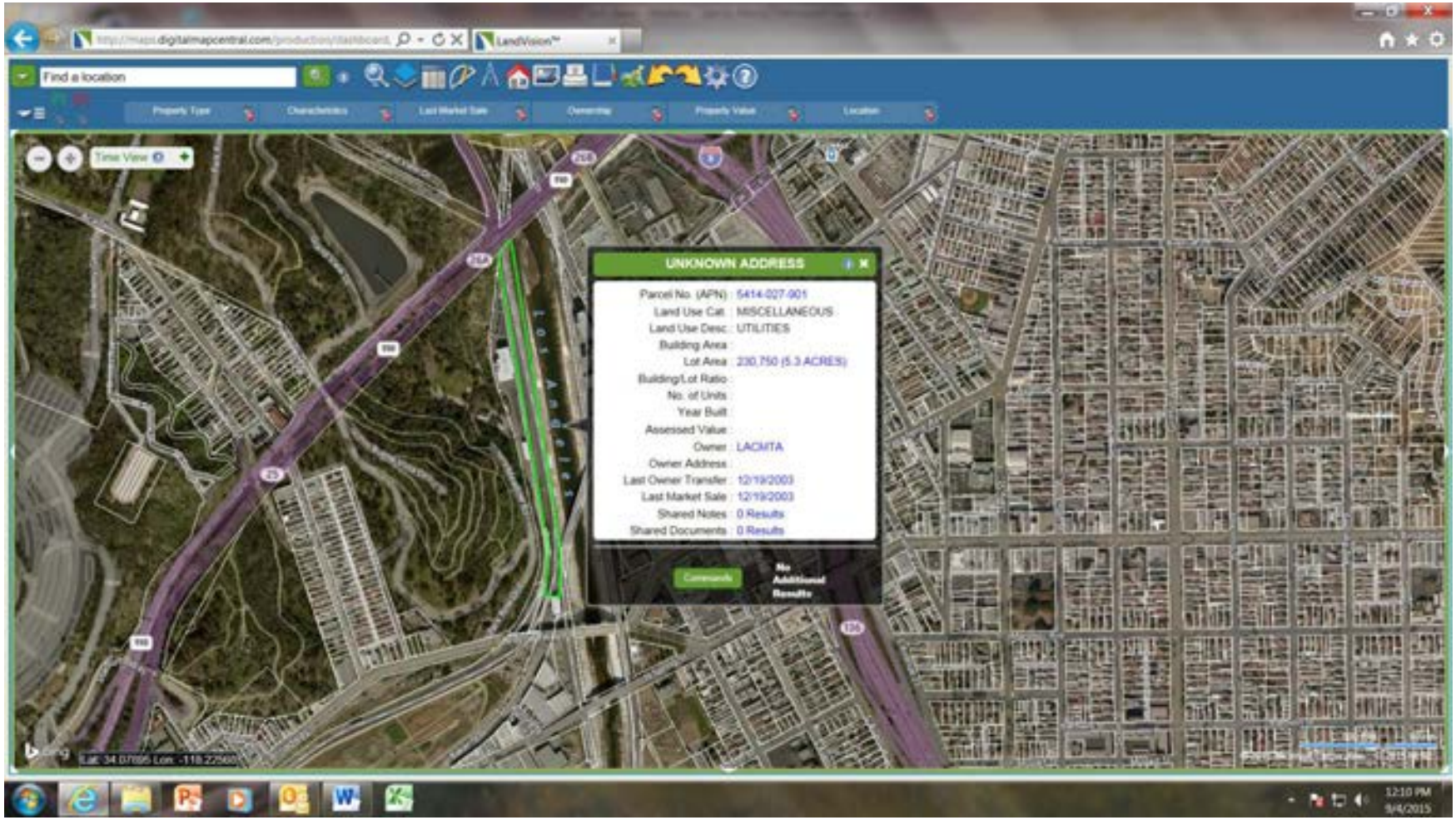

LandVision™
Find a location
Property Type
Characteristics
Last Market Sale
Ownership
Property Value
Location
Time View
UNKNOWN ADDRESS
LOS ANGELES, CA 90012
Parcel No. (APN) : 5409-002-902
Land Use Cat. : MISCELLANEOUS
Land Use Desc : UTILITIES
Building Area :
Lot Area : 4,669 (0.11 ACRES)
Building/Lot Ratio :
No. of Units :
Year Built :
Assessed Value :
Owner : LACMTA
Owner Address :
Last Owner Transfer :
Last Market Sale : 12/10/1992
Shared Notes : 0 Results
Shared Documents : 0 Results
Comments
No Additional Results
Willhardt St
N Main St
Alpine St
Alhambra St
S Avenue 19
N Main St
bing

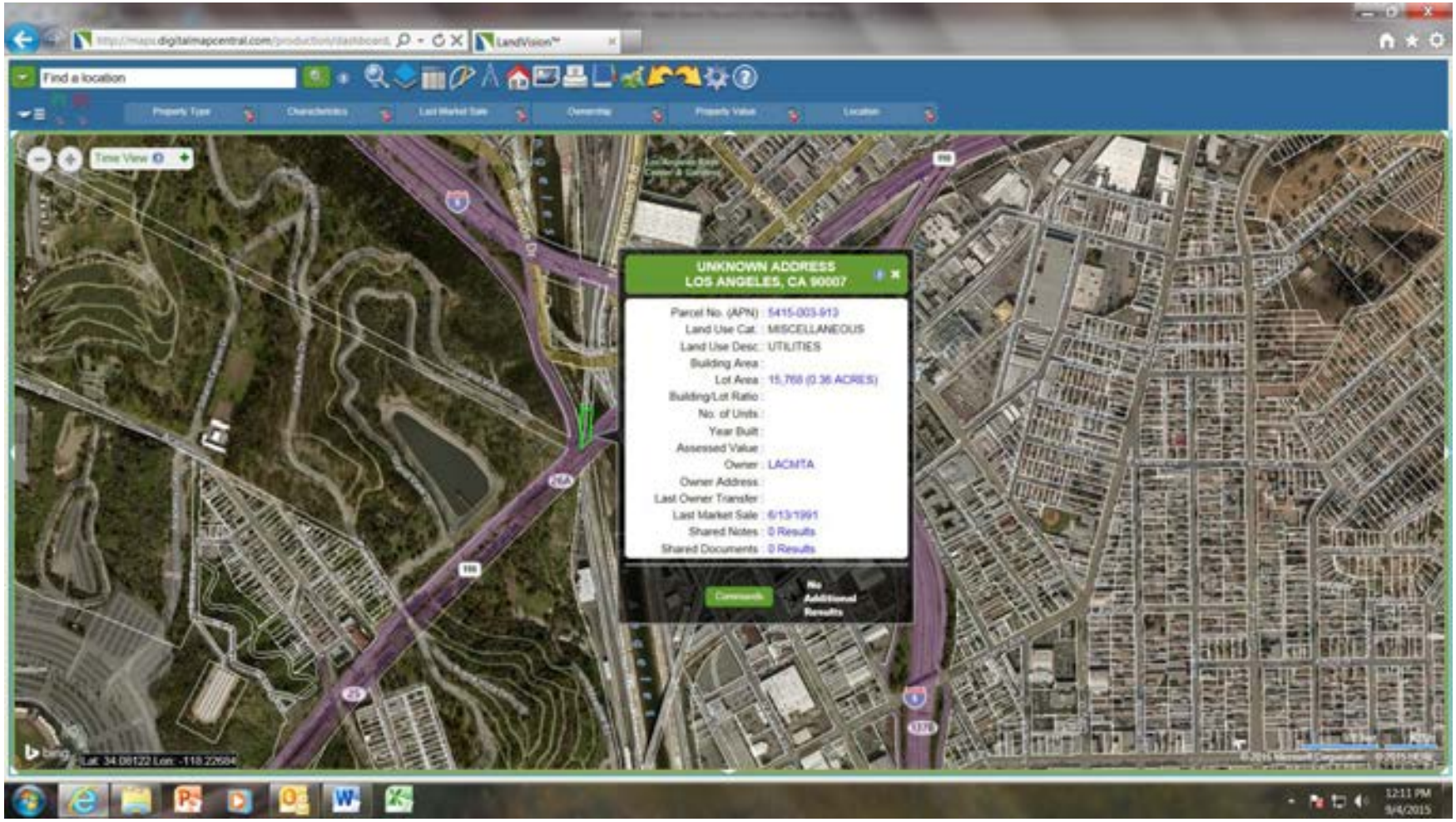

Find a location
UNKNOWN ADDRESS
LOS ANGELES, CA 90012
Parcel No. (APN) : 5409-002-901
Land Use Cat. : MISCELLANEOUS
Land Use Desc. : UTILITIES
Building Area :
Lot Area : 21,716 (0.5 ACRES)
Building/Lot Ratio :
No. of Units :
Year Built :
Assessed Value :
Owner : LACMTA
Owner Address :
Last Owner Transfer :
Last Market Sale : 12/10/1992
Shared Notes : 0 Results
Shared Documents : 0 Results
Comments
No Additional Results
N Main St
Mozart St
Darwin Ave
Naud St
Albion St
Lat: 34.06875 Lon: -118.22482

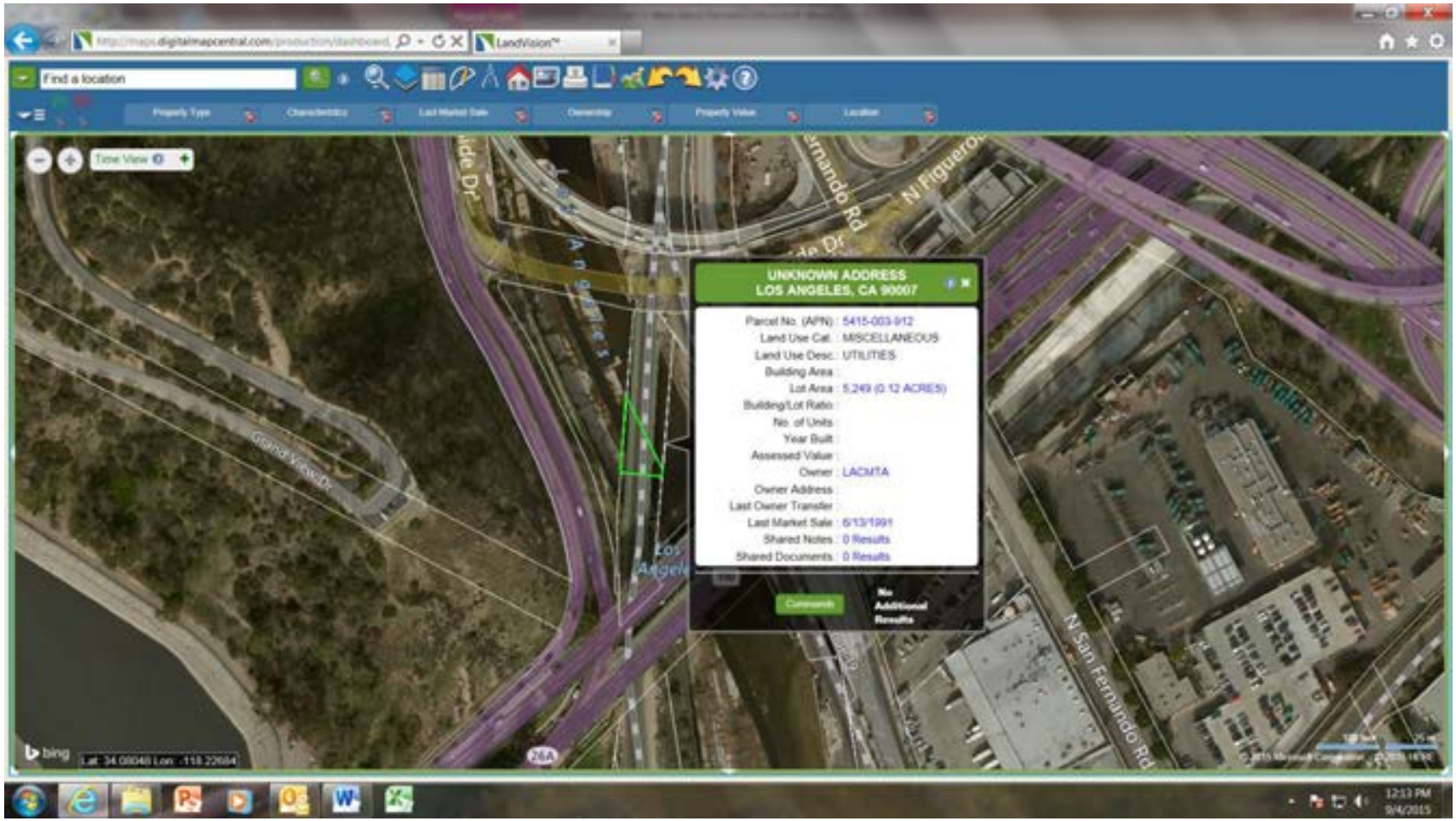

LandVision™
Find a location
Property Type
Characteristics
Last Market Sale
Ownership
Property Value
Location
Time View
N Spring St
Bilker St
Alameda St
Wilmington St
Naud St
Albion St
S Avenue 18
S Avenue 17
UNKNOWN ADDRESS
LOS ANGELES, CA 90012
Parcel No. (APN): 5409-002-900
Land Use Cat: MISCELLANEOUS
Land Use Desc: UTILITIES
Building Area:
Lot Area: 16,213 (0.37 ACRES)
Building/Lot Ratio:
No. of Units:
Year Built:
Assessed Value:
Owner: LACMTA
Owner Address:
Last Owner Transfer:
Last Market Sale: 12/10/1992
Shared Notes: 0 Results
Shared Documents: 0 Results
Commands
No Additional Results

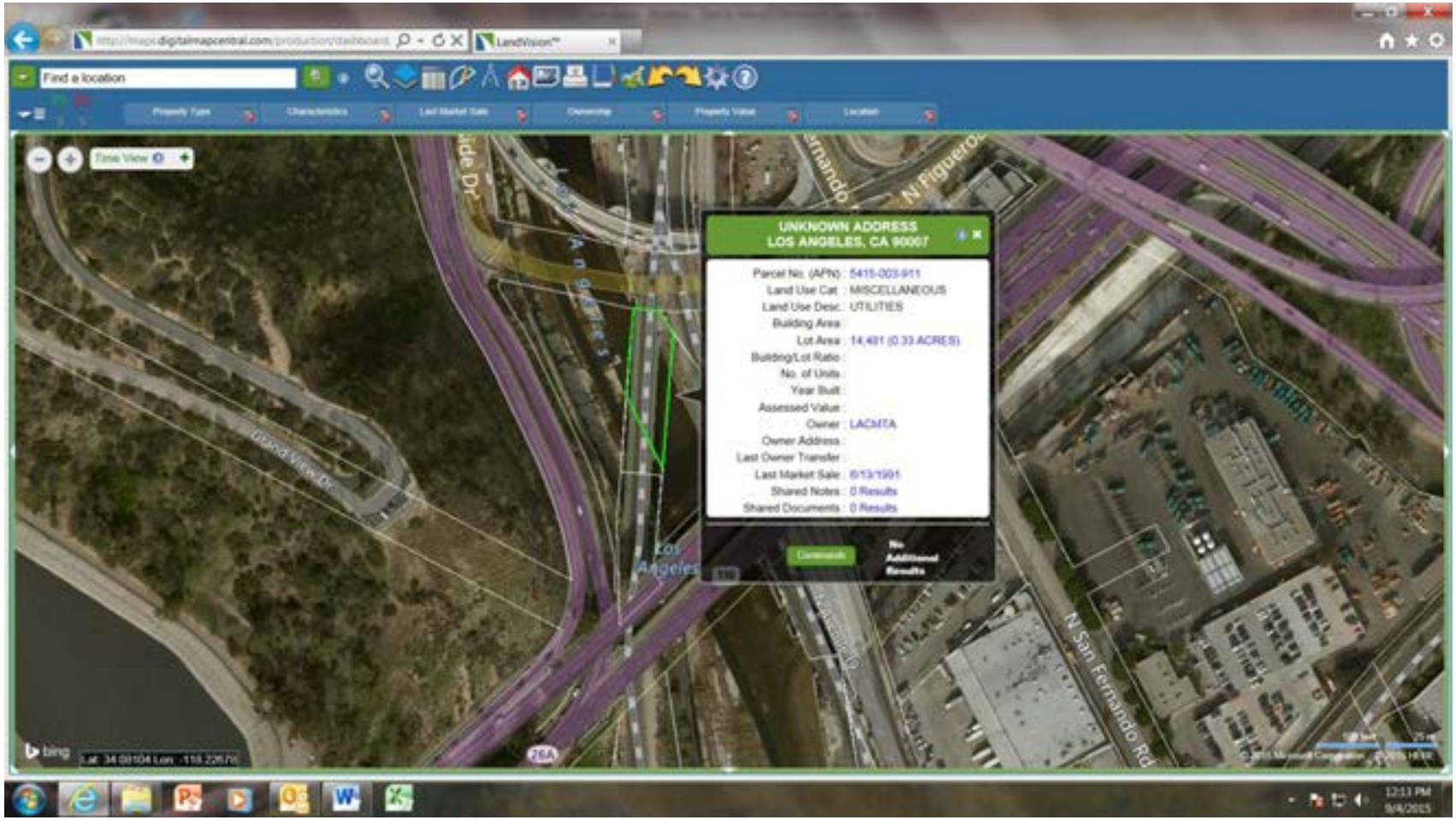

Find a location
1753 N SPRING ST
LOS ANGELES, CA 90012
Parcel No. (APN) : 5409-001-901
Land Use Cat : MISCELLANEOUS
Land Use Desc : UTILITIES
Building Area :
Lot Area : 86,448 (1.99 ACRES)
Building/Lot Ratio :
No. of Units :
Year Built :
Assessed Value :
Owner : LOS ANGELES COUNTY MET ROPOLITAN TRANSPOR
Owner Address : 1 GATEWAY PLZ, LOS ANGEL ES, CA 90012
Last Owner Transfer : 1/22/2015
Last Market Sale : 12/10/1992
Shared Notes : 0 Results
Shared Documents : 0 Results
No Additional Results
N Broadway
N Br
oadway
Los Ang

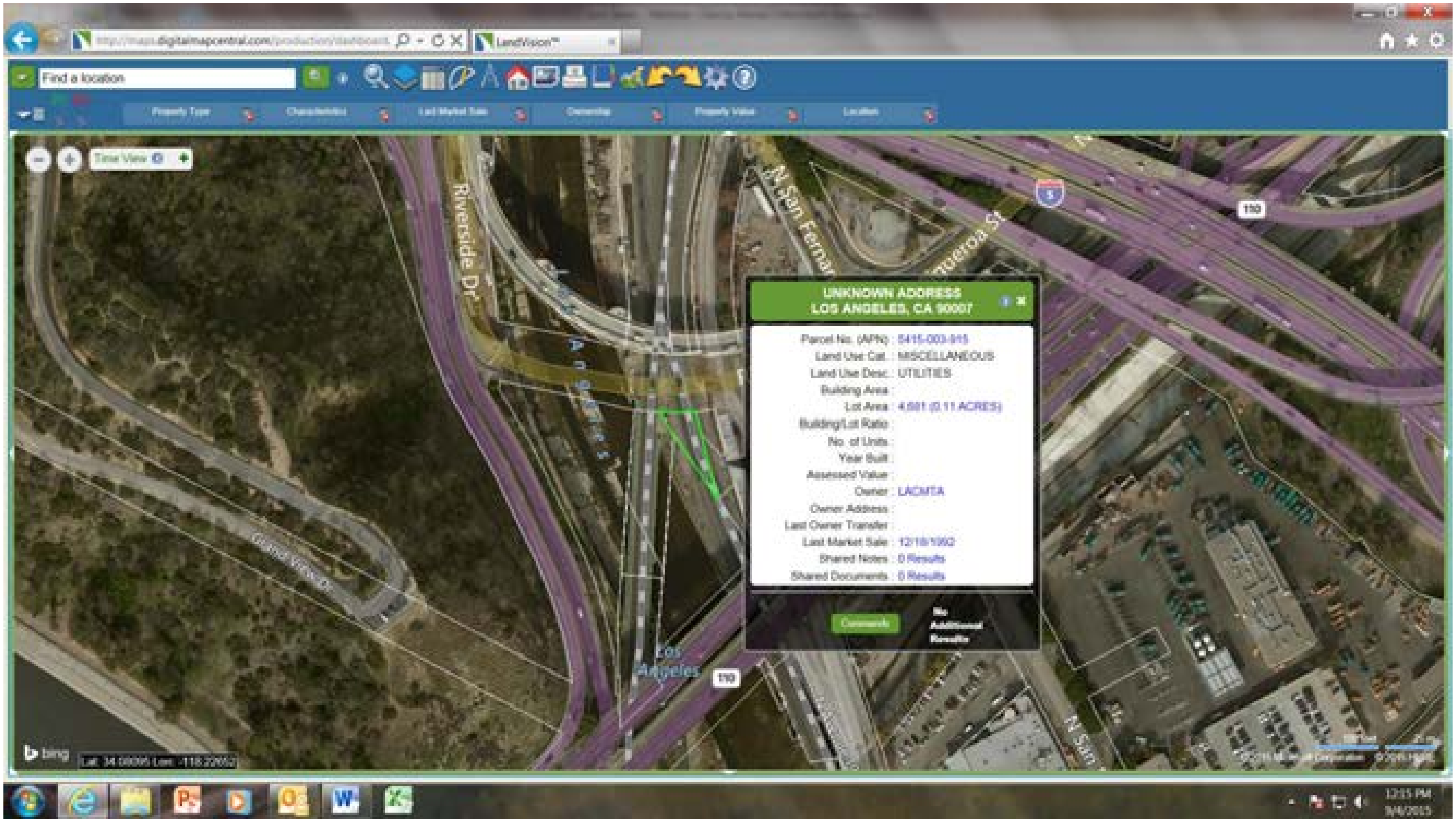

LandVision™
Find a location
Property Type
Characteristics
Last Market Sale
Ownership
Property Value
Location
Time View
UNKNOWN ADDRESS
Parcel No. (APN) : 5414-027-904
Land Use Cat. : MISCELLANEOUS
Land Use Desc : UTILITIES
Building Area :
Lot Area : 30,013 (0.7 ACRES)
Building/Lot Ratio :
No. of Units :
Year Built :
Assessed Value :
Owner : LACMTA
Owner Address :
Last Owner Transfer : 12/19/2003
Last Market Sale : 12/19/2003
Shared Notes : 0 Results
Shared Documents : 0 Results
Commands
No Additional Results
Pasadena Ave
N Broadway
N Broadway
Lat: 34.07305 Lon: -118.2254


LandVision™
Find a location
Property Type
Characteristics
Last Market Sale
Ownership
Property Value
Location
Time View
UNKNOWN ADDRESS
Parcel No. (APN) : 5414-027-901
Land Use Cat. : MISCELLANEOUS
Land Use Desc. : UTILITIES
Building Area :
Lot Area : 230,750 (5.3 ACRES)
Building/Lot Ratio :
No. of Units :
Year Built :
Assessed Value :
Owner : LACMTA
Owner Address :
Last Owner Transfer : 12/19/2003
Last Market Sale : 12/19/2003
Shared Notes : 0 Results
Shared Documents : 0 Results
Comparable
No Additional Results
Los Angeles
Lat: 34.07886 Lon: -118.22560
12:10 PM
9/4/2015

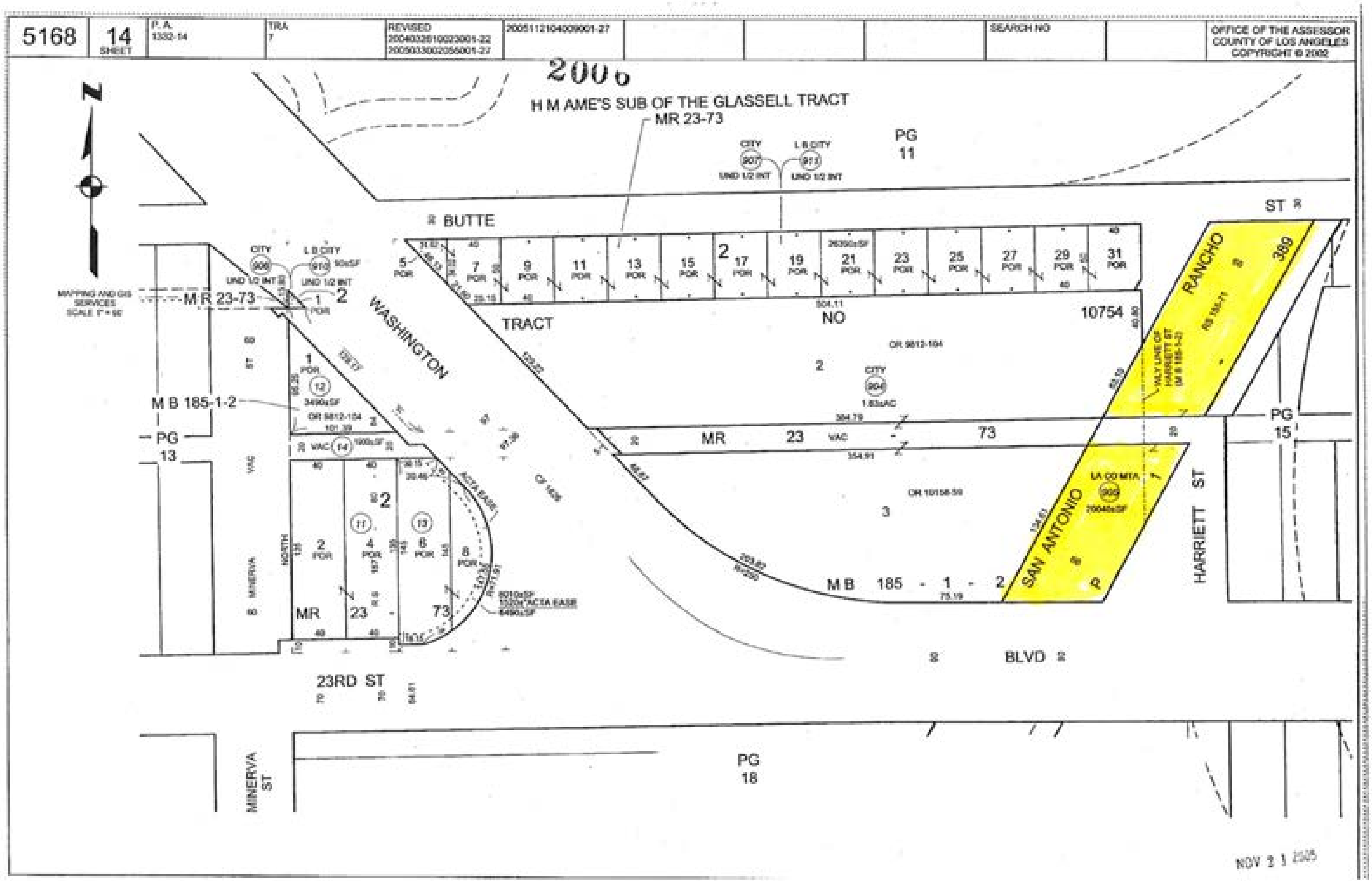

LandVision™
Find a location
Property Type
Characteristics
Last Market Sale
Ownership
Property Value
Location
Time View
UNKNOWN ADDRESS
LOS ANGELES, CA 90007
Parcel No. (APN): 5415-003-913
Land Use Cat.: MISCELLANEOUS
Land Use Desc.: UTILITIES
Building Area:
Lot Area: 15,768 (0.36 ACRES)
Building/Lot Ratio:
No. of Units:
Year Built:
Assessed Value:
Owner: LACMTA
Owner Address:
Last Owner Transfer:
Last Market Sale: 6/13/1991
Shared Notes: 0 Results
Shared Documents: 0 Results
Commands
No Additional Results
Lat: 34.08122 Lon: -118.22684
12:11 PM
9/4/2015


Find a location
Property Type
Characteristics
Last Market Sale
Ownership
Property Value
Location
Time View
UNKNOWN ADDRESS
LOS ANGELES, CA 90007
Parcel No. (APN): 5415-003-912
Land Use Cat.: MISCELLANEOUS
Land Use Desc.: UTILITIES
Building Area:
Lot Area: 5,249 (0.12 ACRES)
Building/Lot Ratio:
No. of Units:
Year Built:
Assessed Value:
Owner: LACMTA
Owner Address:
Last Owner Transfer:
Last Market Sale: 6/13/1991
Shared Notes: 0 Results
Shared Documents: 0 Results
Comments
No Additional Results
Grand View Dr
N San Fernando Rd
bing
12:13 PM
9/4/2015


Find a location
UNKNOWN ADDRESS
LOS ANGELES, CA 90007
Parcel No. (APN) : 5415-003-911
Land Use Cat : MISCELLANEOUS
Land Use Desc. : UTILITIES
Building Area :
Lot Area : 14,491 (0.33 ACRES)
Building/Lot Ratio :
No. of Units :
Year Built :
Assessed Value :
Owner : LACMTA
Owner Address :
Last Owner Transfer :
Last Market Sale : 6/13/1991
Shared Notes : 0 Results
Shared Documents : 0 Results
Comments
No Additional Results
N San Fernando Rd
Los Angeles
bing



LandVision™
Find a location
Time View
Riverside Dr
N San Fernando
Figueroa St
110
Los Angeles
UNKNOWN ADDRESS
LOS ANGELES, CA 90007
Parcel No. (APN) :
Land Use Cat. : MISCELLANEOUS
Land Use Desc. : UTILITIES
Building Area :
Lot Area : (0.11 ACRES)
Building/Lot Ratio :
No. of Units :
Year Built :
Assessed Value :
Owner : LACMTA
Owner Address :
Last Owner Transfer :
Last Market Sale :
Shared Notes : 0 Results
Shared Documents : 0 Results
Comments
No Additional Results
bing

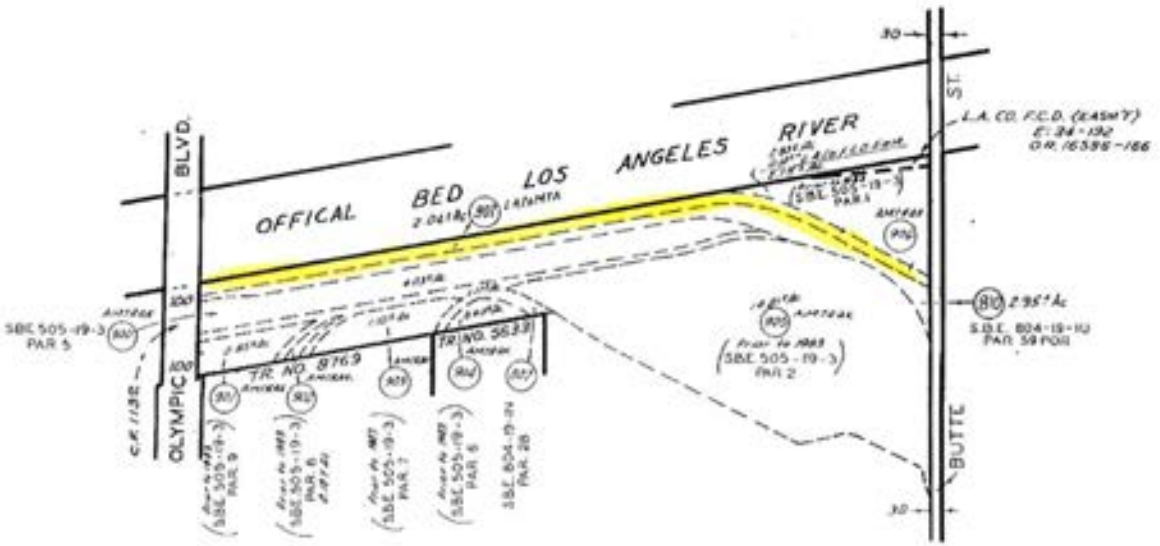

5168
14
SHEET
P. A.
1332-14
TRA
7
REVISED
20040320100230001-22
20050330020550001-27
20051121040090001-27
SEARCH NO
OFFICE OF THE ASSESSOR
COUNTY OF LOS ANGELES
COPYRIGHT © 2002
2006
H M AME'S SUB OF THE GLASSELL TRACT
MR 23-73
PG
11
BUTTE
ST
WASHINGTON
TRACT
NO
10754
RANCHO
389
SAN ANTONIO
HARRIETT ST
PG
15
MR 23 73
MB 185-1-2
BLVD
23RD ST
MINERVA ST
PG
13
PG
18
MAPPING AND GIS SERVICES
SCALE 1" = 60'
NOV 2 1 2005

5168 | 11

SCALE 1" = 400'

1994

Revised 3-4-60



CITY LANDS OF LOS ANGELES

M.R. 2-504-505

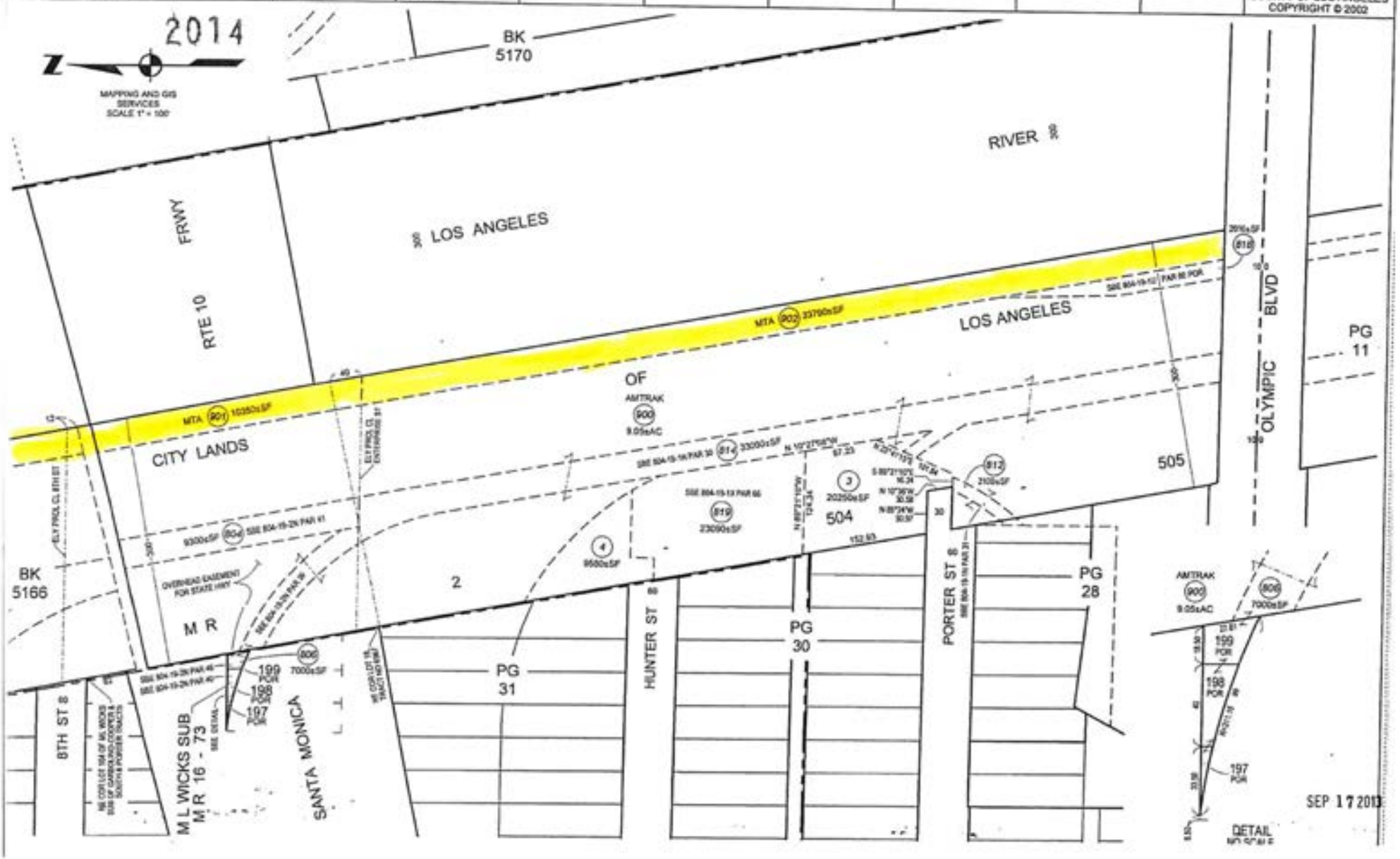
CODE
7

FOR PREV. ASSM'T. SEE: 1332-11
5168-10

94

ASSESSOR'S MAP
COUNTY OF LOS ANGELES, CALIF.

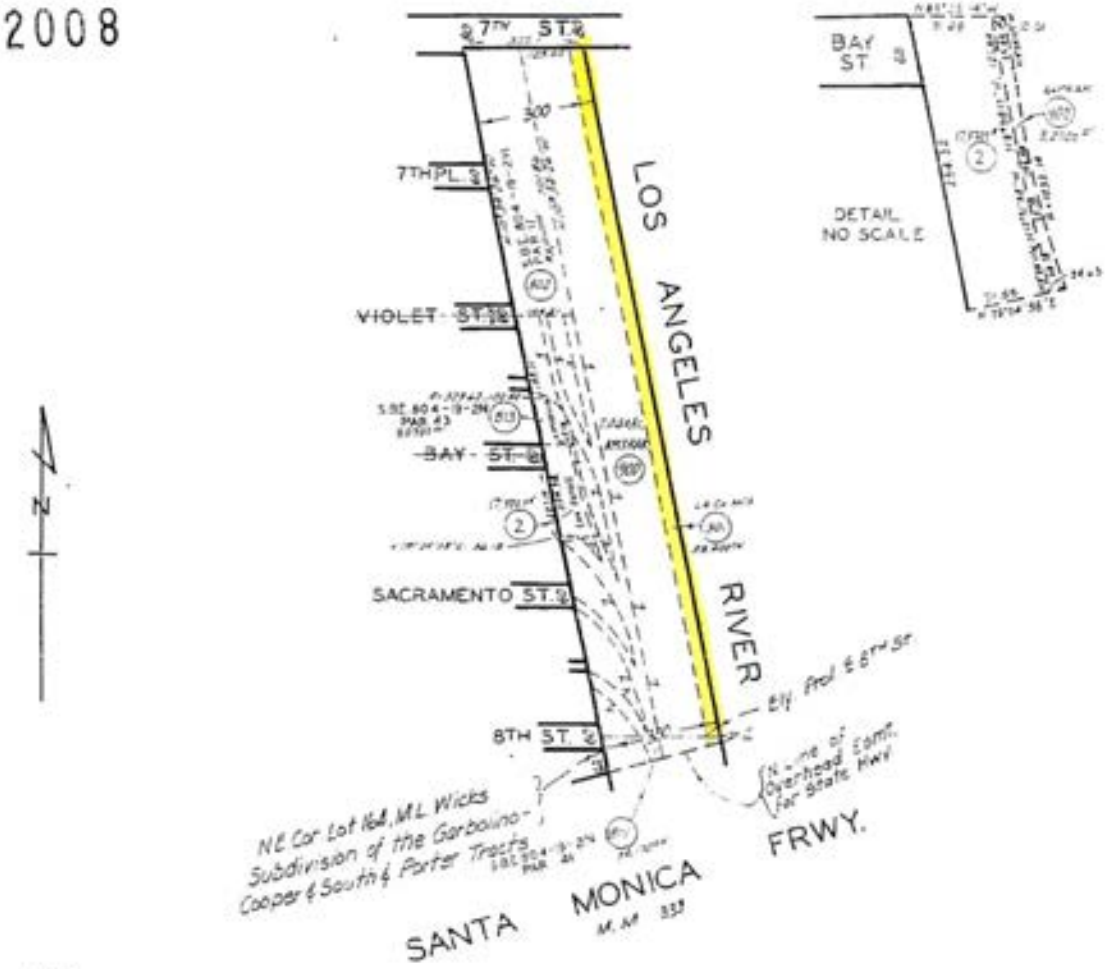
5168	27 SHEET	P. A. 1332-27	TRA 4	REVISED 20040701020001001-27 20100306020002001-27	20121114120120001-27 20130812130030001-27				SEARCH NO		OFFICE OF THE ASSESSOR COUNTY OF LOS ANGELES COPYRIGHT © 2002



5166 | 1

SCALE 1" = 300'

2008



CODE
4

CITY LANDS OF LOS ANGELES

M.R. 2 - 504 - 505

FOR PREV. ASSM'T. SEE: 1093-1

REVISED

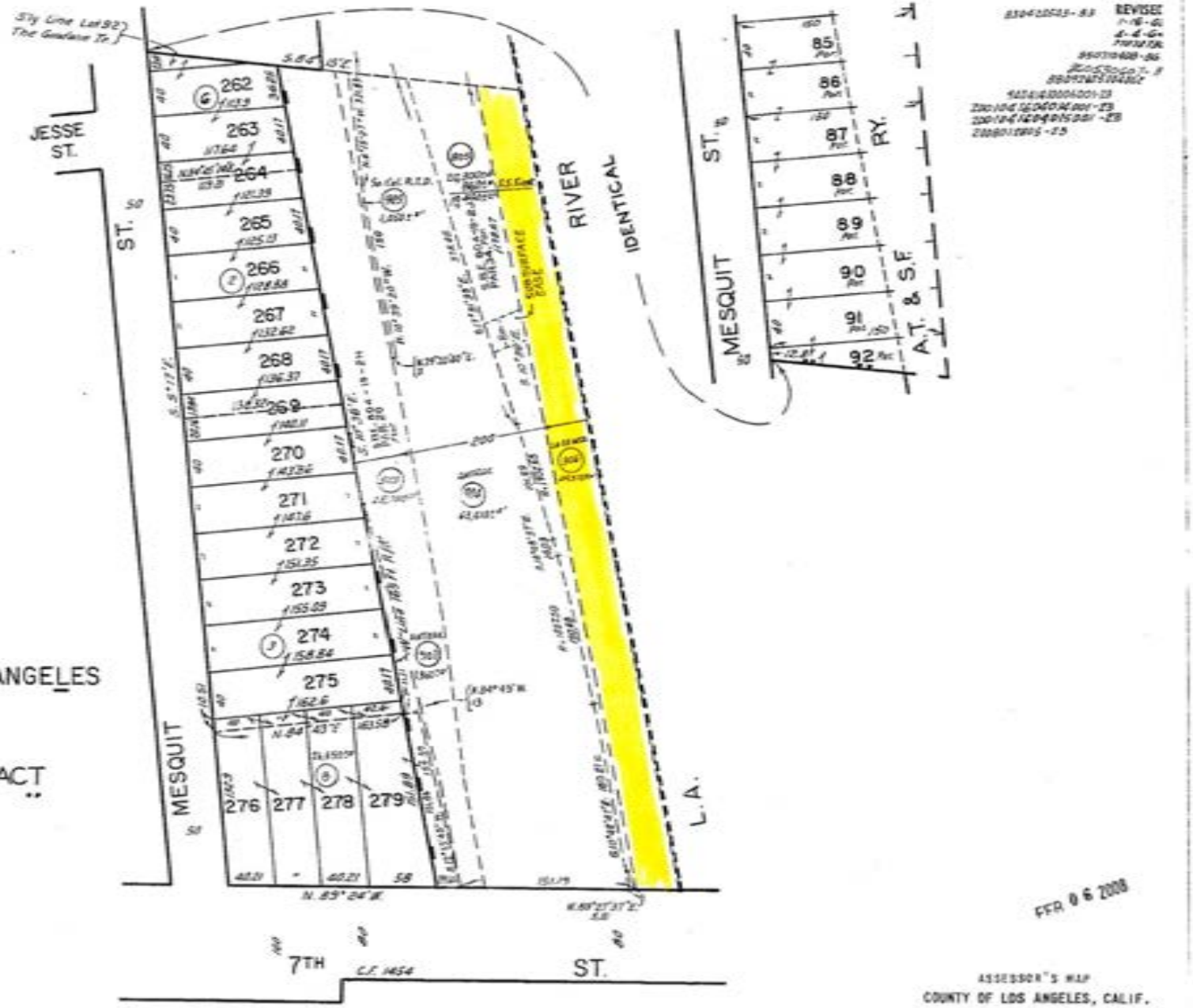
FEB 29 2008

ASSESSOR'S MAP
COUNTY OF LOS ANGELES, CALIF.

5164 | 17

SCALE 1" = 80'

2008



WINGERTER TRACT

M.R. 15-52

CITY LANDS OF LOS ANGELES

M.R. 2-504-505

THE GOODWIN TRACT

" " " " "

M.R. 11-42

CODE

4

FOR PREV. ASSM'T. SEE: 17-2 & 35
5164-16

FEB 06 2008

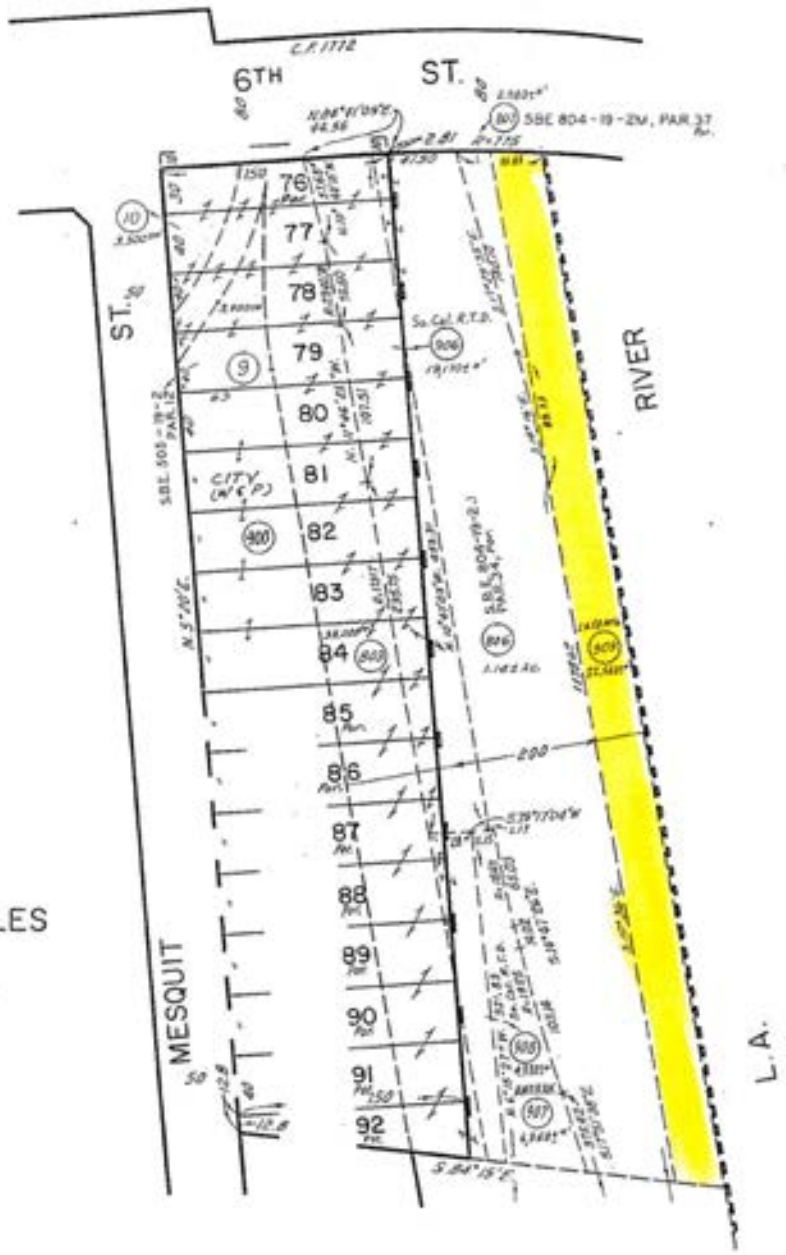
ASSESSOR'S MAP

COUNTY OF LOS ANGELES, CALIF.

5164 | 16

SCALE 1" = 80'

2011



THE GOODWIN TRACT

M.R. 11-42

CITY LANDS OF LOS ANGELES

M.R. 2-504-505

CODE
4

FOR PREV. ASSM'T. SEE: 17-2 & 31

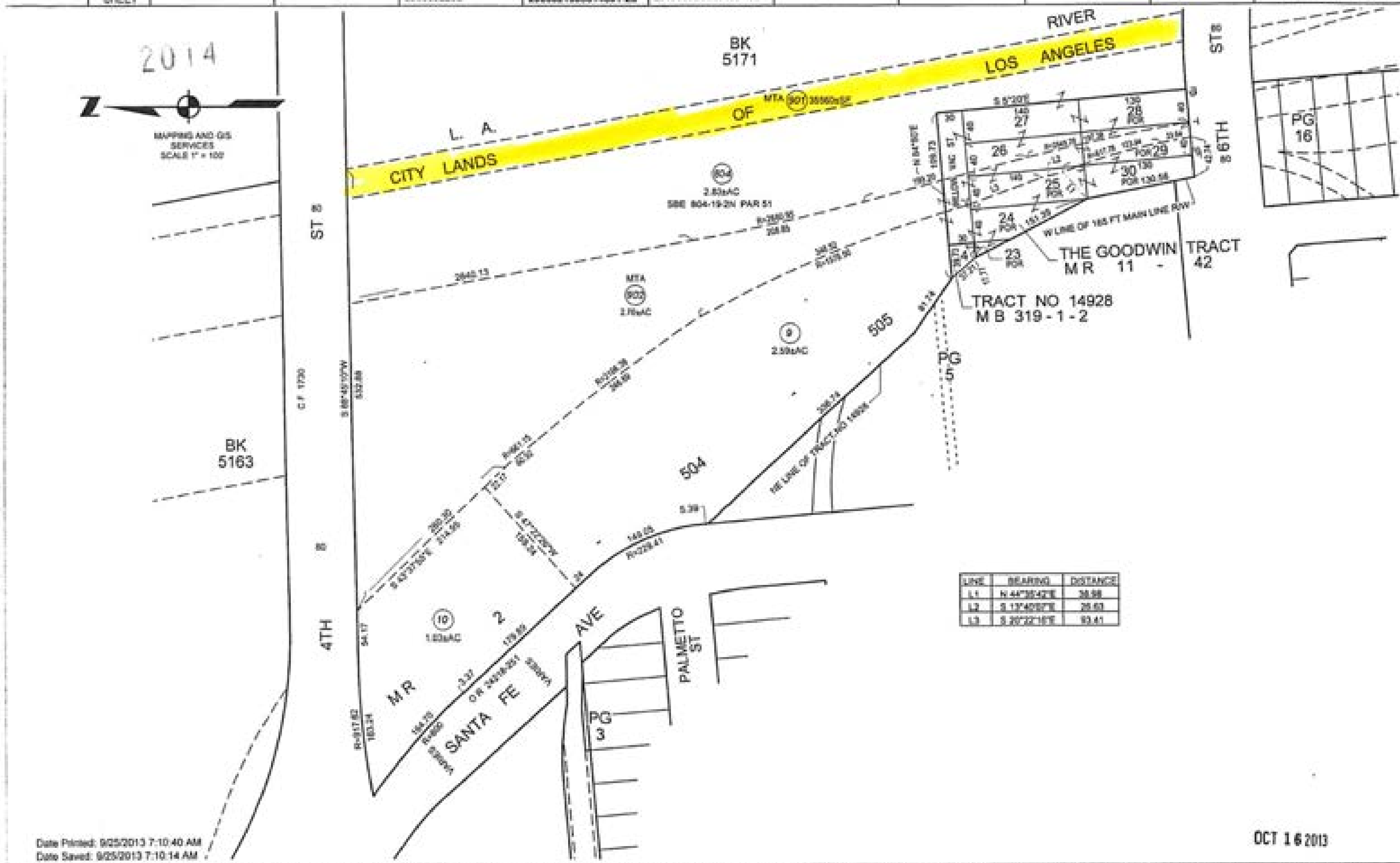
REVISED
1-16-62
6-29-62
8-8-64
7-10-07

JUL 09 2010

ASSESSOR'S MAP
COUNTY OF LOS ANGELES, CALIF.

5164	4 SHEET	P. A. 17-2, 5164-5	TRA 4	REVISED 2003061906 2005062202	20070326006002001-23 20070326006003001-23 20090219050014001-23	20090219050014003-23 20120925060005001-23 20130926020004001-23	SEARCH NO	OFFICE OF THE ASSESSOR COUNTY OF LOS ANGELES COPYRIGHT © 2002

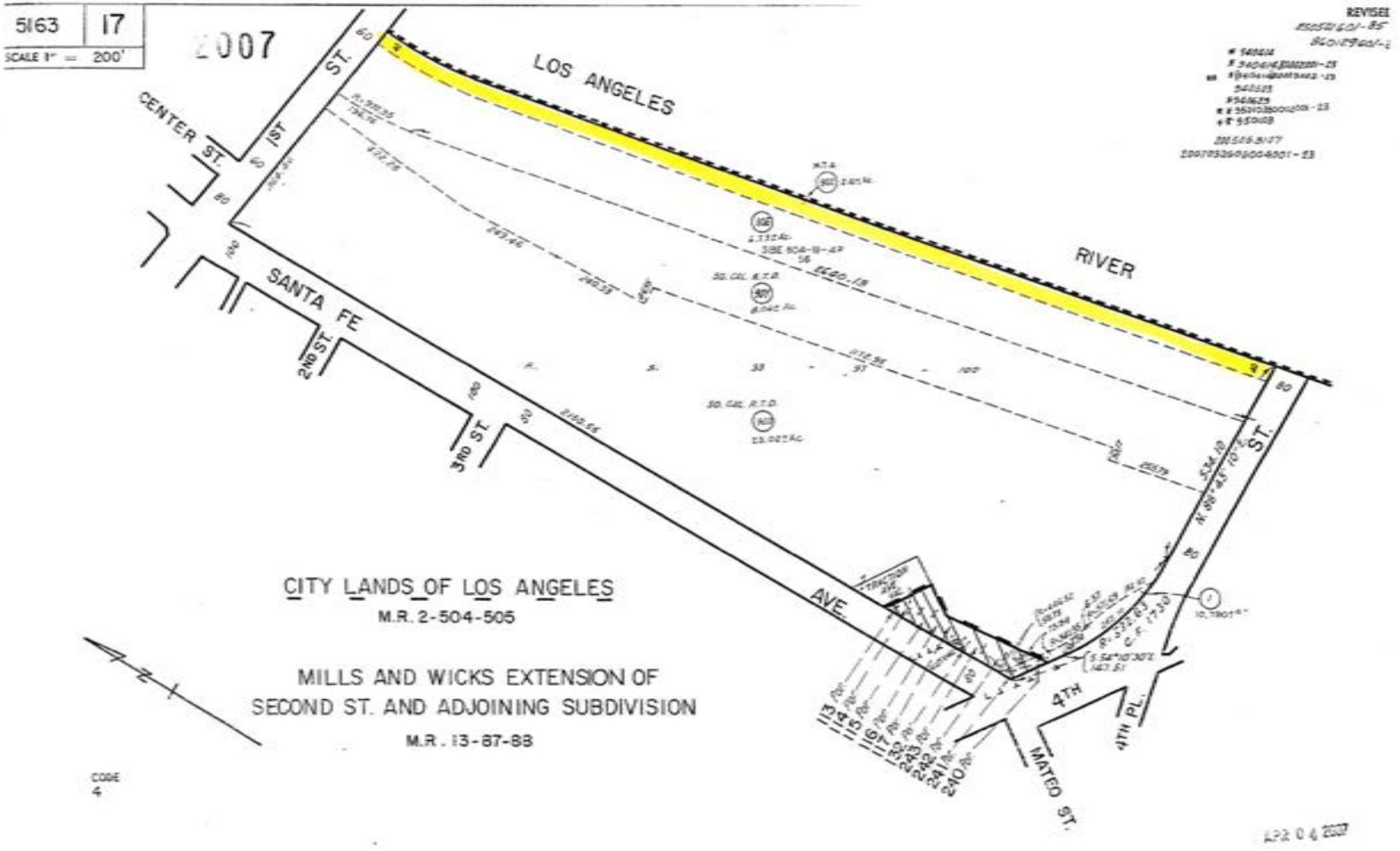
2014



LINE	BEARING	DISTANCE
L1	N 44°35'42"E	38.98
L2	S 13°40'07"E	25.63
L3	S 20°22'16"E	93.41

Date Printed: 9/25/2013 7:10:40 AM
Date Saved: 9/25/2013 7:10:14 AM

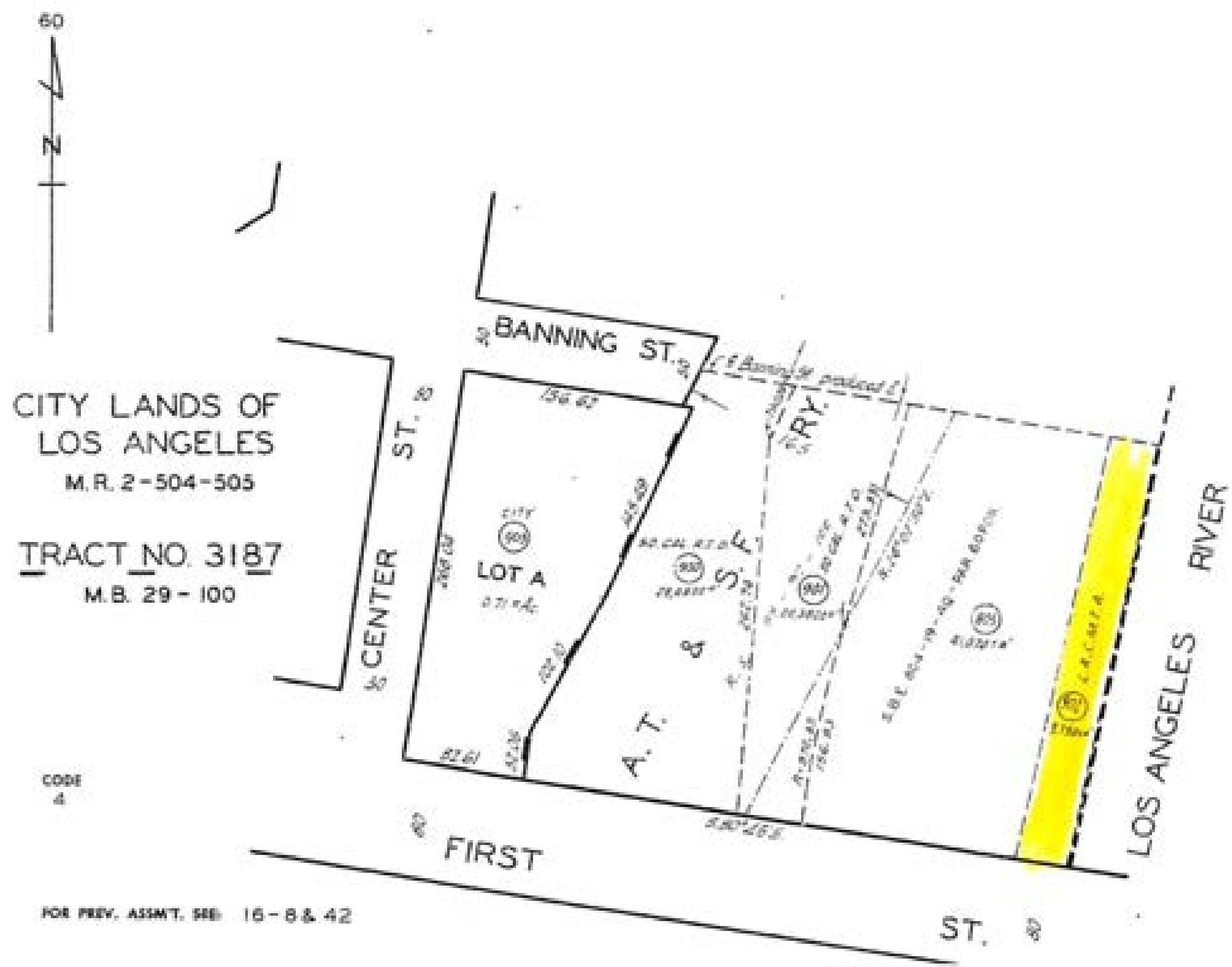
OCT 16 2013


5163 | 17
SCALE 1" = 200'
2007
CENTER ST.
1ST ST.
LOS ANGELES
RIVER
SANTA FE
2ND ST.
3RD ST.
AVE.
4TH
4TH PL.
MATEO ST.
CITY LANDS OF LOS ANGELES
M.R. 2-504-505
MILLS AND WICKS EXTENSION OF
SECOND ST. AND ADJOINING SUBDIVISION
M.R. 13-87-88
CODE
4
FOR PREV. ASSM'T. SEE: 17-2
REVISED
APR 04 2007
ASSESSOR'S MAP
COUNTY OF LOS ANGELES, CALIF.

5173	23
SCALE 1" = 80'	

2008

REVISED
850528606-85
860005601-86
940814940006-23
950812
2007090928006001-23



FOR PREV. ASSM'T. SEE: 16-8 & 42

ASSESSOR'S MAP
COUNTY OF LOS ANGELES, CALIF.

5173 | 22

ALE 1" = 80'

1995

SUBDIVISION OF THE ALISO TRACT
M.R. 4-12-13

CITY LANDS OF LOS ANGELES
M.R. 2-504-505

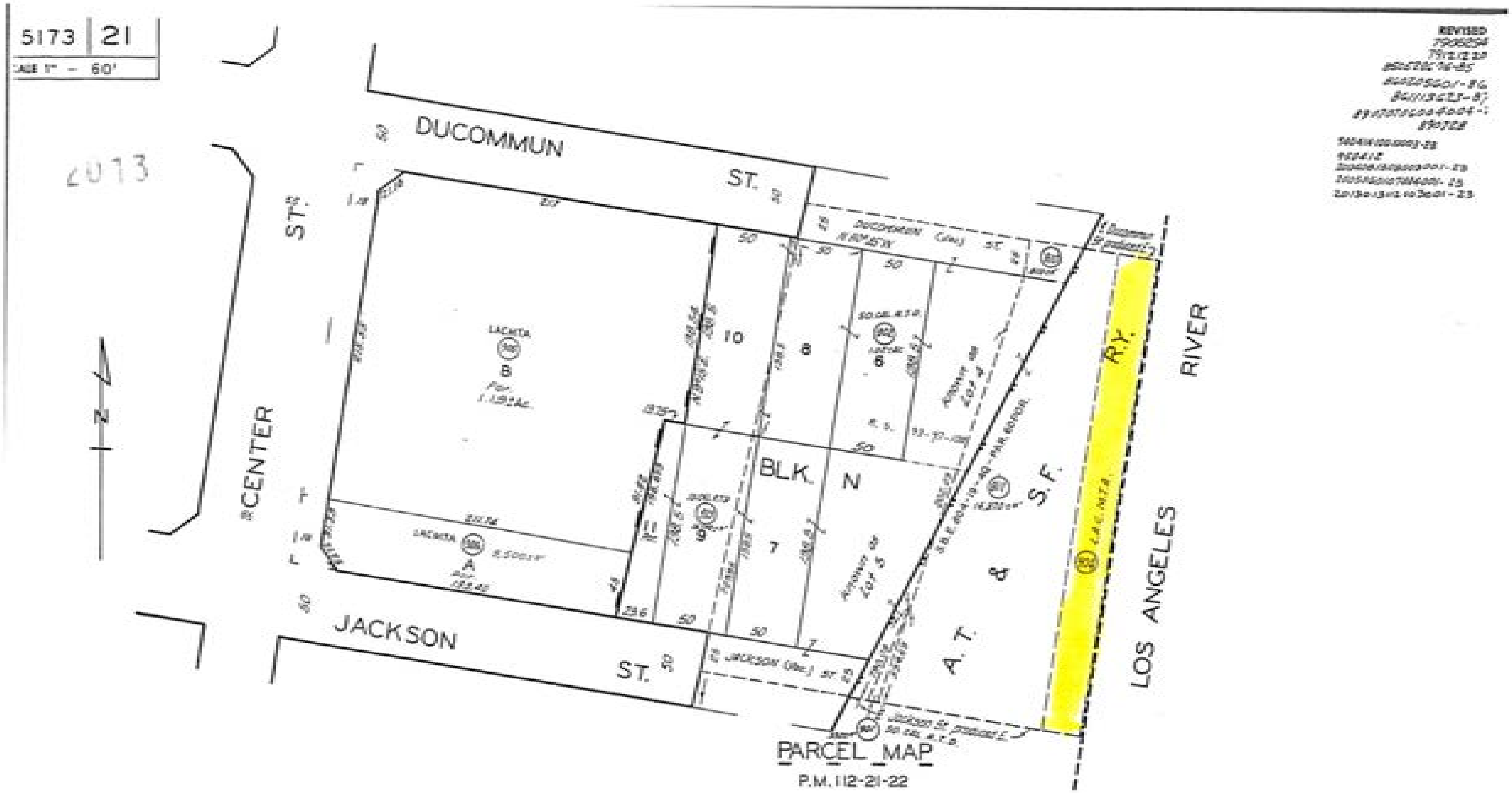
TRACT NO. 20223
M.B. 612-77-78

CODE 4

FOR PREV. ASSMT. SEE: 16-23, 24 & 43
16-23, 24 & 43; 5173-23

APR 28 1995

ASSESSOR'S MAP
COUNTY OF LOS ANGELES, CALIF.



CODE
4

CITY LANDS OF LOS ANGELES
M.R. 2-504-505

SUBDIVISION OF THE ALISO TRACT
M.R. 4-12-13

FOR PREV. ASSM'T. SEE: 16 - 22 & 40

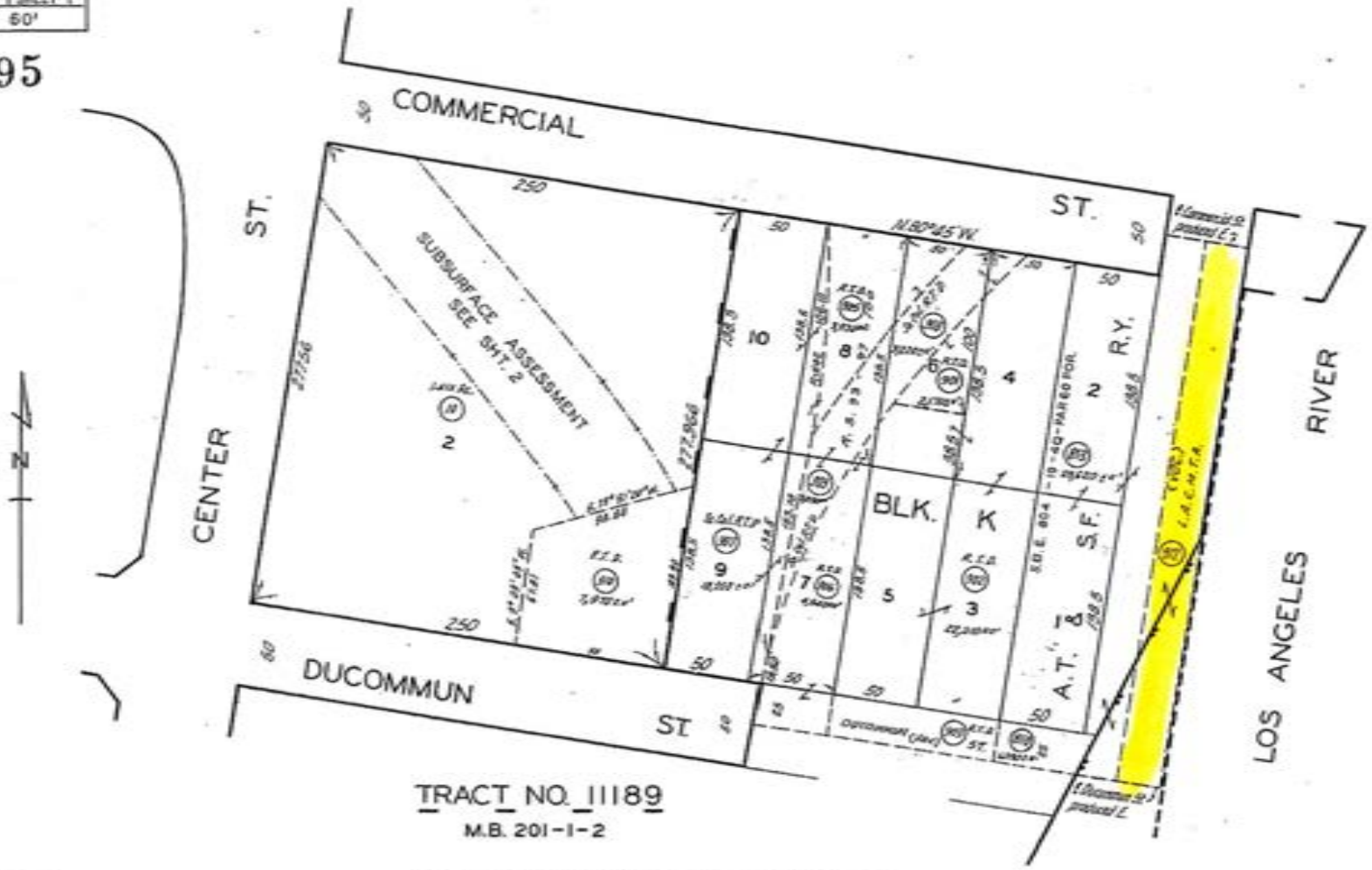
FEB 1 2 2013

ASSESSOR'S MAP
COUNTY OF LOS ANGELES, CALIF.

5173 | 20 SHEET 1

SCALE 1" = 60'

1995



CODE 4

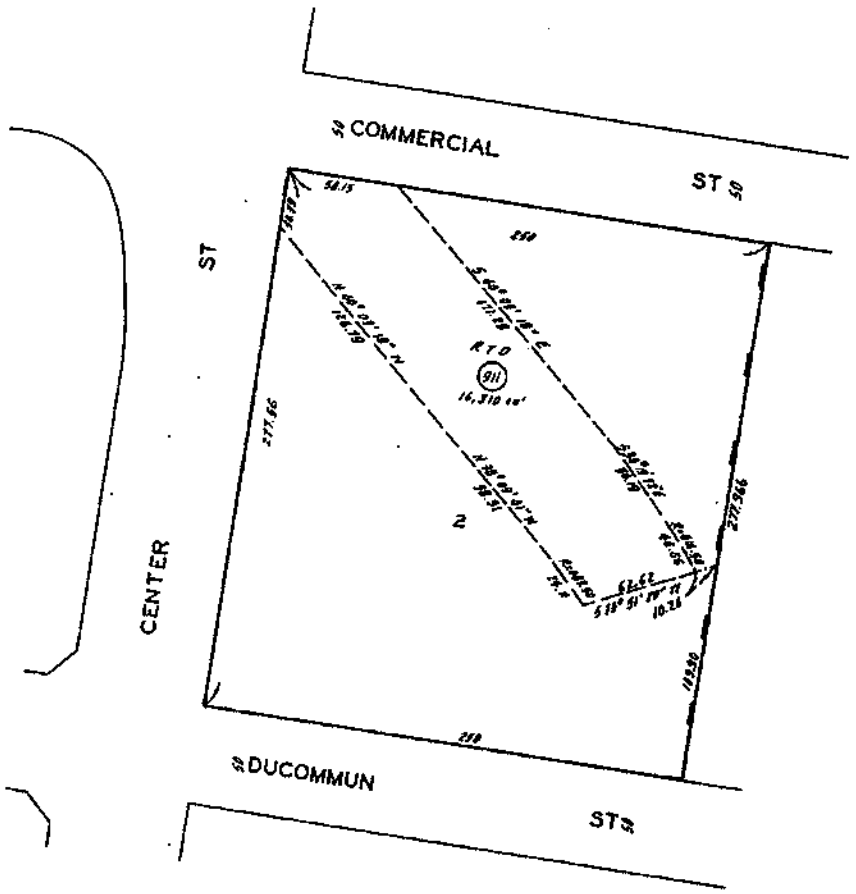
FOR PREV. ASSM'T. SEE: 16 - 20 & 40

APR 20 1995

ASSESSOR'S MAP
COUNTY OF LOS ANGELES, CALIF.

REVISED
9101170608001-25

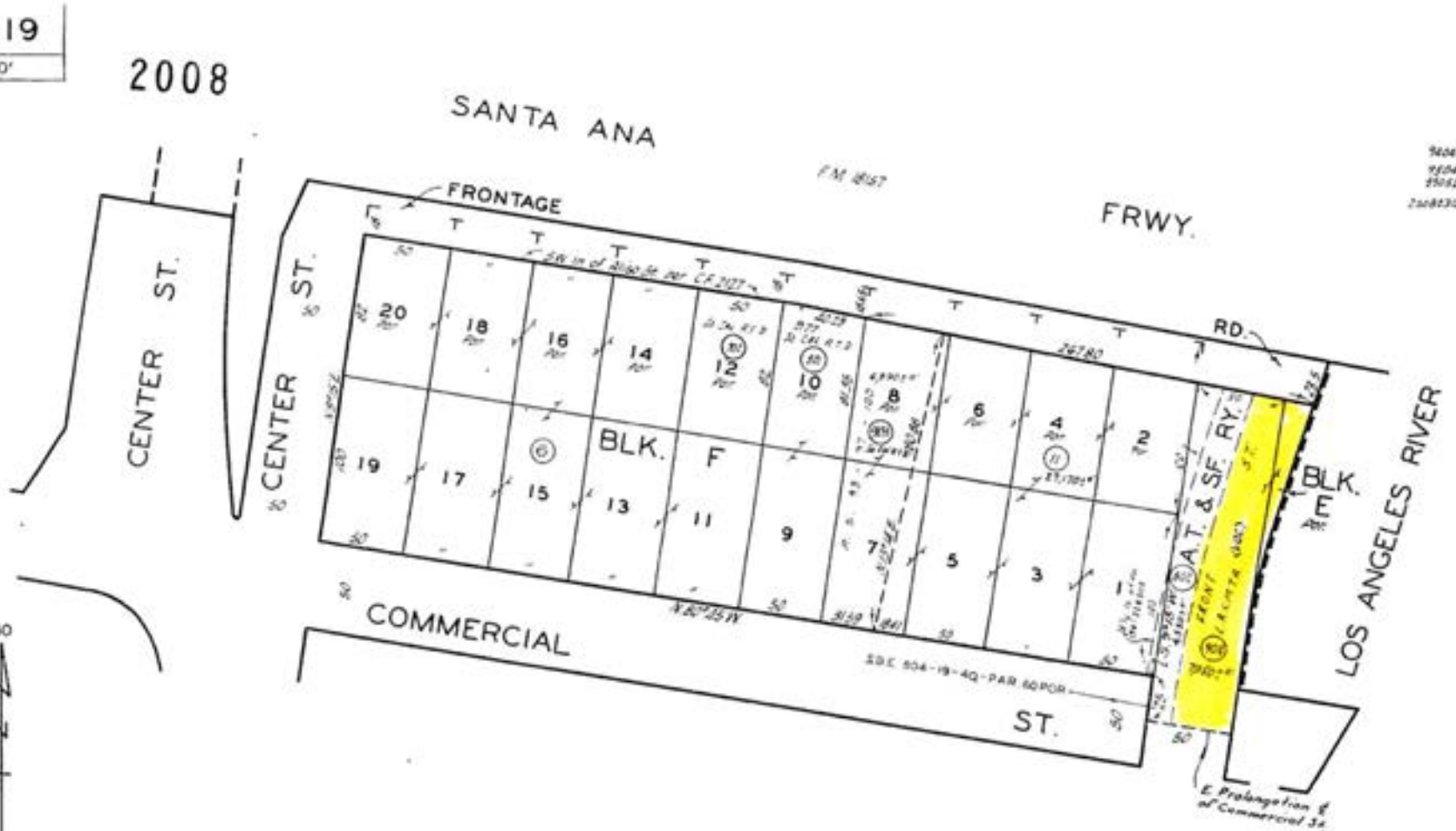
OFFICE OF ASSESSOR COUNTY OF LOS ANGELES	SCALE 1" = 60'	5173	20
	SHEET 2		



5173 | 19

SCALE 1" = 60'

2008



SUBDIVISION OF THE ALISO TRACT

M.R. 4 - 12 - 13

CODE 4

FOR PREV. ASSM'T. SEE: 16 - 18

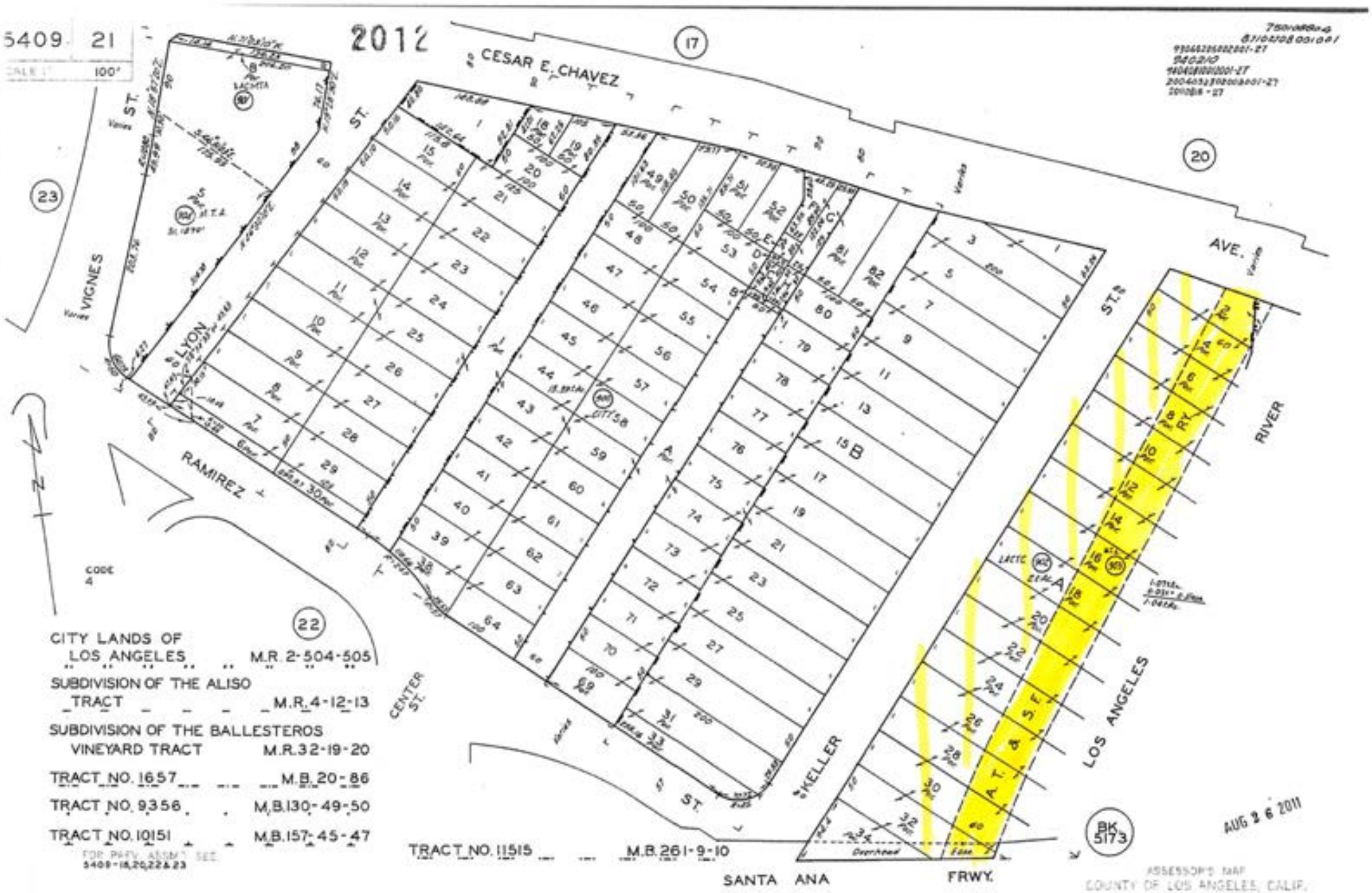
REVIS

11-2-62

MAR 2 1 2008

ASSESSOR'S MAP

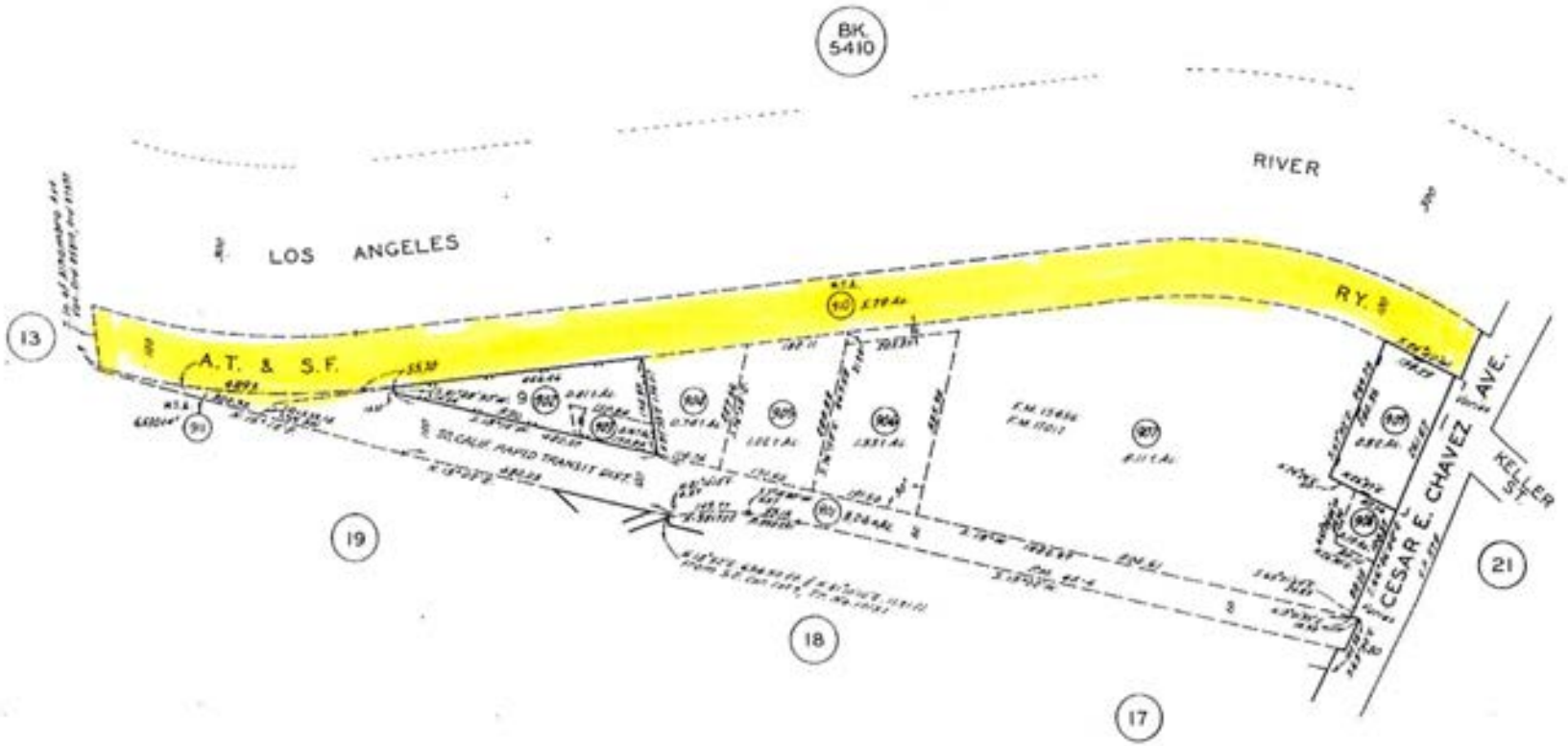
COUNTY OF LOS ANGELES, CALIF.


5409 21
2012
CESAR E. CHAVEZ
17
20
23
22
VIGNES ST.
LYON ST.
RAMIREZ
CENTER ST.
KELLER ST.
AVE.
RIVER
LOS ANGELES
SANTA ANA FRWY.
BK 5173
AUG 26 2011
CITY LANDS OF LOS ANGELES M.R. 2-504-505
SUBDIVISION OF THE ALISO TRACT M.R. 4-12-13
SUBDIVISION OF THE BALLESTEROS VINEYARD TRACT M.R. 32-19-20
TRACT NO. 1657 M.B. 20-86
TRACT NO. 9356 M.B. 130-49-50
TRACT NO. 10151 M.B. 157-45-47
FOR PRIV. ASSM'T SEE 5409-18,20,22 & 23
TRACT NO. 11515 M.B. 261-9-10
ASSESSOR'S MAP
COUNTY OF LOS ANGELES, CALIF.

5409 | 20

200'

1994



CODE
4

CITY LANDS OF LOS ANGELES M.R. 2-504-505
AGNES L. CLINE TRACT M.B. 6 - 51
TRACT NO. 10151 M.B. 157-45-47

All 900 series parcels on this page are assessed to So. Cal. RTD, unless otherwise noted.

FOR PREV. ASSMT SEE:
5409-3

ASSESSOR'S MAP APR 2 4 1994
COUNTY OF LOS ANGELES, CALIF.

5409 13

200'

2015

CITY LANDS OF LOS ANGELES M.R. 2-504-505

POMEROY AND MILLS SUBDIVISION OF THE HOLLENBECK TRACT M.R. 5-199

TRACT NO. 10393 M.B. 159-40-41

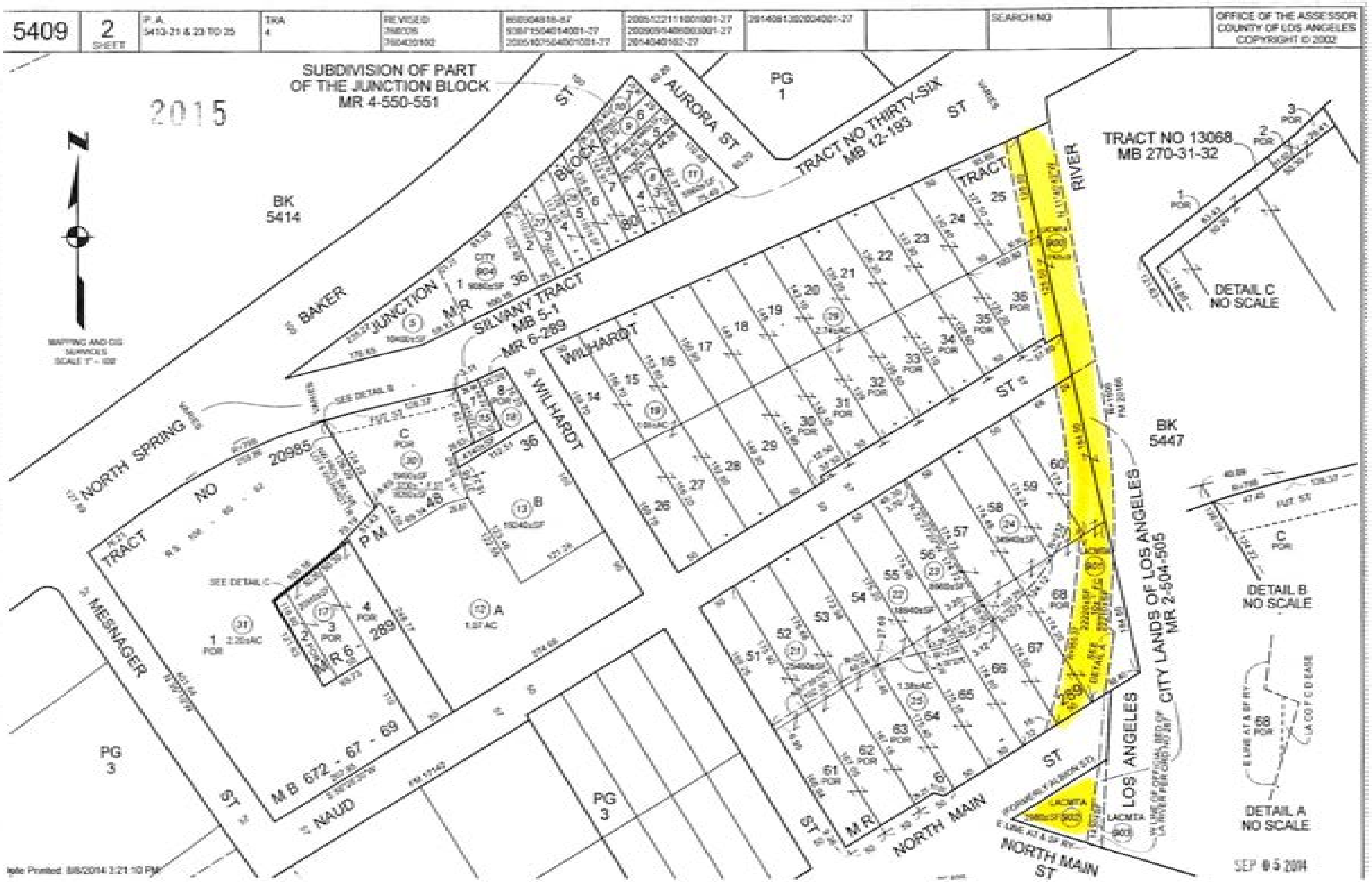
TRACT NO. 11211 M.B. 210-2

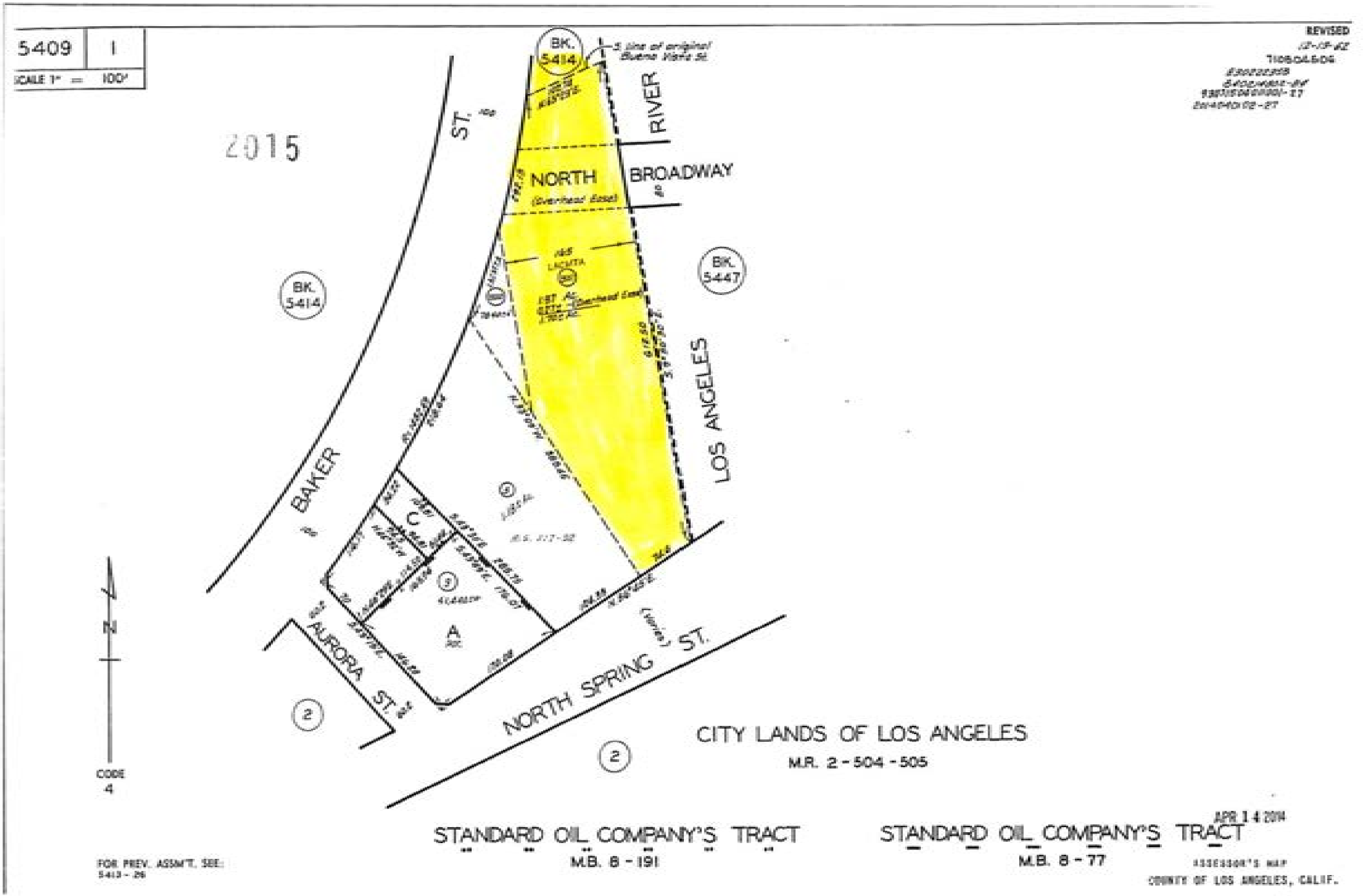
TRACT NO. 9695 M.B. 221-7-8

TRACT NO. 14835 M.B. 389-47-48

TRACT NO. 18946 M.B. 533-19-20

APR 14 2014


5409
2
SHEET
OFFICE OF THE ASSESSOR
COUNTY OF LOS ANGELES
COPYRIGHT © 2002
SEARCH NO
2015
SUBDIVISION OF PART
OF THE JUNCTION BLOCK
MR 4-550-551
PG
1
TRACT NO THIRTY-SIX
MB 12-193
ST
AURORA ST
BLOCK
BK
5414
BAKER
JUNCTION
SILVANY TRACT
MB 5-1
MR 6-289
WILHARDT
WILHARDT
NORTH SPRING
TRACT
NO
20985
PM
TRACT NO 13068
MB 270-31-32
RIVER
DETAIL C
NO SCALE
BK
5447
DETAIL B
NO SCALE
CITY LANDS OF LOS ANGELES
MR 2-504-505
LOS
ANGELES
MESNAGER
ST
NAUD
ST
PG
3
PG
3
M B 672 - 67 - 69
NORTH MAIN
ST
NORTH MAIN
ST
LACMTA
DETAIL A
NO SCALE
SEE DETAIL B
SEE DETAIL C
1.97AC
2.20±AC
7.74±AC
1.38±AC
MAPPING AND GIS
SERVICES
SCALE 1" = 100'
SEP 0 5 2014


5409
1
SCALE 1" = 100'
REVISED
12-19-62
710804506
2015
BK. 5414
5 line of original Buena Vista St.
RIVER
NORTH
BROADWAY
(Overhead Esmt)
LACMTA
BK. 5447
BK. 5414
LOS ANGELES
BAKER
ST.
C
A
AURORA ST.
NORTH SPRING ST.
CODE 4
N
CITY LANDS OF LOS ANGELES
M.R. 2 - 504 - 505
APR 1 4 2014
STANDARD OIL COMPANY'S TRACT
M.B. 8 - 191
STANDARD OIL COMPANY'S TRACT
M.B. 8 - 77
FOR PREV. ASSM'T. SEE: 5413 - 26
ASSESSOR'S MAP
COUNTY OF LOS ANGELES, CALIF.

5414	27
SCALE 1" =	300'

REVISED
7/08/04
8/04/11

2015

CITY LANDS OF LOS ANGELES
M.R. 2 - 504 - 505

HANCOCK'S SURVEY
M.R. 32 - 13 - 14

CODE
4

FOR PREV. ASSM'T. SEE: 40 - 19 & 44

APR 14 2014

ASSESSOR'S MAP
COUNTY OF LOS ANGELES, CALIF.

5415 | 3

ALE 1" = 80'

1994

TRACT NO. 1267
M.B. 18-62-63

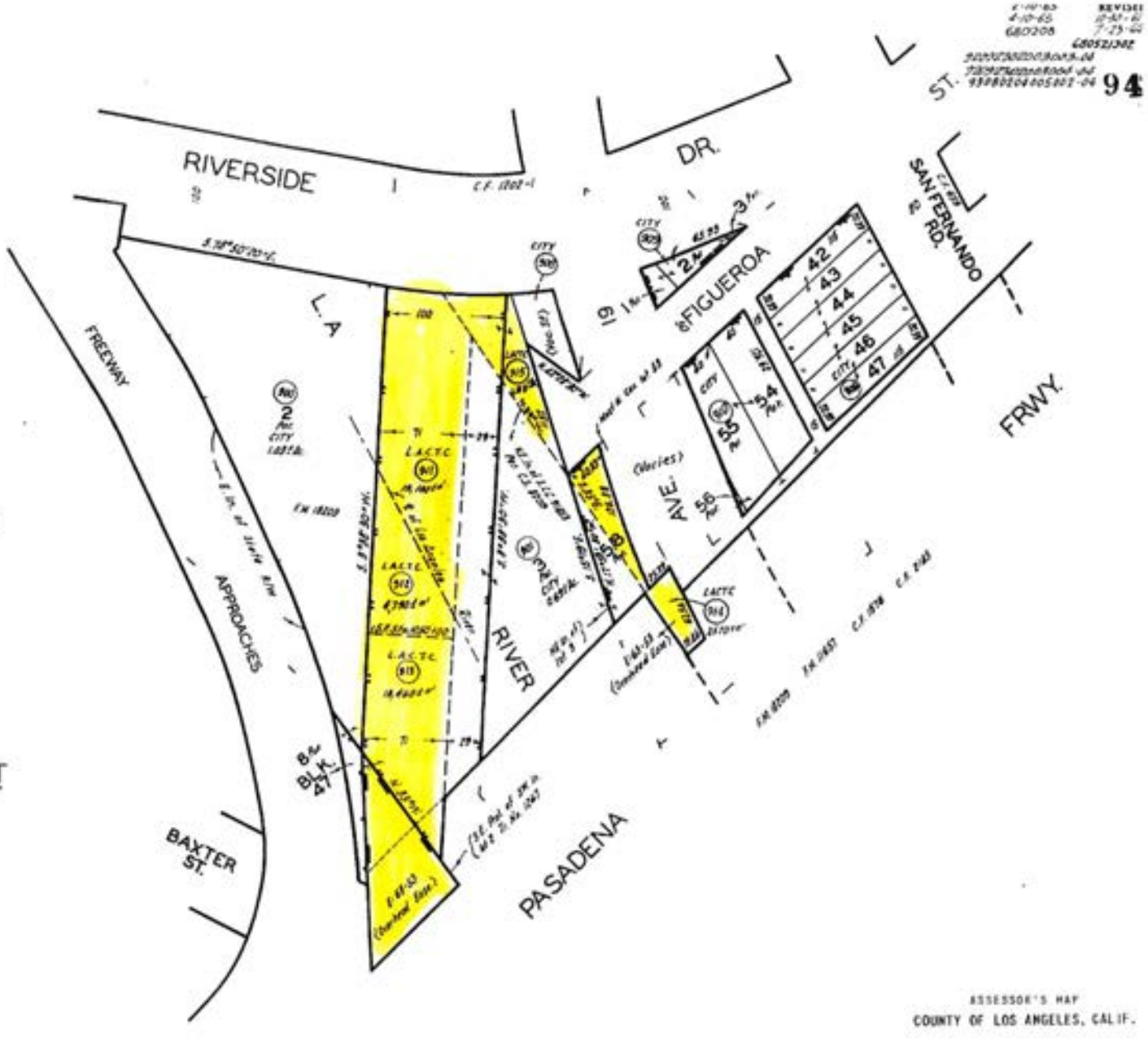
RANCHO SAN RAFAEL
P. 3-222-223

HANCOCK'S SURVEY
M.R. 32-13-14

SUBDIVISION OF CITY LANDS IN EAST LOS ANGELES AND THE ARROYO SECO
M.R. 28-1-4

JEFFRIES TRACT
M.R. 6-441

DAYTON AVENUE HOME TRACT
M.B. 7-69



N

CODE 13

FOR PREV. ASSM'T. SEE: 979-7

94

ASSESSOR'S MAP
COUNTY OF LOS ANGELES, CALIF.

Appendix H

Access Points and Destinations Matrix

Los Angeles River Bike Path – Riverside Drive to Atlantic Boulevard
Access Points and Destinations

Access Point	Destinations and Connectivity			
	Leisure / Recreation	Commuting (Neighborhoods/ Jobs/Schools)	Bike Network Connectivity	Transit Network Connectivity
Riverside Drive	• Elysian Park • Confluence Park • Dodger Stadium • River-Adjacent pocket parks (Marsh Street Nature Park, Elysian Valley Gateway Park, Steelhead Park, Oso Park, Egret Park) • Rio de Los Angeles State Park /Taylor Yard (Future)	• Near Elysian Valley neighborhood • Industrial areas in Elysian Valley	• LA River Bike Path • Tier 2 bike lane (Future – LAMP, 2015)	• Metro Local 96 on Riverside Drive
Broadway Bridge	• Elysian Park • Radio Hill Gardens • Dodger Stadium • Chavez Ravine Arboretum • Downey Recreational Center	• Chinatown • Cathedral HS • Lincoln Heights neighborhood (LH) • Broadway commercial corridor (LH) • LH Industrial (north of Broadway) • Abraham Lincoln HS (LH)	• Protected Bike Lanes on N. Broadway (Future – LAMP, 2015) • Proposed Arroyo Seco Class I bike path (connect via Avenue 19 – Future)	• Chinatown Gold Line Station • Metro Local 45, 28, 83, 84/68 • DASH Lincoln Heights/ Chinatown • Moderate Plus Transit Enhanced Street (Future – LAMP, 2015)
Spring Street Bridge	• Los Angeles State Historic Park • Downey Recreational Center (LH)	• Chinatown • Lincoln Heights neighborhood (LH) • Broadway commercial corridor (LH) • LH Industrial (north of Broadway) • Abraham Lincoln HS (LH)	• Spring Street sharrows (Existing) • Spring Street bike lanes (Future – LABP, 2010)	• Chinatown Gold Line Station

Los Angeles River Bike Path – Riverside Drive to Atlantic Boulevard
Access Points and Destinations

Access Point	Destinations and Connectivity			
	Leisure / Recreation	Commuting (Neighborhoods/ Jobs/Schools)	Bike Network Connectivity	Transit Network Connectivity
Main Street Bridge	• San Antonio Winery • Lincoln Park • Olvera Street and El Pueblo de Los Angeles	• Chinatown • LAC/USC Medical Center • Lincoln Heights neighborhood • William Mead Homes (Public Housing) • Industrial and warehousing uses near Cornfields and Lincoln Heights • DWP Main Street Center	• Protected Bike Lanes on Main St. (Future – LABP, 2010)	• LA Union Station • Chinatown Gold Line Station • Metro Local 76 • DASH Lincoln Heights/Chinatown • Moderate Transit Enhanced Street (Future – LAMP, 2015)
Cesar Chavez Avenue Bridge	• Olvera Street and El Pueblo de Los Angeles • Prospect Park • Evergreen Cemetery	• Chinatown • Boyle Heights neighborhood (BH) • White Memorial Medical Center • Cesar Chavez commercial corridor (BH) • School of Visual and Performing Arts	• Bike Lanes on Cesar Chavez (Future – LABP, 2010)	• LA Union Station • Metro Local 68, 84 • Moderate Plus Transit Enhanced Street (Future – LAMP, 2015)
1st Street Bridge	• Little Tokyo/Arts District • Grand Park • Disney Concert Hall • Cathedral of Our Lady of the Angels • Music Center • Mariachi Plaza (BH) • Pecan Rec. Center (BH)	• LA Civic Center • LA County Superior Court & Courthouse • Little Tokyo/Arts District • BH neighborhood • 1st St. commercial (BH) • East LA HS (BH)	• 1st Street bike lanes (Existing) • 1st Street protected bike lanes (Future – LAMP, 2015)	• Little Tokyo/Arts District Station (Gold Line) • Pico/Aliso Station (Gold Line) • Metro Local 30/330

Los Angeles River Bike Path – Riverside Drive to Atlantic Boulevard
Access Points and Destinations

Access Point	Destinations and Connectivity			
	Leisure / Recreation	Commuting (Neighborhoods/ Jobs/Schools)	Bike Network Connectivity	Transit Network Connectivity
4th Street Bridge	• Little Tokyo/Arts District • Pershing Square • Hollenbeck Park • Aliso/Pico Recreation Center • Evergreen Recreational Center	• Downtown LA Central City District • Historic Downtown • Little Tokyo/Arts District • Boyle Heights neighborhood • Roosevelt High School • Southern California Institute of Architecture (SciArch) • LA Metro Red/Purple Line maintenance yards • Boyle Heights industrial area		• Montebello Bus Lines 40, 341/342 • DASH Arts District
6th Street / Whittier Boulevard	• Arts District • Hollenbeck Park • Jewelry District • Pershing Square • Boyle Heights Sports Center • LA Gun Club • Sixth Street Bridge park and fields (Future)	• Downtown LA Central City District • Historic Downtown • Arts District • Boyle Heights neighborhood • Whittier Boulevard commercial corridor (BH) • Salesian High School (BH) • Boyle Heights industrial area	• 6th Street/ Whittier protected bike lanes (Future - LAMP, 2015) • Sixth Street Bridge bike ramps to riverbed park (Future)	• Metro Local 18 • Metro Rapid 720 • Comprehensive Transit Enhanced Streets (Future – LAMP, 2015)

Los Angeles River Bike Path – Riverside Drive to Atlantic Boulevard
Access Points and Destinations

Access Point	Destinations and Connectivity			
	Leisure / Recreation	Commuting (Neighborhoods/ Jobs/Schools)	Bike Network Connectivity	Transit Network Connectivity
7th Street	• Fashion District • Jewelry District • Macy's Plaza • FIGat7th • Boyle Heights Sports Center	• Downtown LA Central City District • Historic Downtown • Arts District • Boyle Heights • Salesian High School (BH) • Boyle Heights industrial area • DTLA Warehouse District • Fashion District • DTLA Central Industrial District • LA Metro Bus Maintenance Yard	• 7th Street bike lanes (Future – LABP, 2010)	• 7th Street/Metro Center Station • Metro Local 62
Olympic Boulevard	• LA LIVE • Staples Center • Los Angeles Convention Center • Fashion District • South Park district • Sears Building (BH)	• LA LIVE • Fashion District • DTLA Warehouse District • DTLA Produce District • DTLA Central Industrial District • Boyle Heights industrial area • Wyvernwood Public Housing (BH) • Estrada Courts Public Housing (BH) • Lou Costello Junior Youth Center (BH)	• Olympic Boulevard bike lanes (Future – LABP, 2010)	• Metro Local 66 • Pico Station (Blue/Expo Lines) • Moderate Plus Transit Enhanced Street (Future – LAMP, 2015)

Los Angeles River Bike Path – Riverside Drive to Atlantic Boulevard
Access Points and Destinations

Access Point	Destinations and Connectivity			
	Leisure / Recreation	Commuting (Neighborhoods/ Jobs/Schools)	Bike Network Connectivity	Transit Network Connectivity
Washington Boulevard	• Maker City LA / LA Mart	• DTLA Central Industrial District • LA Trade Tech • LA Traffic Court • BNSF Hobart Railyard • Frida Kahlo HS • Santee Educational Complex • South LA neighborhood	• Washington Boulevard bike lane (Future – LABP, 2010)	• Washington Station (Blue Line) • Montebello Bus M50
26th Street Bridge		• Vernon industrial area • BNSF Hobart Railyard • Santa Fe Art Colony • South LA neighborhood		
Soto Street Bridge		• Vernon industrial area • Boyle Heights industrial area • Huntington Park industrial and residential areas		• Metro Local 251 • Metro Rapid 751

Los Angeles River Bike Path – Riverside Drive to Atlantic Boulevard
Access Points and Destinations

Access Point	Destinations and Connectivity			
	Leisure / Recreation	Commuting (Neighborhoods/ Jobs/Schools)	Bike Network Connectivity	Transit Network Connectivity
Bandini Boulevard Bridge		• Vernon industrial area • Exxon Mobil • FedEx Ground • UPS • Farmer John • Vernon Civic Center • South LA neighborhood • Jefferson High School		• Metro Local 251 • Metro Rapid 751
Downey Road Bridge		• Vernon industrial area • UPS • BNSF Hobart Railyard • Maywood and Huntington Park		• Metro Local 254
Atlantic Boulevard Bridge	• Citadel Outlets	• Vernon industrial area • FedEx Freight • Bell Industrial District • BNSF Hobart Railyard • Atlantic and Slauson Commercial Corridors • City of Maywood, Commerce, and Bell residential areas		• Metro Local 260 • Metro Rapid 762

Sources:
Field observations and Google Earth/Maps
Los Angeles Bike Master Plan (LABP), 2010
Los Angeles Mobility Plan (LAMP), 2015
Downtown Center Business Improvement District, 2015
Los Angeles County Metropolitan Transportation Authority (Metro), 2015