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CHAPTER 1.0
INTRODUCTION

EDAW, Inc. was contracted by Black & Veatch to conduct a reconnaissance survey and impact analysis report for the Echo Park Rehabilitation Project. The City of Los Angeles (City) is proposing to rehabilitate Echo Park Lake through in-lake basin improvements, in-lake vegetation and habitat improvements, and parkland structural best management practices (BMPs), including grassy swales/infiltration strips, porous pavement, "SMART" irrigation system, and educational signage and kiosks. Potential impacts to biological resources from construction and operations associated with this project are discussed herein.

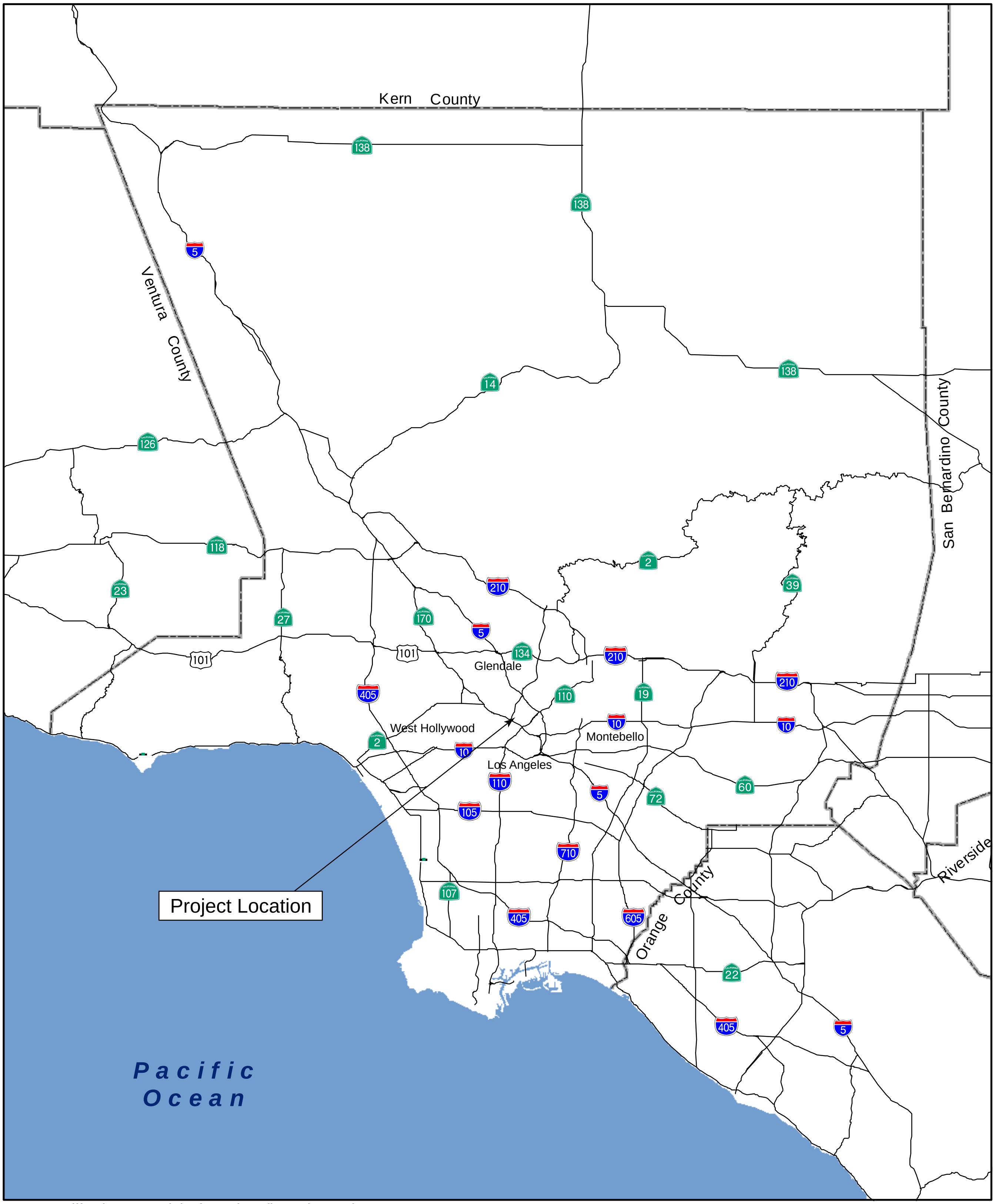
PROJECT LOCATION

Echo Park is a 29-acre open-space recreational facility located at 751 Echo Park Avenue, in the Echo Park/Silverlake community of Los Angeles, California. The park is bounded to the north by Park Avenue, to the east by Echo Park Avenue, to the south by Bellevue Avenue, and to the west by Glendale Boulevard (Figures 1 and 2). Of the 29-acre park, Echo Park Lake occupies 13 acres while the remaining 16 acres contains recreational open space.

The project site is located just north of the Hollywood freeway (SR-101) and the Pasadena freeway (I-110) highway junction. The site is in close proximity to Dodgers Stadium and the Los Angeles River.

LITERATURE REVIEW

Prior to reconnaissance surveys, EDAW biologists conducted a literature review to identify special status plants, wildlife, and habitats known to occur in the vicinity of the survey area. The California Native Plant Society's (CNPS) *Inventory of Rare and Endangered Vascular Plants of California* (CNPS 2008) and the California Department of Fish and Game (CDFG) *California Natural Diversity Database* (CNDDB) (CDFG 2008b) were reviewed. The survey area is within the U.S. Geological Survey 7.5 minute *Hollywood* quadrangle. The *Los Angeles* quadrangle, east of the *Hollywood* quadrangle and the survey area, was queried along with the *Hollywood* quadrangle because of its close proximity to the survey area.



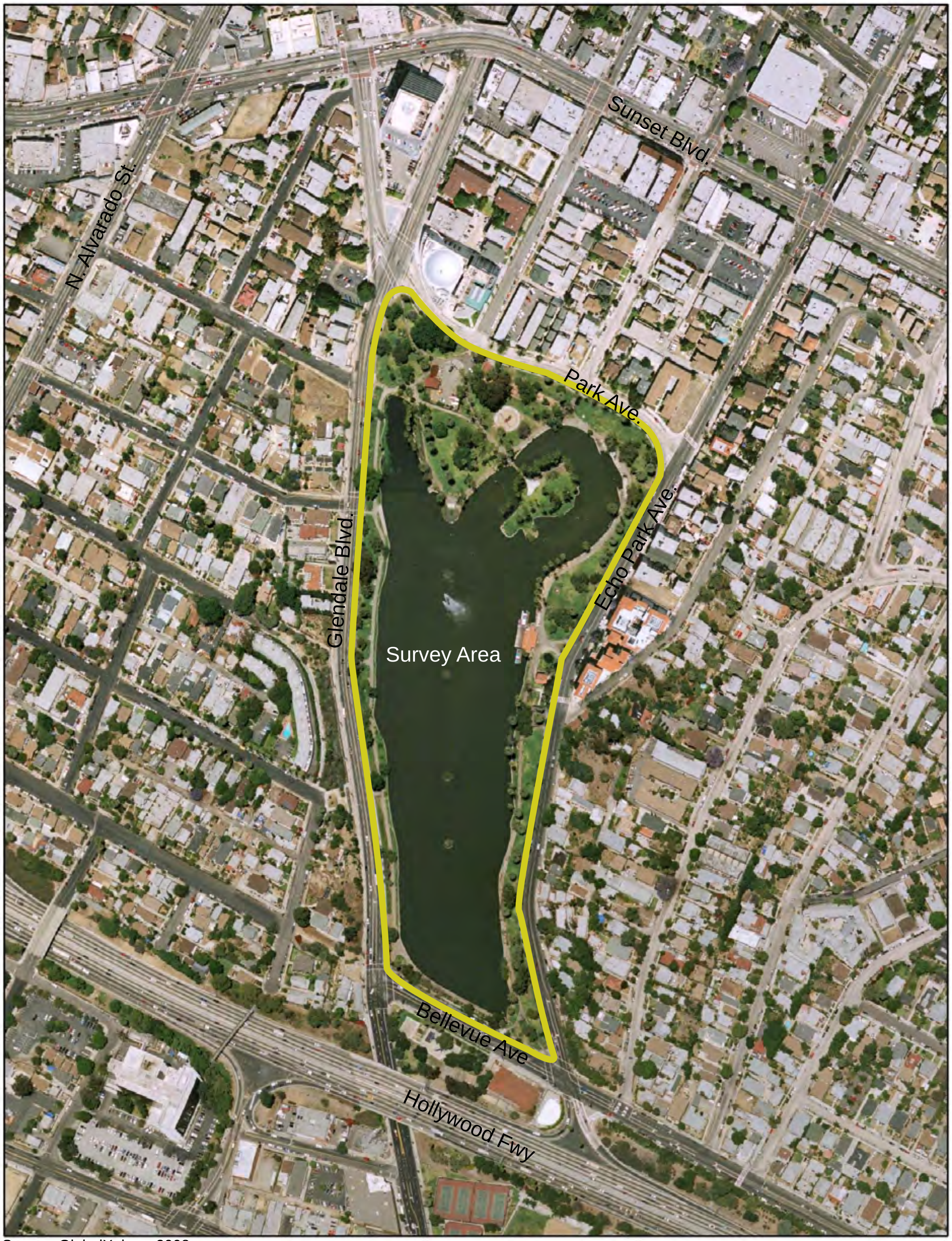
Source: California Geospatial Information Library (2003-5)

N W E S

1 inch equals 12 miles

0 6 12 24 Miles

Figure 1
Regional Location Map



Source: GlobalXplorer 2008

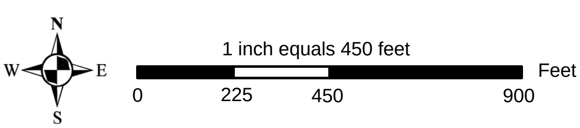


Figure 2
Vicinity Map

The literature review identified the following 21 sensitive plant species as having the potential to occur in the survey area based on known occurrences within the *Hollywood* and *Los Angeles* quadrangles: marsh sandwort (*Arenaria paludicola*), Braunton's milk-vetch (*Astragalus brauntonii*), Ventura marsh milk-vetch (*Astragalus pycnostachyus* var. *lanosissimus*), coastal dunes milk-vetch (*Astragalus tener* var. *titi*), Davidson's saltscale (*Atriplex serenana* var. *davidsonii*), round-leaved filaree (*California macrophylla*), Plummer's mariposa lily (*Calochortus plummerae*), Santa Barbara morning-glory (*Calystegia sepium* ssp. *binghamiae*), Lewis' evening-primrose (*Camissonia lewisii*), southern tarplant (*Centromadia parryi* ssp. *australis*), many-stemmed dudleya (*Dudleya multicaulis*), Los Angeles sunflower (*Helianthus nuttallii* ssp. *parishii*), vernal barley (*Hordeum intercedens*), mesa horkelia (*Horkelia cuneata* ssp. *puberula*), Orcutt's linanthus (*Linanthus orcuttii*), prostrate navarretia (*Navarretia prostrata*), white rabbit-tobacco (*Pseudognaphalium leucocephalum*), Parish's gooseberry (*Ribes divaricatum* var. *parishii*), Gambel's water cress (*Rorippa gambelii*), San Bernardino aster (*Symphyotrichum defoliatum*), and Greata's aster (*Symphyotrichum greatae*). Sensitive plant communities with known occurrences in the vicinity of the survey area include California walnut woodland, southern sycamore alder riparian woodland, and walnut forest.

Eight sensitive wildlife species were identified as having the potential to occur in the survey area based on known occurrences within the *Hollywood* and *Los Angeles* quadrangles: coast (San Diego) horned lizard (*Phrynosoma coronatum* [*blainvillii* population]), pallid bat (*Antrozous pallidus*), coastal California gnatcatcher (*Polioptila californica californica*), western mastiff bat (*Eumops perotis californicus*), hoary bat (*Lasiurus cinereus*), south coast marsh vole (*Microtus californicus stephensi*), big free-tailed bat (*Nyctinomops macrotis*), and American badger (*Taxidea taxus*). In addition, southwestern pond turtle (*Actinemys marmorata pallida*), silver-haired bat (*Lasionycteris noctivagans*), and western yellow bat (*Lasiurus xanthinus*), were assessed.

In addition to the databases described above, other sources consulted for this report include but are not limited to the Final Concept Report for the Echo Park Lake Rehabilitation Proposition O Project, Christmas Bird Counts, landscape plans, and personal communications with CDFG.

SURVEY METHODS

General reconnaissance surveys of the Echo Park (survey area) were conducted by EDAW biologists (Ms. Jeanette Duffels and Ms. Donna Germann) in April, 2008 (Table 1). The surveys encompassed approximately 29 acres. The purpose of the reconnaissance surveys was to assess current biological conditions, identify plant and animal species present in the survey area, map vegetation and/or land cover types, and to evaluate the potential of the survey area to support native special status plant and wildlife species.

Table 1
Echo Park Biological Reconnaissance Surveys

Survey Date	Personnel
April 9, 2008	Donna Germann
April 10, 2008	Donna Germann
April 22, 2008	Jeanette Duffels

The survey area was generally mapped for land cover types. The survey area contains no native plant communities as classified according to Holland (1986) or Sawyer and Keeler-Wolf (1995).

General wildlife and vegetation surveys consisted of meandering transects through the recreational open space. The island, floating wetlands, and open water were observed through binoculars. Plant species were identified in the field or collected for later identification. Wildlife species were identified by direct observation and indirect sign including tracks, scat, calls, nests, and burrows. General habitat assessments for sensitive and special status species were conducted by assessing various microhabitat features of the study area, including the plant species composition of the vegetation on-site, the structure of the vegetation, and the presence of any required or preferred soils, topography and other habitat requirements.

Rare plant surveys, protocol-level or focused wildlife surveys, and jurisdictional delineations were not conducted as part of the reconnaissance surveys.

CHAPTER 2.0
EXISTING CONDITIONS

LAND COVER TYPES

There are three general cover types in the project area: open water, landscaped, and developed. In addition, there are lotus beds and four small manufactured floating wetlands (Figure 3).

Open Water

The dominant cover type in Echo Park is the lake itself, a man-made retarding basin, which is primarily open water. Echo Park Lake contains four artificial floating wetlands that support monotypic stands of cattail (*Typha* sp.). Additionally, the lake contains sacred lotus (*Nelumbo nucifera*) beds.

Landscaped

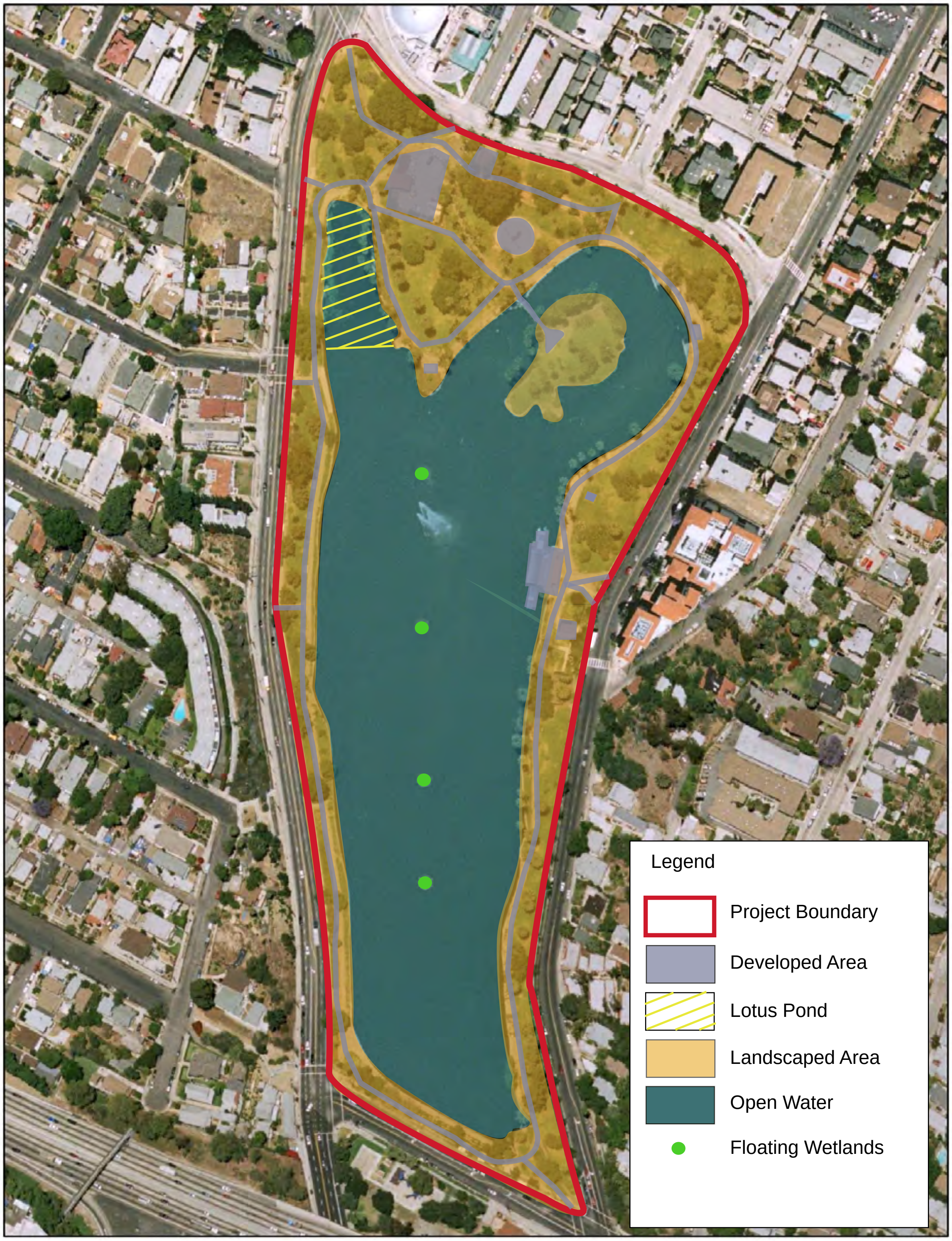
Landscaped vegetation consists of horticultural and ornamental plantings usually supported by irrigation. Landscaped cover at Echo Park consists of regularly mowed grass lawns, ornamental shrubs and ground covers and mature trees. The lake contains a small island containing palm and pine trees, grassy areas, and ornamental pampass grass (*Cortaderia jubata*).

Developed

Developed areas support no native vegetation and may be additionally characterized by the presence of man-made structures such as buildings or paved roads. At Echo Park, developed areas consist of an asphalt walking path that circumvents the lake and buildings including a paddle boat house, maintenance building, restrooms, electrical shack, and park office; other structures including monuments, picnic tables/areas, and a children's play area.

FLORA

Landscaped vegetation in urban park settings like Echo Park typically consists of shade trees, grassy lawns, and hardy ornamental shrubs and groundcovers that are aesthetically pleasing, require minimal maintenance, and can withstand trampling.



Source: GlobalXplorer 2008

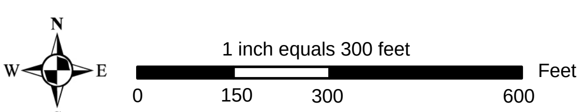


Figure 3
Land Cover Types

Echo Park contains a great number and variety of mature trees, including some that are not typically planted in the Los Angeles area. Some typical trees at Echo Park include palms such as Pindo palm (*Butia capitata*), European fan palm (*Chamaerops humilis*), Canary Island date palm (*Phoenix canariensis*), Senegal date palm (*Phoenix reclinata*), queen palm (*Syagrus romanzoffianum*), windmill palm (*Trachycarpus fortunei*), California fan palm (*Washingtonia filifera*), and Mexican fan palm (*Washingtonia robusta*); pines such as Aleppo pine (*Pinus halepensis*), Canary Island pine (*Pinus canariensis*), fern pine (Podocarpus gracilior), and yew pine (*Podocarpus macrophyllus* 'Maki'); and ficus such as edible fig (*Ficus carica*), rubber tree (*Ficus elastica*), and petiolate fig (*Ficus pumila*). Trees native to California at Echo Park include white alder (*Alnus rhombifolia*), western sycamore (*Platanus racemosa*), and California fan palm. Some of the trees not typically planted or found in the Los Angeles area include flame tree (*Brachychiton acerifolia*), Moreton Bay chestnut (*Calodendron capense*), petiolate fig, cow itch tree (*Lagunaria patersonii*), dawn redwood (*Metasequioia glyptostroboides*), Caucasian wingnut (*Pterocarya fraxinifolia*), and Montezuma cypress (*Taxodium mucronatum*).

Some typical perennials at Echo Park include: lily-of-the-Nile (*Agapanthus orientalis*), hibiscus (*Hibiscus rosa-sinensis*), daylily (*Hemerocallis middendorffii*), oleander (*Nerium oleander*), Indian hawthorn (*Rhaphiolepis indica*), and bird of paradise (*Strelitzia reginae*). Other ground covers at Echo Park include English ivy (*Hedera helix*), lantana (*Lantana* sp.), and cape plumbago (*Plumbago auriculata*).

The partially submerged floating wetlands were installed by the Los Angeles Bureau of Sanitation as an experiment in improving the quality of the water in the lake. They consist of monotypic stands of cattail anchored to the lake bottom. The species of cattail could not be determined through binoculars.

The northwestern lobe of the lake contains beds of sacred lotus, which are demarcated from the rest of the lake by a string of small buoys. At the time of the reconnaissance survey, the plants were evident only from a few dead stalks and leaves. The lotus performed poorly in 2007, when only 30 blossoms appeared; reportedly down from several hundred in 2006 (Schoch 2008).

A list of floral species observed or known to occur in Echo Park is included in Appendix A.

FAUNA

Urban park settings provide habitat for common wildlife species typically adapted to disturbed areas and human presence. Palm, deciduous, and conifer trees within the park provide suitable habitat for a variety of nesting birds. Additionally, the maintained lake and floating wetlands provide ideal roosting and nesting habitat for common waterfowl in the midst of suburbia. Animal species typically associated with such urban park and lake settings include: American crow (*Corvus brachyrhynchos*), Anna's hummingbird (*Calypte anna*), northern mockingbird (*Mimus polyglottos*), house finch (*Carpodacus mexicanus*), house sparrow (*Passer domesticus*), western-scrub jay (*Aphelocoma californica*), mourning dove (*Zenaida macroura*), rock dove (*Columbia livia*), mallard (*Anas platyrhynchos*), and California ground squirrel (*Spermophilus beecheyi*). The species mentioned above, with the exception of the northern mockingbird, were observed within Echo Park during the biological reconnaissance surveys.

A complete list of animal species observed or detected within Echo Park during biological reconnaissance surveys is included in Appendix B. The above observations are incidental and do not constitute a complete faunal inventory of the survey area.

In addition to a list of the birds observed during reconnaissance surveys, Christmas Bird Counts collected at Echo Park for the years 2000 through 2007 are also provided in Appendix B. Christmas Bird Counts are a census of birds performed annually in early winter by volunteer, often amateur, birders. The purpose of collecting the data is to provide population data for use in conservation biology. The Christmas Bird Counts are provided here to give a sense of the number and diversity of birds that occur at Echo Park in winter.

Aquatic surveys of the lake were not conducted, however CDFG was contacted to determine the probable wildlife contents of Echo Park Lake. CDFG regularly stocks the lake with rainbow trout (*Oncorhynchus mykiss*) and channel catfish (*Ictalurus punctatus*) in support of Fishing in the City, their catch-and-release program. Other species that have potential to be in found in the lake include: bluegill (*Lepomis macrochirus*), redear sunfish (*Lepomis microlophus*), green sunfish (*Lepomis cyanellus*), blue catfish (*Ictalurus furcatus*), smallmouth bass (*Micropterus dolomieu*), spotted bass (*Micropterus punctulatus*), largemouth bass (*Micropterus salmoides*), white crappie (*Pomoxis annularis*), black crappie (*Pomoxis nigromaculatus*), oscar fish (*Astronotus ocellatus*), other Cichlidae species, and any number of other exotic warm water species that are sold in pet/aquarium stores. Red swamp crayfish (*Procambarus clarkii*) also have the potential to occur in Echo Park Lake (CDFG 2008e).

At least two species of turtle, red-eared slider (*Pseudemys scripta elegans*) and yellow-bellied slider (*Trachemys scripta scripta*) were observed basking along the edge of Echo Park Lake during reconnaissance surveys. Other turtle species that have potential to occur in the lake include: pond sliders (*Trachemys scripta*), painted turtles (*Chrysemys picta*), river cooters (*Pseudemys concinna*), common cooters (*Pseudemys floridana*), common map turtles (*Graptemys geographica*), various other sliders, cooters, pond turtles, map turtles, mud turtles (*Kinosternon* spp.), musk turtles (*Sternotherus* spp.), and any number of other exotic species that are sold in pet/aquarium stores. Southwestern pond turtles (*Actinemys marmorata pallida*), a California Species of Special Concern, is the only native species that occurs in the greater Los Angeles area, however, it is unlikely to occur within Echo Park Lake. In 2007, 13 turtles were found dead at Echo Park, reportedly from a naturally occurring bacterial infection (Schoch 2008).

SENSITIVE BIOLOGICAL RESOURCES

Echo Park was evaluated for the extent, quality, and significance of existing sensitive biological resources.

Sensitive Vegetation Communities

Sensitive habitats are those that are regulated by the U.S. Fish and Wildlife Service (USFWS) and U.S. Army Corps of Engineers (ACOE) and those considered sensitive by the CDFG. There are no sensitive natural vegetation communities at Echo Park.

Sensitive Plant Species

Sensitive plants include those listed as threatened or endangered, proposed for listing, or candidates for listing by the USFWS and CDFG (2008c) or those listed by the CNPS (2008).

A CNDDB query for the *Hollywood* and *Los Angeles* USGS quadrangles resulted in 17 sensitive plant species known to occur in the vicinity of the project site; a CNPS query resulted in 4 additional species from the same quadrangles. No sensitive plant species were observed within Echo Park during biological reconnaissance surveys, nor are any expected to occur. Echo Park contains no natural habitat or undisturbed soils to support sensitive plant species. Furthermore, Echo Park is isolated within an urbanized environment with no natural habitat immediately adjacent or nearby. Sensitive plant species determined to have a potential to occur at Echo Park based on geographic proximity to known occurrences are listed in Table 2, along with their sensitivity status and comments on their potential to occur at Echo Park.

Table 2
Sensitive Plant Species Known to Occur in the Vicinity of Echo Park

Common Name *Scientific Name*	**Sensitivity Status**[1]	**General Habitat Description**	**Probability of Occurrence**
marsh sandwort *Arenaria paludicola*	USFWS: Endangered CDFG: Endangered CNPS: List 1B.1	Marshes and swamps. Known to grow up through dense mats of cattail, rush, and sedge in freshwater marsh. Grows at elevations of 10 to 170 meters. Blooms May-August.	Not expected. Not detected during general surveys. Echo Park does not contain suitable habitat for this species. The only known occurrence in the vicinity of Echo park was in 1900 in a swamp in the community of Cienega.
Braunton's milk-vetch *Astragalus brauntonii*	USFWS: Endangered CDFG: None CNPS: List 1B.1	Closed-cone coniferous forest, chaparral, coastal scrub, valley and foothill grassland. Known from recently burned or disturbed areas; prefers stiff gravelly clay soils overlying granite or limestone. Grows at elevations of 4 to 640 meters. Blooms January-August.	Not expected. Not detected during general surveys. Echo Park does not contain suitable habitat for this species. The only known occurrence in the vicinity of Echo Park was in 1908 in the foothills near Sherman Power Station. CNPS considers occurrences of this species in the *Hollywood* quadrangle extirpated.
Ventura marsh milk-vetch *Astragalus pycnostachyus* var. *lanosissimus*	USFWS: None CDFG: None CNPS: List 1B.1	Coastal salt marsh. Known from within the reach of high tide or areas protected by barrier beaches and rarely near seeps on sandy bluffs. Grows at elevations 1 to 35 meters. Blooms June-October.	Not expected. Not detected during general surveys. Echo Park does not contain suitable habitat for this species. Known from an unspecified occurrence in the *Hollywood* quadrangle. CNPS considers occurrences of this species in the *Hollywood* quadrangle extirpated.
coastal dunes milk-vetch *Astragalus tener* var. *titi*	USFWS: Endangered CDFG: Endangered CNPS: List 1B.1	Coastal bluff scrub, coastal dunes. Known to occur in moist, sandy depressions of bluffs or dunes along and near the Pacific Ocean (one site on a clay terrace). Grows at elevations 1 to 50 meters. Blooms March-May.	Not expected. Not detected during general surveys. Echo Park does not contain suitable habitat for this species. The only known occurrence in the vicinity of Echo Park was in 1903 in the general vicinity of Inglewood.

Common Name ***Scientific Name***	**Sensitivity Status[1]**	**General Habitat Description**	**Probability of Occurrence**
Davidson's saltscale *Atriplex serenana* var. *davidsonii*	USFWS: None CDFG: None CNPS: List 1B.2	Coastal bluff scrub, coastal scrub (alkaline soils). Grows at elevations 3 to 250 meters. Blooms April-October.	Not expected. Not detected during general surveys. Echo Park does not contain suitable habitat for this species. The only known occurrences in the vicinity of Echo Park were in 1902 in the Temple Street area near highway 101 and Alvarado Street, and in the vicinity of Cienega. CNPS considers occurrences of this species in the *Hollywood* quadrangle extirpated.
round-leaved filaree *California macrophylla*	USFWS: None CDFG: None CNPS: List 1B.1	Cismontane woodland, valley and foothill grassland (clay soils). Grows at elevations 15 to 1,200 meters. Blooms March-May.	Not expected. Not detected during general surveys. Echo Park does not contain suitable habitat for this species. The only known occurrence in the vicinity of Echo Park was in 1900 in the vicinity of Hollywood.
Plummer's mariposa lily *Calochortus plummerae*	USFWS: None CDFG: None CNPS: List 1B.2	Coastal scrub, chaparral, valley and foothill grassland, cismontane woodland, lower montane coniferous forest. Known to occur on rocky and sandy sites (granitic or alluvial material). Can be common after fire. Grows at elevations 90 to 1,610 meters. Blooms May-July.	Not expected. Not detected during general surveys. Echo Park does not contain suitable habitat for this species. The only known occurrences in the vicinity of Echo Park were in 1901 and 1913 in Ammandale and in the hills near Sherman Power Station, respectively. CNPS considers occurrences of this species in the *Hollywood* and *Los Angeles* quadrangles extirpated.
Santa Barbara morning-glory *Calystegia sepium* ssp. *binghamiae*	USFWS: None CDFG: None CNPS: List 1A	Coastal marshes. Grows at elevations 0 to 30 meters. Blooms April-May.	Not expected. Not detected during general surveys. Echo Park does not contain suitable habitat for this species. The only known occurrence in the vicinity of Echo Park was in 1899 near Cienega. CNPS considers occurrences of this species in the *Hollywood* quadrangle extirpated.
Lewis' evening-primrose *Camissonia lewisii*	USFWS: None CDFG: None CNPS: List 3	Valley and foothill grassland, coastal bluff scrub, cismontane woodland, coastal dunes, and coastal scrub. Grows at elevations 0 to 300 meters. Blooms March-May (rarely June).	Not expected. Not detected during general surveys. Echo Park does not contain suitable habitat for this species. Known from an unspecified occurrence in the *Hollywood* quadrangle.

Common Name *Scientific Name*	Sensitivity Status[1]	General Habitat Description	Probability of Occurrence
southern tarplant *Centromadia parryi* ssp. *australis*	USFWS: None CDFG: None CNPS: List 1B.1	Marsh and swamps (margins), valley and foothill grassland. Known to occur in disturbed sites near the coast at marsh edges; also in alkaline soils, sometimes with saltgrass. Grows at elevations 0 to 427 meters. Blooms May-November.	Not expected. Not detected during general surveys. Echo Park does not contain suitable habitat for this species. The only known occurrence in the vicinity of Echo Park was in 1994 between West Adams and Culver City. CNPS considers occurrences of this species in the *Hollywood* quadrangle extirpated.
many-stemmed dudleya *Dudleya multicaulis*	USFWS: None CDFG: None CNPS: List 1B.2	Chaparral, coastal scrub, valley and foothill grassland. Known to occur in heavy, often clayey soils or on grassy slopes. Grows at elevations 0 to 790 meters. Blooms April-July.	Not expected. Not detected during general surveys. Echo Park does not contain suitable habitat for this species. The only known occurrence in the vicinity of Echo Park was in 1925 in the foothills north of Los Angeles between Vermont and Western Avenues.
Los Angeles sunflower *Helianthus nuttallii* ssp. *parishii*	USFWS: None CDFG: None CNPS: List 1A	Marsh and swamps (coastal salt and freshwater). Grows at elevations 5 to 1,675 meters. Blooms August-October.	Not expected. Not detected during general surveys. Echo Park does not contain suitable habitat for this species. The only known occurrence in the vicinity of Echo Park was in 1903 at Oak Knoll in Pasadena. CNPS considers occurrences of this species in the *Hollywood* and *Los Angeles* quadrangles extirpated, and presumes the species is extinct in California.
vernal barley *Hordeum intercedens*	USFWS: None CDFG: None CNPS: List 3.2	Valley and foothill grassland, vernal pools. Known to occur in vernal pools, dry, saline streambeds, and alkaline flats. Grows at elevations 10 to 1,000 meters. Blooms March-June.	Not expected. Not detected during general surveys. Echo Park does not contain suitable habitat for this species. Known from an unspecified occurrence in the *Los Angeles quadrangle*. CNPS considers occurrences of this species in the *Los Angeles* quadrangle possibly extirpated.

Common Name ***Scientific Name***	**Sensitivity Status**[1]	**General Habitat Description**	**Probability of Occurrence**
mesa horkelia *Horkelia cuneata* ssp. *puberula*	USFWS: None CDFG: None CNPS: List 1B.1	Chaparral, cismontane woodland. Known to occur in sandy or gravelly sites. Grows at elevations 70 to 810 meters. Blooms February-July (rarely September).	Not expected. Not detected during general surveys. Echo Park does not contain suitable habitat for this species. The only known occurrences in the vicinity of Echo Park were in 1902 and 1918 in Garvanza and Griffith Park, respectively. CNPS considers occurrences of this species in the *Hollywood* and *Los Angeles* quadrangles extirpated.
Orcutt's linanthus *Linanthus orcuttii*	USFWS: None CDFG: None CNPS: List 1B.3	Chaparral, lower montane coniferous forest. Sometimes known to occur in disturbed areas, often in gravelly clearings. Grows at elevations 1,060 to 2,000 meters. Blooms May-June.	Not expected. Echo Park does not contain suitable habitat for this species. Not detected during general surveys. The only known occurrence in the vicinity of Echo Park was in 1925 in the general area of Pasadena.
prostrate navarretia *Navarretia prostrata*	USFWS: None CDFG: None CNPS: List 1B.1	Coastal scrub, valley and foothill grassland, vernal pools. Known to occur in mesic, alkaline soils in grassland or vernal pools. Grows at elevations 15 to 700 meters. Blooms April-July.	Not expected. Echo Park does not contain suitable habitat for this species. Not detected during general surveys. The only possible occurrence was in 1881 in the Los Angeles vicinity. CNPS considers occurrences of this species in the *Los Angeles* quadrangle as uncertain and possibly extirpated.
white rabbit-tobacco *Pseudognaphalium leucocephalum*	USFWS: None CDFG: None CNPS: List 2	Riparian woodland, cismontane woodland, coastal scrub, chaparral. Known to occur in sandy, gravelly sites. Grows at elevations 0 to 2,100 meters. Blooms (rarely July) August-November (rarely December).	Not expected. Echo Park does not contain suitable habitat for this species. Not detected during general surveys. The only known occurrence was in 1907 in the vicinity of Hollywood. CNPS considers occurrences of this species in the *Hollywood* quadrangle extirpated.
Parish's gooseberry *Ribes divaricatum* var. *parishii*	USFWS: None CDFG: None CNPS: List 1A	Riparian woodland. Known to occur in willow swales in riparian habitats. Grows at elevations 65 to 100 meters. Blooms February-April.	Not expected. Echo Park does not contain suitable habitat for this species. Not detected during general surveys. The only known occurrence was in 1882 in the general area of Pasadena. The CNPS presumes that this species is extinct in California.

Common Name *Scientific Name*	**Sensitivity Status[1]**	**General Habitat Description**	**Probability of Occurrence**
Gambel's water cress *Rorippa gambelii*	USFWS: Endangered CDFG: Endangered CNPS: List 1B.1	Marshes and swamps. Grows at elevations 5 to 1,305 meters. Blooms April-October.	Not expected. Echo Park does not contain suitable habitat for this species. Not detected during general surveys. Known from an unspecified occurrence in the *Hollywood* quadrangl*e*. CNPS considers occurrences of this species in the *Hollywood* quadrangle possibly extirpated.
San Bernardino aster *Symphyotrichum defoliatum*	USFWS: None CDFG: None CNPS: List 1B.2	Meadows and seeps, marshes and swamps, coastal scrub, cismontane woodland, lower montane coniferous forest, grassland. Known to occur in vernally mesic grassland or near ditches, streams and springs; disturbed areas. Grows at elevations 2 to 2,040 meters. Blooms July-November.	Not expected. Echo Park does not contain suitable habitat for this species. Not detected during general surveys. The only known occurrence was in 1902 in Cienega.
Greata's aster *Symphyotrichum greatae*	USFWS: None CDFG: None CNPS: List 1B.3	Chaparral, cismontane woodland. Known to occur in mesic canyons. Grows at elevations 800 to 1,500 meters. Blooms June-October.	Not expected. Not detected during general surveys. Echo Park does not contain suitable habitat for this species. The only known occurrences in the vicinity of Echo Park were in 1902 and 1932 in Arroyo Seco near Garvanza and Elysian Park, respectively. CNPS considers occurrences of this species in the *Los Angeles* quadrangle as uncertain and possibly extirpated.

[1]Sensitivity Status Codes

Federal U.S. Fish and Wildlife Service (USFWS)
State California Department of Fish and Game (CDFG)
Other California Native Plant Society (CNPS)
1A: Presumed extinct in California
1B: Plants rare, threatened, or endangered in California and elsewhere
2: Plants rare, threatened, or endangered in California, but more common elsewhere
3: Plants more information is needed for
4: Plants of limited distribution – a watch list
Threat Ranks
0.1- Seriously threatened in California (high degree/immediacy of threat)
0.2- Fairly threatened in California (moderate degree/immediacy of threat)
0.3- Not very threatened in California (low degree/immediacy of threats or no current threats known)

Sources:- California Native Plant Society (CNPS). 2008. Inventory of Rare and Endangered Plants (online edition, v7-08b). California Native Plant Society. Sacramento, CA. Available at http://www.cnps.org/inventory

- California Department of Fish and Game (CDFG). 2008b (March 30). RareFind: California Department of Fish and Game Natural Diversity Database (Version 3.1.0). California Department of Fish and Game, Biogeographic Data Branch.

Sensitive Wildlife Species

Sensitive wildlife species are those listed as threatened or endangered, proposed for listing, or candidates for listing by the USFWS and CDFG (2008d), or considered sensitive by CDFG (2008a).

A CNDDB query for the *Hollywood* and *Los Angeles* USGS quadrangles resulted in 10 sensitive wildlife species known to occur in the vicinity of the project site. In addition to the 10 species identified by the CNDDB, southwestern pond turtle, silver-haired bat, and western yellow bat were also assessed.

No sensitive animal species were observed within Echo Park during biological reconnaissance surveys. Palm, deciduous and conifer trees within the park may provide roosting habitat for four sensitive bat species known from the region: the hoary bat, western mastiff bat, pallid bat, and western yellow bat. The southwestern pond turtle, a California Species of Special Concern, is the only native turtle species to occur in the greater Los Angeles area. Multiple non-native turtle species are known to occur in Echo Park Lake, however, the likelihood of southwestern pond turtle to occur is low; the nearest recent observation is approximately 120 miles from the lake (CDFG 2008e).

A great blue heron (*Ardea herodias*) rookery was observed on the island within Echo Park lake during the biological reconnaissance surveys. The first pair of great blue herons reported to nest at the lake occurred in 2006. There was also an active heron nest in 2007, and 2008 has marked the first year a rookery (multiple pairs of nesting herons) has occurred at the park. At least three, potentially four, pairs of great blue herons are reportedly nesting on the island at Echo Park in 2008 (Raskin 2008). The great blue heron does not currently have a sensitivity listing, but is protected, along with most bird species found within the vicinity of Echo Park, under the federal Migratory Bird Treaty Act (MBTA) of 1918.

Echo Park lacks suitable habitat and/or food sources for the other sensitive wildlife species identified during the literature search. All sensitive animal species that have potential to occur at Echo Park based on a query of the CNDDB for the *Los Angeles* and *Hollywood* USGS quadrangles are listed in Table 3 along with their sensitivity status and comments on their potential to occur at Echo Park.

Table 3
Sensitive Wildlife Species Known to Occur in the Vicinity of Echo Park

Common Name Scientific Name	Sensitivity Status[1]	Habitat Requirements	Probability of Occurrence
Reptiles			
southwestern pond turtle *Actinemys marmorata pallida*	USFWS: none CDFG: Species of Special Concern	Associated with permanent water or nearly permanent water from sea level to 1830 meter (6000 feet). Prefers habitats with basking sites such as floating mats of vegetation, partially submerged logs, rocks, or open mud banks.	Low. Echo Park Lake contains suitable habitat for this species and non-native turtle species are known to occur in Echo Park; however, the nearest known recent observation of this species is approximately 120 miles from the lake, and as the park is centrally located in an urban area it is unlikely for this species to occur in Echo Park.
coast (San Diego) horned lizard *Phrynosoma coronatum* (*blainvillii* population)	USFWS: none CDFG: Species of Special Concern	Inhabits coastal sage scrub and chaparral in arid and semi-arid climate conditions. Prefers friable, rocky, or shallow sandy soils.	Not expected. Echo Park does not contain suitable habitat for this species. The only known occurrences of this species in the vicinity of Echo Park from a fossil record at La Brea Tar Pits in 1953 and a specimen housed at the Whittier Narrows Nature Center in 1974.
Birds			
burrowing owl *Athene cunicularia*	USFWS: none CDFG: Species of Special Concern	Open, dry annual or perennial grasslands, deserts and scrublands characterized by low-growing vegetation. A subterranean nester, dependent upon burrowing mammals, most notably, the California ground squirrel.	Not expected. Echo Park does not contain suitable habitat for this species. The only known occurrence of this species in the vicinity of Echo Park was in 1921 in Hermon Hills, Los Angeles.
southwestern willow flycatcher *Empidonax traillii extimus*	USFWS: Endangered CDFG: Endangered	Riparian woodlands in southern California.	Not expected. Echo Park does not contain suitable habitat for this species. The only known occurrences of this species in the vicinity of Echo Park were in 1894 and 1906 in the general vicinity of Los Angeles and Pasadena, respectively.
coastal California gnatcatcher *Polioptila californica californica*	USFWS: Threatened CDFG: Species of Special Concern	Obligate, permanent resident of coastal sage scrub below 2,500 feet in southern California. Known to occur in low, coastal sage scrub in arid washes, on mesas and slopes. Not all areas classified as coastal sage scrub are occupied.	Not expected. Echo Park does not contain suitable habitat for this species. The only known occurrence of this species in the vicinity of Echo Park was in 1980 in Baldwin Hills.

Common Name Scientific Name	Sensitivity Status[1]	Habitat Requirements	Probability of Occurrence
Mammals			
pallid bat *Antrozous pallidus*	USFWS: none CDFG: Species of Special Concern WBWG: H	Deserts, grasslands, shrublands, woodlands, and forests. Most common in open, dry habitats with rocky areas for roosting; known to roost in trees. Roosts must protect bats from high temperatures. Very sensitive to disturbance of roosting sites.	Low. Echo Park does not contain suitable habitat for this species. The only known occurrence of this species in the vicinity of Echo Park was in 1971 along Hoover Boulevard on the USC campus.
western mastiff bat *Eumops perotis californicus*	USFWS: none CDFG: Species of Special Concern WBWG: H	Many open, semi-arid to arid habitats, including conifer and deciduous woodlands, coastal scrub, grasslands, chaparral. Primarily a cliff-dwelling species, but also known to roost in high buildings, trees, and tunnels. Roost locations are generally high above the ground, providing a 3m minimum clearance below the entrance for flight. Requires large open-water drinking sites.	Low: Trees and palms within Echo Park provide potential, though unlikely, roosting habitat for this species, and the lake could be utilized as a water source; however, the nearest known occurrences of this species include one in central Alhambra in 1918, one in the general vicinity of Hollywood in 1991, and one in Los Angeles in 1990.
hoary bat *Lasiurus cinereus*	USFWS: none CDFG: none WBWG: M	Prefers open habitats or habitat mosaics, with access to trees for cover and open areas or habitat edges for feeding. Roosts in dense foliage of medium to large trees, and have been found in trees in dense forests, open wooded areas, and urban parks. Feeds primarily on moths. Requires water.	Low: Trees within Echo Park provide potential roosting habitat for this species. The only known occurrences of this species in the vicinity of Echo Park were in 1894 and 1906 in the general vicinity of Los Angeles and Pasadena, respectively.
south coast marsh vole *Microtus californicus stephensi*	USFWS: none CDFG: Species of Special Concern	Tidal marshes in Los Angeles, Orange, and southern Ventura counties.	Not expected. Echo Park does not contain suitable habitat for this species. The only known occurrence of this species in the vicinity of Echo Park was in 1957 in the general vicinity of Culver City and Baldwin Hills.
big free-tailed bat *Nyctinomops macrotis*	USFWS: none CDFG: Species of Special Concern WBWG: MH	Low-lying arid areas in southern California; need high cliffs or rocky outcrops for roosting sites; feeds principally on large moths	Not expected. Echo Park does not contain suitable habitat for this species. The only known occurrence of this species is in the vicinity of central Los Angeles in 1985.
silver-haired bat *Lasionycteris noctivagans*	USFWS: none CDFG: none WBWG: M	Primarily coastal and montane forest dweller; feeds over streams, ponds and open brushy areas. Roosts in hollow trees, beneath exfoliating bark, abandoned woodpecker holes, and rarely under rocks. Requires water.	Low: Trees within Echo Park provide potential roosting habitat for this species. The only known occurrences of this species in the vicinity of Echo Park are from specimens collected in 1985 in the general vicinity of West Los Angeles and Van Nuys and in 1978 in the vicinity of La Canada.

Common Name Scientific Name	Sensitivity Status[1]	Habitat Requirements	Probability of Occurrence
western yellow bat *Lasiurus xanthinus*	USFWS: none CDFG: none WBWG: H	Found in valley foothill riparian, desert riparian, desert wash, and palm oasis habitats occasionally in urban and sub-urban areas. Roosts in trees, particularly palms; forages over water and among trees.	Low: Palm trees within Echo Park provide potential roosting habitat for this species. The only known occurrence of this species in the vicinity of Echo Park however, is known from a specimen collected in 1984 in the vicinity of Glendale.
American badger *Taxidea taxus*	USFWS: none CDFG: Species of Special Concern	Most abundant in drier open stages of shrub, forest, and herbaceous habitats with friable soils. Requires sufficient food, friable soils and open uncultivated ground. Preys on burrowing rodents, digs burrows.	Not expected. Echo Park does not contain suitable habitat for this species. The only known occurrence of this species is from a collection from the vicinity of Los Angeles with no specified date.

[1] **Sensitivity Status Key**

Federal:
U.S. Fish and Wildlife Service (USFWS)
State:
California Department of Fish and Game (CDFG)
Other:
Western Bat Working Group (WBWG)
- -H: High Priority
- -M: Medium Priority
- -MH: Medium-High Priority

Sources

- California Department of Fish and Game (CDFG). 2008b (March 30). RareFind: California Department of Fish and Game Natural Diversity Database (Version 3.1.0). California Department of Fish and Game, Biogeographic Data Branch.
- Sibley, D.A. 2001. The Sibley Guide to Bird Life and Behavior. Alfred A. Knopf, New York.

Wildlife Corridors

In an urban context, a wildlife migration corridor can be defined as a linear landscape feature of sufficient width and buffer to allow animal movement between two patches of comparatively undisturbed habitat, or between a patch of habitat and some vital resources. Regional corridors are defined as those linking two or more large areas of natural open space, and local corridors are defined as those allowing resident animals to access critical resources (food, cover, and water) in a smaller area that might otherwise be isolated by urban development.

Wildlife migration corridors are essential in geographically diverse settings, and especially in urban settings, for the sustenance of healthy and genetically diverse animal communities. At a minimum, they promote colonization of habitat and genetic variability by connecting fragments of like habitat and they help sustain individual species distributed in and among habitat fragments. Habitat fragments, by definition, are separated by otherwise foreign or inhospitable habitats, such as urban/suburban tracts. Isolation of populations can have many harmful effects and may contribute significantly to local species extinction.

A viable wildlife migration corridor consists of more than a path between habitat areas. To provide food and cover for transient species as well as resident populations of less mobile animals, a wildlife migration corridor must also include pockets of vegetation.

There are no adjacent large open space areas south of Echo Park. Topanga State Park, Angeles National Forest, Griffith Park, and Elysian Park contain suitable habitat for a variety of wildlife, and are located approximately 15 miles west, 10 miles north, 3 miles northwest, and less than one mile east of Echo Park, respectively. Echo Park, along with the nearby Los Angeles River and Silverlake Reservoir, approximately 2 miles east and 1 mile north of Echo Park, respectively, provides a valuable water resource and suitable nesting habitat for migratory and resident bird populations. However, it is not part of a major contiguous linkage between two or more large areas of open space, and thus does not serve as a regional wildlife corridor.

CHAPTER 3.0
IMPACT ANALYSIS

The proposed project would result in both direct and indirect impacts to biological resources. Biological resources may be either directly or indirectly impacted. Direct and indirect impacts may furthermore be either permanent or temporary in nature. These impacts are defined below.

Direct: Any alteration, disturbance, or destruction of biological resources that would result from project-related activities is considered a direct impact. Examples include clearing vegetation, encroaching into wetlands, diverting surface water flows, and the loss of individual species and/or their habitats.

Indirect: As a result of project-related activities, biological resources may also be affected in a manner that is not direct. Examples include elevated noise and dust levels, soil compaction, increased human activity, decreased water quality, and the introduction of invasive wildlife (domestic cats and dogs) and plants.

Permanent: All impacts that result in the irreversible removal of biological resources are considered permanent. Examples include constructing a building or permanent road on an area containing biological resources.

Temporary: Any impacts considered to have reversible effects on biological resources can be viewed as temporary. Examples include the generation of fugitive dust during construction, or removal of vegetation for underground pipeline trenching activities and allowing the natural vegetation to recolonize the impact area.

Significant biological impacts include, but are not restricted to:

- All impacts to federally or state listed species or sensitive habitats.
- Impacts to high-quality or undisturbed biological communities and vegetation associations that are restricted on a regional basis or serve as wildlife corridors.
- Impacts to habitats that serve as breeding, foraging, nesting, or migrating grounds that are limited in availability or serve as core habitats for regional plant and wildlife populations.

Adverse but not significant impacts would include:

- Impacts that adversely affect biological resources but would not significantly change or stress the resources on a long-term basis.
- Impacts to biological resources that are already disturbed or lack importance in the preservation of local or regional native biological diversity and productivity.

REGULATORY SETTING

The following provides a general description of the regulations that may pertain to the biological resources detected within Echo Park.

City of Los Angeles Tree Protection Ordinance

Section 17.02 of the Los Angeles Municipal Code protects the following Southern California native tree species, which measures four inches or more in cumulative diameter, four and one-half feet above the ground level at the base of the tree:

(a) Oak trees including Valley Oak (*Quercus lobata*) and California Live Oak (*Quercus agrifolia*), or any other tree of the oak genus indigenous to California but excluding the Scrub Oak (*Quercus dumosa*).
(b) Southern California Black Walnut (*Juglans californica* var. *californica*)
(c) Western Sycamore (*Platanus racemosa*)
(d) California Bay (*Umbellularia californica*)

Relocation or removal of any protected trees is prohibited without a permit or exemption from the Board of Public Works or its designated officer or employee.

Migratory Bird Treaty Act

The MBTA restricts the killing, taking, collecting, and selling or purchasing of native bird species or their parts, nests, or eggs. Certain gamebird species are allowed to be hunted for specific periods determined by federal and state governments. The intent of the MBTA is to eliminate any commercial market for migratory birds, feathers, or bird parts, especially for eagles and other birds of prey. Although no permit is issued under the MBTA, if vegetation removal within the project area occurs during the breeding season for raptors and migratory birds (February 15 through September 15), the USFWS requires that surveys be conducted to locate active nests within the construction area. If active raptor or migratory bird nests are detected, project activities may be temporarily curtailed or halted.

Section 404 of the Clean Water Act

Pursuant to Section 404 of the Clean Water Act, the ACOE regulates the discharge of dredged or fill material into waters of the U.S. Waters of the U.S. have been defined as:

> "… (1) all waters which are currently used, or were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide; (2) all interstate waters including interstate wetlands; (3) all other waters such as intrastate lakes, rivers, streams (including intermittent streams), mudflats, sandflats, wetlands, sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds, the use, degradation or destruction of which could affect interstate or foreign commerce including such waters: (i) which are or could be used by interstate or foreign travelers for recreational or other purposes; or (ii) from which fish or shellfish are or could be taken and sold in interstate or foreign commerce; or (iii) which are used or could be used for industrial purposes by industries in interstate commerce; (4) all impoundments of waters otherwise defined as waters of the United States under the definition; (5) tributaries of waters identified in paragraphs (1) through (4) of this section; (6) the territorial seas; and (7) wetlands adjacent to waters identified in paragraphs (1) through (6) …" (33 CFR 328.3[b]; 40 CFR 230.3[t]).

However, as a result of a U.S. Supreme Court decision (*Solid Waste Agency of Northern Cook County v. U.S. Army Corps of Engineers*, No. 99-1178, January 9, 2001), the ACOE no longer has regulatory authority over many isolated intrastate waters, including wetlands.

The ACOE defines wetlands as:

> "Those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas" (33 CFR 328.3[b]; 40 CFR 230.3[t]).

In the absence of wetlands, the limits of ACOE jurisdiction in nontidal waters, such as rivers, streams, lakes, and ponds, extends to the Ordinary High Water Mark.

Section 401 of the Clean Water Act

The Regional Water Quality Control Board (RWQCB) has primary authority for permit and enforcement activities under the Porter-Cologne Water Quality Control Act (Cal. Water Code 13000-13999.10) and Section 401 of the Clean Water Act. Section 401 of the Clean Water Act requires certification from the California RWQCB that the proposed project is in compliance with established water quality standards. Projects that have the potential to discharge pollutants are required to comply with established water quality objectives.

The RWQCB reviews a project to determine whether the activity would comply with state water quality objectives and, subsequently, either issues a certification with conditions or denies the certification. No license or permit may be issued by a federal agency until certification required by Section 401 has been granted. Under the Clean Water Act, Section 404 permits are subject to RWQCB Section 401 water quality regulation. The ACOE cannot issue an individual or nationwide 404 permit until a 401 certification has been obtained from the RWQCB.

Section 1600 of the California Fish and Game Code

Under Sections 1600-1616 of the California Fish and Game Code, the CDFG regulates activities that would alter the flow, bed, channel, or bank of streams and lakes. The limits of CDFG jurisdiction are defined in the code as the "bed, channel or bank of any river, stream or lake designated by the department in which there is at any time an existing fish or wildlife resource or from which these resources derive benefit." The California Code of Regulations (14 CCR 1.72) defines a stream as:

> "[A] stream is a body of water that flows at least periodically or intermittently through a bed or channel having banks and supports fish or other aquatic life. This includes watercourses having a surface or subsurface flow that supports or has supported riparian vegetation."

In practice, the CDFG usually extends its jurisdictional limit to the top of a stream or lake bank, or outer edge of the riparian vegetation, whichever is wider. Riparian habitats do not always have identifiable hydric soils, or clear evidence of wetland hydrology as defined by the ACOE. Therefore, CDFG wetland boundaries often extend beyond ACOE wetland boundaries, which sometimes include only portions of the riparian habitat adjacent to a river, stream, or lake. Jurisdictional boundaries under Sections 1600-1616 may encompass an area that is greater than that under the jurisdiction of Section 404 (Cylinder et al. 1995).

DIRECT IMPACTS

The following section presents the potential effects to biological resources that will result from implementation of the proposed project. Because site designs have not been finalized, the impacts analyzed herein may change and require additional analysis. This analysis assumes that, as described in the Final Concept Plan, impacts to trees will be avoided as part of the proposed project.

Vegetation

Construction of the proposed project could result in direct, permanent impacts to landscaped vegetation due to establishment of staging areas and construction activities. Impacts to landscaped vegetation would not be considered significant.

Protected Trees

Echo Park contains at least one western sycamore tree, a species protected by the City of Los Angeles. The proposed project is not anticipated to impact any trees at Echo Park; therefore, no direct impacts to protected trees are anticipated.

Jurisdictional Waters of the U.S. and State Waters

Jurisdictional delineations were not performed as part of the biological reconnaissance surveys. The determination of jurisdictional waters would be determined through consultation with the U.S. Army Corps of Engineers (USACE) and/or the California Department of Fish and Game (CDFG). Direct impacts to state and federally regulated waters would be considered significant and would require mitigation in accordance with USACE and CDFG requirements. A separate memorandum will be prepared by EDAW evaluating the permitting requirements for this project.

Sensitive Plants

No sensitive plant species were detected within the survey area, and the site is not expected to support sensitive plant species due to lack of suitable habitat. No impacts to sensitive plants are expected due to the proposed project.

Sensitive Wildlife and Wildlife Corridors

Only six sensitive animal species, southwestern pond turtle, pallid bat, western mastiff bat, hoary bat, western yellow bat, and silver-haired bat, have low potential to be present in Echo Park. No other sensitive animal species are expected.

Direct impacts to the southwestern pond turtle would be considered significant. However, the likelihood of southwestern pond turtle to occur is extremely low; the nearest recent observation is approximately 120 miles from the lake (CDFG 2008e).

Sensitive bats have a low potential to occur in Echo Park. Direct impacts to sensitive bats would be considered significant. The proposed project is not anticipated to impact any trees at Echo Park, therefore no direct impacts to sensitive bats are anticipated.

The floating wetlands provide suitable nesting habitat for migratory birds such as Canada geese (*Branta canadensis*). If migratory birds were found to be nesting in the artificial wetlands, temporary removal of the floating wetlands during the breeding season would constitute a significant impact to nesting waterfowl under the protection of the MBTA.

Although Echo Park is not part of a major contiguous linkage between areas of open space, direct impacts may occur to local wildlife movement corridors as a result of the proposed project. Temporary loss of open water habitat would have a significant impact on local wildlife such as birds, fish, turtles, and other wildlife that utilize the lake.

INDIRECT IMPACTS

Indirect impacts were analyzed based on the Final Concept Plan.

Vegetation

Indirect impacts, including deposition of fugitive dust onto adjacent landscaping, may occur. However, due to the lack of legal status for landscaped plants, these indirect impacts would not be considered significant.

Protected Trees

Indirect impacts including deposition of fugitive dust onto trees including western sycamore, may occur. However, with implementation of BMPs, these indirect impacts would not be considered significant.

Sensitive Plants

No sensitive plant species were detected within the survey area, and the site is not expected to support sensitive plant species due to lack of suitable habitat. No indirect impacts to sensitive plants are expected due to the proposed project.

Sensitive Wildlife Species and Wildlife Corridors

Potential indirect noise impacts may occur to native migratory birds from short-term construction noise, including nesting great blue herons on the island in the northeastern corner of the lake. These impacts would be considered significant during the breeding season (February 15- August 31).

Sensitive bats have a low potential to occur in Echo Park. Noise and construction activities would constitute indirect impacts to sensitive bats that would be considered significant.

No nighttime construction is expected to occur; therefore, potential indirect impacts associated with wildlife movement during the night and early morning hours will be less than significant.

CHAPTER 4.0
MITIGATION

The following general mitigation measures are recommended for all construction activities. These measures are standard construction specifications to prevent environmental degradation during construction.

GENERAL MITIGATION REQUIREMENTS

1. Provision should be made to inform the construction contractor(s), prior to the bidding process, about the biological constraints of this project. The contractor(s) will be responsible for impacts to sensitive biological resources beyond those identified in this report that occur as a direct result of construction activities. All sensitive habitat areas to be avoided should be clearly marked on project maps provided to the contractor. These areas should be designated as "no construction" zones. These areas should be flagged by the project biologist prior to the onset of construction activities. In some cases, resources may need to be fenced or otherwise protected from direct or indirect impacts.

2. A contractor education program should be implemented to ensure that contractors and all construction personnel are fully informed of the biological resources associated with this project. This program should focus on (a) the purpose for resource protection; (b) contractor identification of sensitive resource areas in the field (e.g., areas delineated on maps and by flags or fencing); (c) sensitive construction practices (see numbers 3 through 9, below); (d) protocol to resolve conflicts that may arise at any time during the construction process; and (e) ramifications of noncompliance. This program should be conducted by a qualified biologist.

3. Activities are prohibited within drainages or other wetland areas, including staging areas, equipment access, and disposal or temporary placement of excess fill.

4. Vehicles should use existing access roads to the degree feasible. Where new access is required, all vehicles should use the same route, even if this requires heavy equipment to back out of such areas. All access routes outside of existing roads or the construction corridor should be clearly marked (i.e., flagged and/or staked) prior to the onset of construction. All access roads outside of existing roads or the construction corridor should be delineated on the grading plans and reviewed by a qualified biologist.

5. Topsoil should be stockpiled in disturbed areas presently lacking vegetation, if possible. Stockpile areas will be delineated on the grading plans and reviewed by a qualified biologist.

6. Staging areas should be located in disturbed habitat, to the degree feasible. Staging areas are prohibited within sensitive habitat areas. Staging areas will be delineated on the grading plans and reviewed by a qualified biologist. If staging areas outside the construction footprint are used, they will be surveyed for biological resources.

7. Fueling of equipment should take place within existing paved roads, and not within or adjacent to drainages or native habitats. Contractor equipment will be checked for leaks prior to operation and repaired as necessary. "No-fueling zones" will be designated on construction maps and will be situated a minimum distance of 50 feet from all drainages.

8. Construction in or adjacent to sensitive areas will be appropriately scheduled to minimize potential impacts to biological resources.

9. Erosion and siltation into off-site areas during construction will be minimized. An erosion control plan and a Storm Water Pollution Prevention Plan will be required of the contractor. The contract supervisor will be responsible for ensuring that the erosion control plan is developed and implemented. The plan will include the use of hay bales, silt fences, siltation basins, or other devices necessary to stabilize the soil in denuded or graded areas during the construction and revegetation phases of the project.

RESOURCE-SPECIFIC MITIGATION

The preferable mitigation is the avoidance of impacts to sensitive resources by project design. If avoidance is not possible, all feasible mitigation measures should be incorporated into the project such that minimal environmental damage occurs.

Sensitive Vegetation Communities

The site does not support any sensitive vegetation communities, therefore no mitigation for impacts to sensitive vegetation communities are required.

Sensitive Plants

The site is not expected to support sensitive plants, therefore no mitigation for impacts to sensitive plants are required.

Jurisdictional Waters of the U.S. and State Waters

Jurisdictional delineations were not performed as part of biological reconnaissance surveys, however, several state and local permits related to jurisdictional waters that would be required prior to the start of construction. These include, but are not limited to:

- Construction General Permit issued by State Water Resources Control Board (SWRCB) which includes the Storm water Pollution Prevention Plan (SWPPP).
- Erosion Control Plan - Approval by LA City Department of Building & Safety & filing of a Notice of Intent (NOI) with State Water Resources Control Board
- Grading & Export Permit from LA City Department of Building & Safety
- Floodplain Mapping Review
- United States Army Corps of Engineers (USACOE) Nationwide Permit: A Nationwide Permit can be obtained for temporary impacts that result from cut and fill activities within the waters of the US (this assumes that the lake falls under USACE jurisdiction)
- United States Army Corps of Engineers (USACOE) 404 Permit
- Regional Water Quality Control Board (RWQCB) 401 Permit
- Section 7 Consultation with the United States Fish and Wildlife Service (USFWS)
- California Department of Fish and Game (CDFG) 1602 Lake and Streambed Alteration Note: CDFG was contacted during the Concept Report phase, CDFG indicated that Echo Lake Park will require a 1602 Lake and Streambed Alteration Notification, and further suggested that the lake be drained/dredged in sections to allow for fish to remain in the lake.

Impacts to the jurisdictional areas on-site may require mitigation. Mitigation could be accomplished through on-site creation, as a part of the proposed project.

Sensitive Wildlife Species

The southwestern pond turtle, a California Species of Special Concern, has low potential to be present at Echo Park Lake. If a southwestern pond turtle is found at Echo Park, the City, or its contractor, must halt all clearance/construction disturbance activities and contact the CDFG immediately and act upon their direction.

Five sensitive bat species, pallid bat, western mastiff bat, hoary bat, western yellow bat and silver-haired bat, have low potential to be present in Echo Park. Pre-construction presence/absence bat roosting surveys for five sensitive species should be performed to detect any bats utilizing trees or structures in Echo Park as roost sites.

Potential direct and indirect impacts to nesting avian and raptor species will be mitigated by performing preconstruction nest surveys and avoidance of any active nests. Clearing of vegetation prior to the nesting period may be conducted to avoid the potential for project delays due to nesting birds and the need to adhere to the MBTA.

Should commencement of construction activities in the project site occur during the breeding season for migratory non-game native bird species (February 15 through September 15), a preconstruction bird survey should be performed to detect any protected native birds in the trees to be removed and other suitable nesting habitat within 300 feet of the construction work area (500 feet for raptors). The survey would be conducted no more than 72 hours prior to the disturbance of suitable nesting habitat by a qualified biologist with experience in conducting nesting bird surveys. If a protected (i.e. nesting) native bird is found, the City, or its contractor, must halt all clearance/construction disturbance activities in suitable nesting habitat or within 300 feet of nesting habitat (within 500 feet for raptor nesting habitat) until August 31 or continue the surveys in order to locate any nests. If an active nest is located, clearing and construction within 300 feet of the nest (within 500 feet for raptor nests) must be postponed until the nest is vacated and juveniles have fledged and when there is no evidence of a second attempt at nesting. Limits of construction to avoid a nest should be established in the field with flagging and stakes or construction fencing. Construction personnel should be instructed on the sensitivity of the area. A biological monitor should be present during construction activities that occur within 200 feet of any flagged boundaries. Once a flagged nest is determined to be no longer active, the biological monitor would remove all flagging and allow construction activities to proceed.

EDAW is preparing a Wildlife Relocation Plan for Echo Park Lake, which will include additional mitigation measures to reduce impacts to wildlife to a less than significant level during construction of the project.

CHAPTER 5.0
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APPENDIX A
PLANT SPECIES OBSERVED ON-SITE

APPENDIX A
PLANT SPECIES OBSERVED OR KNOWN TO OCCUR ON-SITE

Scientific Name	Common Name
Acacia melanoxylon	black acacia
Agapanthus orientalis	lily-of-the-Nile
Ailanthus altissima	tree of heaven
Albizia jullbrissin	floss silk tree
*Alnus rhombifolia**	white alder
Asperagus densiflorus 'Sprengeri'	Sprenger asparagus
Bambusa multiplex	hedge bamboo
Bougainvillea sp.	bougainvillea
Brachychiton acerifolia	flame tree
Butia capitata	pindo palm
Calodendron capense	Moreton Bay chestnut
Callistemon viminalis	weeping bottlebrush
Cassia leptophylla	gold medallion tree
Chamaerops humilis	European fan palm
x Chitalpa tashkentensis	chitalpa
Chorisia speciosa	floss silk tree
Cortaderia jubata	pampas grass
Cupaniopsis anacardioides	carrot wood
Cupressus sempervirens	Italian cypress
Cyathea cooperi	Australian tree fern
Erythrina caffra	naked coral tree
Eucalyptus citriodora	lemon scented gum
Eucalyptus polyanthemos	silver dollar gum
Eucalyptus sp.	eucalyptus species
Ficus carica	edible fig
Ficus elastica	rubber tree
Ficus petiolaris	petiolate fig
Ficus pumila	creeping fig
Ficus sp. (probably *microcarpa nitida*)	ficus
Fraxinus oxycarpa 'Raywood'	raywood ash
Fraxinus uhdei	shamel ash
Grevillea robusta	silk oak
Hedera helix	English ivy
Hemerocallis middendorffii	daylily
Hibiscus rosa-sinensis	hibiscus
Lagunaria patersonii	cow itch tree
Lantana sp.	lantana
Limonium perezii	statice
Liquidambar styraciflua	sweet gum
Melaleuca quinquenervia	cajeput tree

Scientific Name	Common Name
Magnolia grandiflora	southern magnolia
Metasequoia glyptostroboides	dawn redwood
Nelumbo nucifera	sacred lotus
Nerium oleander	oleander
Nicotiana glauca	tree tobacco
Phoenix canariensis	Canary Island date palm
Phoenix reclinata	Senegal date palm
Phormium tenax	New Zealand flax
Pinus halepensis	Aleppo pine
Pinus pinea	Italian stone pine
Pinus canariensis	Canary Island pine
Pittosporum undulatum	Victorian box
Platanus racemosa	western sycamore
Plumbago auriculata	cape plumbago
Podocarpus gracilior	fern pine
Podocarpus macrophyllus ‘Maki’	yew pine
Prunus persica	peach
Pterocarya fraxinifolia	Caucasian wingnut
Rhaphiolepis indica	Indian hawthorn
Rubus discolor	Himalayan blackberry
Sequoia sempervirens	redwood
Strelitzia reginae	bird of paradise
Syagrus romanzoffianum	queen palm
Taxodium mucronatum	Montezuma cypress
Trachycarpus fortunei	windmill palm
Typhus sp.	cattail
Ulmus parvifolia	Chinese elm
*Washingtonia filifera**	California fan palm
Washingtonia robusta	Mexican fan palm

* Indicates a native species

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APPENDIX B
ANIMAL SPECIES OBSERVED ON-SITE

APPENDIX B

ANIMAL SPECIES OBSERVED DURING BIOLOGICAL RECONNAISSANCE SURVEYS

Species	Common Name
REPTILIA	**REPTILES**
Pseudemys scripta elegans	Red-eared slider
Trachemys scripta scripta	Yellow-bellied slider
AVES	**BIRDS**
Anas platyrhynchos	Mallard
Anser Anser	Graylag (Barnyard) goose
Anser cygnoides	Swan (Chinese) goose
Aphelocoma californica	Western scrub jay
Ardea herodias	Great blue heron
Bombycilla cedrorum	Cedar waxwing
Branta canadensis	Canada goose
Calypte anna	Anna's hummingbird
Carduelis psaltria	Lesser goldfinch
Carpodacus mexicanus	House finch
Columbia livia	Rock dove
Corvus brachyrhynchos	American crow
Dendroica coronata	Yellow-rumped warbler
Euphagus cyanocephalus	Brewer's blackbird
Fulica americana	American coot
Larus spp.	Gulls
Molothrus ater	Brown-headed cowbird
Passer domesticus	House sparrow
Phalacrocorax auritus	Double-crested cormorant
Podilymbus podiceps	Pied-billed grebe
Quiscalus mexicanus	Great-tailed grackle
Sayornis nigricans	Black phoebe
Sturnus vulgaris	European starling
Zenaida macroura	Mourning dove
MAMMALIA	**MAMMALS**
Spermophilus beecheyi	California ground squirrel

Echo Park Christmas Bird Count
Summary, 2000-2007

Common Name	Scientific Name	2000	2001	2002	2003	2004	2005	2006	2007
Cooper's Hawk	*Accipiter cooperii*		1						
White-throated Swift	*Aeronautes saxatalis*	5			95	50		3	6
American Wigeon	*Anas americana*	14	16	24	17	29	20	27	26
Northern Shoveler	*Anas clypeata*								5
Mallard Duck	*Anas platyrhynchos*	620	55	46	70	26	30	55	53
Gadwall	*Anas strepera*	2		6	4				
Western Scrub Jay	*Aphelocoma californica*							1	
Great Egret	*Ardea alba*	2							
Great Blue Heron	*Ardea herodias*	4			1		1	1	
Redhead	*Athya americana*							1	
Ring-necked Duck	*Aytha collaris*	50	42	66	16	7	3	6	
Lesser Scaup	*Aythya affinis*		1					1	
Greater Scaup	*Aythya marila*				2				
Cedar Waxwing	*Bombycilla cedrorum*		10	24	52	24			
Canada Goose	*Branta canadensis*	1		1				5	8
Yellow-chevroned Parakeet	*Brotogeris chiriri*	2	10	3	5		12	4	7
Red-tailed Hawk	*Buteo jamaicensis*	5	1	1	6	1		1	1
Green Heron	*Butorides virescens*	1	2	4	2				
Vaux's Swift	*Caetura vauxi*								1
Anna's Hummingbird	*Calypte anna*	3		4	3	1		4	2
Lesser Goldfinch	*Carduelis psaltria*					5			
House Finch	*Carpodacus mexicanus*	12		10	10	7		2	11
Purple Finch	*Carpodacus purpureus*			1					
Belted Kingfisher	*Ceryle alcyon*		1						
Ross's Goose	*Chen rossii*						1	1	1
Northern Flicker	*Colaptes auratus*								1
Rock Dove	*Columbia livia*	300	350	176	515	334	100	195	247
American Crow	*Corvus brachyrhynchos*		5	1	4			2	2
Yellow-rumped Warbler	*Dendroica coronata*	20	8	12	13	4		17	26
Black-throated Gray Warbler	*Dendroica nigrescens*				2				
Townsend's Warbler	*Dendroica townsendi*			1	2	2			1
Brewer's Blackbird	*Euphagus cyanocephalus*	50	61	189	50	114	20	30	73
Peregrine Falcon	*Falco peregrinus*		1						

Common Name	Scientific Name	2000	2001	2002	2003	2004	2005	2006	2007
American Kestrel	*Falco sparverius*				1				
American Coot	*Fulica americana*	350	400	506	250	241	200	327	229
Common Yellowthroat	*Geothlypis trichas*		1						
Herring Gull	*Larus argentatus*		1	20	36				
California Gull	*Larus californicus*	100		10	4		2		12
Ring-billed Gull	*Larus delawarensis*		2		6	16	2		1
Glaucous-winged Gull	*Larus glaucescens*		6						
Western Gull	*Larus occidentalis*	100	50	75		109	40	137	146
Thayer's Gull	*Larus thayeri*		1						1
Northern Mockingbird	*Mimus polyglottos*	3	1	2	2				2
Brown-headed Cowbird	*Molothrus ater*	6							29
Black-crowned Night Heron	*Nycticorax nycticorax*	2	4	3	1	2	1	3	5
Ruddy Duck	*Oxyura jamaicensis*	20	34	35	30	2		4	
House Sparrow	*Passer domesticus*	20	13	19	6	9		18	2
White Pelican	*Pelicanus erythrorhynchos*				1				
Double-crested Cormorant	*Phalacrocorax auritus*	20	48	6	7	3	4	13	2
Nutall's Woodpecker	*Picoides nuttallii*		1						
Pied-billed Grebe	*Podilymbus podiceps*	16	17	7	8	5		4	4
Great-tailed Grackle	*Quiscalus mexicanus*		3	1				43	128
Ruby-crowned Kinglet	*Regulus calendula*			2				1	
Black Phoebe	*Sayornis nigricans*		1					3	1
Allen's Hummingbird	*Selaasphorus sasin*		3	1					
Red-breasted Sapsucker	*Sphyrapicus ruber*					1			
Caspian Tern	*Sterna caspia*				1				
Spotted Dove	*Streptopelia chinensis*	4	6	1					
European Starling	*Sturnus vulgaris*	5	11	12	12	22		3	116
Cassin's Kingbird	*Tyrannus vociferans*					1			2
Mourning Dove	*Zenaida macroura*	20	1	3				1	
	Total Individuals	1757	1168	1272	1234	1015	436	913	1151
	Total Species	29	35	33	33	24	15	30	32

Source: Judy Raskin, 2008.

APPENDIX C
Representative Site Photos

APPENDIX C
REPRESENTATIVE SITE PHOTOS – ECHO PARK LAKE

Photo 1. View from the north of the park, southern aspect. Grassy lawn, mature shade trees, and palm trees landscape the perimeter of the park.

Photo 2. Ornamental shrubs bordering the southern end of Echo Park Lake. Mature trees and palms in the background line the perimeter of the park and Bellvue Avenue.

Photo 3. Southerly view of the lotus beds, located in the northwestern lobe of the lake. Four small floating wetlands in background. Lake bordered by mature trees, palms and grassy lawns.

Photo 4. Lotus beds are evident by only a few stalks and leaves.

Photo 5. Northwesterly view of one of four floating wetlands. Lake bordered by mature trees, palms and grassy lawns.

Photo 6. Westerly view. The island located in the northeastern lobe of the lake. Cattails adorn the island's perimeter. Great blue herons are nesting in the ornamental pines located at the center of the island.

Photo 7. Great blue heron rookery located in mature pine trees on the island.

Photo 8. Yellow-bellied and red-eared sliders basking on the island's banks, between cattails.

Photo 9. Northerly view. Echo Park historic boathouse and associated structures located on the west side of the lake. Grassy lawn and walking path in foreground. Ornamental trees and palms in background.

City of Los Angeles, Department of Public Works

Bureau of Engineering

Prop O - Clean Water Bond Program

Echo Park Lake Rehabilitation Project

Technical Memorandum No. 4

Wildlife Relocation Plan

October 2008

In Association with:

B&V Project No. 160464

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ABBREVIATIONS AND ACRONYMS

The following abbreviations and acronyms are used in this Technical Memorandum.

B&V	Black & Veatch
BMP	Best Management Practice
BOE	City of Los Angeles Bureau of Engineering
BOS	City of Los Angeles Bureau of Sanitation
CEQA	California Environmental Quality Act
City	City of Los Angeles
CNDDB	California Natural Diversity Base
CNPS	California Native Plant Society
Concept Report	Echo Park Lake Rehabilitation Final Concept Report
County	County of Los Angeles
DFG	Department of Fish and Game
DRP	City of Los Angeles Department of Recreation and Parks
cfs	cubic feet per second
DSOD	California Division Department of Safety of Dams
HDPE	high density polyethylene
Lake	Echo Park Lake
PCB	polychlorinated biphenyls
PDR	Preliminary Design Report
PPM	parts per million
Project	Echo Park Lake Rehabilitation Project
Prop O	Proposition O Clean Water Bond Program
RWQCB	Regional Water Quality Control Board
TM	Technical Memorandum
TMDL	Total Maximum Daily Load

EXECUTIVE SUMMARY

Echo Park Lake (Lake) is a 13-acre urban lake surrounded by 16 acres of recreational open space located within the Echo Park/Silverlake community of the City of Los Angeles (City). The objective of the Echo Park Lake Rehabilitation Project (Project) is to improve water quality in both the lake and the Los Angeles River Watershed by rehabilitating the lake so it can contribute to improving the water quality of urban runoff in the watershed.

During the Project, the Lake water will be drained, and aquatic wildlife will need to be removed and relocated. Associated upland wildlife may also be affected by various phases of project construction. This technical memorandum (TM) presents the Wildlife Relocation Plan for the Project. The plan provides a summary of the species expected to be encountered during Lake draw-down and other phases of Project construction and the recommended steps to relocate these animals or to avoid impacts, as appropriate. The final measures required for each species group may need to be modified based on final Project construction plans (including Project timing), the types of species encountered, physical conditions of the Lake, and associated changes in wildlife handling requirements stipulated by wildlife agency personnel particularly the California Department of Fish and Game (DEG). The successful implementation of the Wildlife Relocation Plan will require regular, ongoing coordination between project biologists, project engineers, and wildlife agency personnel.

Handling and relocation methods, and/or avoidance methods for the following wildlife species are included:

<u>Relocation</u>

* Game fish including trout, catfish, bass, sunfish
* Non-native, introduced fish
* Native turtles, including western pond turtle
* Non-native turtles, including sliders
* Native amphibians
* Other reptiles and amphibians

<u>Avoidance</u>

* Great blue heron
* Other migratory and local resident birds, including ducks, coots, and songbirds
* Mammals, including bats

Additional information is presented in three technical appendices: A, B, and C.

1.0 INTRODUCTION

1.1 Background

As shown on Figure 1, the Lake is part of an existing storm drain system that provides hydraulic relief during storm events in the form of flood control before discharging to the Los Angeles River. Two City storm drains, housed in a large concrete structure, empty into the Lake at the northeastern end, and the Lake outlet is located at the southern end. On the west side of the Lake, Los Angeles County maintains a flood control outfall, which is designed to flow into the Lake during high flows and is diverted during low flows. Water quality is a serious concern in the Lake, which was identified on the 2006 California 303(d) list of impaired water bodies for the following pollutants/stressors: algae, ammonia, copper, eutrophic, lead, odor, polychlorinated biphenyls (PCBs), pH, and trash. The City received Proposition O (Prop O) funding to finance the design and construction of facilities that provide water quality benefits and reduce pollutant loads to the impaired waters of the City to meet water quality standards.

1.2 Project Objectives

The overall Project objective is to improve water quality in both the Lake and the Los Angeles River Watershed by rehabilitating the Lake so it can contribute to improving the water quality of urban runoff in the watershed. A significant reduction in pollutants will assist the City in meeting current and future Total Maximum Daily Load (TMDL) requirements.

Another objective is to reduce the use of municipal water to maintain the water level of the Lake. Deterioration of the storm drain system infrastructure prevents the Lake from functioning as it was designed. As a result, the City supplies the Lake with significant quantities of potable water to maintain the Lake level.

The Lake and associated recreational space are assets to the community, providing recreational opportunities such as boating and fishing. The lotus flowers located in the northwest lobe of the Lake are enjoyed by park visitors and are the focus of festivals and cultural events. Another objective is to improve conditions of the lotus bed, as well as habitat conditions for fish and other wildlife around the Lake.

1.3 Project Features

The proposed Project is currently in the preliminary design phases; therefore, exact details of proposed activities are conceptual at this point. However, an overall approach to improve water quality and restore habitat has been determined. Specific improvements are categorized as: (a) In-Lake Basin Improvements; (b) In-Lake Vegetation and Habitat Improvements; and (c) Parkland Structural Best Management Practices (BMPs). To conduct In-Lake Basin Improvements, the proposed Project includes draining the Lake, either removing contaminated sediments or constructing a soil-cement edging and high density polyethylene (HDPE) liner, replacing the Lake liner, installing more efficient Lake aeration systems, and improving or repairing the storm drain inlet and outfall structures. Some In-Lake vegetation and habitat improvements that were identified in the Echo Park Lake Rehabilitation Final Concept Report (Concept Report) include reconditioning the lotus beds, submerging the existing floating wetland islands, improving Lake edge treatments, and possibly creating structures to improve habitat for fish and birds. Specific parkland structural BMPs are to be determined; however, suggested parkland improvements identified in the Concept Report include installing grassy swales and infiltration strips in upland areas frequented by waterfowl and other wildlife, replacing existing asphalt walkways with porous pavement, installing "integrated" irrigation systems, and placing educational signage and kiosks throughout the park to inform visitors about water quality improvements and wildlife.

2.0 EXISTING CONDITIONS

2.1 Setting

The Lake is a 13-acre urban lake surrounded by 16 acres of recreational park space located at 751 Echo Park Avenue in the City's Echo Park / Silverlake community. The park is bordered to the north by Park Avenue, to the south by Bellevue Avenue, to the east by Echo Park Avenue, and to the west by Glendale Avenue. The Los Angeles County (County) Assessor's Parcel, Tract and Lot Number for the property is 5404-015-900 (Los Angeles County, 2006).

2.2 Bank Characteristics

The shoreline has a sloped concrete edge that starts approximately 2 to 3 feet above the water level and slopes down into the water. The surrounding edge is mostly unvegetated, with adjacent margins characterized by lawn, *eroding asphalt* and ornamental vegetation.

2.3 Hydrology

The Lake is centrally located within the Los Angeles River Watershed, just east of the Ballona Creek Watershed, and south of the convergence of Verdugo Wash and Arroyo Seco. It discharges to a storm drain, which is tributary to the Los Angeles River, Reach 3. Reach 3 is a 5-mile long stretch of the Los Angeles River spanning the area between Arroyo Seco and Washington Boulevard in downtown Los Angeles. According to the City's Bureau of Sanitation (BOS) BMP model, the tributary area which drains to the Lake is approximately 356 residential/commercial acres. Historically, the Lake was designed as a retarding basin to provide hydraulic relief to the surrounding storm drain system as a form of flood control. Currently, the Lake still acts as a collection point for area runoff, but requires the addition of City water to maintain its level (CDM 2006).

The Lake is connected to the existing City and County storm drain systems by an incoming 63-inch reinforced concrete pipe and an 8-foot by 4-foot reinforced concrete box. This junction box also has a 36-inch storm drain that appears to allow low or dry weather flow to bypass the Lake. As-built drawings indicate a 30-inch drain connecting to this bypass downstream of the overflow structure. The volume, structural condition, and pollutant loading within these existing bypass drains are unknown. A County Flood Control District storm drain enters the Lake on the western edge immediately south of the lotus bed area. Based on the conceptual plan for this Project, there is a low-flow diversion pipe connected to the flood control storm drain box at the north end. Therefore, the low flow storm water from the County storm drains also appears to be bypassed around the Lake (BOS 2006).

Based on the conceptual plan for this project there is a low-flow diversion pipe connected to the flood control storm drain box at the north end. Therefore, the low flow storm water from the County storm drains also appears to be bypassed around the lake (CDM 2006).

2.4 Bathymetry and Bottom Composition

Water depths in the lake range from 3 to 8 feet. Lake bottom contours and spot elevations vary from 380 feet in elevation on the northern portion to 375 feet on the center and southern end of the Lake near the outlet. Design drawings indicate heights of the perimeter wall in the range of from 1.5 feet to 4 feet (BOS 2006).

2.5 Biological Resources

2.5.1. Vegetation

The native vegetation that was once present on this site was completely removed with urbanization of the area. Currently, the park surrounding the lake is primarily composed of non-native ornamental plant species. Typical non-native trees include palms (including pindo palm, *Butia capitata*, Canary Island date palm, *Phoenix canariensis,* and Mexican fan palm, *Washingtonia robustus*), southern magnolia (*Magnolia grandiflora*), *Eucalyptus* species, and pine species (including *Pinus halepensis*, *P. pinea*, and *P. caneriensis*). Other notable mature non-native specimen trees such as the Queensland Pyramid Tree (*Lagunaria patersonii*) exist on the Lake perimeter. All efforts will be made to include the existing mature trees whether California natives or ornamental, within the project planting plan. The final design plans will include specifications to provide tree protection measures required throughout the construction process. Native species include white alder *(Alnus rhombifolia)*, western sycamore *(Platanus racemosa),* and California fan palm (*Washingtonia filfera;* O'Brian 2006). Emergent vegetation is limited and is primarily composed of cattail (*Typha* spp.) found on the four floating wetlands in the center of the lake and the island on the north side of the Lake (Figure 1). The partially submerged floating wetlands are anchored to the Lake bottom with chain. Additionally, a lotus (*Nelumbo nucifera*) bed is located in the northwestern corner of the Lake that is maintained by the Los Angeles Department of Recreation and Parks (DRP).

2.5.2. Wildlife

i. Fish

Information regarding fish species inhabiting and likely to inhabit the Lake was obtained during recent discussions with Brian Young, a DFG staff member. Wild, native fish species with protected status are not expected to occur in the Lake. Currently, the Lake is stocked regularly with game fish: rainbow trout (*Oncorhynchus mykiss*) and channel catfish (*Ictalurus punctatus*) by DFG's Fishing in the City Program. Other fish species that have potential to be found in the Lake include: bluegill (*Lepomis macrochirus*); red-ear sunfish (*Lepomis microlophus*); green sunfish (Lepomis cyanellus); blue catfish (*Ictalurus furcatus*); smallmouth bass (*Micropterus dolomieu*); spotted bass (*Micropterus punctulatus*); largemouth bass (*Micropterus salmoides*); white crappie (*Pomoxis annularis*); black crappie (*Pomoxis nigromaculatus*); mosquito fish (*Gambusia affinis*); oscar fish (Astronotus ocellatus); and other cichlid species (B. Young, DFG, pers. comm.). Because this lake is in the center of a large heavily populated city, numerous other exotic warm water species that are sold in pet/aquarium stores may inhabit the lake. These species are nonnative and many are considered invasive, with potential to consume and/or outcompete native and game species.

ii. Reptiles

Western fence lizard (*Sceloporus occidentalis*) is the only native lizard species likely to be found near the Lake; it is expected to be common in the terrestrial vegetation surrounding the Lake.

The open Lake banks and islands provide ample basking opportunities for aquatic turtles, while the fish and aquatic vegetation present in the Lake provide forage. Western pond turtle (*Clemmys marmorata*), a California species of special concern, is the only native turtle species with some potential to occur within the Lake, although the nearest recent observation is approximately 10 miles away (CNDDB 2008). Sonoran mud turtle (*Kinossternon sonoriense*), also a California species of special concern, is found in the far southeast portion of the California desert, and is highly unlikely to be present in the Lake. Other aquatic turtle species with higher potential to be in found in the Lake, all of which are nonnative, include: pond slider (*Trachemys scripta elegans)*; this species was documented in 2008); painted turtle (*Chrysemys picta*); river cooter (*Pseudemys concinna*); common map turtle (*Graptemys geographica*); common cooter (*Pseudemys floridana*); various other sliders, cooters, pond turtles, map turtles, mud turtles, musk turtles; and other exotic species sold in pet/aquarium stores.

iii. Amphibians

No amphibian survey data was available for the Lake. Few amphibians are likely to be present due to the presence of predatory fish (B. Young, DFG, pers. comm.). In addition, the majority of the Lake lacks emergent aquatic or overhanging bank vegetation, which amphibians prefer for egg deposition and cover from the elements and predators. The northern and floating islands do however contain some of these characteristics (Figure 1). Thus, there are a number of common species with some potential to occur in the lake: Pacific tree frog (*Pseudacris* [=*Hyla] regilla*, a native species that does well in a wide range of habitats, including urban areas); Western toad (*Bufo boreas hadophilus*, a native species requiring shallow water for breeding); American bullfrog (*Rana catesbeiana*, an invasive native of eastern and midwestern United States (U.S.); and African clawed frog (*Xenopus laevis*, an invasive nonnative). No special-status amphibian species are likely to occur or breed in the lake due to the surrounding urbanization isolating the site from natural habitats and known populations, lack of appropriate habitat, and the presence of nonnative predatory fish species.

iv. Birds

Table 1 identifies bird species detected at the Lake during the Christmas system. Most of the birds associated with the Lake are those typically found in urban park settings, and around permanent urban water sources. The most common species detected around the Lake that are likely to be found year-round and also to breed around the Lake include mallard (*Anas platyrhynchos*), great blue heron (*Ardea herodias*), Canada goose (*Branta canadensis*), yellow-chevroned parakeet (*Brotogeris chiriri*), green heron (*Butorides virescens*), Anna's hummingbird (*Calypte anna*), house finch (*Carpodacus mexicanus*), rock dove (*Columba livia*), American crow (*Corvus brachyrhynchos*), Brewer's blackbird (*Euphagus cyanocephalus*), American coot (*Fulica americana*), northern mockingbird (*Mimus polyglottos*), brown-headed cowbird (*Molothrus ater*), house sparrow (*Passer domesticus*), European starling (*Sturnus vulgaris*), and mourning dove (*Zenaida macroura*), (J. Raskin, pers. comm.).

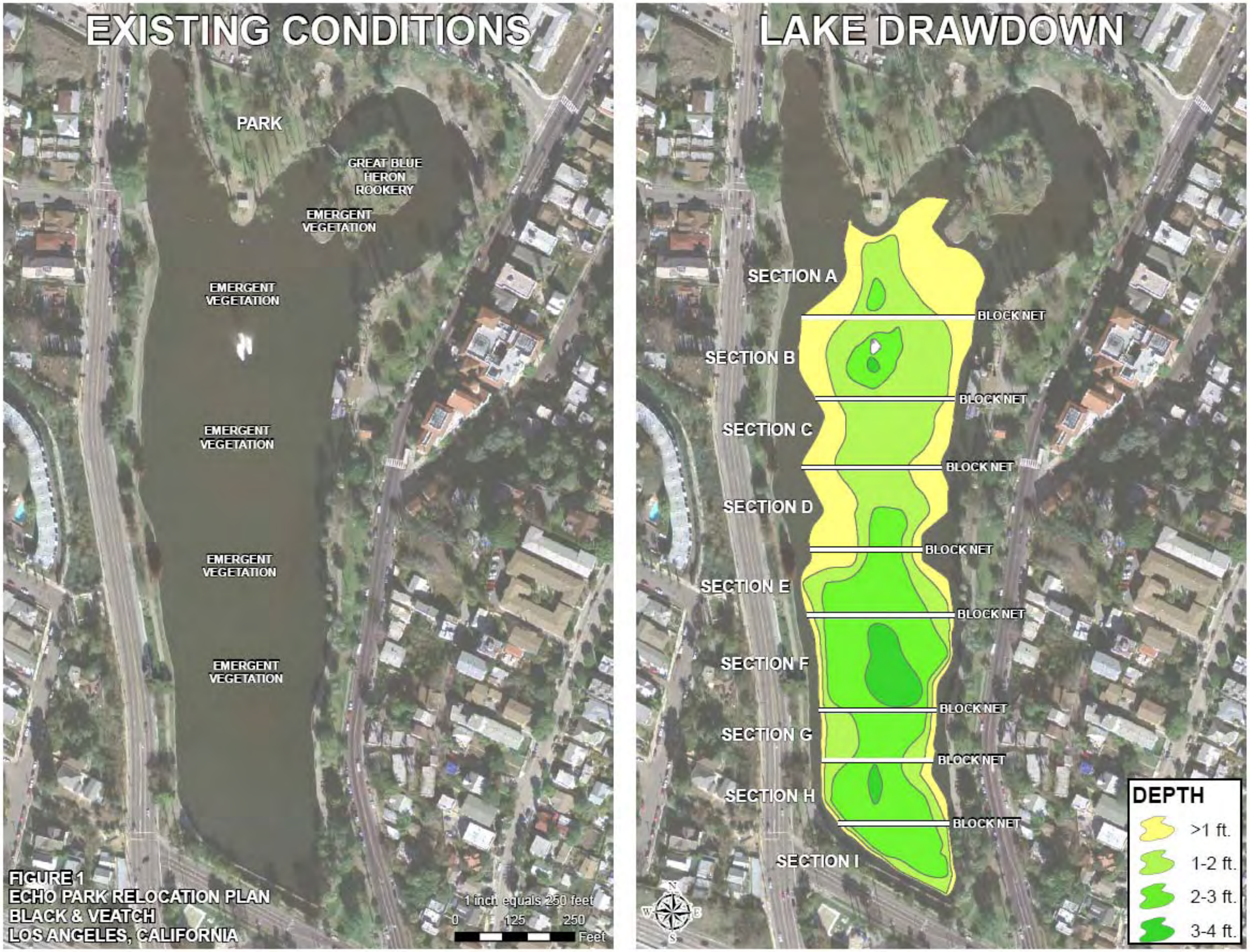

Figure 1: Existing Conditions and Lake Drawdown

The existing floating emergent freshwater marsh islands are potential breeding habitat for waterfowl (including mallard and American coot) and songbirds (including red-winged blackbird). One of the most noteworthy wildlife resources on site is a blue heron rookery located on the northern portion of the island at the north end of the Lake (Figure 1). The first heron pair nested here in 2006, and in 2008 three or four pairs were documented nesting in pine trees (J. Raskin, pers. comm.).

v. Mammals

Mammals likely to be found around the Lake are those species that typically thrive in urban areas and are primarily terrestrial species that are likely to inhabit the parklands surrounding the Lake. Potential species include big brown bat (*Eptesicus fuscus*), Brazilian free-tailed bat (*Tadarida brasiliensis*), California myotis (*Myotis californicus*), raccoon (*Procyon lotor*), western gray squirrel (*Sciurus griseus*), muskrat (*Ondatra zibethicus*), eastern fox squirrel (*Sciurus niger*), California ground squirrel (*Spermophilus beechyii*), striped skunk (*Mephitis mephitis*), opossum (*Didelphis virginiana*), roof rat (*Rattus rattus*), Norway rat (*Rattus norvegicus*), house mouse (*Mus musculus*), Botta's pocket gopher (*Thomomys bottae*), and California vole (*Microtus californicus*). No special-status species are likely to be found.

vi. Other species

Asiatic clam (*Corbicula fluminea*) are also found in the lake and other nonnative or invasive invertebrates may be present as well (B. Young, DFG, pers. comm.).

Table 1: Existing Biological Conditions. Bird Species Detected at Echo Park Lake during Christmas Bird Counts conducted by the Los Angeles Audubon Society (December 2000 – 2007; Raskin 2008).

Common Name	Scientific Name	Abundance category [1]	Likelihood of breeding on site	Conservation status [3]
Cooper's hawk	*Accipiter cooperi*	Low	Low	CWL
western grebe [2]	*Aechmophorus occidentalis*	Low	Low	
white-throated swift	*Aeronautes saxatalis*	High	Low	
American wigeon	*Anas americana*	High	Low	
northern shoveler	*Anas clypeata*	Low	Low	
mallard	*Anas platyrhynchos*	High	moderate	
gadwall	*Anas strepera*	Moderate	Low	
graylag (barnyard) goose [2]	*Anser anser*	[unknown]	[unknown]	
Swan (Chinese) goose [2]	*Anser cygnoides*	[unknown]	[unknown]	
western scrub-jay	*Aphelocoma californica*	Low	Moderate	
great egret	*Ardea alba*	Low	Low	
great blue heron	*Ardea herodias*	Moderate	Confirmed	
lesser scaup	*Aythya affinis*	Low	Low	
redhead	*Aythya americana*	Low	Low	
ring-necked duck	*Aythya collaris*	High	Low	
greater scaup	*Aythya marila*	Low	Low	
cedar waxwing	*Bombycilla cedrorum*	High	Low	

Common Name	Scientific Name	Abundance category [1]	Likelihood of breeding on site	Conservation status [3]
Canada goose	*Branta canadensis*	High	High	
yellow-chevroned parakeet	*Brotogeris chiriri*	High	Moderate	Nonnative
red-tailed hawk	*Buteo jamaicensis*	High	Low	
green heron	*Butorides virescens*	High	Moderate	
Anna's hummingbird	*Calypte anna*	High	High	
lesser goldfinch	*Carduelis psaltria*	Low	Moderate	
house finch	*Carpodacus mexicanus*	High	High	
purple finch	*Carpodacus purpureus*	Low	Low	
belted kingfisher	*Ceryle alcyon*	Low	Low	
Vaux's swift	*Chaetura vauxi*	Low	Low	CSC
Ross's goose	*Chen rossii*	Moderate	Low	
northern flicker	*Colaptes auratus*	Low	Low	
rock dove [pigeon]	*Columba livia*	High	High	Nonnative, invasive
American crow	*Corvus brachyrhynchos*	Moderate	Moderate	
yellow-rumped warbler	*Dendroica coronata*	High	Low	
black-throated gray warbler	*Dendroica nigrescens*	Low	Low	
Townsend's warbler	*Dendroica townsendi*	Moderate	Low	

Common Name	Scientific Name	Abundance category [1]	Likelihood of breeding on site	Conservation status [3]
Brewer's blackbird	*Euphagus cyanocephalus*	High	Moderate	
peregrine falcon	*Falco peregrinus*	Low	Low	SE
American kestrel	*Falco sparverius*	Low	Low	
American coot	*Fulica americana*	High	Moderate	
common yellowthroat	*Geothlypis trichas*	Low	Low	
black-necked stilt [2]	*Himantopus mexicanus*			
herring gull	*Larus argentatas*	Moderate	Low	
California gull	*Larus californicus*	High	Low	CWL
ring-billed gull	*Larus delawarensis*	High	Low	
glaucous-winged gull	*Larus glaucescens*	Low	Low	
western gull	*Larus occidentalis*	High	Low	
Thayer's gull	*Larus thayeri*	Low	Low	
northern mockingbird	*Mimus polyglottos*	Moderate	High	
brown-headed cowbird	*Molothrus ater*	Moderate	High	
black-crowned night-heron	*Nycticorax nycticoarx*	High	Low	
ruddy duck	*Oxyura jamaicensis*	High	Low	
house sparrow	*Passer domesticus*	High	High	Nonnative, invasive
American white pelican	*Pelecanus erythrorhynchos*	Low	Low	
double-crested cormorant	*Phalacrocorax auritus*	High	Low	CWL

Common Name	Scientific Name	Abundance category [1]	Likelihood of breeding on site	Conservation status [3]
Nuttall's woodpecker	*Picoides nuttallii*	Low	Low	CNDDB
pied-billed grebe	*Podilymbus podiceps*	High	Low	
great-tailed grackle	*Quiscalus mexicanus*	High	Low	
ruby-crowned kinglet	*Regulus calendula*	Low	Low	
black phoebe	*Sayornis nigricans*	Moderate	Low	
Allen's hummingbird	*Selasphorus sasin*	Low	Low	CNDDB
red-breasted sapsucker	*Sphyrapicus ruber*	Low	Low	CNDDB
Caspian tern	*Sterna caspia*	Low	Low	
spotted dove	*Streptopelia chinensis*	Moderate	Low	
European starling	*Sturnus vulgaris*	High	High	Nonnative, invasive
shelduck	*Tadorna* sp.	Low	low	Nonnative, probable escapee
Cassin's kingbird	*Tyrannus vociferans*	Low	Low	
mourning dove	*Zenaida macroura*	High	High	

1 Low = detected during one or two counts; moderate = detected during three or four counts; high = detected during five or counts.
2 These species were observed outside Christmas Bird Counts (J. Raskin, pers comm.)
3 CWL = California Watch List; CSC = California Species of Special Concern; CNDDB = tracked in the California Natural Diversity Database, California Department of Fish and Game, SE = State of California Endangered species.

3.0 CONSTRUCTION METHODS, EQUIPMENT, AND TIMING

Because the project is currently in the preliminary design phases, specific details about construction methods and equipment are still to be determined. However, the construction activities described in this section are reasonably expected to occur.

3.1 Construction Activities

Construction activities for the proposed Project are expected to require at least two years to complete. Draining the Lake and conducting In-Lake Improvements are anticipated in the first year. In-Lake Vegetation and Habitat Improvements and Parkland Structural BMPs are anticipated to be constructed the second year. Prior to draining the Lake, relocation efforts and construction-related avoidance measures as described in this TM will be implemented. Relocation efforts will require the use of boats and traps. Prior to conducting In-Lake Improvements, the entire Lake will be drained as described below in Section 3.2 to allow for a dry excavation approach to repairing the Lake bottom. Excavators, or other similar equipment, will likely be used to first remove trash from the Lake bottom, and trucks will haul the trash to an approved off-site location.

As part of the Project, water quality and sediment analysis studies were conducted to determine whether the contaminated sediment must be dredged and removed from the Lake, or if it will be possible to solidify the contaminated sediment into a soil-cement edging and HDPE liner. If the sediment must be removed, scrapers, excavators, and backhoes will be used to dredge the soils. Dump trucks will be used to haul spoils to a pre-approved off-site location. If the contaminated soil may be solidified into a soil-cement liner, then scrapers and excavators will be used to grade and contour the Lake bottom. Compacters may also be used to compact the Lake bottom. Cement trucks, cement mixers, and concrete pouring equipment will be used to line the Lake. Excavators will be used to install riprap where needed. Similar construction equipment will be used to install the Lake aeration systems and improve/repair the inlets and outfalls.

Most of the In-Lake Vegetation and Habitat Improvements can be implemented using hand tools and small equipment. However, large construction equipment as described above may be required to install Parkland Structural BMPs, such as the grassy swales/infiltration strips and remove asphalt to install the porous pavement.

This TM assumes that large construction equipment will be used to complete most of the Project activities; therefore, the avoidance and minimization measures detailed herein should be implemented prior to and during any activity that may impact wildlife.

3.2 Lake Drawdown Methods

It has been determined that pumping the Lake water is the only feasible option for drawing-down the Lake. The existing outfall cannot be used because it is non-operational. Allowing natural seepage was considered, but rejected because the seepage rate could be too slow. The pumped Lake water will be discharged to the storm drain or sewer system.

Several alternatives for the drawdown were considered during the preliminary design phase. Under any alternative, a partial drawdown will be necessary as a first step to manage fish capture and relocation. Partial drawdown will result in Lake depths between 1 and 3 feet as shown on Figure 1.

The three alternatives for Lake drawdown are described below.

3.2.1 Alternative One

The first alternative would not require complete removal of fish from the Lake. Fish would be translocated on site to allow In-Lake Improvements to be conducted in sections in sequence. Fish would be translocated out of one section to the other sections, and water would be removed. Upon completion of the first section, water would be returned to that section, fish would be translocated back, and water would be removed from the other sections. Construction would then be completed on the final sections. Berms or cofferdams would be necessary to section off the construction phases and there would be added mobilization time for construction of each section. Therefore, this alternative would be difficult and costly from a construction and engineering stand point.

3.2.2 Alternative Two

The second alternative would require preparing a temporary holding area on site for the fish so that construction activities could be completed for all remaining areas of the Lake. Possible holding areas considered include the lotus pond (which is already separated from the rest of the Lake by a short wall), creation of an isolated pool around the existing aerator, or creation of an isolated pool in another feasible portion of the Lake (i.e. around the northern island).

3.2.3 Alternative Three –Recommended

The third and preferred alternative would require removing all fish and wildlife during one initial effort. After a partial drawdown, the Lake would be divided into nine sections for fish removal (Figure 1). After removal of fish and other aquatic species, the Lake would be completely drained to allow construction to be completed on the entire Lake at once. Any remaining aquatic species would be removed from deeper pools before they are completely drained.

Due to construction and budgetary constraints as well as timing, the third option is the recommended alternative. Therefore, this TM assumes that the third option will be implemented, that fish and other aquatic wildlife will not be retained on site, and that they must be removed prior to completion of the drawdown of the Lake.

4.0 WILDLIFE RELOCATION AND AVOIDANCE MEASURES

DFG regulates fish, wildlife, native plants and habitat necessary for biologically sustainable populations (Fish and Game Code Section 1802). This relocation and avoidance plan is designed to minimize mortality to native species and to avoid relocation of nonnative species into other water bodies, many of which are highly invasive and out-compete native species. Various methods will be necessary to remove aquatic animals from the site before construction activities can begin and to protect terrestrial wildlife prior to and during construction. These are presented in Appendix C. These methods have been recommended by the DFG based on assumptions about the presence of particular species. As construction design details evolve, the wildlife relocation methods may need to be altered. If special-status species, or unexpected native species, are detected and/or captured, DFG will be contacted to arrange a relocation plan, and capture methods may need to be modified. If required by DFG, non-native fish and invertebrate species will be removed and will not be re-released. In the case of non-native turtles, captive homes will be found. Records will be kept detailing the number of individuals of each species captured, and their disposition; other data related to size, sex, age, etc. will be recorded as appropriate, and as time permits.

The timing or degree of effort for relocation activities for some wildlife groups may change depending on the actual start date of construction (e.g., removing fish after usual late-summer heat-related mortality may require less effort than in mid-summer and will be faster if fish have not been stocked for some time). For other species, the start date should not affect the relocation activities (e.g., turtle removal can start immediately and will be less labor-intensive than the fish relocation, regardless of the season the construction starts).

Given the current set of assumptions about existing conditions and Project construction plans, all aquatic animal species will be actively removed. Impacts to terrestrial species will be avoided by conducting pre-construction surveys, removing habitat as appropriate, and establishing non-disturbance buffers as needed (Appendix C). Details for relocation, removal, and avoidance of each group of wildlife are described in detail below.

4.1 Aquatic Species Capture and Relocation

4.1.1. Agency Coordination to Date

Conservations were held with Brian Young of DFG on April 16, April 17, and May 28, 2008 regarding the Project and the associated Wildlife Relocation Plan. DFG provided a number of recommendations and explained the requirements, which are summarized below. These requirements and recommendations are also included in subsequent descriptions of wildlife relocation and avoidance measures, where applicable. The following is a summary of DFG's requirements:

<u>i. Fish</u>

- Channel catfish and rainbow trout (native game species farmed specifically for release for recreational use) are stocked in the Lake by DFG's *Fishing in the City Program*. DFG stocks 3,500 pounds per year of channel catfish (between May and November) and several hundred pounds of rainbow trout per week (late October through March or April, depending on water temperatures). DFG intends to suspend its catfish stocking program as soon as the construction schedule is finalized and suspend the trout stocking program six months before the start of construction. Stocking would resume after rehabilitation is complete. Suspension of stocking will greatly reduce the number of fish that would need to be removed and relocated to DFG facilities.

- Only game fish (catfish, bass and trout) should be translocated. These species should be transferred to a DFG quarantine facility to ensure they are free from disease before being relocated to another lake.
- No animals should be moved directly from the Lake to other bodies of water due to concerns related to spreading invasive species, disease, and aquatic contaminants.
- All exotic, non-native, and invasive species should be removed and disposed of in a humane manner, but should not be moved to another Lake or returned back into the Echo Park Lake.
- A record of the number and size of each species should be recorded and reported to DFG after the operation. Measurements should be taken of a sub-sample of the animals captured.
- DFG would like to see a sample of fish species before beginning relocation/removal work if possible (i.e. sample by trawling or seining).
- DFG understands that it will be infeasible to capture all fish in the Lake and that fish will be captured to extent practical.

ii. Turtles

- All non-native turtles should be removed and appropriate captive homes found. If captive homes cannot be found, they should be disposed of in a humane manner. No non-native turtles should be returned to the Lake.
- Any native turtles found should be considered for re-release into the rehabilitated environment following construction.and handled on a case-by-case basis. DFG should be notified to determine the most appropriate storage and relocation strategy.
- Basking traps will probably be the most effective means of capture. However, any traditional means of turtle trap will be acceptable (i.e. minnow, circle, or pitfall).
- DFG understands that it will be infeasible to capture all turtles in the Lake and that turtles will be captured to extent practical.

iii. Amphibians

- Any non-native/invasive amphibian species should be removed. DFG should be notified of any invasive amphibians found in the Lake.

iv. Birds

- Disturbance to the heron rookery should be avoided.

v. Invasive Species

- Invasive species should be handled carefully and not transported to other water bodies.
- A protocol will need to be put in place to handle any invasive species captured. All invasive species need to be disposed of in a humane manner. They can only

be transported/kept out of state if taken to a zoo or educational facility. A permit will be required for this transportation.

- A protocol should be set up for the treatment of equipment and gear before and after use in the Lake.

4.1.2. Fish

The fish relocation plan will include procedures for capturing fish in the Lake before it is drawn down, and for coordinating with DFG to relocate native and game fish and remove non-native fish species. Aquatic amphibians and reptiles are likely to be captured along with fish. If special-status or unexpected native species are captured, DFG will be contacted to coordinate their dispensation. No animals will be relocated to other sites without coordination with DFG, who may elect to relocate or remove the animals, depending on the species and the likelihood of disease transmission.

i. Overview of the Dewatering Operations and Fish Removal Effort

As described above, suspension of channel catfish and rainbow trout stocking will greatly reduce the number of fish to be removed and relocated to DFG facilities. Additionally, rainbow trout are very sensitive to higher temperatures and will not likely survive the summer temperatures found in the Los Angeles basin. All fish remaining in the Lake will be removed utilizing the steps outlined below.

The City's contractor will be responsible for dewatering the Lake, but will work closely with the biologists to ensure that fish and wildlife are protected during the operation. The contractor will draw the Lake down with pumps. The pumps should be surrounded by in-water fish screen, which will remain in place throughout the dewatering process. The fish relocation operation will occur in two phases.

Phase One – This phase will commence following the initial drawdown of the Lake, which will have reduced the maximum Lake depth from approximately 8 feet to 4 feet (Figure 1). This will decrease the volume and area of the Lake, thus reducing the effort required for the fish capture and relocation. Phase One will include systematically electrofishing and/or seining nine segments of the Lake and relocating captured game fish to DFG holding facilities. Securing and relocating the majority of the game fish from the Lake in Phase One will minimize the potential for mortality during the final drawdown and dewatering of the Lake. The fish removal team will need a maximum of 10 calendar days to electro-fish/seine and relocate game species before the final dewatering. All amphibians and reptiles caught during this period will also be removed, and their dispensation will depend on whether they are native or non-native species (see below).

Phase Two – Upon completion of the capture and removal/relocation effort, full dewatering will commence, and the fish removal team will rescue any fish (and amphibians and reptiles) in isolated pools remaining in the Lake, working in conjunction with the contractor. The final dewatering will potentially leave three isolated pools in the deepest portions of the Lake. When the removal is complete, construction can begin. Details of the sequencing and communication chain should be verified during pre-construction meetings with the contractor.

Species Prioritization and Handling – This fish relocation effort is directed at game fish. However, it is important to handle all fish humanely. The following species will also be removed as prioritized below:

1) Native species that were not stocked (although it is very unlikely any will be present)
2) Stocked trout (more sensitive than other game species)
3) Other game species
4) Exotic non-natives, many of which are invasive (relocated, but removed)

All non-native and invasive species will need to be removed per DFG requirements. This will be done in a humane way by either putting these fish on ice or by submerging them in a bath of MS-222 until they expire. If sensitive species are encountered during the fish relocation effort, they will be given top priority.

ii. Fish Capture

Coordination with DFG for Relocation, Salvaging, and Quarantine – Coordination with DFG must take place in advance of the capture effort. DFG will require all removed game fish to be quarantined in their facilities before being relocated to any of the other lakes in their Fishing in the City Program. Therefore, all removed game fish will be handed over to DFG on site at the Lake at the time of removal. Alternatively, the fish will be taken to DFG facilities by the removal team in temporary holding tanks. The principal biologist or the City will contact DFG at least 48 hours prior to pre-sampling operations and at least one month prior to the fish relocation efforts to coordinate the relocation, salvaging, and quarantine activities.

Staffing – The fish removal effort will include one electrofishing/seining crew and one ground support crew to expedite this work effort and make the site available to the contractor as soon as possible. The electrofishing/seining crew will include one boat operator, one electrofishing operator, and two netters. The ground crew will consist of one live–well monitor/data collector and three fish handlers/sorters. The live-well monitor and fish handlers will also serve to hand the removed fish over to DFG.

Pre-Sampling Operations – At the request of DFG, a fish pre-sampling survey should be conducted to establish species composition in the Lake. The pre-sampling can take place any time prior to the fish relocation effort. However, to provide ample lead time for adjustments in strategy and to ensure that the pre-sampling conditions are similar to those expected at the time of relocation, it is recommended to sample at least two weeks before the relocation effort, but within the same season. The pre-sampling survey will also serve as a training session to ensure all team members are familiar with the procedures for the fish relocation effort including use of equipment, drop off locations, transportation routes, etc.

Division of Capture Zone Sections – The Lake will be divided into nine sections using block nets and screening; each section will be approximately 200 feet long, and between 200 to 350 feet wide (Figure 1). The Lake segmentation will take advantage of choke-points and minimize the Lake's cross-section. Multiple passes will be made in each section to clear it of fish before the next section is started. Beginning with Section A on the northern end of the Lake, after it is cleared, the southern net will be left in place to become the northern block net of the next section to be cleared. Leapfrogging the sections and nets will keep cleared sections from being re-inoculated as work progresses and will require only two sets of block nets.

Capture Methods – The methods described in this fish relocation and removal plan have been selected to maximize efficiency and minimize handling and transport time to reduce fish stress. These methods can be used in Phase One (initial drawdown) and Phase Two (after final drawdown), as appropriate.

Daily Set Up – Upon arrival at the site, a review of operation sequence and logistics will be discussed. Final field assignments will be designated and equipment deployed. Prior to commencement of operations, review of safety and operation methods will be conducted. Elements may include: strategies for identifying native vs. non-native species of fish, amphibians and reptiles; site access considerations; local hazards; environmental considerations; media and public safety; equipment operation; and risks associated with collection methods.

Live Well Operation – Live wells will be set up at the start of the day so that tank conditions will be stabilized by the time fish are placed. The removal team will have at least two re-circulating live wells, each at least 100 quarts volume, made of insulated plastic (i.e., water coolers). Ambient Lake water will be used to fill live wells. Fish will be segregated to the appropriate live well as they are delivered from the Lake. Captured trout, if any, will be transported separately from other fish to reduce stress and handling time. Temperature and oxygen levels will be monitored in live wells during loading and transport. Temperature will be reduced and managed at 5° F below ambient water temperature to reduce stress in the fish and avoid thermal shock. A live well aeration system will be started prior to placing fish to ensure that sufficient oxygen is present during the adjustment period. The aeration rate and number of fish in a live well will be managed such that the dissolved oxygen concentration in live wells will be greater than 6 parts per million (ppm), but less than saturation.

Electrofishing/Seining Operation - One Smith-Root Model boat mounted electrofishing unit will be employed. Electrofishing equipment unit settings will be adjusted to the conductivity and temperature of the water to minimize possible fish injury. Adjustments will be made in step-wise increments, as needed, to ensure taxis is achieved, but complete tetany is avoided. Recovery time will be monitored to ensure power settings are not over-energizing the taxis response. Settings used will be recorded, and any incidental electrofishing mortalities will be recorded. In areas where a seine net would be a more effective means of capture, it will be used to increase the rate of capture. Decisions on the best method to be used are very site specific and depend on bottom composition or the potential to encounter snags. A decision on which method to utilize will have to be made by the lead biologist in the field. However, it is expected that both methods will be implemented. During Phase Two, when only small pools remain, methods may need to be modified further, and dip nets may be all that is required.

Data Collection – Fish will be inventoried, and measurements will be taken of a subset of fish if circumstances allow. If conditions preclude detailed inventory, a list of the species present and an estimation of their abundance will be documented along with their disposition (i.e. released, mortality, reason for mortality, removed, or relocated). Information recorded will include ambient site conditions, photo-documentation of collection sites, collection and handling methods, and transport conditions.

iii. Fish Relocation and Removal Operation

Local Transport – The team will use nets to transfer fish from the Lake to live wells in the boat. Fish will be transferred with buckets from the boat live wells to live wells onshore where fish will be sorted into game fish (to be transferred to DFG) vs. non-game fish (to be removed). Buckets will be used to transfer fish from the onshore collection team to live wells on the transport truck.

Fish collection will be conducted in a manner to minimize handling time and stress, yet maintain the safety of the ground personnel. Multiple buckets and/or live wells will be used to reduce crowding during collection and transfer. Pre-sorting fish will be conducted as soon as they are captured for transport to a live well. Buckets for holding game fish (particularly trout), until subsequent release into the live wells for transport, will be equipped with portable aerators.

The need for the transportation of fish will be based on discussions and coordination with DFG. If transportation of removed fish is necessary, it will be conducted by qualified personnel only. Transport of fish will be conducted in an efficient manner and coordinated with ongoing collection activities to minimize holding time. Qualified biologists will accompany and supervise transport and drop-off actions. Normal live-well operations will be continued during transport. Mobile communications will be carried in transport vehicles. Documentation of fish relocation efforts will be undertaken at the time of operations using a standardized form.

Disposal of Removed Fish – After exotic, non-native, and invasive fish species have been removed, they will need to be disposed of properly as to not create a public nuisance or health hazard. A waste disposal company will need to be contracted to provide an on-site dumpster for fish removal crews to dispose of the fish. This dumpster will need to be lockable and located in an area that is away from public areas. The dumpster will need to be replaced or emptied daily during the fish relocation/removal efforts. If the dumpster is only emptied and not replaced, it may need to be cleaned in order to limit odor and avoid creating an attraction to urban wildlife or becoming a public nuisance.

iv. Post-Operation Steps

A report on the fish removal results will be prepared. The report will include:

- Site conditions, including photos at collection and release sites
- Collection and handling methods
- Transport methods and conditions
- List of species present
- Quantity or estimate of abundance of species, and disposition (i.e. mortality, reason for mortality, Removal, or relocation)

4.2.3. Turtles

All aquatic habitat will be removed during the two-year duration of construction activities at Echo Park; therefore, retaining aquatic turtles on site is not feasible. All turtles will need to be removed and relocated before complete drawdown of the Lake. Turtles on site are not likely to be breeding (due to the disturbed and degraded condition of the surrounding habitat); thus, there are no recommended measures to avoid disturbing breeding habitat. Although it is highly unlikely that native species, such as western pond turtle or Sonoran mud turtle, are currently using the Lake due to its degraded condition and isolation from occupied habitat, the recommendations are based on the potential for the western pond turtle to be present, and the recommended capture methods are designed to ensure their capture with low probability of mortality. Turtle capture and relocation will occur within the three months prior to ensure as many turtles as feasible are removed before drawdown starts. Turtles not captured prior to drawdown may be captured during the fish removal effort. Because methods used to capture fish (i.e. seining) have a higher probability of causing turtle mortality and stress than do basking traps designed specifically for turtles, as many turtles as possible will be removed in advance of the fish capture efforts.

i. Turtle Capture

Several types of traps are available to efficiently and humanely capture turtles. These traps are very unlikely to cause mortality as long as they are monitored on a daily basis. A combination of basking traps and baited partly-submerged traps will be employed. Baiting the turtles with fish hooks is neither efficient nor humane and will be employed.

Basking traps float in the water and attract turtles when they need to warm themselves in the sun. The turtle climbs up onto a ramp which tilts inward with the turtle's body weight dropping it into a submerged basket; turtle cannot get back out into the water. The basking trap will allow turtles to have access to water and breathing space at the surface. Considered designs include the Deluxe Sunning Turtle Trap (available at Bugspray.com, item number #882438, cost approximately $250, Appendix A, photo 1). Other similar designs are available (Appendix A, photo 2, 3).

For the baited trap, a do-it-yourself design requiring components that are readily available and inexpensive will be appropriate (Appendix B).

Initially, 20 basking traps and 10 baited traps will be deployed. The number of traps will be decreased as the number of turtles captured falls off. Before installing the basking traps, other basking substrates will be removed, e.g. floating logs. If turtles tend to sun on the banks of the Lake, it may not be possible to deter them and encourage them to go into the basking traps, and the trapping effort may take longer. It may take several days for the turtles to notice the basking traps and start using them. Traps may be more effective on weekends when human disturbance along the banks is higher and turtles search for more isolated basking surfaces.

Data Collection – Turtles will be removed from the traps on a daily basis. They will be inventoried by species and standard measurements taken (sex, age, length, weight). Information recorded will include ambient site conditions, photo-documentation at collection sites, collection and handling methods, and transport conditions. Their disposition will be documented (i.e. released, mortality, reason for mortality, removed or relocated).

ii. Turtle Relocation and Removal

Only non-native turtle species are expected to be captured. These species cannot be relocated to other water bodies under provisions of DFG. The California Turtle and

Tortoise Club has a Turtle and Tortoise Rescue and Adoption Program. Initial contact has been made with this organization, and they have indicated willingness to assist with recovery and relocation of the turtles. Prior to trapping, additional coordination and arrangements will be made to have a rescue program member available to retrieve captured turtles on a daily basis.

If native species, such as the western pond turtle or Sonoran mud turtle, are captured, DFG will be contacted immediately so that arrangements can be made for salvaging and returning them. If it is determined unfeasible to return them to Echo Park Lake, The Department will need to quarantine these species to ensure they are free from disease before releasing them at another site. If suitable storage conditions can be arranged, DFG may decide that pond turtles should be returned to Echo Park Lake after lake rehabilitation is complete.

If western pond turtles are captured, standard morphological data will be collected (sex, age, length, weight, etc) and individuals, will be marked for identification using standardized methods (IWPTWG 2001; Jones and Stokes 2004). These procedures require appropriate permits from DFG and will only be carried out if permission is granted from DFG.

iii Post-Operation Steps

A report on the turtle removal results will be prepared. The report will include:

- Site conditions, including photos at collection and release sites
- Collection and handling methods
- Transport methods and conditions
- List of species present
- Quantity or estimate of abundance of species, and disposition (i.e. released, mortality, reason for mortality, removal, or relocation).

4.1.4 Amphibians

According to DFG, few amphibians are expected, even common invasive species, such as the bullfrog (B. Young, pers. comm.). However, if amphibians are present, they are likely to be captured during the fish salvaging effort. DFG requires non-native species to be removed. Bullfrogs may attempt to jump out of nets, and a gig (a stick with pointed barbs at the end) may be necessary to catch them. These frogs may be removed and disposed of with the non-native fish.

If native amphibian species, such as Pacific tree frog, are captured, the project biologist will coordinate with DFG to coordinate their eventual quarantine and release or onsite return relocation. If native amphibians are found, DFG may also require that additional measures be taken during fish capture, to prevent disease transmission via fish capturing equipment. Amphibians are susceptible to a number of recently-identified highly contagious diseases including chitrid fungus (Padgett-Flohr 2002), and relocation from one site to another should always be carried out with caution.

4.2 Terrestrial Species Avoidance Measures

Terrestrial species on site will not be actively removed during project implementation. Of the terrestrial species currently on site, breeding birds are the most sensitive, and impacts to these species will be avoided by implementing the various strategies described below. Removal of potential breeding habitat within the Lake (primarily emergent vegetation on the four floating islands) during the time they are not breeding (i.e. between September and December) will ensure that the birds do not attempt to nest in the vegetation prior to Lake drawdown. Most mammal species likely to be found currently on site are non-native; all are assumed to be mobile and can move out of harm's way during construction.

Pre-construction surveys for nesting birds will be conducted within two weeks of project start. If unanticipated special-status species are observed during pre-construction surveys, project biologists will contact DFG to develop additional avoidance measures.

4.2.1. Nesting birds

Active bird nests are protected under the federal Migratory Bird Treaty Act of 1918 and DFG §§ 3503 and 3503.5. If nests are found, concurrence from regulatory agencies regarding appropriate non-disturbance buffers may be necessary. Typically, buffers range from 100 to 500 feet for raptors and 25 to 100 feet for passerines and non-passerine land birds. The size of buffer zones varies between species and is based on the sensitivity of the species to human disturbance, the type of construction activities occurring, and the site conditions. Given the urbanized nature and existing high disturbance levels at the Lake site, 25- to 50-foot non-disturbance buffers will likely be adequate for protection of most non-raptor species nesting in park vegetation adjacent to the Lake. The heron rookery is more sensitive as it is somewhat protected from disturbance in the center of the Lake. Its protection during construction is addressed in more detail below.

<u>i. Timing</u>

Avoidance of impacts to nesting birds can be achieved primarily by timing the start of construction during the period most birds are not likely to be nesting (September through December). Project schedules must also consider any permit requirements for the identified start of rainy season that formally begins on October 31. Any planned permanent vegetation removal (e.g., removal of landscaping on the pond perimeter that will be replaced as part of the Project) will be scheduled for the non-breeding season, so that nesting substrates are removed before the breeding season. In other areas, such as the floating cattail ponds, vegetation will be removed to deter nesting the following spring and to avoid conflicts between nesting birds and construction plans.

<u>ii. Pre-construction Surveys</u>

Pre-construction surveys will be conducted between two weeks to one month prior to construction to inventory the species on site and to ensure that no species are nesting. This will be the case even if construction starts during the non-breeding season (September through December). If nesting birds are found or other sensitive species are observed, additional avoidance measures may be necessary.

<u>Pre-construction Survey Methods</u> - The survey area will include the Project footprint (including all portions of the Lake where construction activities will occur, staging areas, and equipment storage areas), plus a 250- to 500- foot buffer.

A qualified biologist will survey the site for the presence or sign of nesting raptors, passerine, and non-passerine birds. All birds, breeding or non-breeding, will be mapped and counted. If found, active nests will be mapped, and appropriate non-disturbance buffer zones will follow the wildlife relocation and avoidance protocol as indicated in the project construction contract documents. Active nests should be monitored to determine when the young have fledged and are safely feeding on their own. In the case of negative findings, vegetation removal and ground disturbance activities may begin within 15 days of the survey. If more than 15 days elapses, the surveys will expire and may need to be reinitiated. Surveys may need to be reinitiated several times during construction if disturbance is phased. If areas are continually disturbed, birds are less likely to build nests.

If sensitive species are found during the non-breeding season and if these species are likely to nest in the area, recommendations will be made for avoiding impacts to the species, in coordination with DFG. Regular construction monitoring for special-status species and nesting birds will be conducted, depending on the season.

iii. Heron Rookery

Great blue herons have been nesting on the northern island since 2006 (J. Raskin, pers. comm.). In 2008, three or four pairs were nesting in the tall pines. Nesting trees on the island will not be removed under current construction plans. However, to avoid disturbing nesting herons, construction should begin during the period when they are not likely to be nesting (September through December). When all aquatic species are removed from the Lake, the herons will lose their year-round food supply. Although potential nesting habitat will still be present the following spring, while construction is presumably ongoing, the herons may be deterred from nesting by the lack of food resources and by construction activities. If they nest in spite of this, construction activities may need to be altered within 250-500 feet of the nests (the exact buffer distance will need to be negotiated with DFG). For this reason, if it is possible to schedule all work in the area around the island during the period when herons are not likely to be nesting, the probability of construction delays will be reduced.

4.2.2. Roosting bats

Pre-construction surveys will be conducted between two weeks to one month prior to construction to inventory the bat species on site (if present). If sensitive species are observed, appropriate non-disturbance activities and measures for the implementation of buffer zones will follow the wildlife relocation and avoidance protocol as indicated in the project construction contract documents. Trees that will be removed during construction should receive particular attention.

Pre-construction Survey Methods - The survey area will include the Project footprint (including all portions of the Lake where construction activities will occur, staging areas, and equipment storage areas).

A qualified biologist will conduct pre-construction surveys for bats. The entire site will be surveyed for the presence or sign of roosting bats. Any potential bat habitats, such as tree cavities, rock crevices, burrows, buildings, and etc., will be identified and surveyed for bats or evidence of bat usage. Active nests and/or roosts will be mapped, and appropriate non-disturbance buffer zones will be recommended. Concurrence from regulatory agencies regarding the appropriate non-disturbance buffers may be necessary. Passive relocation of bats from roost sites may be possible in coordination with DFG.

5.0 REFERENCES

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Personal communications

- EDAW. 2008. Memo: Summary of conversation between Jason Phillips of EDAW and Brian Young of DFG on April 16 and April 17, 2008 regarding the Echo Park Lake Project and associated wildlife relocation plan.
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APPENDIX A
PHOTOS OF TURTLE BASKING TRAPS

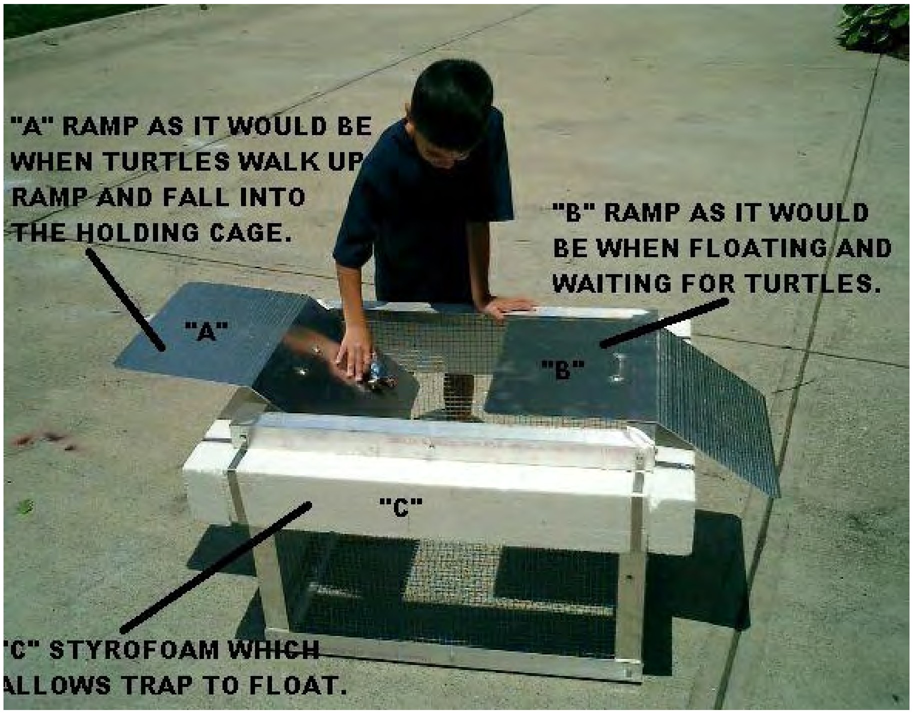


Photo 1. Deluxe Sunning Turtle Trap

Photo 2. Another basking trap design with an internal basking board.

APPENDIX B
BAITED TURTLE TRAPS

FROM CHELYDRA.ORG

A Simple but Effective Turtle Trap

It is not difficult to build a turtle trap. Below is an example of a trap which is inexpensive to built yet effective.

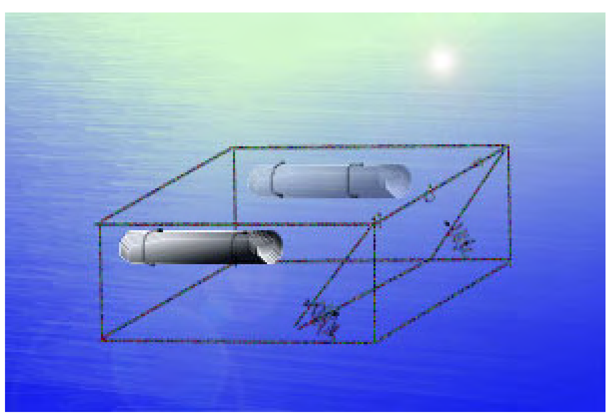
Materials

- Four (4) pieces of BBQ camping grill large size
- Two (2) small pieces of BBQ grill
- Steel wire
- Two springs
- Plastic bottles or styrofoam
- Rope

Take the 4 bigger and one small piece of grill and connect them with wire to make a crate. Make trap door: insert one small piece of grill inside and attach one side of it to the edge of the crate with a wire. Make sure that such made hinge will have enough clearance to move freely.

Attach two springs to the bottom of the crate and inner edge of the swiveling trap door and secure with wire.

Make floats: take the plastic bottles (filled with air and closed), styrofoam or pieces of dry wood and attach them to the sides of the trap. Use enough of them so the whole set ups top wall, with 10 pounds snapper inside, will stay few inches above water.



There are ways of improving the trap, such as making floats from lacquered wood, instead of wire welding the crates.

Setting the trap

For snapping turtles use stripes of fish or whole fish as bait, although any type of raw meat should work. Place the bait in a sack or wrap it with a piece of rope and attach to the side of the trap inside.

Choose a spot where you have seen turtles before. Snappers, prefer shallows close to some submerged branches. If setting a trap in a stream, any place should be adequate. Put it in the water and tie the trap to a solid object on the shore so it will not float away. Check the trap daily and remove the turtle as soon as you spot it.

Few Rules to Obey

Do not forget to leave some clearance between the ceiling of the trap and the surface of the water to let the turtle breathe. Handle the snapper with care. Put it in a solid cardboard box or plastic container and take it to its new home as soon as possible.

Consideration

Once set, traps should be checked, signed off, and emptied by designated trained personnel to ensure proper deployment.

APPENDIX C
SUMMARY OF WILDLIFE RELOCATION AND AVOIDANCE MEASURES – ECHO PARK LAKE REHABILITATION PROJECT

Appendix C. Summary of Wildlife Relocation and Avoidance Measures – Echo Park Lake Rehabilitation Project

Wildlife group	Conservation status [1]	Capture Method	Planned Disposition	Details	Timing relative to construction
FISH					
Trout	Game/native; protected	Net capture	Quarantine	Quarantine at DFG facilities prior to translocation	Capture during water drawdown
Catfish, bass, sunfish	Game/native; protected	Net capture	Quarantine	Quarantine at DFG facilities prior to translocation	Capture during water drawdown
Nonnative species	N/A	Net capture	Remove		Capture during water drawdown
REPTILES					
Turtles					
Western pond turtle	CSC	Basking traps; net capture during fish removal	Quarantine; may be returned to Echo Park Lake after construction is complete.	DFG should be contacted to arrange quarantine or alternate disposition	Begin 3 months prior to drawdown, ongoing until water drawdown
Sonoran mud turtle	CSC	Basking traps; net capture during fish removal	Quarantine	DFG should be contacted to arrange quarantine or alternate disposition	Begin 3 months prior to drawdown, ongoing until water drawdown

Wildlife group	Conservation status [1]	Capture Method	Planned Disposition	Details	Timing relative to construction
All nonnative species	N/A	Basking traps; net capture during fish removal	Find captive homes	Coordinate with rescue organizations to arrange collection and adoption	Begin 3 months prior to drawdown, ongoing until water drawdown
AMPHIBIANS					
Native species	N/A -No special-status species expected	Net capture during fish removal	Quarantine	DFG should be contacted to arrange quarantine or alternate disposition	Capture during water drawdown
All nonnative species	N/A	Net capture during fish removal	Remove		Capture during water drawdown
MAMMALS					
Bats	Species-specific	None	Passive relocation on site if necessary	Passive relocation by removing habitat; construction buffer during breeding	Ongoing; conduct pre-construction survey and construction monitoring if necessary
All other species	N/A -No special-status species expected	None	Passive relocation on site if necessary	Anticipated to disperse on own from construction areas	N/A

Wildlife group	Conservation status [1]	Capture Method	Planned Disposition	Details	Timing relative to construction
BIRDS					
Great blue heron rookery	MB	None	N/A	Avoidance; construction buffer if nests are present	Avoid disturbance by timing construction during non-breeding season around northern island; conduct pre-construction survey; maintain non-disturbance buffer, while breeding; construction monitoring
Other nesting birds	MB	None	N/A	Avoidance; construction buffer if nests are present	Avoid disturbance by timing vegetation removal during non-breeding season; conduct pre-construction survey; establish non-disturbance buffers as needs; construction monitoring

1 CSC = California Species of Special Concern; MB = Migratory Bird Treaty Act.

DRAFT ENVIRONMENTAL IMPACT REPORT
APPENDIX E

CULTURAL RESOURCES PHASE I AND CULTURAL LANDSCAPE TREATMENT PLAN

CULTURAL RESOURCES PHASE I AND CULTURAL LANDSCAPE TREATMENT PLAN FOR THE PROPOSED ECHO PARK REHABILITATION PROJECT CITY OF LOS ANGELES, CALIFORNIA

Prepared for:

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November 2008

U.S.G.S. Quadrangles: Los Angeles
Acreage: Approx 16

Keywords: Echo Park, Reservoir No. 4,
Joseph Tomlinson, Landscape Architecture

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EXECUTIVE SUMMARY

The City of Los Angeles (City) is proposing to make improvements to Echo Park and Echo Park Lake. Improvements are proposed for the portion of Echo Park located north of Bellevue Avenue (Project area). Suggested project improvements (Project) include draining the lake to either remove contaminated sediments or construct a soil-cement edging and high density polyethylene (HDPE) liner, replacing the lake liner, installing more efficient lake aeration systems, and improving or repairing the storm drain inlet and outfall structures. Some in-lake vegetation and habitat improvements that were identified in the concept report include reconditioning the lotus beds, submerging the existing floating wetland islands, improving lake edge treatments, and possibly creating structures to improve habitat for fish and birds. Specific parkland structural Best Management Practices (BMPs) are to be determined; however, some conceptual proposals include installing grassy swales and infiltration strips in upland areas frequented by waterfowl and other wildlife, replacing existing asphalt walkways with porous pavement, installing "smart" irrigation systems, and placing educational signage and kiosks throughout the park to inform visitors about water quality improvements and wildlife.

Echo Park was designated Los Angeles Historic-Cultural Monument (HCM) No. 836 on March 1, 2006. The park was recommended for Monument status because "it embodies the distinguishing characteristics of an architectural and landscape type specimen, inherently valuable for a study of a period style or method of construction." The park was constructed in 1892 and exhibits Spanish Colonial Revival style architecture and English style landscaping. Defining characteristics include the lake, bridge, perimeter path, boathouse, recreation building, restroom buildings, lotus stand, and fountain, as well as some of the park's more unusual trees (Cultural Heritage Commission 2005).

Archival research of the Project area was conducted by Sara Dietler, B.A. on April 21, 2008 at the South Central Coastal Information Center housed at California State University, Fullerton. Nine cultural resources investigations have taken place within a ½-mile radius of the Project area. One historic archaeological resource was previously recorded approximately ½-mile from the Project area. No archaeological resources were previously recorded within the Project area itself. Eight historic or potentially historic properties are located within or adjacent to the Project area.

An archaeological field survey of the Project area was conducted on July 31, 2008. The survey area consists of the landscaped park surrounding Echo Park Lake. No cultural materials were identified during the survey.

A cultural landscape survey of the Project area was conducted on August 25, 2008. The cultural landscape survey documented park landscape features and systems within the Project area. Echo Park was evaluated as a cultural landscape for its eligibility to the National Register of Historic Places and the California Register of Historical Resources and was found eligible for historic events (Criterion A or 1), design styles (Criterion C or 3), and for its connection with locally significant people (Criterion 2). A landscape treatment plan was prepared to identify the essential character defining features of the Echo Park landscape and to allow for planned development within the park while protecting the park's significant features and characteristics.

No prehistoric or historic archaeological resources have been previously recorded within the limits of the record search. The survey conducted in connection with this Project failed to reveal any surface evidence of archaeological resources within the Project area itself. Any work in the vicinity of Bellevue Avenue will require an archaeological monitor. In all other localities archaeological monitoring is not required. In the event any archaeological materials are encountered in these areas during earthmoving activities, the construction contractor shall cease activity in the affected area until the discovery can be evaluated by a qualified cultural resources specialist (archaeologist).

INTRODUCTION

This document reports a cultural resources Phase I and cultural landscape treatment plan in connection with the proposed improvements to Echo Park and Echo Park Lake in northwestern Los Angeles (Figure 1). The Project is located at 751 Echo Park Avenue in the Echo Park/Silverlake community of Los Angeles (Figure 2). This survey and assessment was conducted under the California Environmental Quality Act (CEQA).

PROJECT PERSONNEL

EDAW personnel involved in the archaeological and cultural resources assessment are as follows: Rob McGinnis, Cultural Landscape Research Director; Rachel Evans Lloyd, Cultural Landscape Surveyor and Report Author; Monica Strauss, principal investigator and archaeological surveyor; Candace Ehringer, report author and archaeological surveyor; Sara Dietler, archival researcher; Adela Amaral, archival researcher; and Tim Harris, graphics and GIS specialist. Resumes of key personnel are included in Appendix A.

REPORT ORGANIZATION

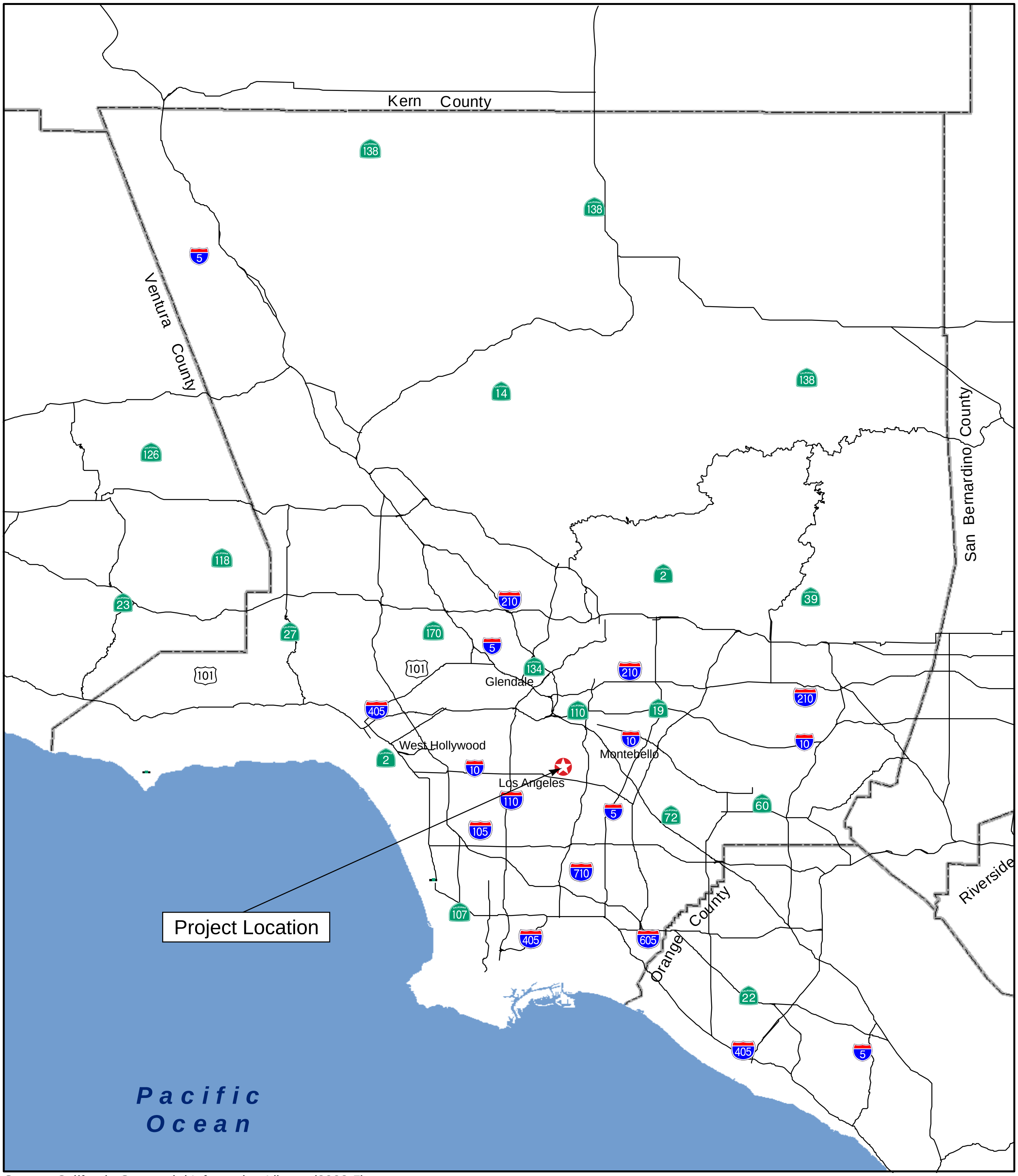
This report is organized following the *Archeological Resource Management Reports (ARMR): Recommended Contents and Format* guidelines, Department of Parks and Recreation, Office of Historic Preservation, State of California, 1990. These guidelines provide a standardized format and suggested report content, scaled to the size of the Project. First, Project description, objectives, features, and construction activities are provided. Next, the environmental and cultural settings are presented along with a detailed historic overview of the Project area. A description of the archival research is presented next along with the archaeological and cultural landscape field survey methods. The resource eligibility and significance evaluation for Echo Park is presented in the following chapter. The final two chapters provide the landscape treatment plan for Echo Park and archaeological recommendations.

The treatment plan conforms to National Park Service (NPS) guidelines and other precedents and standards, including the following:

- NPS Director’s Order 28 (Cultural Resources Management Guidelines)

- National Register Bulletin No. 16: How to Apply the National Register Criteria for Evaluation

- The Secretary of the Interior’s Standards for Treatment of Historic Properties, with Guidelines for the Treatment of Cultural Landscapes.



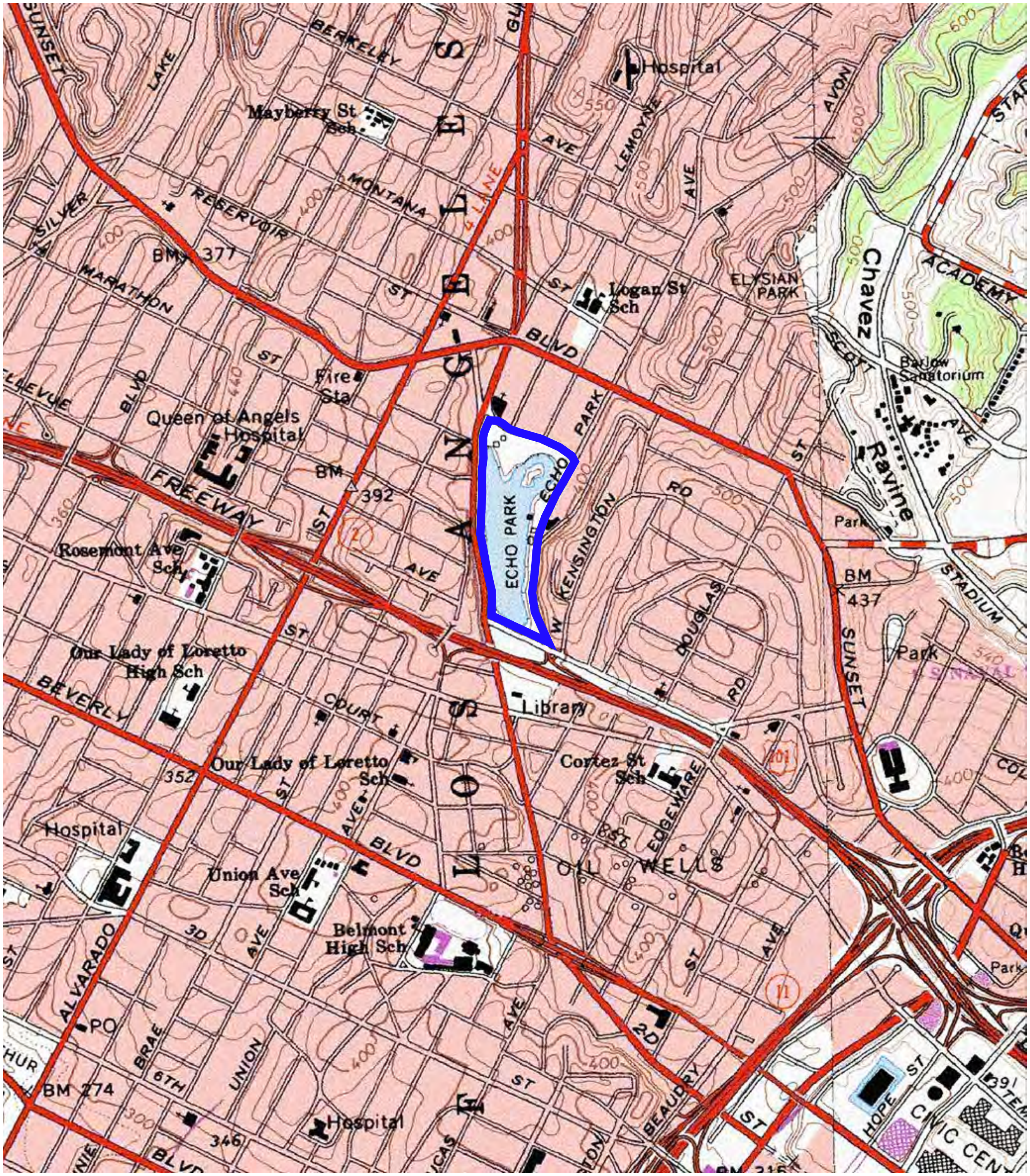
Source: California Geospatial Information Library (2003-5)

EDAW | AECOM

1 inch equals 12 miles

0 6 12 24 Miles

Figure 1
Regional Location Map



Source: California Geospatial Information Library (2003-5)

Legend

Project Site

EDAW | AECOM

N W E S

1 inch equals 0.5 miles

0 0.5 1 Miles

Figure 2
Project Location Map

PROJECT DESCRIPTION

PROJECT LOCATION AND SETTING

Echo Park is a 29-acre park located at 751 Echo Park Avenue in the Echo Park/Silverlake community of Los Angeles. Echo Park proper is bordered to the north by Park Avenue, to the south by Temple Street, to the east by Echo Park Avenue, and to the west by Glendale Blvd. Echo Park is bisected from east to west by Bellevue Avenue in the central portion of the park and by the Hollywood (SR 101) Freeway in the southern portion of the park. The Project area for the purposes of this cultural resources assessment is the portion of the park located north of Bellevue Avenue consisting of the 13-acre Echo Park Lake surrounded by approximately 10 acres of open recreational space (Figure 3). The lake is part of an existing storm drain system that provides hydraulic relief during storm events in the form of flood control before discharging to the Los Angeles River. Two city storm drains, housed in a large concrete structure, empty into the lake at the northeastern end, and the lake outlet is located at the southern end. On the west side of the lake, Los Angeles County maintains a flood control outfall, which is designed to flow into the lake during high flows and is diverted during low flows. The City of Los Angeles (City) received Prop O funding to finance the design and construction of facilities that provide water quality benefits and reduce pollutant loads to the impaired waters of the City to meet water quality standards.

Echo Park Lake is centrally located within the Los Angeles River Watershed, just east of the Ballona Creek Watershed, and south of the convergence of Verdugo Wash and Arroyo Seco. It discharges to a storm drain which is tributary to the Los Angeles River, Reach 3. Reach 3 is a 5-mile long stretch of the Los Angeles River spanning the area between Arroyo Seco and Washington Boulevard in downtown Los Angeles. According to the City of Los Angeles Bureau of Sanitation (BOS) Best Management Practice (BMP) model, the tributary area which drains to Echo Park Lake is approximately 356 residential/commercial acres. Historically, the lake was designed as a retarding basin to provide hydraulic relief to the surrounding storm drain system as a form of flood control. Currently, the lake still acts as a collection point for area runoff, but requires the addition of City water to maintain its level (Black and Veatch 2008).

Echo Park Lake is connected to the existing City and County storm drain systems by an incoming 63-inch reinforced concrete pipe and an 8-foot by 4-foot reinforced concrete box. This junction box also has a 36-inch storm drain that appears to allow low or dry weather flow to bypass the lake. As-built drawings indicate a 30-inch drain connecting to this bypass downstream of the overflow structure. The volume, structural condition, and pollutant loading within these existing bypass drains are unknown. A Los Angeles County Flood Control District storm drain enters the lake on the western edge immediately south of the lotus bed area. Based on the conceptual plan for this Project there is a low-flow diversion pipe connected to the flood control storm drain box at the north end. Therefore, the low flow storm water from the County storm drains also appears to be bypassed around the lake (Black and Veatch 2008).

Source: GlobalXplorer 2008

Legend

Project Site

EDAW AECOM

1 inch equals 450 feet

0 225 450 900 feet

Figure 3
Project Site Map

The shoreline has a vertical edge that starts approximately 2 to 3 feet above the water level and slopes down into the water. The surrounding edge is mostly unvegetated, with adjacent margins characterized by lawn and ornamental vegetation. Water depths in the lake range from 3 to 8 feet. Lake bottom contours and spot elevations vary from 380 feet in elevation on the northern portion to 375 feet on the center and southern end of the lake near the outlet. Design drawings indicate heights of the perimeter wall in the range of from 1.5 feet to 4 feet (Black and Veatch 2008).

PROJECT OBJECTIVES

The overall Project objective is to improve water quality in both the lake and the Los Angeles River Watershed by rehabilitating the lake so it can contribute to improving the water quality of urban runoff in the watershed. A significant reduction in pollutants will assist the City in meeting current and future Total Maximum Daily Load (TMDL) requirements. Another objective is to reduce the use of municipal water to maintain the water level of the lake. Deterioration of the storm drain system infrastructure prevents the lake from functioning as it was designed. As a result, the City supplies the lake with significant quantities of potable water to maintain the lake level.

The lake and associated recreational space are assets to the community, providing recreational opportunities such as boating and fishing. The lotus flowers located in the northwest lobe of the lake are enjoyed by park visitors and are the focus of festivals and cultural events. Over time, however, the lotus beds have become filled with sediment that has over-insulated the plant roots, keeping them too cool and decreasing their vigor. Therefore, another objective is to improve conditions of the lotus bed, as well as habitat conditions for fish and other wildlife around the lake.

PROJECT FEATURES

The proposed Project is currently in the preliminary design phases; therefore, exact details of proposed activities are conceptual at this point. However, an overall approach to improve water quality and restore habitat has been determined. Specific improvements are categorized as: (a) In-Lake Basin Improvements; (b) In-Lake Vegetation and Habitat Improvements; and (c) Parkland Structural BMPs. To conduct in-lake basin improvements, the proposed Project includes draining the lake, either removing contaminated sediments or constructing a soil-cement edging and HDPE liner, replacing the lake liner, installing more efficient lake aeration systems, and improving or repairing the storm drain inlet and outfall structures. Some in-lake vegetation and habitat improvements that were identified in the concept report include reconditioning the lotus beds, submerging the existing floating wetland islands, improving lake edge treatments, and possibly creating structures to improve habitat for fish and birds. Specific parkland structural BMPs are to be determined; however, some conceptual proposals include installing grassy swales and infiltration strips in upland areas frequented by waterfowl and other wildlife, replacing existing asphalt walkways with porous pavement, installing “smart” irrigation systems, and placing educational signage and kiosks throughout the park to inform visitors about water quality improvements and wildlife.

CONSTRUCTION ACTIVITIES

Because the Project is currently in the preliminary design phases, specific details about construction methods and equipment are still to be determined. However, the construction activities described in this section are reasonably expected to occur.

Construction activities for the proposed Project are expected to require at least two years to complete. Draining the lake and conducting in-lake improvements is anticipated in the first year. In-lake vegetation and habitat improvements and parkland structural BMPs are anticipated to be constructed the second year. Prior to draining the lake, relocation efforts and construction-related avoidance measures as described in this report will be implemented. Relocation efforts will require the use of boats and traps. Prior to conducting in-lake improvements, the entire lake will be drained as described below to allow for a dry excavation approach to repairing the lake bottom. Excavators, or other similar equipment, will likely be used to first remove trash from the lake bottom and trucks will haul the trash to an approved off-site location.

The Project engineer is currently conducting water quality and sediment analysis studies to determine whether the contaminated sediment must be dredged and removed from the lake, or if it will be possible to solidify the contaminated sediment into a soil-cement edging and HDPE liner. If the sediment must be removed, scrapers, excavators and backhoes will be used to dredge the soils. Dump trucks will be used to haul spoils to a pre-approved off-site location. If the contaminated soil may be solidified into a soil-cement liner, then scrapers and excavators will be used to grade and contour the lake bottom. Compacters may also be used to compact the lake bottom. Cement trucks, cement mixers, and concrete pouring equipment will be used to line the lake. Excavators will be used to install riprap where needed. Similar construction equipment will be used to install the lake aeration systems and improve/repair the inlets and outfalls.

Most of the in-lake vegetation and habitat improvements can be implemented using hand tools and small equipment. However, large construction equipment as described above may be required to install parkland structural BMPs, such as the grassy swales/infiltration strips and remove asphalt to install the porous pavement.

The City's engineer has determined that pumping the lake water is the only feasible option for drawing-down the lake. The existing outfall cannot be used because it is non-operational. Allowing natural seepage was considered, but rejected because the seepage rate could be too slow. The pumped lake water will be discharged to the storm drain or sewer system. The City will implement required pre-treatments to the water per the requirements of a City Industrial Wastewater Permit and/or Regional Water Quality Control Board permit.

Several alternatives for the drawdown were considered during the preliminary design phase. Under any alternative, a partial drawdown will be necessary as a first step to manage fish capture and relocation. Partial drawdown will result in lake depths between 1 and 3 feet.

The three alternatives for lake drawdown are described below:

Alternative One

The first alternative would not require complete removal of fish from the lake. Fish would be translocated on site to allow in-lake improvements to be conducted in sections in sequence. Fish would be translocated out of one section to the other sections, and water would be removed. Upon completion of the first section, water would be returned to that section, fish would be translocated back, and water would be removed from the other sections. Construction would then be completed on the final sections. Berms or cofferdams would be necessary to section off the construction phases and there would be added mobilization time for construction of each section. Therefore, this alternative would be difficult and costly from a construction and engineering stand point.

Alternative Two

The second alternative would require preparing a temporary holding area on site for the fish so that construction activities could be completed for all remaining areas of the lake. Possible holding areas considered include the lotus pond (which is already separated from the rest of the lake by a short wall), creation of an isolated pool around the existing aerator, or creation of an isolated pool in another feasible portion of the lake (i.e., around the northern island).

Alternative Three – Preferred Alternative

The third and preferred alternative would require removing all fish and wildlife during one initial effort. After a partial drawdown, the lake would be divided into nine sections for fish removal. After removal of fish and other aquatic species, the lake would be completely drained to allow construction to be completed on the entire lake at once. Any remaining aquatic species would be salvaged from deeper pools before they are completely drained.

Due to construction and budgetary constraints as well as timing, the third option is the preferred alternative. Therefore, this report assumes that the third option will be implemented, that fish and other aquatic wildlife will not be retained on site, and that they must be removed prior to completion of the drawdown of the lake.

PROJECT SETTING

ENVIRONMENTAL SETTING

The surrounding area is a relatively flat area of the western Los Angeles Basin formed by Santa Monica Mountains to the north, the San Gabriel Mountains to the northeast, and the San Bernardino and San Jacinto Mountains to the east. The basin was formed by alluvial and fluvial deposits derived from these surrounding mountains. Prior to urban development and the channeling of the Los Angeles River, the Project area (located approximately 1.80 miles west of the Los Angeles River Channel) was covered with marshes, thickets, dense woodland, and grassland. The floodplain forest of the Los Angeles Basin formed one of the most biologically rich habitats in Southern California. Willow, cottonwood and sycamore, and a dense underbrush of alder, hackberry, and shrubs once lined the Los Angeles River as it passed near present-day downtown Los Angeles. Although historically most of the Los Angeles River was dry for at least part of the year, shallow bedrock in the Elysian Park area north of downtown forced much of the river's underground water to the surface. This allowed for a steady year-round flow of water through the area that later became known as downtown Los Angeles (Gumprecht 1999).

Echo Park is located in a natural depression located between two hills approximately seven miles south of the San Gabriel Mountains. The area is presently an urban environment. The adjacent hills are steep and densely covered with single- and multi-family residences. Narrow streets cut through the surrounding neighborhood.

At Echo Park, the native vegetation that was once present on this site was completely removed with urbanization of the area. Currently, the park surrounding the lake is primarily composed of nonnative ornamental plant species. Typical nonnative trees include palms (including pindo palm, *Butia capitata*, Canary Island date palm, *Phoenix canariensis*, and Mexican fan palm, *Washingtonia robustus*), southern magnolia (*Magnolia grandiflora*), *Eucalyptus* species, and pine species (including *Pinus halepensis, P. pinea*, and *P. caneriensis*). Native species include white alder (*Alnus rhombifolia*), western sycamore (*Platanus racemosa*), and California fan palm (*Washingtonia filfera*). Emergent vegetation is limited and is primarily composed of cattail (*Typha* spp.) found on the four floating wetlands in the center of the lake and the island on the north side of the lake. The partially submerged floating wetlands are anchored to the lake bottom with chain. Additionally, there is a lotus (*Nelumbo nucifera*) bed located in the northwestern corner of the lake that is maintained by the Los Angeles Department of Recreation and Parks (Black and Veatch 2008).

CULTURAL SETTING

As a framework for discussing the potential cultural resources expected during the archaeological investigation of the Project area, the following discussion summarizes our current understanding of major prehistoric and historic developments in and around Los Angeles. This is followed by a more focused discussion of the history of Echo Park itself.

Prehistoric Overview

The earliest evidence of occupation in the Los Angeles area dates to at least 9,000 years before present (B.P.) and is associated with a period known as the Millingstone Cultural Horizon (Wallace 1955; Warren 1968). Departing from the subsistence strategies of their nomadic big-game hunting predecessors, Millingstone populations established more permanent settlements. These settlements were located primarily on the coast and in the vicinity of estuaries, lagoons, lakes, streams and marshes where a variety of resources including seeds, fish, shellfish, small mammals, and birds were exploited. Early Millingstone occupations are typically identified by the presence of handstones (manos) and millingstones (metates), while those Millingstone occupations dating later than 5,000 years B.P. contain a mortar and pestle complex as well, signifying the exploitation of acorns in the region.

Although many aspects of Millingstone culture persisted, by 3,500 years B.P. a number of socioeconomic changes occurred (Erlandson 1994; Wallace 1955; Warren 1968). These changes are associated with the period known as the Intermediate Horizon (Wallace 1955). Increased populations in the region necessitated the intensification of existing terrestrial and marine resources (Erlandson 1994). This was accomplished in part through the use of the circular shell fishhook on the coast and more abundant and diverse hunting equipment. Evidence for shifts in settlement patterns has been noted at a variety of locations at this time and is seen by many researchers as reflecting increasingly territorial and sedentary populations. The Intermediate Horizon marks a period in which specialization in labor emerged, trading networks became an increasingly important means by which both utilitarian and non-utilitarian materials were acquired, and travel routes were extended. Archaeological evidence suggests that the margins of numerous rivers, marshes, and swamps within the Los Angeles River Drainage served as ideal locations for prehistoric settlement during this period. These well-watered areas contained a rich collection of resources and are likely to have been among the more heavily trafficked travel routes.

The Late Prehistoric period, spanning from approximately 1500 years B.P. to the mission era, is the period associated with the florescence of the contemporary Native American group known as the *Gabrielino* (Wallace 1955). Coming ashore near Malibu Lagoon or Mugu Lagoon in October of 1542, Juan Rodriguez Cabrillo was the first European to make contact with the Gabrielino Indians. Occupying the southern Channel Islands and adjacent mainland areas of Los Angeles and Orange counties, the Gabrielino are reported to have been second only to their Chumash neighbors in terms of population size, regional influence, and degree of sedentism (Bean and Smith 1978). The *Gabrielino* are estimated to have numbered around 5,000 in the pre-contact period (Kroeber 1925) and maps produced by early explorers indicate that at least twenty-six Gabrielino villages were within close proximity to known Los Angeles River courses, while an additional eighteen villages were within reasonably close proximity to the river (Gumprecht 1999). Subsistence consisted of hunting, fishing, and gathering. Small terrestrial game were hunted with deadfalls, rabbit drives, and by burning undergrowth, while larger game such as deer were hunted using bows and arrows. Fish were taken by hook and line, nets, traps, spears, and poison (Bean and Smith 1978; Reid 1939 [1852]). The primary plant resources were the acorn, gathered in the fall and processed in mortars and pestles, and various seeds that were harvested in late spring and summer and ground with manos and metates. The seeds included chia and other sages, various grasses, and islay or holly leafed-cherry (Reid 1939 [1852]).

Historic Overview

The *Gabrielino* were virtually ignored between the time of Cabrillo's visit and the Spanish Period, which began in 1769 when Gaspar de Portola and a small Spanish contingent began their exploratory journey along the California coast from San Diego to Monterey. Passing through the Los Angeles area, they reached the San Gabriel Valley on August 2nd and traveled west through a pass between two hills where they encountered the Los Angeles River and camped on its east bank near the present-day North Broadway Bridge. Father Crespi's diaries indicate that on that day they "entered a spacious valley, well grown with cottonwoods and alders, among which ran a beautiful river. This plain where the river runs is very extensive and…is the most suitable site for a large settlement" (The River Project 2001). He goes on to describe this "green, lush valley", its "very full flowing, wide river", the "riot of color" in the hills, and the abundance of native grapevines, wild roses, grizzly, antelope, quail and steelhead trout. Crespi observed that the soil was rich and "capable of supporting every kind of grain and fruit which may be planted." The river was named *El Rio y Valle de Nuestra Senora la Reina de Los Angeles de la Porciuncula*.

Gabrielino villages are reported by early explorers to have been most abundant near the Los Angeles River, in the area north of downtown, known as the Glendale Narrows, and those areas along the rivers various outlets into the sea. Among those villages north of downtown are Maawnga near Griffith Park; Totongna and Kawengna, in the San Fernando Valley; Hahamongna, northeast of Glendale; and closest to the Project area, the village of Yangna, under present day downtown Los Angeles. At the time of Portola's visit, the village of Yangna is reported to have supported a population of at least two hundred (Gumprecht 1999) and was later reported to have contained anywhere between 500 and 1,500 huts, implying an even greater population (Reid 1939 [1852]). The exact location of Yangna continues to be debated, although some believe it to have been located under the present-day Civic Center (McCawley 1996). This settlement, widely regarded as a precursor of modern Los Angeles, was abandoned by 1836.

Missions were established in the years that followed the Portola expedition, the fourth being the *Mission San Gabriel Arcangel* founded in 1771 near the present-day city of Montebello. By the early 1800s, the majority of the surviving *Gabrielino* population had entered the mission system. The Gabrielino inhabiting Los Angeles County were under the jurisdiction of either *Mission San Gabriel*, or *Mission San Fernando*. Mission life offered the Indians security in a time when their traditional trade and political alliances were failing and epidemics and subsistence instabilities were increasing (Jackson 1999).

On September 4, 1781, twelve years after Crespi's initial visit, the *El Pueblo de la Reina de los Angeles* was established not far from the site where Portola and his men camped. Watered by the river's ample flow and the areas rich soils, the original pueblo occupied 28 square miles and consisted of a central square, surrounded by twelve houses, and a series of 36 agricultural fields occupying 250 acres, plotted to the east between the town and the river (Gumprecht 1999).

An irrigation system that would carry water from the river to the fields and the pueblo was the communities' first priority and was constructed almost immediately. The main irrigation ditch, or *Zanja Madre*, was completed by the end of October 1781. It was constructed in the area of present-day Elysian Park, and carried water south (roughly parallel to what is presently Spring Street) to the agricultural lands situated just east of the pueblo (Gumprecht 1999).

By 1786, the flourishing pueblo attained self-sufficiency and funding by the Spanish government ceased (Gumprecht 1999). Fed by a steady supply of water and an expanding irrigation system, agriculture and ranching grew, and by the early 1800s the pueblo produced 47 cultigens. Among the most popular were grapes used for the production of wine (Gumprect 1999). Vineyards blanketed the landscape between present-day San Pedro Street and the river. By 1830 an estimated 100,000 vines were being cultivated at twenty-six Los Angeles vineyards. Over 8,300 acres of land were being irrigated by the zanjas during the 1880s (Gumprecht 1999).

When the Southern Pacific Railroad extended its line from San Francisco to Los Angeles in 1876, newcomers poured into Los Angeles and the population nearly doubled between 1870 and 1880. The completion of the second transcontinental line, the Santa Fe, took place in 1886 causing a fare war which drove fares to an unprecedented low. More settlers continued to head west and the demand for real estate skyrocketed. As real estate prices soared, land that had been farmed for decades outlived its agricultural value and was sold to become residential communities. The subdivision of the large ranchos took place during this time. The city's population rose from 11,000 in 1880 to 50,000 by 1890 (Meyer 1981:45).

As a result of growing population and the increasing diversion of water, the once plentiful water supply provided by the Los Angeles River began to dwindle. The once extensive flood plain dried up, the abundant lushly forested landscape had been cleared for construction materials and fuel, and the tens of thousands of head of cattle, horses, and sheep owned by ranchers had decimated the local grasses (Gumprecht 1999). A number of waterworks projects were underway during the second half of the 19th century in an effort to increase water flow and water retention. Projects included the construction of the Reservoir No. 4 (present-day Echo Park Lake and the Project area), the Silverlake Reservoir, and the further expansion of the Zanja Madre irrigation ditches.

Reservoir No. 4 was created around 1870 when the City of Los Angeles constructed a 20-ft dam at the south end of present-day Echo Park Lake. The reservoir was fed by a canal and ditch to the north. The Main Ditch Supply, whose source was five miles north of what were then the city limits, turned away from the river at a pass through the hills near the present-day intersection of Riverside Drive and Glendale Blvd (approximately 2.4 miles north-northwest of the Project area). From this division point, the east-side waters were piped across the river, while the west-side supply continued south in the old Canal and Reservoir Ditch to Reservoir No. 4. Reservoir No. 4, built to provide storage for 150 million gallons of water, never held more than 50 million gallons because the dam was deemed unsafe (Gumprecht 1999).

Echo Park Historical Overview

The following is a detailed history and chronology of the development of Echo Park (Table 1). Historical research was conducted at the Los Angeles Public Library and the information presented has been gleaned from historic photographs, aerial photographs, and newspaper and magazine articles.

Table 1
Timeline of the Development of Echo Park

Date	Event
1870	Reservoir No. 4 completed in northwestern Los Angeles
1889	Los Angeles Department of Parks established
1889	Joseph Henry Tomlison appointed first superintendent of parks
1891	City of Los Angeles regains control of area known as Reservoir No. 4/Echo Park
1892	Echo Park formally established as a public city park
1893	5,000 yards of dirt excavated from lake to build small island; rock taken from Elysian Park to riprap the island
1895	Original wooden bridge to island constructed
1896	First boathouse opens
1896	10,600 plants put in; watering done by taking buckets of water from lake
1899	Several thousand plants added throughout the year
1900	New lawn = 4,300 sq. ft.; 4,700 new plants
1901	Law passed requiring permit for fishing
1903	Echo Park connected to downtown Los Angeles by 3 streetcar lines
1905	Work to build playground begins (between Bellevue and Temple)
1906	100 rustic benches constructed by F. B. Johnson for 3 parks, incl. Echo Park
1907	Playground opens – 2nd playground in Los Angeles
1907	Worries of Echo Park bursting its dam. Flood gates opened and refused to close.
1908	Echo Park clubhouse constructed between lake and playground
1909	Water from Owen's Lake to allow parks to be greatly improved.
1915	Lighting added to the park
1919	Tennis court constructed
1924	New iron fence placed around playground
1924	New 2-inch pipe rail fence and sidewalk constructed on embankment along Glendale Blvd.
1924	Section of cement sidewalk replaced with gravel and oil pavement
1925	New boathouse constructed near old boathouse
1928	Lotus plants appear
1932	New Echo Park Recreation Center replaces old clubhouse
1935	Lady of the Lake Statue installed
1938	All but one of the willows were removed
1930s/40s	Original bridge replaced with new steel and wooden bridge
1943	Construction of 101 Hollywood Freeway results in demolition of old playground
1976	Bronze bust of Jose Marti erected
1977	First Lotus Festival held in Echo Park
1970s	Most of the shrubbery and flowers removed to deter crime and vagrancy
1986	Lady of the Lake removed and placed in storage; new pump house built at that location
1999	Lady of the Lake statue moved to present location on east side of the lake

1850–1891: Reservoir No. 4

When Los Angeles was incorporated as an American city in 1850, its boundaries remained the same as those of the original Spanish land grant that first established *El Pueblo de la Reina de Los Angeles* in 1781. The city's public land holdings included the area which later became known as Echo Park (Historic Resources Group 2005a).

In 1867, the City of Los Angeles sold the rights to distribute city water to the Los Angeles City Water Company. Around the same time, the City contracted the Los Angeles Canal & Reservoir Company to construct a new canal and water storage system in the western part of the City. In return for doing so, the City conveyed a third of the City's original land grant to the company. The Los Angeles Canal & Reservoir Company completed the new canal system in 1870, diverting water from the Los Angeles River (at a point near present-day Griffith Park) and conveying it through an irrigation ditch in what was then known as the Arroyo de Los Reyes (present-day Echo Park Avenue) and into a new reservoir (Plate 1).

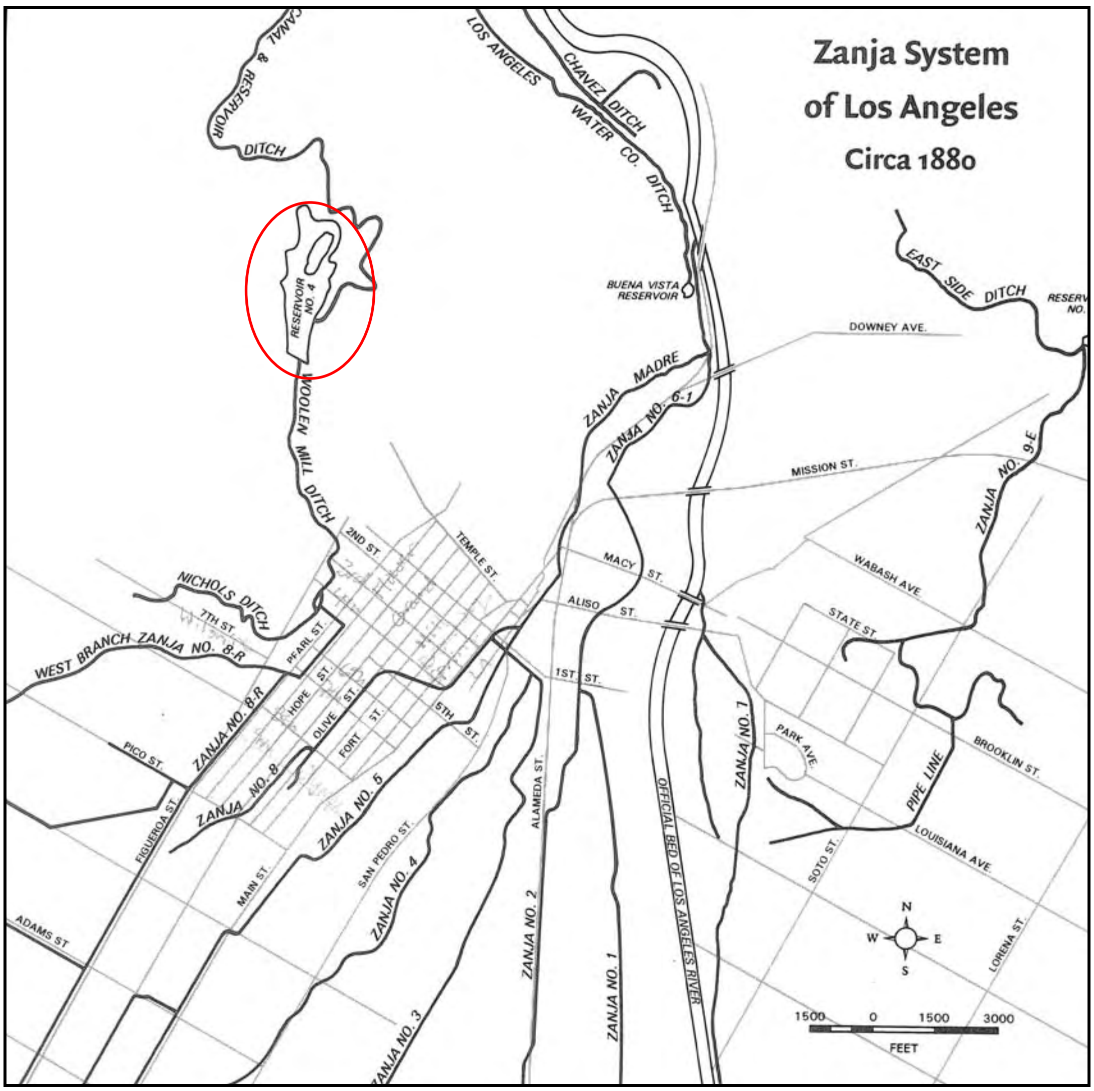


Plate 1. Reservoir No. 4 (modified after Gumprecht 1999).

Plate 2. Baxter and Echo Park Avenues.

The new reservoir (called Reservoir No. 4) was created by erecting a 20-foot dam. The dam was placed across the Arroyo de Los Reyes and a large basin at the location of present-day Bellevue Avenue. Reservoir No. 4 was supplied with water from the diversion of the Los Angeles River and a spring-fed stream originating at Baxter Avenue (approximately one mile north-northeast of Echo Lake) (Plate 2). The stream flowed down the Arroyo de Los Reyes (present-day Echo Park Avenue) (Historic Resources Group 2005a).

The woolen mill ditch carried water from the reservoir to the Coulter Woolen Mills, located at the corner of Sixth and Pearl (now Figueroa) Streets. Waste water was carried through a Zanja to irrigate orchards and vineyards in the area. The population boom of the mid-1880s resulted in the development of new residential subdivisions in outlying areas to the west and northwest of downtown Los Angeles, including the area of Echo Park. Responding to criticism that Los Angeles did not have enough public parks for its increasing citizenry, in 1891 the City regained control of the 33 acre tract in northwest Los Angeles which was to become Echo Park. Echo Park, the city's seventh public park, was formally established one year later in 1892 (Historic Resources Group 2005a).

1892–1909: Creation and Early Use of Echo Park and Echo Park Lake

Once Echo Park was established, Joseph Henry Tomlinson, a landscape architect and Superintendent of the Department of Parks from 1889 to 1909, began the design, layout, and landscaping of the park. Tomlinson, a native of Derbyshire, England, created a park in the picturesque English style (Plate 3). Aspects of the English style which were evident in Echo Park's design are "use of the long lake and middle-distance plantings to create appealing vistas and the illusion of great distance, and open lawns defined by groves of trees with some set apart to emphasize their features, undulations in ground form, and winding, peripheral paths and drives to create interesting natural settings" (Historic Resources Group 2005a).

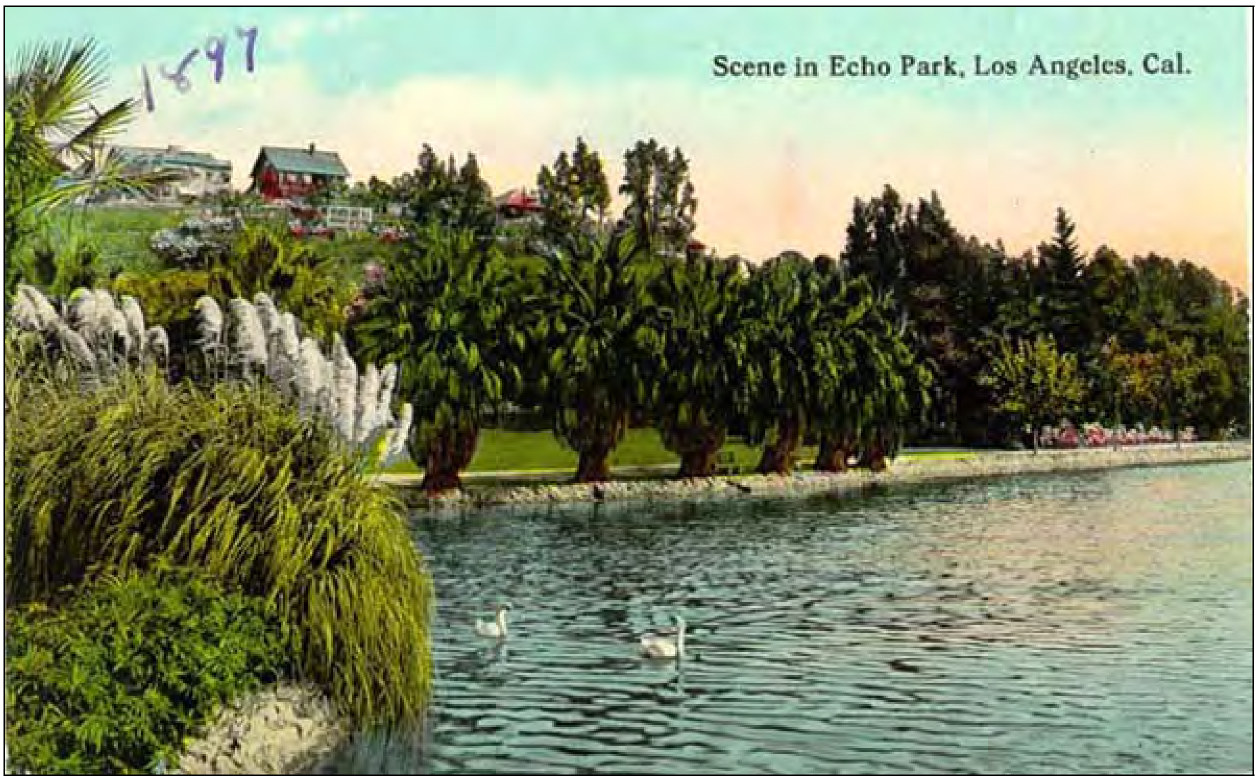


Plate 3. Early Postcard of Echo Park, 1897 (LAPL Photo Collection).

Joseph Tomlinson and other Los Angeles landscape designers working during the turn-of-the-century were greatly inspired by the natural environment. Rustic benches, bridges and gazebos were constructed of natural materials with little modification, "so that people could keep in touch with the country" (Emler 1999). Plantings were selected for suitability to the Southern

Californian climate and included acacia and eucalyptus. Some exotics, such as weeping willows, roses, hydrangea and spirea required special care (Laurie 1979).

Andrew Jackson Downing, a renowned American landscape designer, appears to have influenced Tomlinson (Emler 1999). Downing advocated creating lakes with "irregular outline[s]." Artificial islands would appear "most natural when sufficiently near the shore, on either side, to maintain in appearance some connexion with it." These islands could be made suitable to attracting waterfowl. The banks of the lake should contain "rocks of various size, forms, and colors, often projecting out of or holding up the bank in various places." Plantings should vary in height, and include various types of trees and shrubs. Native vegetation should be removed and replaced with exotic or rare varieties which "convey the idea of refined and elegant art" (Downing 1865 [1991]).

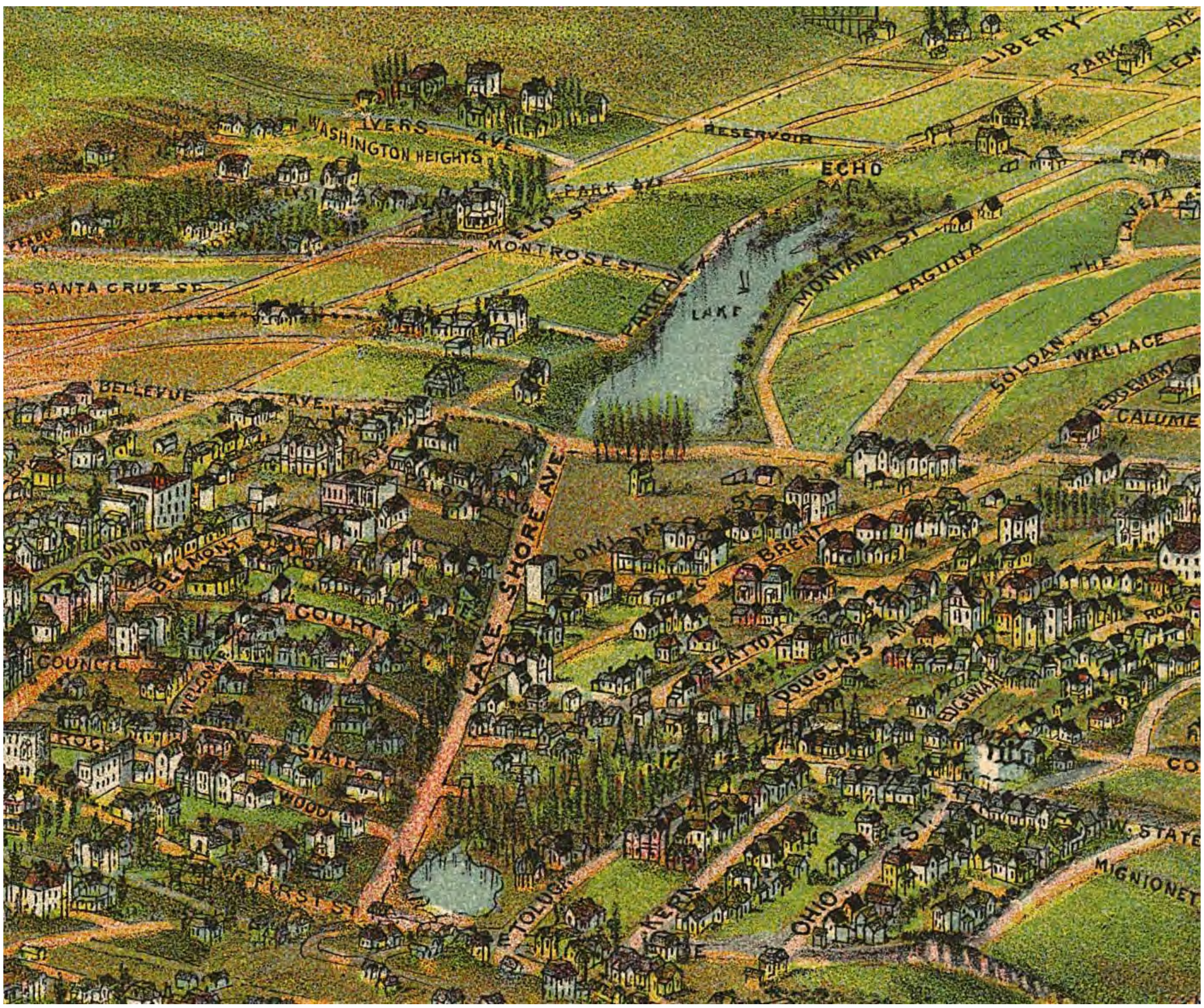


Plate 4. Map of Echo Park, 1894 (Library of Congress).

The park reputedly got its name when Tomlinson noticed an echo as he shouted across the arroyo. Work on the park began in 1892 when the reservoir was shut down. The stream at present-day Baxter Avenue was capped and a sixteen acre lake formed in the reservoir basin. Eucalyptus trees were planted on top of the dam (Plate 4). Willow trees, shrubs and blooming annuals were placed around the perimeter of the lake (Historic Resources Group 2005a).

In 1893, 5,000 cubic yards of soil were excavated from the lake bottom to build an island in the northeast corner of the lake. About 275 loads of rock from Elysian Park were used to riprap the perimeter of the island (LAT 1893).

The original bridge to the island was constructed in 1895 in the same location as the present-day bridge. The bridge had a gradual arch and was made from wood with natural, rustic wooden railing (Plate 5). Its rustic style and the use of twigs in their natural state were typical of the English garden theme (Historic Resources Group 2005a).

Plate 5. Original Bridge to Island, ca. 1900 (LAPL Photo Collection).

A second bridge was once located in the northwestern lobe of the lake. It was constructed in a similar style. The wooden bridge was a flat-span bridge made of wooden planks and twig railings (Plate 6) (Historic Resources Group 2005a).

Plate 6. Flat-span Wooden Bridge in Northwestern Arm of Lake, ca. 1900 (LAPL Photo Collection).

The first boathouse opened one year later in 1896. The boathouse was constructed of wood in the Victorian style (Plate 7). It was open from 8 a.m. to 10 p.m. daily and, in addition to renting rowboats and a sailboat, park patrons could also purchase candy, nuts and lemonade from the small concession stand located within (Historic Resources Group 2005a).

Plate 7. First Boathouse Constructed in 1895–1896 (LAPL Photo Collection).

In the early 1890s, activities at Echo Park reflected the desires of affluent Victorian residents living in surrounding upper-class neighborhoods such as Angelino Heights. Popular outings included boating on the lake, drives in horse-drawn carriages, ladies' luncheons, picnics, and boating parties. Echo Park was a place to see and be seen (Historic Resources Group 2005a).

Between 1896 and 1909 improvements to the park continued steadily, but on a relatively small scale. The lack of an irrigation system and the occasional lowering or draining of the lake to supply water to local farmers limited the potential of the park. However, in 1896 10,600 plants were put in, even though they had to be watered by hand, taking buckets of water from the lake (LAT 1896). Several thousand more plants were added in 1899 (LAT 1899). In 1900, 4,300 square feet of lawn and 4,700 more plants were put in (LAT 1900). In 1906, rustic wooden benches constructed by F. B. Johnson were placed in the park (LAT 1906).

In 1909, the construction of the LA Aqueduct and the diversion of water from Owens Lake allowed the park to be greatly improved. Suggested improvements included placing an artesian well at the north end of the lake to provide a free and constant supply of water. Until this time, the lake could be under-filled at various times of the year and the exposed mud caused a bad odor (LAT 1909).

As Los Angeles's population expanded, Echo Park became less isolated and more developed. By 1903, the park was connected to downtown Los Angeles by three streetcar lines. New residences dotted the hills surrounding Echo Park. The local population began to change as lower and middle class families moved into the surrounding older once-affluent neighborhoods. Improvements to the park began to reflect the mores and needs of this new local demographic (Historic Resources Group 2005a).

Plate 8. Girls Playing Baseball on the New Playground, 1907 (LAPL Photo Collection).

In 1907, the Echo Park Playground, only the second public playground to be built in the city, opened on a triangular piece of land south of the lake. Prior to this, the land was a muddy lot and a nuisance to the neighbors. The land was filled in and a 4-acre playground was built upon the fill. The playground originally consisted of a ball field, basketball, tennis and croquet courts, box swing sets, and a children's wading pool (Plate 8). In 1906, two small wood-frame structures were added for showers, dressing rooms, and storage. An outdoor gymnasium, shelter for parents, and a residence for the playground director were added later (Historic Resources Group 2005a).

In 1908, a new clubhouse, designed by the architectural firm of Hunt, Eager & Burns, was added to the park on a strip of land between the lake and the playground. The clubhouse was a 2-story, rustic style building constructed of darkly-stained Oregon pine, with a weathered oak finish on the interior. Features included a fireplace, built-in bookcases, window seats, an auditorium, dressing rooms, administrative offices, a kitchen, a workshop, and a bowling alley. Activities such as dramatic productions, a music program for boys and girls, and an annual Christmas pageant took place in the clubhouse. The clubhouse was also used by organized sports teams competing against other city playground teams (Historic Resources Group 2005a; LAT 1908).

Fishing also became a popular pastime at Echo Park in the early 1900s. Although it is not known exactly when the lake was stocked with fish, there is mention in the *Los Angeles Times* of fishing the lake as early as 1901. Species included freshwater carp and bass (LAT 1901a; 1902). In 1901, the city passed legislation requiring a fishing permit for all city parks (LAT 1901b).

1910s: No Major Changes or Improvements to Echo Park

Little appears to have changed at Echo Park in the 1910s. However, two major new additions did occur. In 1915, the first park lights were installed (Laurie 1979). The playground saw the addition of tennis courts in 1919 (LAT 1919). Park Maintenance Building was constructed sometime prior to 1916 (Historic Resources Group 2005a).

By the mid-1910s, there were calls for replacing the original 1896 Victorian boathouse with a new boathouse (LAT 1915), but a new boathouse was not constructed until 1932.

1920s–1940s: Modifications/Improvements to Echo Park

Echo Park saw significant changes in the 1920s, '30s, and '40s. Some of these changes greatly improved the park, while others were detrimental to the bucolic nature of the park. In 1910, Frank Shearer was appointed as the new Superintendent of Parks. By the 1920s, perhaps due to a lack of funding, Echo Park had fallen into disrepair. A new City Charter, enacted in 1925, established separate funding for the Department of Parks and Department of Playgrounds and Recreation. This action, along with funds provided to the parks by unemployment relief bonds during the Great Depression, allowed for substantial improvements to Los Angeles's city parks, including Echo Park. Superintendent Shearer (from 1910 to 1936) recognized that Echo Park had fallen into disrepair and responded to neighborhood groups' pleas for park improvement, initiating many of the improvements during his tenure himself (Laurie 1979; Historic Resources Group 2005a).

Improvements to Echo Park included major plantings (the last of which occurred in 1931), stocking the lake with fish to control waterweed and algae, and the installation of formal entryways (three poured concrete stairwells along Glendale Boulevard). Many aspects of the park's present appearance, including existing vegetation and landscaping, were introduced during this period. The 1908 clubhouse was replaced with the existing Echo Park Recreation Center in 1925, a new boathouse (still standing) was constructed on the site of the old boathouse in 1932 (Plate 9), and the "Lady of the Lake" sculpture by Ada May Sharpless was installed in 1935 (Historic Resources Group 2005a).

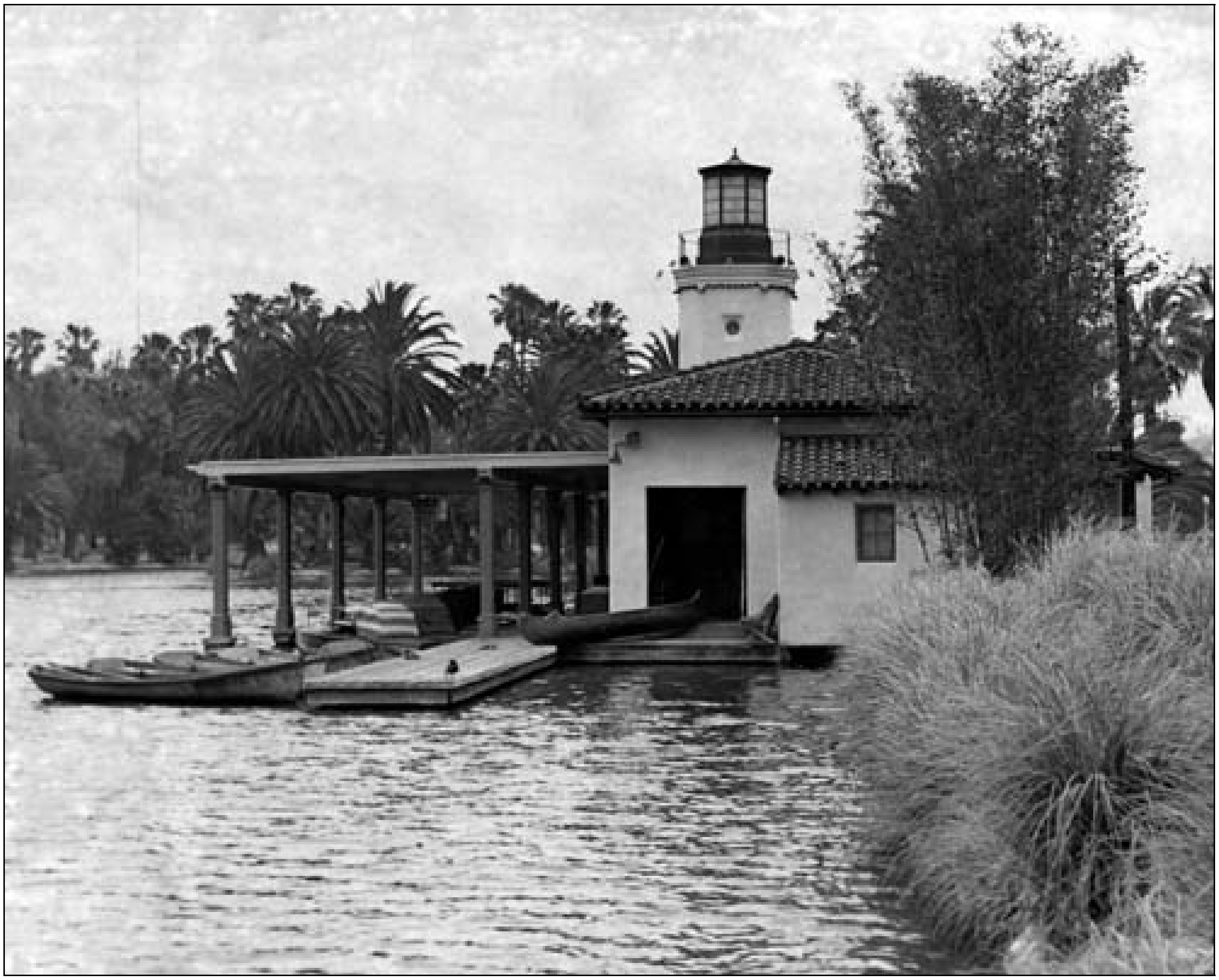


Plate 9. Existing Boathouse, ca. 1948 (LAPL Photo Collection).

The lotus plants (*Nelumbo nucifera*) appeared for the first time during this period (by 1928), but their origin remains a mystery (Plate 10). By the 1940s, the lotus beds, which were located in the northeast and northwest sections of the lake, had encompassed most of the island (Historic Resources Group 2005a).

Plate 10. Lotus Beds, ca. 1929 (LAPL Photo Collection).

Some minor improvements which took place in 1924 included a new iron fence around the playground, a new 2-inch pipe rail fence and sidewalk on the embankment along Glendale Boulevard, replacement of 240 feet of concrete sidewalk on the north end of the park with gravel and oil (Los Angeles City Clerk 1924a; 1924b; and 1924c).

The original arched bridge was replaced during this time period, probably sometime in the 1930s or 1940s. The new bridge was a fixed arch bridge with an open spandrel and an angled wooden plank deck. The span consists of riveted steel construction anchored to mortared masonry abutments with a deck of wooden planks (Historic Resources Group 2005a). During the same time period, all but one of the weeping willows had to be removed due to disease (Laurie 1979:40).

In 1943, the original Echo Park Playground was demolished to make way for the 101 Hollywood Freeway. The Freeway currently divides the clubhouse from the playground (Historic Resources Group 2005a).

By 1931, Communists began to purposely move to the hills of Echo Park (formerly Edendale)) (Hurewitz 2007:153). They reportedly used the street corner near Echo Park to express their opinions (Hurewitz 2007:164). During the fifties, the hills of Echo Park became known as the "Red Gulch" or "Red Hill" because so many leftists and communists who had been blacklisted had settled there; many of whom were associated with the film industry or political activists. During the seventies, this group largely relocated to the Venice area (Klein 1997:135).

1950s-present: Modern Developments

By the late 1970s, most of the shrubbery and flowers had been removed due to increasing crime, vagrancy, and a lack of budget to maintain exotic and lush plantings (Laurie 1979). In 1976, a local Cuban American arts and culture group erected a bronze bust of Jose Marti in the northwest corner of the park (Historic Resources Group 2005a).

In the 1980s, the "Lady of the Lake" statue was removed due to vandalism. The statue was re-installed in its present location on the east side of the lake in 1999. The pump house was built on the site that the statue formerly occupied in 1986 (Plate 11).

Plate 11. Original Location of Lady of the Lake Statue, 1937 (LAPL Photo Collection).

Currently, the park is still used for a variety of community recreational activities, including the annual Lotus Festival. The festival was created in 1977 and celebrates Asian and Pacific Islander cultures.

Modern amenities include a modern playground and picnic tables at the northern end of the lake. Cement benches have replaced the wooden rustic benches around the perimeter of the lake. The boathouse continues to rent paddleboats on the weekends (Historic Resources Group 2005a).

RESEARCH METHODS

The cultural resources investigation for this Project involved archival research including historical resources record search, a sacred land files check, and other background research.

ARCHIVAL RESEARCH

Records Search

Archival research of the Project area was conducted by Sara Dietler, B.A. on April 21, 2008 at the South Central Coastal Information Center housed at California State University, Fullerton. The research focused on the identification of previously recorded cultural resources within a ½-mile radius of the proposed Project area. The archival research involved review of archaeological site records, historic maps, and historic site and building inventories.

The records search revealed that a total of 9 cultural resource investigations have been previously conducted within a 1/2-mile radius of the Project (Table 2). Two of these consisted of survey, assessment, or survey and assessment, two consisted of literature searches, one was conducted in preparation of an Environmental Impact Report, one dealt with telecommunication services, and the final investigation was associated with a Phase III project. Approximately ten percent of the ½-mile radius has been previously surveyed. However, none of the Project area has been previously surveyed.

The records search revealed that no prehistoric archaeological resources have been recorded within ½-mile of the Project area. One historic archaeological resource (P-19-100429) was recorded approximately ½-mile south-southwest of the Project area (Table 3). This resource consists of a historic railroad bed, possibly a remnant of the Pacific Electric trolley system which once operated in Los Angeles. The remains of the historic transportation system run east/west along Beverly Boulevard, between Loma Drive and Wider Street and were found approximately 6–8 feet below the surface of the road.

A review of the Office of Historic Preservation's Directory of Properties for Los Angeles County, the National Register of Historic Places, and documents provided by the City of Los Angeles were limited to properties within the Project area and to properties on streets immediately adjacent to the Project area. The records indicated that eight historic or potentially historic properties have been previously recorded. Of these, two are within the Project area and six are situated near or adjacent to the Project area (Table 4).

Table 2 **Previous Surveys Conducted within 1/2 Mile of the Project Area**			
Author	Report # (LA-)	Description	Date
Billat, Lorna	7995	Historic Consultation for Nextel Communications, Inc. Telecommunications Service (WTS) Facility Project Elevado/CA-7512B, in Los Angeles City and County, California	2005
Dillon, Brian D.	1741	Archaeological and Paleontological Reconnaissance and Impact Evaluation of the Central City West Study Area Los Angeles, California	1989
Dillon, Brian D. and Roy Sails	2768	Draft Environmental Impact Report Central City West Specific Plan	1989
Duke, Curt	4606	Cultural Resource Assessment for Pacific Bell Mobile Services Facility LA 671-02, County of Los Angeles, California	1999
McKenna, Jeanette A.	7387	Historic Cultural Resources Study: The Los Angeles Unified School District Central Region Elementary School No. 14, Located in the Echo Park Area of The City of Los Angeles, Los Angeles County, California	2005
Thal, Erika	7382	CA-7728A/Cortez 1333 West Temple Street, Los Angeles, CA, Los Angeles County	2004
Unknown	5069	Initial Study/Mitigated Negative Declaration for the El Centro del Pueblo Recreation Center	2000
Wlodarski, Robert J.	7357	A Phase I Archaeological Study for the Proposed Temple Villas Apartment Building Located at 1417–1429 Temple Street City of Los Angeles, County of Los Angeles, California	2004
Wood, Catherine	8265	Archaeological Report for the Visaya Garden Project Located at 418-430 N. Alvarado Street, Los Angeles, California	2007

Table 3 **Previously Recorded Archaeological Resources sithin 1/2 Mile of the Project Area**				
Permanent Trinomial (CA-LAN-)	P-Number (P-19-)	Other Number	Description	Date Recorded
	100429		Linear feature associated with historic trolley or railroad system	4/2001

Table 4 Previously Recorded Historic Properties within or Adjacent to the Project Area				
Address	Building Name	Year Built/Completed	Location in Relation to Project area	Status
751 N. Echo Park Ave.	Echo Park**	1892	Project area	LAHCM No. 836
751 N. Echo Park Ave.	Echo Park Boathouse**	1932	Within the Project area, on the east side of the lake	Code Unknown: Eligible for listing on the National Register
1632 Bellevue Ave.	Echo Park Recreation Center	1925	South of the lake, between Bellevue and 101 Hollywood Freeway	2D2: eligible as contributor to NR district. Listed in CR.
840 Echo Park Ave.	Saints Athanasius & Paul Episcopal Church and associated buildings	1921/1931	East of the Boat House, between Echo Park Ave. and Laguna Ave.	7N: needs to be re-evaluated
801 Glendale Blvd.	Residence	1912	West of Echo Park, between Kent and Santa Ynez Streets	5S2: eligible for local listing or designation
823 Glendale Blvd.	Residence	1905	West of Echo Park, between Kent and Santa Ynez Streets	5S2: eligible for local listing or designation
827 Glendale Blvd.	Residence	1920	West of Echo Park, between Kent and Santa Ynez Streets	5S2: eligible for local listing or designation
1100 Glendale Blvd.	Angelus Temple	1921–23	North of Echo Park, at intersection of Glendale Blvd. and Park Ave.	1S: listed on the National Register as individual property

**indicates Historic Property within the Project area

Echo Park was designated Los Angeles HCM No. 836 on March 1, 2006. Information provided in the Cultural Heritage Commission *Historic-Cultural Monument Application* suggests that Echo Park has design significance (Criterion C) for its English-style park landscape and for the Spanish Colonial Revival architectural style of the buildings. It also suggests that Echo Park has historical significance (Criterion A) as "one of Los Angeles' earliest parks and is the location of the city's second established, and oldest remaining, municipal playground. The history of Echo Park's creation and development represents significant trends in the provision of municipally funded parks and recreation facilities in Los Angeles during the early twentieth century. It is also significant as a remnant of Los Angeles' early water system and the trends and policies that shaped the city's distribution and use of public lands in the late nineteenth century."

The primary designers associated with the earliest construction of the park's historic resources are Joseph Tomlinson (Los Angeles Department of Recreation and Parks superintendent from 1889 to 1909) and Frank Shearer (Los Angeles Department of Parks superintendent from 1910 to 1936); and Allied Architect Association of Los Angeles, which designed the Echo Park Recreation Center. Allied Architect Association consisted of thirty-three prominent architects from the Los Angeles area who were responsible for the design of many important civic buildings in the city in the early 1920s and 1930s, including the Los Angeles Civic Center, the Hall of Justice, Patriotic Hall, the Hollywood Bowl, and the Los Angeles USC Medical Center among others (Cultural Heritage Commission 2005).

Defining characteristics of Echo Park include the lake, bridge, perimeter path, boathouse, recreation building, restroom buildings, lotus stand, and fountain, as well as some of the park's more unusual trees. The creation of Echo Park in 1892 reflected a local materialization of the national late 19th century beautification and urbanization advance, the City Beautiful Movement (Historic Resources Group 2005a). In its initial years, Echo Park was frequented by affluent society members and often served as the backdrop for upscale social events. By the beginning of the 20th century though, the demographics of park dwellers changed from upper to lower and middle class as downtown Los Angeles and the park were connected via street car and residential housing tracts were constructed. Also at the onset of the 20th century, additions within the park, such as the playground, Clubhouse, Echo Park Recreation Center, and the extant Echo Park Boathouse were made.

The present Echo Park Boathouse, located on the eastern side of the lake, was completed in 1932. The building was constructed in the Spanish Colonial Revival style and provided canoe and boat rental, a full kitchen, and a concession area. The building was evaluated between 2003 and 2005 as part of the Echo Park Boathouse Rehabilitation Project and was found eligible for listing on the National Register (Historic Resources Group 2005b).

The Echo Park Recreation Center, located immediately south of the Project area at 1632 Bellevue Avenue, is listed on the California Register of Historical Resources. The recreation center was built in 1925 in the Spanish Colonial Revival style (Historic Resources Group 2005a).

Sacred Land File Search

The Native American Heritage Commission (NAHC) conducted a check of its Sacred Lands File for the Project on July 24, 2008. The results indicated no sacred lands had been previously documented for the Project area. However, the absence of specific site information in the Sacred Lands File does not preclude the possibility of cultural resources within the Project area.

Additional Historical Research

Additional historic research to develop a historical context for Echo Park was conducted at a number of archival repositories and local agency archives. Archives searched include the Los Angeles Public Library (LAPL), Los Angeles Public Library Echo Park branch, the University of California Los Angeles Air Photo Archives, University of Southern California Regional History Center, the office of the Los Angeles City Clerk, the City of Los Angeles Bureau of Engineering Vault, and the Department of Recreation and Parks. Documents obtained as a result of this research include book publications, historic newspaper articles, historic photographs, historic aerials, historic maps, and engineering plans. Efforts were made to coordinate a review of documents on file with the Echo Park Historical Society, but no such review has been scheduled to date.

CULTURAL RESOURCES SURVEYS

Archaeological Survey

An archaeological field survey of the Project area was conducted by Monica Strauss, M.A., R.P.A. and Candace Ehringer, M.A., R.P.A. on July 31, 2008. The survey area consists of the approximately 10-acre landscaped park area surrounding Echo Park Lake. Approximately 95 percent of the archaeological survey area was covered by lawn and ground surface visibility was poor (Plate 12). As a result, surveyors focused on examining all areas throughout the Project area where soils were exposed; these, in most instances, were limited to tree wells.

Plate 12. Overview of Project Area (view to the south).

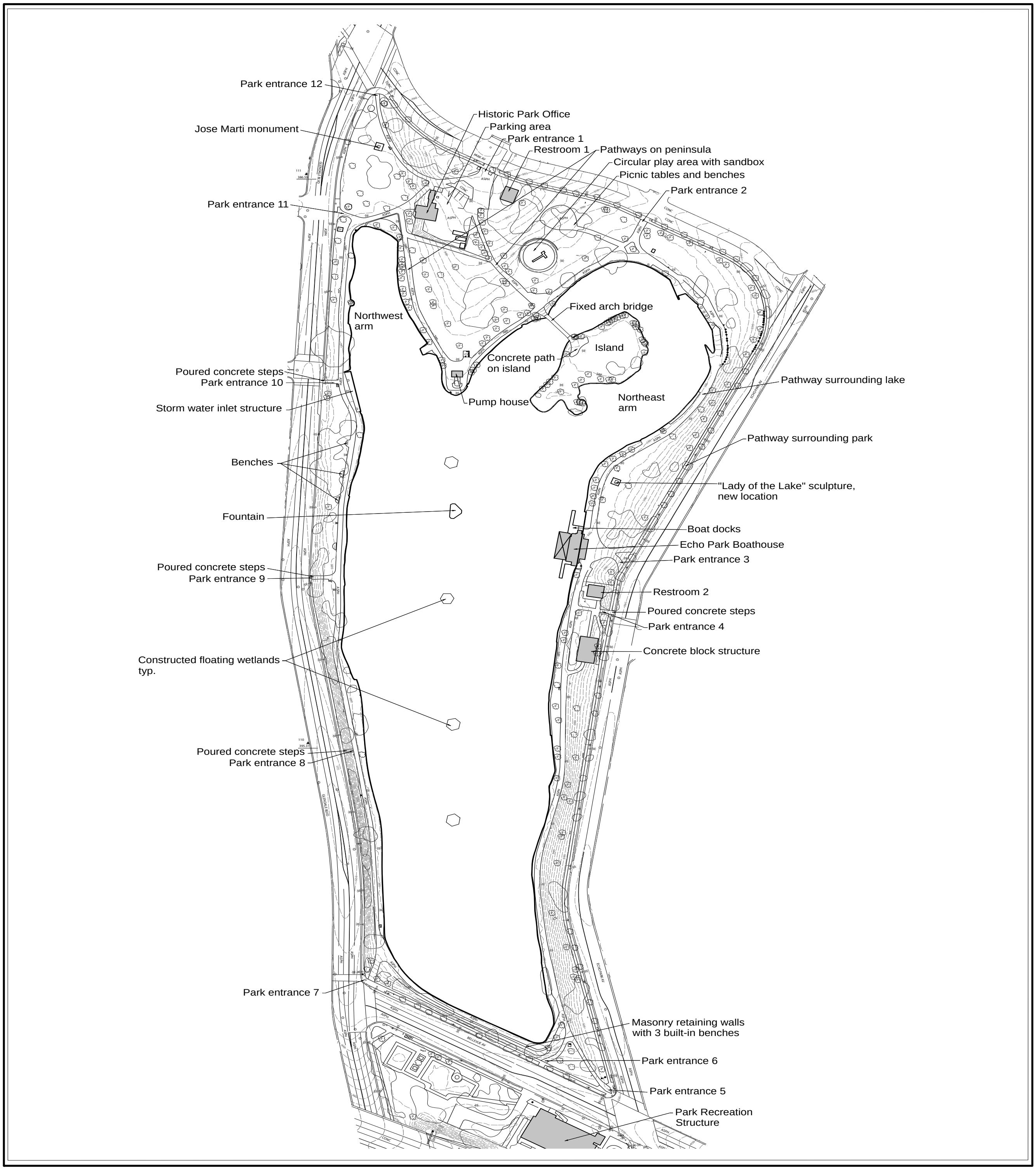
Survey of the area was conducted on foot, with surveyors focusing their attention on areas of greater ground visibility. Soils observed within the tree wells and other bare spots varied from dark brown organic top soils to lighter brown sandy clay (Plate 13). A low vertical cut on the east side of the lake where the grass meets the pathway was also inspected. Soils observed ranged from tan to medium brown sandy clay. No cultural materials were identified during the survey.

Plate 13. A Range of Soil Types Observed within the Project Area.

Historic Resources Survey: Existing Conditions

A cultural landscape survey of the Project area was conducted by Rachel Evans Lloyd, M.L.A. on August 25, 2008 to document the park's historic landscape. The survey included field work to photograph landscape features and systems within the Project area and to update the existing conditions map. Historic features were recorded on State of California, Department of Parks and Recreation (DPR) forms.

In order to understand the relationship between the 2008 Echo Park landscape and the historic landscape that existed during its period of significance (1870–1943), this report presents a description of existing conditions (see Figure 4). The analysis focuses on extant historic features within the Project area (see Figure 5), though known missing features are also identified. The goal of the analysis is to understand what historic features contribute to the significance of the landscape, and to provide the basis for a treatment plan for the cultural landscape. Sources such as historic photographs, maps, and aerial photographs were used to understand the character of the landscape during its period of significance. Available historic documentation of the park's physical development included early (1910s) engineering and planning maps and historic oblique aerial photographs that provide only limited information about the park's physical evolution and development. Given the documentation obtained, the analysis presented here reflects the fullest possible picture of the park's history.



EDAW | AECOM

Not to Scale

N W E S

Figure 4
Existing Conditions

Echo Park Los Angeles, Ca

EDAW AECOM

Not to Scale

N W E S

Figure 5
Surviving Historic Features

Historic Buildings

Three historic buildings remain in the Echo Park landscape: the Park Maintenance Building (pre-1916) on peninsula near Park Avenue (Plate 14), the Boathouse (1932) on the east edge of the lake (Plate 15), and the Park Recreation Structure (1925) located directly adjacent the Project area to the south of Bellevue Avenue (Plate 16).

Plate 14. Park Maintenance Building (pre-1916)

Plate 15. The Boathouse (1932)

Plate 16. The Park Recreation Structure (1925)

These buildings all remain from the period of significance, and the Boathouse and Park Recreation Structure reflect the significance of the Spanish Colonial Revival architecture theme through characteristics such as their stucco or brick cladding and tiled roofs. These buildings include small additions, such as a new accessibility ramp at the Park Recreation Structure, and the Boathouse has minor new additions of fencing/railing on its roof. The Park Office Building, a small, ivy-covered, brick maintenance building with a small shed addition, appears to have a new set of concrete steps on its west side. Missing historic buildings include the original Victorian boat house and earlier restroom buildings.

Additional Buildings

Several buildings have been constructed in the park since the period of significance. These include; the restroom near the Park Office Building (Plate 17), the restroom near the Boathouse (Plate 18), a concrete block utility shed near the Boathouse (Plate 19), and a stuccoed pump house (Plate 20). These buildings mimic many of the Spanish Colonial Revival design characteristics of the historic buildings, including the neutral colors, tiled roofs, and stucco/concrete or brick cladding.

Plate 17. Restroom near Park Office Building

Plate 18. Restroom near Boathouse

Plate 19. Concrete Block Utility Shed near Boathouse

Plate 20. Pump House

Historic Structures

The historic structures in the park are the bridge to the island in the lake (Plate 21) and perhaps some sections of the lake edge wall. It is the second bridge in that location in the park's history (c. 1930–1950), and replaced the original rustic-style bridge. The bridge's abutments on both the island and the peninsula side appear to include the original riprap that was used to create the island and shore up the peninsula edges. The boat docks at the Boathouse may survive from the historic period as well (Plate 22). One stormwater inlet also appears to survive from the historic period (Plate 23). Missing structures include two historic bridges: one that occupied the location of the existing bridge, and one in the northwestern lobe of the lake crossing the lotus bed area.

Plate 21. Bridge to Island with Bridge Abutments (c. 1930–1950)

Plate 22. Boat Docks at Boathouse

Plate 23. Stormwater Inlet Structure

Additional Structures

Many additional structures have been added to the park since the 1940s. These include recreational structures such as the new circular play area on the peninsula (Plate 24), masonry retaining walls with built-in benches (Plate 25), four constructed floating wetlands (Plate 26), a storm water infrastructure inlet (Plate 27), sections of retaining wall/lake edge (Plate 28), the retaining walls near the Boathouse restroom (Plate 29).

Plate 24. Circular Play Area with Sandbox

Plate 25. Masonry Retaining Walls with Three Built-in Benches

Plate 26. Constructed Floating Wetlands (4)

Plate 27. Storm Water Infrastructure Inlet

Plate 28. Retaining Wall/Lake Edge

Plate 29. Retaining Walls Near Boathouse Restroom

Historic Circulation

Surviving historic circulation systems include the approximate alignments of the pathways that encircle the lake and provide access to the peninsula. These paths remain in their approximate locations from the 1910s (Plates 30–32). The historic materials of the path system may have included crushed stone, sand, soil, and later, asphalt and concrete. In addition, two concrete stairways (Plate 33) installed along the sidewalk at Glendale Boulevard also survive from the historic period (one additional original stairway appears to have been reconstructed in place). Missing historic circulation systems include pathways around the island, and pathways in other locations such as at the former location of the first historic Boathouse.

Plate 30. Path Sections on Peninsula

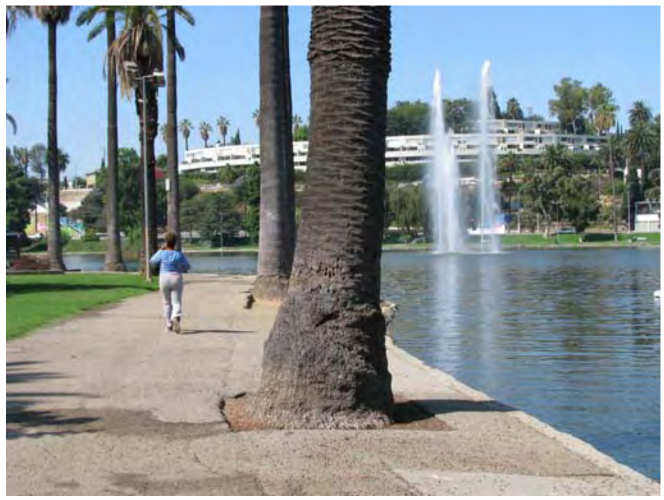


Plate 31. Pathway Surrounding Lake

Plate 32. Park Entrance North of Island

Plate 33. Concrete Steps from Street-level Pathway to Park-level Pathway (1920s-early 1930s)

Additional Circulation

There have been changes and additions to the circulation system at the park since the period of significance including the addition of the parking and maintenance area at the office building; new park entrance locations (such as the entrances near the Boathouse, at the corner of Echo Park and Bellevue Avenues, and near the north end of the park at Glendale Boulevard); street-level sidewalks at Echo Park Avenue and Glendale Boulevard; and some sections of pathways on the peninsula. (Plates 34–39).

Plate 34. Park Entrances

Plate 35. Sidewalks Surrounding Park (at Street Level)

Plate 36. Sidewalks Surrounding Park (at Street Level)

Plate 37. Parking Area at Park Office

Plate 38. Pathways on Peninsula

Plate 39. Ramps near Boathouse Restrooms

Historic Vegetation

Some trees at Echo Park survive from the earliest construction (Plate 40), such as the palm trees along the lake north of the Boathouse, palm trees lining paths on the peninsula, and other scattered trees on the island and along the lake and street edges. The lotus beds (Plate 41), the exact origins of which are unknown, have been growing at Echo Park Lake since the 1920s. The lotus plants are also the focus of the Lotus Festival, which has been taking place at the park since the 1970s. The lotus plants do not appear to be surviving in 2008. There are some plantings, such as a small grove of bamboo (Plate 42) near the southeast end of the park, and pampas grass on the island which may be remnants of historic plantings. Much of the historic vegetation, however—whether trees, shrubs, or perennials—is missing.

Plate 40. Trees

Plate 41. Lotus Beds

Plate 42. Bamboo Planting

Additional Vegetation

Though substantial numbers of trees and shrubs have been cleared from the park—or died and have not been replaced—many new plantings have been added. These new plantings include ornamental, hardy shrubs such as lantana and plumbago in sloped or terraced areas such as along the retaining walls on the park's south side (Plate 43), or along the embankment at Glendale Boulevard (Plate 44). Other ornamental plantings include small planting beds at park entrances and at the two sculptures (Plates 45–47).

Plate 43. Planting Beds Along Southern Side of Lake

Plate 44. Shrubs along Glendale Boulevard

Plate 45. Ornamental Planting Beds

Plate 46. Planting Beds at the Base of the Sculptures

Plate 47. Lakeside Plantings

Historic Water Features

The most important feature of the park is the lake (Plate 48), which survives from the late 1870s when it was still a reservoir. The reservoir was modified during the site's creation as a park, though the lake continues to serve as a retarding basin for the city's storm water system. The precise configuration of the lake edge has changed, although the lake's outline remains much as it did over the last century. One section of the lake—its northwestern lobe—was partially filled in, and no longer remains as a water feature. Another historic water feature that is now missing is a small fountain formerly located south of the concrete block utility shed along the east side of the park.

Plate 48. Lake (1892)

Additional Water Features

The large fountain in the northern half of the lake is a relatively new feature, reported to have been installed in the early 1980s as part of Los Angeles' hosting of the1984 Olympic Games (Plate 49).

Plate 49. Fountain

Historic Small-scale Features

The Lady of the Lake, sculpted by Ada May Sharpless, was installed at Echo Park in 1935 at the tip of the peninsula. After being vandalized, the sculpture was removed and stored for many years before it was reinstalled in a different location on the east side of the lake (Plate 50). Missing small-scale historic features include park lights, benches, fencing and bollards, and a flagpole.

Plate 50. *Reina de la Los Angeles* or "Lady of the Lake" Sculpture (1935) Moved To Current Location in 1999

Additional Small-scale Features

Many new small-scale features have been added to the park since its period of significance. These include many types of benches, trash receptacles, lights, fencing, playground equipment, and others. Some of these features, such as benches or lights, are replacements of older ones. Many, though, such as the new sculpture and new playground equipment are new additions. (Plates 51–58)

Plate 51. Lights

Plate 52. Benches (Many Types)

Plate 53. Benches

Plate 54. Jose Marti Monument

Plate 55. Picnic Tables and Benches

Plate 56. Playground Equipment

Plate 57. Trash Receptacles

Plate 58. Dumpsters

Spatial Organization

The Picturesque design principles that guided the park's historic configuration are evident today, though less than they were in the first half of the 1900s. The spatial organization was defined primarily by the creation of views and vistas along the lake, and between the park and the surrounding neighborhood. Other designed spaces included open lawn areas surrounded by groves of trees. These lawn areas were located at the widest spaces between the lake and street, and also on the peninsula and on the island. The island and peninsula landscapes have a distinct spatial organization that is defined by water on all (or most) sides, and by groves of trees. (Plates 59–63)

Plate 59. Open Lawns Defined by Groves of Trees

Plate 60. Designed Views from Park into Surrounding Residential Development, the Nearby Urban Landscape and within the Park and Lake Landscape

Plate 61. Designed Views from Park into Surrounding Residential Development, the Nearby Urban Landscape and within the Park and Lake Landscape

Plate 62. Island Landscape

Plate 63. Peninsula Landscape

Topography

The topography at Echo Park appears to have remained remarkably intact to at least the 1910s; the original bowl-shaped lake bed, the embankments to the streets above, and the undulating groundplane at the northern end of the park still exist today. The constructed island, created from dredged soil and stones brought from Elysian Park, has had small sections of land added on its northern side. The original constructed lake edge, with its rip-rap walls, may also survive in some places. The northwestern lobe of the lake, north of the lotus bed, has been filled in to reduce the lake footprint. Additionally, some modification to the lakes southern edge may also have occurred. (Plates 64–68).

Plate 64. Undulating Groundplane at the North Section of the Park

Plate 65. Sections of Exposed Riprap that May Survive from the 1890s

Plate 66. Embankment on Park Edges near Glendale Boulevard and Echo Park Avenue

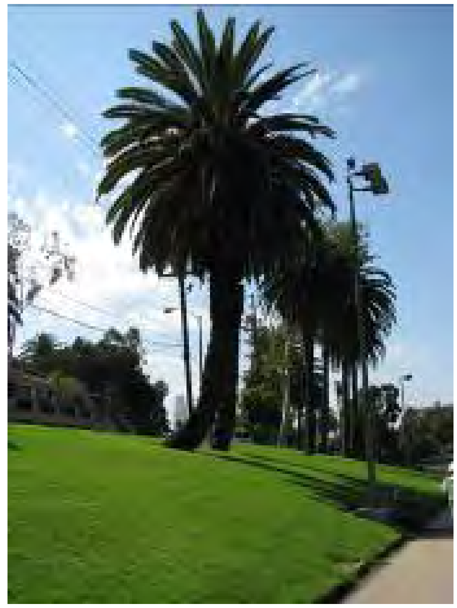


Plate 67. Embankment on Park Edges near Glendale Boulevard and Echo Park Avenue

Plate 68. Island, Surviving from 1895

RESOURCE ELIGIBILITY AND SIGNIFICANCE EVALUATION

SIGNIFICANCE CRITERIA

National Register of Historic Places

As part of this cultural resources assessment, a significance evaluation of Echo Park has been conducted to determine whether it is eligible for listing on the National Register of Historic Places (National Register). The criteria for evaluation of cultural resources for inclusion in the National Register as historic properties are set forth in 36 CFR 60.4.

The quality of significance in American history, architecture, archaeology, engineering, and culture is present in districts, sites, buildings, structures, and objects that possess integrity of location, design, setting, materials, workmanship, feeling, and association and

A. that are associated with events that have made a significant contribution to the broad patterns of our history; or

B. that are associated with the lives of persons significant in our past; or

C. that embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or

D. that have yielded, or may be likely to yield, information important in prehistory or history.

A resource meeting one or more of the National Register criteria must also retain the essential physical features that enable it to convey its historic identity. The quality of significance is present in districts, sites, buildings, structures, and objects that possess integrity of location, design, setting, materials, workmanship, feeling and association. To retain historic integrity a property will always possess several, and usually most, of the aspects.

California Register of Historical Resources

The California Register of Historical Resources (California Register) was created to identify resources deemed worthy of preservation on a state level and was modeled closely after the National Register. The criteria are nearly identical to those of the National Register but focus on resources of statewide, rather than national, significance. The California Register consists of properties that are listed automatically as well as those that must be nominated through an application and public hearing process.

The criteria for eligibility of listing in the California Register are based upon National Register criteria, but are identified as 1–4 instead of A-D. To be eligible for listing in the California Register, a property must be at least 50 years of age and possess significance at the local, state, or national level, under one or more of the following four criteria:

1. It is associated with events that have made a significant contribution to the broad patterns of local or regional history, or the cultural heritage of California or the United States; or

2. It is associated with the lives of persons important to local, California, or national history; or

3. It embodies the distinctive characteristics of a type, period, or method of construction or represents the work of a master, or possesses high artistic values; or

4. It has yielded, or has the potential to yield, information important in the prehistory or history of the local area, California, or the nation.

Historic resources eligible for listing in the California Register may include buildings, sites, structures, objects, and historic districts. A resource less than 50 years of age may be eligible if it can be demonstrated that sufficient time has passed to understand its historic importance. While the enabling legislation for the California Register is less rigorous with regard to the issue of integrity, there is the expectation that properties reflect their appearance during their period of significance.

ECHO PARK ELIGIBILITY EVAULATION

As part of a previous evaluation of Echo Park as a Los Angeles Historic-Cultural Monument, Echo Park has design significance (Criterion C of the National Register), for its English-style park landscape and for the Spanish Colonial Revival Architectural Style of the buildings. The previous evaluation also concluded that Echo Park has historical significance (Criterion A of the National Register) as "one of Los Angeles' earliest parks and is the location of the city's second established, and oldest remaining, municipal playground. The history of Echo Park's creation and development represents significant trends in the provision of municipally funded parks and recreation facilities in Los Angeles during the early twentieth century. It is also significant as a remnant of Los Angeles' early water system and the trends and policies that shaped the city's distribution and use of public lands in the late nineteenth century" (Cultural Heritage Commission 2005; Historic Resources Group 2005a, 2005b).

Cultural Landscape Significance Evaluation

This significance statement was guided by current methodology and standards established by the NPS and landscape preservation professionals. *A Guide to Cultural Landscape Reports: Contents, Process, and Techniques* maintains that "defining the significance of a landscape involves relating findings from the site history and existing conditions to the historic context associated with the landscape" (Page et. al. 1998). As part of this process, individual landscape characteristics and features are identified with a particular historic context.

The Historic Overview section of this report provides a historic context for Echo Park from which relevant themes can be drawn and provide a framework to evaluate the Echo Park landscape. Themes significant in the history of Echo Park are correlated with relevant National Register and California Register Criteria below.

Themes associated with *Criterion A or 1: Events that have made a significant contribution to the broad patterns of our history* include:

- Development of Los Angeles' early water supply systems, by both public and private entities (c. 1860–1900)

- Development of Los Angeles municipal parks as part of a larger national City Beautiful Movement (c. 1850–1910)

- Development of Los Angeles recreational facilities as part of the Progressive-era Parks and Playgrounds Movement (c. 1890–1910)

Based upon the available research and analysis performed in preparation for this treatment plan, it is recommended that the following additional areas of *local* cultural landscape significance be considered:

- Echo Park was a "gateway" for immigrants into Los Angeles that resulted in its multi-cultural history. Echo Park continues to support the cultural activities of the neighborhood through the Lotus Festival, for example.

- Echo Park neighborhood functioned for a time as a community characterized by its leftist politics; it was referred to as "Red Gulch," and Echo Park playground was the home to one of its cooperative schools.

Themes associated with *Criterion B or 2: Associated with the lives of persons significant in our past* may include:

- Ada May Sharpless, a prolific artist in the Los Angeles area during the New Deal era (c. 1930s); *likely local significance only*.

Themes associated with *Criterion C or 3: Distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction* include:

- Picturesque-style municipal park design in the United States (c. 1840–1910)

- Spanish Colonial Revival architecture in California (c. 1910–1940)

There are no known themes associated with *Criterion D or 4: have yielded, or may be likely to yield information important in prehistory or history.*

The following statement of significance for Echo Park is organized around these themes.

Echo Park Statement of Significance

The Echo Park landscape is connected with significant historic events (Criterion A or 1) and design styles (Criterion C or 3). It is also connected with locally significant people (likely Criterion 2 only).

Significant historical events associated with the landscape include the development of Los Angeles' early water supply systems, by both public and private entities. These entities included the Los Angeles Canal and Reservoir Company which created the Reservoir No. 4—later to become Echo Park Lake—and the City of Los Angeles which retained overflow rights at the reservoir. Landscape features reflecting this association include the lake basin and the approximate location of the original dam, now largely obscured by Bellevue Avenue.

After the reservoir property was transferred to the City, its design as a city park coincided with the development of Los Angeles' municipal parks system, inspired by the national City Beautiful Movement. Guided by a growing belief in the benefits of public parks for urban citizens, Los Angeles was increasing its public park land in the late 1880s and 1890s. Los Angeles was the first city in the United States to establish a Department of Parks, and Echo Park was one of its early creations. Landscape features associated with this significance theme include the lake, transformed from the former reservoir, some plantings, and the island. However, many landscape features are missing from this period, such as the first boathouse, the original arched bridge to the island, the bridge across the northwestern lobe of the lake, the driving lane, and many plantings, particularly understory plantings. The original outline of the lake has been manipulated over the years as well. The northwestern lobe of the lake has been shortened as well as possible modifications to the southern end of the lake.

Shortly after Echo Park was developed as a public park, the surrounding, growing neighborhood required additional public amenities, including a playground. The Echo Park playground is associated with the development of Los Angeles' recreational facilities as part of the Progressive-era Parks and Playgrounds Movement. The City of Los Angeles established a Department of Playgrounds and Recreation in 1904, and the Echo Park playground was its second established (and today, its oldest remaining) playground. The Echo Park playground occupied the land south of the former dam, and included several buildings and structures, a ball field, tennis and croquet courts, swing sets, and a wading pool. The original playground facilities were demolished for the construction of the Hollywood Freeway; however, new playground facilities were constructed south of the freeway.

The Echo Park landscape, and its buildings and structures, reflect the design principles of styles that include Picturesque and Spanish Colonial Revival. The landscape, as first created by Joseph Henry Tomlinson in 1892, originally displayed characteristics of Picturesque design such as the treatment of the lake as a park feature—its irregular outline, its peninsula and island—meandering paths, and plantings designed to frame views in the middle ground and distance. Rustic structures, such as a small bridge to the island, complemented the Picturesque style. That bridge was replaced with another sometime between 1930 and 1950. Many of the earliest plantings at the park included eucalyptus and willows, and some may survive from that period. The lotus plants may also survive from the 1920s, although their exact origin is unknown. Existing landscape features that characterize this significance theme include some sections of the lake (those retaining the original outline), some plantings, sections of lawn, and topographic features such as the steeply sloping edges of the park at Glendale Boulevard and Echo Park Avenue, and the gently sloping contours on the peninsula. However, many of the designed features such as the curving pathways and dense understory plants, are now gone.

Although the original structures in the park—the first boathouse and the park clubhouse—were designed in Victorian and "rough rustic style," the architectural style for the second phase of building was characterized by the Spanish Colonial Revival style. The Echo Park Recreation Center was designed by Allied Architect Association of Los Angeles in 1925, and was a brick clad building. The new Echo Park Boathouse, built in 1932 by the Department of Parks, also exhibited the Spanish Colonial Revival style and is one of the last surviving historic boathouse facilities in Los Angeles. The Spanish Colonial Revival style became popular in Los Angeles in the 1910s through 1940, especially after the 1915 Panama-California Exposition in San Diego and through the designs of California architect Bertram Grosvenor Goodhue (Historic Resources Group 2005a). Spanish Colonial Revival style is characterized by the use of stucco walls, tile roofs, and terra cotta ornamentation.

The park's "Lady of the Lake" sculpture may also provide local significance for its association with artist Ada May Sharpless. Originally entitled *Nuestra Reina de Los Angeles*, the sculpture was commissioned in 1934 by the Public Works of Art Project and was installed at Echo Park in 1935. It was one of two that Sharpless was commissioned to create by the Public Works of Art Project in 1934–35. Sharpless grew up in California and returned to the state in 1929 after studies in France. She exhibited extensively throughout the area, and was involved with arts organizations such as the California Art Club and the Los Angeles Art Association (Historic Resources Group 2005a). The sculpture has been restored and re-installed, though in a different location from its original site.

Period of Significance

The period of significance for Echo Park spans the years between 1870 (when the dam was completed for Reservoir No. 4) and 1943, when construction on the Hollywood Freeway began. Freeway construction resulted in the removal of many houses along the park's edge, and the removal of the historic playground (later replaced in the left-over space). Streetcar access to the park also disintegrated, and many of the historic houses adjacent to the park were razed. Crime and neglect later plagued the park, and resulted in renovations to some aspects of the park's design such as its vibrant understory of plantings.

Integrity Assessment

The assessment of a landscape's historic integrity is based on the presence and condition of historic physical features and systems remaining from the site's period of significance. The National Register lists seven qualities of integrity including: location, design, setting, materials, workmanship, feeling, and association.

Based on the significance evaluation, the Echo Park landscape maintains:

- A high degree of integrity of location.

- A moderate degree of integrity of design. Though many elements—particularly the lake, many buildings, some vegetation, open areas, some views, and approximate pathway alignments in some locations—remain from the period of significance, other important elements such as historic vegetation, have been lost. The addition of the Hollywood Freeway has substantially altered the southern end of the park south of the original dam.

- A moderate degree of integrity of setting. The surrounding neighborhood is largely intact and resembles its character during the period of significance. However, the addition of the Hollywood Freeway created a substantial change in the setting of the southern end of the park.

- A moderate to low degree of integrity of materials. Many sections of pathways, stairs, lake edging, vegetation, and small-scale features have been replaced over the years.

- A moderate to low degree of integrity of workmanship, as most of the evidence of the original construction work on the park has been lost.

- A high degree of integrity of feeling. The park's use as a place where people come to enjoy the lake, stroll around its perimeter, fish, and boat is entirely consistent with its original design. The lake, as the dominant feature of the park, creates a serene quality in the bustling neighborhood. Though the park is not as removed visually from the surrounding neighborhood as it once was due to the loss of many trees and shrubs, its topographic drop-off creates a sense of removal from the streets and buildings that surround it.

- A moderate degree of integrity of association. The lake continues its original use as a storm water retention basin, and the park continues its use as a recreational area for its neighborhood.

Comparative Analysis of Historic and Existing Conditions

The following comparison photographs demonstrate the similarities and differences between the historic and existing conditions in the landscape. The existing conditions photographs are, in some cases, only approximate replications of the historic photographs; many times, the historic photographs were taken from the island which is no longer accessible or from boats on the lake. The photographs shown below illustrate many of the landscape characteristics described in the historic survey, and depict the changes that have occurred at Echo Park. Many of the park's landscape characteristics have remained remarkably consistent, however. Many of the trees in the northern section of the park, the island, buildings such as the Boathouse, and the lake itself, remain much as they did during the period of significance.

Some island vegetation—ornamental grasses—and the palms that line the lake edge on its eastern side may remain from the period of significance. Though the palm trees in the existing conditions photograph appear to be the same trees shown in the historic photograph (1897), their growth has changed the spatial quality of the landscape (Plates 69 and 70).

Plate 69. Historic Photograph (1897)

Plate 70. Modern Photograph (2008)

These photographs show both of the bridges that have connected the island to the peninsula. The historic photograph (c. 1900) shows the original bridge, built in 1895, with its rustic character and arch. The bridge in the existing conditions photograph shows the second bridge, constructed sometime between 1930 and 1950 (Plates 71 and 72).

Plate 71. Historic Photograph (c. 1900)

Plate 72. Modern Photograph (2008)

The Boathouse shown in these photographs has remained intact since the period of significance. Many of the trees in the historic photograph (1937) also remain, although some of the understory vegetation is now missing. The lake has also remained the same, with minor additions of the floating wetlands visible in the existing conditions photograph (Plates 73 and 74).

Plate 73. Historic Photograph (1937)

Plate 74. Modern Photograph (2008)

These photographs of the Boathouse demonstrate some minor changes to the Boathouse and its environs—the loss of windows and a door, and the loss of low vegetation such as the ornamental grasses that lined the lake edge. However, the palm trees in the background seem to remain from the historic period (Plates 75 and 76).

Plate 75. Historic Photograph

Plate 76. Modern Photograph (2008)

The tip of the peninsula has changed substantially since the period of significance. The Lady of the Lake, willows and ornamental plantings, the configuration of the original benches, and the alignment of the paths shown in the historic photograph (1937) are now missing from this location. However, with the removal of the pump house it would be possible to reverse the current condition to its historic appearance (Plates 77 and 78).

Plate 77. Historic Photograph (1937)

Plate 78. Modern Photograph (2008)

The pathway along Glendale Boulevard retains its long, straight character shown in the historic photograph (circa 1910s). It is tree-lined for much of its length, and retains the grade separation between the lake and road above (Plates 79 and 80).

Plate 79. Historic Photograph (1910s)

Plate 80. Modern Photograph (2008)

The historic photograph shown above was taken in 1965, when most of the understory vegetation had already been removed from the park or had died without being replaced. However, the grade change between the lake and the street above remain the same, as does the character of the setting of the park (Plates 81 and 82).

Plate 81. Historic Photograph (1965)

Plate 82. Modern Photograph (2008)

The lotus plants, in their full glory above (1988), have all but disappeared now. Other vegetation, such as the palms, remain to frame the important long views south across the lake (Plates 83 and 84).

Plate 83. Historic Photograph (1988)

Plate 84. Modern Photograph (2008)

LANDSCAPE TREATMENT PLAN

The landscape treatment and design guidelines and recommendations that comprise this section were prepared to provide specific near-term recommendations to mitigate construction impacts to the park landscape during the lake rehabilitation. All landscape treatment guidelines and recommendations were developed in accordance with the *Secretary of the Interior's Standards for the Treatment of Historic Properties with Guidelines for the Treatment of Cultural Landscapes*, 1996.

The information included in this section is intended to address the challenges associated with balancing resource protection, construction, operations, and interpretation. The landscape treatment and design guidelines and recommendations address this need by identifying an overall flexible approach to the protection, preservation, and maintenance of site resources; and by recommending a body of specific concepts for managing the park.

The Department of the Interior currently recognizes four appropriate treatment alternatives for historic landscapes: preservation, rehabilitation, restoration, and reconstruction. These are defined and discussed in both *The Secretary of the Interior's Standards for Historic Preservation Projects* and the NPS Director's Order 28: *Cultural Resource Management Guideline* (DO-28). DO-28 provides the following definitions of the four treatment alternatives for cultural landscapes:

> **Preservation** maintains the existing integrity and character of a cultural landscape by arresting or retarding deterioration caused by natural forces and normal use. It includes both maintenance and stabilization. Maintenance is a systematic activity mitigating wear and deterioration of a cultural landscape by protecting its conditions. In light of the dynamic qualities of a landscape, maintenance is essential for the long-term preservation of individual features and integrity of the entire landscape. Stabilization involves re-establishing the stability of an unsafe, damaged, or deteriorated cultural landscape while maintaining its existing character.
>
> **Rehabilitation** improves the utility or function of a cultural landscape, through repair or alteration, to make possible an efficient compatible use while preserving those portions or features that are important in defining its significance.
>
> **Restoration** accurately depicts the form, features, and character of a cultural landscape as it appeared at a specific period or as intended by its original constructed design. It may involve the reconstruction of missing historic features, and selective removal of later features, some having cultural value in themselves.
>
> **Reconstruction** entails depicting the form, features, and details of a non-surviving cultural landscape, or any part thereof, as it appeared at a specific period or as intended by its original constructed design. Reconstruction of an entire landscape is always a last-resort measure for addressing a management objective and will be undertaken only after policy review in the regional and Washington offices.

RECOMMENDED TREATMENT APPROACH

One goal of the treatment plan is to identify the essential character-defining features of the Echo Park landscape and to allow for planned development within the park area while protecting these features and general characteristics. **Preservation** is one component of the treatment approach for the lake area because many landscape features are in good condition and through maintenance and stabilization can remain that way. **Restoration** and **Reconstruction**, however, are not considered viable options for the park landscape because they require rebuilding lost historic features, which is not appropriate or feasible for a park landscape.

Based on the definition of rehabilitation as "the act or process of making possible a compatible use for a property through repair, alterations, and additions, while preserving those portions or features which convey its historical, cultural, or architectural values," **rehabilitation** is the primary overall recommended approach to resource management. Rehabilitation balances the implementation of necessary functional site improvements with the maintenance of the park's historical legacy. Rehabilitation will also allow the park to pursue resource management initiatives that are intended to promote sustainability.

Rehabilitation efforts must remain sensitive to the qualities and resources that render the site significant, and new design within the historic landscape must be based on a thorough understanding of the integrity of the site so as not to detract from it. Park managers should undertake analysis of the potential impacts on the landscape prior to the implementation of any rehabilitation projects or development of new facilities.

The *Secretary of the Interior's Standards for Rehabilitation* are ten basic principles created to help preserve the distinctive character of a historic building and its site, while allowing for reasonable change to meet new needs.

The *Standards* (36 CFR Part 67) apply to historic buildings of all periods, styles, types, materials, and sizes, and to both exteriors and interiors. The *Standards* also encompass related landscape features, building site, and environment as well as attached, adjacent, or related new construction. The *Standards* are as follows:

- A property shall be used for its historic purpose or be placed in a new use that requires minimal change to the defining characteristics of the building and its site and environment.

- The historic character of a property shall be retained and preserved. The removal of historic materials or alteration of features and spaces that characterize a property shall be avoided.

- Each property shall be recognized as a physical record of its time, place, and use. Changes that create a false sense of historical development, such as adding conjectural features or architectural elements from other buildings, shall not be undertaken.

- Most properties change over time; those changes that have acquired historic significance in their own right shall be retained and preserved.

- Distinctive features, finishes, and construction techniques or examples of craftsmanship that characterize a historic property shall be preserved.

- Deteriorated historic features shall be repaired rather than replaced. Where the severity of deterioration requires replacement of a distinctive feature, the new feature shall match the old in design, color, texture, and other visual qualities and, where possible, materials. Replacement of missing features shall be substantiated by documentary, physical, or pictorial evidence.

- Chemical or physical treatments, such as sandblasting, that cause damage to historic materials shall not be used. The surface cleaning of structures, if appropriate, shall be undertaken using the gentlest means possible.

- Significant archeological resources affected by a project shall be protected and preserved. If such resources must be disturbed, mitigation measures shall be undertaken.

- New additions, exterior alterations, or related new construction shall not destroy historic materials that characterize the property. The new work shall be differentiated from the old and shall be compatible with the massing, size, scale, and architectural features to protect the historic integrity of the property and its environment.

- New additions and adjacent or related new construction shall be undertaken in such a manner that if removed in the future, the essential form and integrity of the historic property and its environment would be unimpaired.

Identification of Potential Impacts to the Historic Landscape from Construction Activities

The goals of the Echo Park Lake Rehabilitation Project are to improve the water quality of the lake and to reduce the current use of municipal water resources in order to maintain the level of the lake. Construction activities to support these goals include in-lake and storm drain improvements as well as lake-edge improvements, parkland structural BMPs, water conservation, educational elements and habitat restoration. New construction and the associated construction staging and access areas at the park without proper mitigation may result in negative impacts to the historic landscape features and systems. The potential impacts may include:

Re-alignment of paths

Though very few exact historic paths alignments remain, there are small sections within the park that appear to remain from the historic period. New construction may present the opportunity to re-align paths to their historic configuration.

Loss of historic plantings

Many of the understory plantings at the park have been removed over the years. Many trees, however, appear to remain from the historic period. These trees should be protected during construction to minimize damage to them and to ensure their survival.

Loss of historic views
The picturesque design theory which guided the design of Echo Park influenced the strategically placed views throughout the park. Vegetation framed views in the middle and far ground of the park. These framed views have been lost due to the removal of understory vegetation.

Modification of historic water edge conditions
The water (lake) edge historically appeared to have included both hard and soft edges. The lake continues to have hard edges. New design could rebuild some soft edges along areas of the lake edge. Some areas of the water edge are now developed as [concrete] access points. New construction in the lake presents opportunities to renew the historic edging for the water body.

Destruction of historic topography
The topography at Echo Park appears to have remained intact in some locations, though it has been modified in others. The main modifications include the fill at the northwestern lobe of the lake and the fill placed south of the lake in the vicinity of Bellevue Avenue. However, the sloping topography at the peninsula, the flat topography at the island, and the bowl shape of the lake bed remain.

Modifications to historic building environs
The historic Boathouse, which remains on the lake edge, is very sensitive to change. It appears that the lake edge adjacent to the Boathouse was a hard edge with low retaining walls flanking the building's edges and vegetation (such as ornamental grasses) hanging over the edges.

RECOMMENDATIONS FOR PROTECTION OF RESOURCES AND MITIGATION OF POTENTIAL IMPACTS

The following treatment recommendations suggest preservation and rehabilitation for the park landscape during design and construction phases. These recommendations are based on an understanding of the park's historic character as described in the previous report sections. Because the historic documentation of Echo Park's development does not provide a complete chronology of the landscape's evolution, the analysis and evaluation provide the most thorough picture of the historic resources at this time. The analysis and evaluation provide the context for the treatment recommendations. In general, because this analysis is based on limited historic documentation, the treatment approach at the park should be conservative and err on the side of more preservation rather than more change.

Design Phase (See Figures 6 and 7)

Lake

- Retain or enhance the linear quality of the lake along its North/South axis.

- Avoid the addition of designed structures in the lake such as new islands, new bridges, boardwalks, or cantilevered walks.

- Additional structures that remain below the water line and are related to water quality control or storm water control are acceptable additions to the lake.

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Figure 6
Design Phase Recommendations
North Section

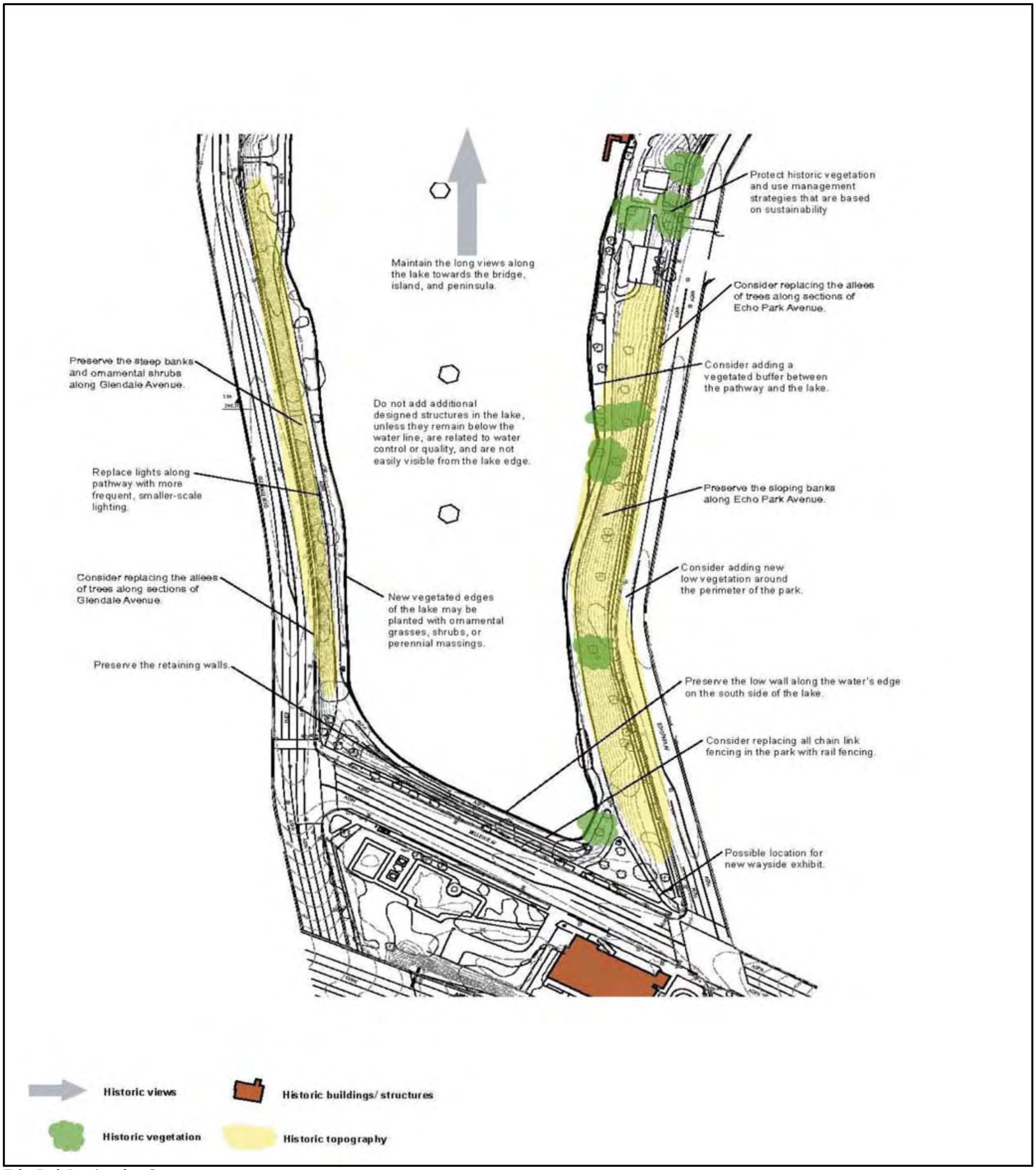

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Figure 7
Design Phase Recommendations
South Section

- Additional wetland vegetation is an acceptable addition to the lake, although it should remain along the lake or island edges.

- Historically, the lake edge appeared to have both vegetated and constructed edges. New edging at the lake could have either vegetated or constructed edges. The vegetated edges appeared predominantly on the west side, and the constructed edges on the east side.

- The precise outline of the lake has shifted over time, and so small variations that achieve a smoother and gentler curving geometry along the edge are acceptable. However, avoid large changes that create new concave or convex shapes in the lake outline.

- When creating engineered berms or other water control devices in the lake bed, minimize their visibility from the lake edge.

Spatial Organization/Views

- Maintain the long views along the lake towards the bridge, island, and peninsula. Avoid obstructing views to the island or peninsula with overly tall wetland vegetation.

- Proposed viewing areas that provide access to the lake edge may be located at existing storm water infrastructure locations that are required to remain. Redesign viewing areas for user safety.

Topography

- Preserve the existing undulating topography at the peninsula.

- Preserve steep banks along Glendale Boulevard at the park's southern edge.

- Preserve the sloping banks along Echo Park Avenue.

- Preserve the retaining walls at the southern edge of the lake.

Land Use

- Retain, and encourage, current land use such as fishing, walking/running, and boating.

- Consider adding *interpretation*, using interpretive facilities such as wayside exhibits, in order to describe the park's history and ecology to the community.

- New wayside exhibit locations could include the lotus garden, the Lady of the Lake, the Boathouse, and the dam.

Vegetation

- Retain the services of a certified arborist to evaluate the park's trees. The arborist should identify the existing trees in the park, determine the anticipated life span of the trees, and recommend tree protection and preservation strategies for historic trees.

- Undertake tree and plant protection for historic vegetation.

- Undertake historic vegetation management strategies based on principles of sustainability.

- New plantings should enhance and re-establish the spatial character and structure of the historic landscape. Historically, plantings included allees along straight stretches of paths, groupings of palms of similar heights, massings of shrubs to frame views, and perennials in some locations.

- Use plants and planting locations to frame views in the park; avoid obscuring long views along the north/south axis, or views of the boathouse, island or peninsula.

- When designing new plantings at the site, consider replacing the understory plantings to the degree possible; consider site security and crime prevention through environmental design.

- Match replacement plantings to the species or character of the historic plantings to the greatest extent feasible. Historic tree plantings included willows, eucalyptus, magnolias and palms, and understory plants such as fuschias, roses, pampas grass, bamboo, hydrangeas, and spireas. Avoid using invasive species, however, regardless of the historical plant palette.

- When adding or replacing plants, consider using drought-tolerant plants.

- Consider replacing the allees of trees along sections of Glendale Boulevard and Echo Park Avenue.

- The historic planting design of created massings of shrubs, ornamental grass, and perennials to obscure the lake edge at some locations. Adding new plant massings along the lake edge continues to be an appropriate planting design strategy. Even on constructed edges, the plants can cascade over the edge of the retaining wall.

- New vegetated areas along the lake edge may be planted with grass or ornamental plants.

- Wetland emergent vegetation may be submerged at lake edges along sections of the lake.

- Refurbish the lawn with drought-tolerant grass species.

- Restock the lotuses as necessary to create the fully planted lotus bed in the northwest lobe of the lake. Monitor the health of the lotuses to ensure their survival.

- Consider adding additional shrubs and ornamental plants to the island to improve wildlife habitat.

- If historic trees need to be replaced due to death or removal during construction, replace the trees with the same species if possible.

- Maintain ornamental shrubs on the hillside adjacent to Glendale Boulevard.

- New wetland vegetation should be distinguishable from the lotus in form.

- Consider adding new low vegetation, as hedges or as shrub massings, around sections of the perimeter of the park. The shrubs should not become so high that they block views into the park.

Circulation

- Incorporate existing circulation routes into proposed accessible park entrance routes whenever possible. Avoid alteration to existing topography when locating new accessible routes.

- New paths may be realigned to match the path system present during the period of significance. Historic paths appeared to meander along the lake edge, and follow curving geometry on the peninsula and on the island. However, the lake edge has been modified over time, and it would be difficult to recreate the exact historic path alignment.

- Historically, the path system materials may have been crushed stone, sand, soil, or other materials. More modern materials may have included asphalt or concrete. However, in order to balance a desire for historic authenticity with demands for sustainability, consider using materials such as porous paving or decomposed granite for the path system.

- Construct new paths to match historic surface appearance (color/texture).

- Retain the concrete steps at the entrances into the park from Glendale Boulevard.

- Design new paths to be wide enough to accommodate necessary maintenance vehicles, and no wider.

- Consider rebuilding pathways on the peninsula that reflect the curving geometry of the historic pathways.

- Plant a vegetated buffer between the pathway encircling the lake and the lake itself; this vegetated buffer could be grass or ornamental plantings.

- The path encircling the lake may bump out towards the lake edge at some locations to provide direct access to the water for fishing or bird watching.

- Design and construct all new circulation systems to be barrier free when practical.

Lake Edge

- If historic edging—such as stone edging—remains, preserve it in place.

- If a new constructed edge is proposed, it should be made from concrete or stone.

- If an overlook or viewing location is proposed at the lake edge, consider using a railing for safety that is painted a dark or neutral color and is a low as possible per applicable codes.

- Preserve the low wall along the lake edge on the south side of the lake.

Interpretation

- Minimize the visual and physical impacts of new education and interpretive facilities on the historic landscape.

Small-Scale Features

- Create an identity for the park with a coherent set of small-scale features that reflect a contemporary interpretation of the historic structures in the park; these features may include new signage, seating, lights, trash and recycling receptacles, wayside exhibits, fencing and railings.

- Preserve the Lady of the Lake sculpture, and consider replacing it in its original location.

- Preserve the José Martí sculpture in its current location.

- Replace lights along pathway encircling the lake with more frequent, smaller-scale lighting.

- Replace benches with one unified type of bench throughout the park.

- Place benches in locations along the lake pathway, at the tip of the peninsula, and at the Boathouse.

- Replace or add new railings and fencing where necessary; the new railings and fencing should be fine in texture, with a dark or natural color.

- Consider replacing all chain link fencing in the park with rail fencing.

- Maintain design consistency in wayfinding and informational signs throughout the park.

- Wayfinding and informational signs and wayside exhibits should have a low profile, should be accessible, and should use dark or natural colors.

- Wayside exhibits may use text, and images such as photographs and maps to convey information about the park’s history and ecology.

Buildings and Structures

- Consider relocating the pump house from the peninsula.

- Preserve the bridge to the island as well as the bridge abutments on the island and peninsula.

- Preserve the Boathouse.

- Preserve the Park Office Building.

- Replace/reconstruct storm water structures in the northeast lobe of the lake per engineer specifications.

- Preserve the historic lake edge rip rap if possible.

- Consider using stucco or concrete in a neutral color for proposed new structures or buildings.

Construction Phase (See Figure 4 and Figure 8)

Undertake tree and plant protection for historic vegetation.

- Retain the services of a certified arborist to determine tree preservation strategies during construction. Create a tree protection plan.

- Control fugitive dust during construction.

- Protect tree root zones during construction to minimize root zone compaction.

- Control invasive species on disturbed sites during construction.

- All vegetation to be protected should be marked on plans and in the field prior to construction.

- Consider transplanting rather than removing plants within the site.

- Protect historic trees by avoiding the raising or lowering of the surrounding grades.

- Toxic materials shall not be stored within 100 feet of vegetation areas to remain.

- Minimize ground disturbance in sensitive historic areas when installing new plantings. Use methods such as installing plants by hand, select planting locations that are not in conflict with desirable plants to remain, and protect existing plants and resources to remain.

Identify preferred location of staging areas.

- Stockpile topsoil and other construction materials in areas with little or no known historic resources.

- Potential staging areas locations include: the lake bed, the park office maintenance/parking area, the far northwest lobe of the park near the corner of Park Avenue and Glendale Boulevard.

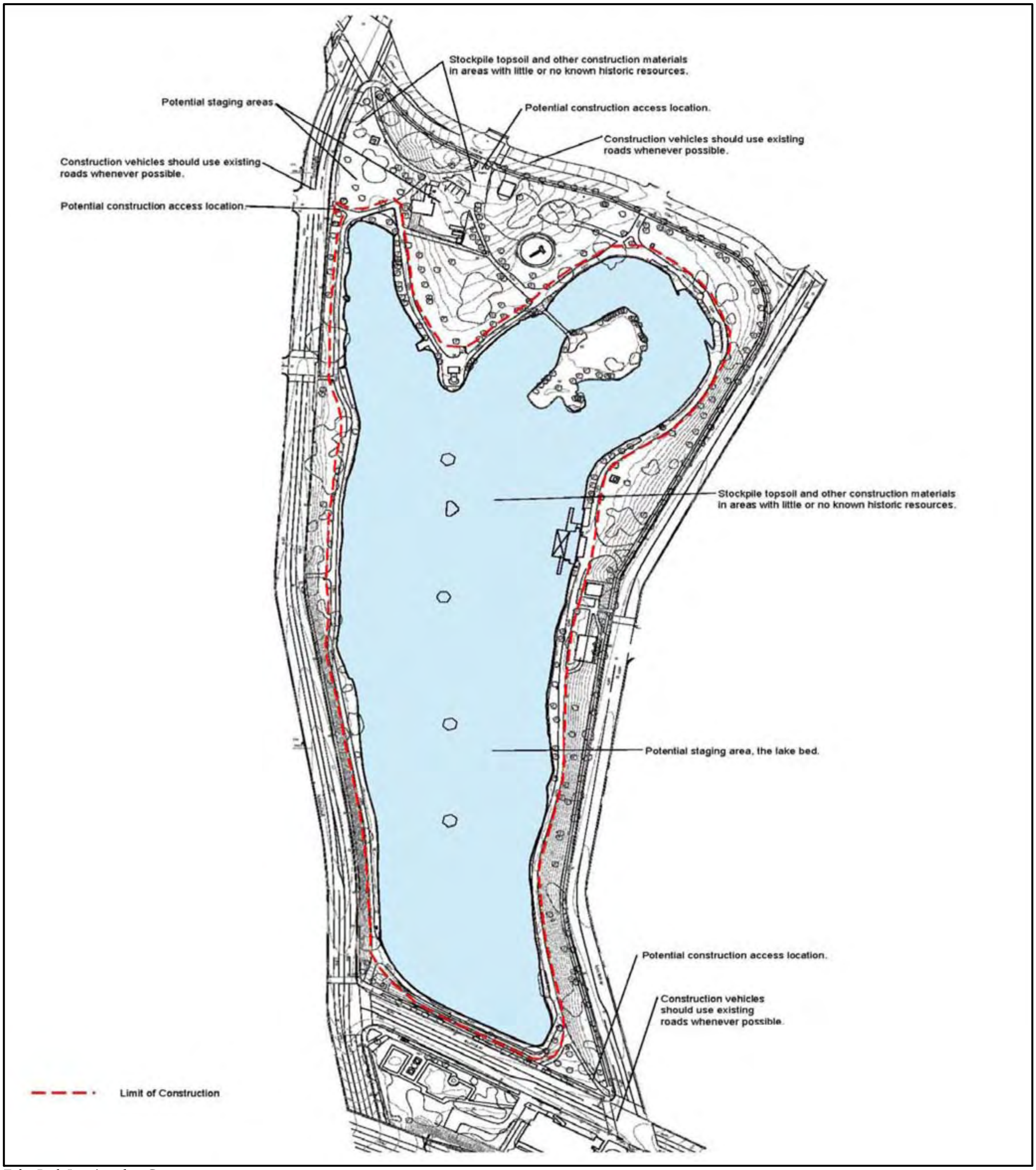

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Figure 8
Construction Phase Recommendations

Identify preferred location of access areas.

- All construction vehicles should use existing roads whenever possible. New construction access routes should be located in a way to minimize negative impacts to the historic landscape.

- Potential access locations include: the park entrance at the corner of Bellevue and Echo Park Avenues (park entrance 5), the park entrance on the northern end of Glendale Boulevard (park entrance 11), and the entrance to the park office maintenance area (park entrance 1).

Restrict construction activities/entry/staging to identified construction locations.

- Flag construction areas prior to construction.

- When new construction access routes are required, all vehicles should use these proposed routes.

Identify known historic resources on a plan that is available to the contractor.

- Flag all areas containing sensitive historic resources prior to construction and designate them as "no construction" zones. Some resources may need to be fenced.

Materials

- Take into consideration life-cycle costing of materials to assess the long term wearing capacity and maintenance costs. Consider materials that are non-toxic, durable, long-lived and low maintenance.

- Consider locally-produced products to construct design features.

- Explore the availability of recycled materials, and consider re-usable materials.

- Avoid the use of petroleum-based materials.

- Use stable, non-hazardous materials that do not emit toxins through off-gassing or soil leaching.

Documentation

- Document all historic features to be removed with photographs and on plans.

ARCHAEOLOGICAL RECOMMENDATIONS

No prehistoric or historic archaeological resources have been previously recorded within the limits of the record search. The survey conducted in connection with this Project failed to reveal any surface evidence of archaeological resources within the Project area itself. However, the lack of surface evidence of archaeological materials does not preclude the possibility that subsurface archaeological materials may exist. The dam constructed during the 1870s still exists and is buried at the south end of the lake in the vicinity of Bellevue Avenue. Any work in this area would require archaeological monitoring. In all other localities archaeological monitoring is not required. However, in the event any archaeological materials are encountered during earthmoving activities, the construction contractor shall cease activity in the affected area until the discovery can be evaluated by a qualified cultural resources specialist (archaeologist) in accordance with the provisions of CEQA Section 15064.5.

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APPENDIX A

Resumes of Key Personnel

ROBERT M. McGINNIS, RLA, ASLA
Senior Associate / Director of Historic Preservation

EDUCATION
M.L.A., University of Virginia, 1987
M.F.A., California Institute of the Arts, 1982
B.F.A., James Madison University, 1978

PROFESSIONAL REGISTRATIONS
CLARB-Certified, 2001
Registered Landscape Architect:
Virginia, 1987
Maryland, 1989
Pennsylvania, 1989 (inactive)
Kentucky, 1998 (inactive)

AFFILIATIONS
US Committee / International Council on Monuments and Sites
American Society of Landscape Architects
Alliance for Historic Landscape Preservation
National Association for Olmsted Parks
Association for Preservation Technology International
Allied Member, Virginia Society of the American Institute of Architects

SERVICE
Member, Board of Directors, Historic American Buildings Survey/Historic American Engineering Record/Historic American Landscapes Survey Foundation, 2004-2007

Member, Georgetown Urban Design Charette, Guyana, South America, US/ICOMOS & Conservation International, 2003

Reviewer, Historic American Landscapes Survey Draft Guidelines for Drawings, 2003

Member, Virginia History Initiative, Virginia Department of Historic Resources, 1996-1998

Virginia Chapter ASLA Representative, *Commonwealth of Virginia Construction and Professional Services Manual* Task Force, Virginia Society of the American Institute Architects, Virginia Society of Professional Engineers, Consulting Engineers Council of Virginia, and the Virginia Chapter ASLA, 1998-2000

Member, *1996 Virginia Outdoors Plan* Technical Advisory Committee, Virginia Department of Conservation & Recreation, 1992-1996

Panelist, "Developing Local Preservation Programs: Rural Issues," Preservation Partners, Roanoke, Virginia, 1996

Panelist, "The Changing World of Work," Career Forum, University of Virginia School of Architecture, 1996

Member, Native Plant Conservation Initiative, Virginia Department of Conservation & Recreation, 1995-1996

Rob McGinnis is a licensed landscape architect and award-winning designer with over twenty years of planning, design, and cultural landscape preservation experience throughout the US. He focuses on park, educational, institutional, industrial, commercial, and civic and open space projects with cultural and historical significance. His special areas of expertise include historic campuses; historic parks; commemorative and memorial landscapes; rural, vernacular, and settlement landscapes; and military landscapes including battlefields and fortifications. In addition, Mr. McGinnis undertakes the planning and design of educational facilities and museums including interpretive planning and exhibit design services.

SELECTED PROJECT EXPERIENCE

Pearl Harbor and Pacific Missile Range Facilities Cultural Landscape Reports, Oahu and Kauai, Hawaii
Project Manager
CLIENT: US Navy
Three Cultural Landscape Reports (CLRs) are being prepared to assist the US Navy in the management of their cultural landscape resources on the islands of Oahu and Kauai. The project area includes Pearl Harbor, a National Historic Landmark (NHL), all outlying installations on Oahu as well as all properties associated with the Pacific Missile Range Facility on both Oahu and Kauai. The scope of services includes project management; coordination of consultants undertaking research, preparation of site physical histories, and existing conditions documentation; landscape analysis, treatment recommendations, and design guidelines.

Landscape Heritage Plan, University of California, Davis, California
Project Manager
CLIENT: The Regents of the University of California
This project is funded by the Getty Foundation Campus Heritage Program, a multi-year program providing research and planning grants to colleges and universities to aid in their efforts to investigate and preserve their historic buildings, landscapes, and other cultural resources. The scope of project includes: research; historic context for the campus; documenting the campus design and evolution over time; evaluating and documenting eleven potential historic districts; historic tree preservation plan for the historic Quad District; cultural landscape inventories for eleven historic districts; and, preparing a historic landscape treatment plan for the historic Quad district. The UC Davis campus is historically significant for its association with the early UC Berkeley farm period and early to mid-century Modern landscape architectural design.

Presidio of San Francisco Cultural Landscape Analysis and Cultural Landscape Report, Golden Gate National Recreation Area, San Francisco, California*
Project Manager
CLIENT: Architectural Resources Group
In support of a National Park Service General Management Plan Amendment, a cultural landscape analysis and Cultural Landscape Report were prepared to better understand what features survived from the various historic periods and to compare the existing landscape with the

Member, Storm Water Management Regulations Review Committee, Virginia Department of Conservation & Recreation, 1994-1996

Member, State Park Regulations Review Committee, Virginia Department of Conservation & Recreation, 1994-1996

Member, Roster of Visiting Evaluators, Landscape Architecture Accreditation Board, 1994-1998

Virginia Chapter ASLA Liaison to the Board of Architects, Professional Engineers, Land Surveyors, and Certified Interior Designers, and Landscape Architects, Virginia Department of Commerce, 1994-1995

Reviewer, Draft Outdoor Recreation Accessibility Guidelines, U.S. Architectural and Transportation Barriers Compliance Board, 1994

Immediate Past-President, Virginia Chapter ASLA, 1993-1994

Virginia Chapter ASLA Representative, Virginia Environmental Network, 1993

Virginia Chapter ASLA Representative, Virginia Surface Transportation Council, 1993

President, Virginia Chapter ASLA, 1992-1993

Vice-President, Virginia Chapter ASLA, 1991-1992

HONORS + AWARDS

Merit Award, Star Fort Resource Management and Interpretation Plan, Virginia Chapter of the American Society of Landscape Architects, 2005

Merit Award, Stories of the Chesapeake Heritage Area Cultural Landscape and Scenic Assessment, Virginia Chapter of the American Society of Landscape Architects, 2005

Honorable Mention, Star Fort Resource Management and Interpretation Plan, Virginia Chapter of the American Planning Association, 2001

Honor Award, Sutro Historic District, American Society of Landscape Architects, 1993

Award of Excellence, Sutro Historic District, California Council of American Society of Landscape Architects, 1993

Award of Excellence, Sutro Historic District, The Waterfront Center, 1993

Annual Design Award in Recognition of Outstanding Achievement in Design for Preservation Projects, Presidio of San Francisco Cultural Resource Studies, California Preservation Council, 1993

PRESENTATIONS + PUBLICATIONS

“Sustainable Woodland Cover,” Sustainable Military Earthworks Management, *Cultural Landscape Currents 05*, National Park Service, U.S. Department of the Interior, 2004

“The Good Fight,” *Landscape Architecture*, Volume 90, Number 7, July 2000

landscapes of those periods. In addition, recommendations and guidelines for the treatment and management of important resources were developed.

Grand Canyon Village National Historic District Cultural Landscape Report, Grand Canyon National Park, Arizona

Project Manager*

CLIENT: SMA/JMA and VWRL Architects

With over 247 historic buildings, 55 historic landscape structures, and three historic sites— many dating to the 1920s and 1930s and representing the NPS Rustic Style—the district has been experiencing General Management Plan-related changes to support increased visitation including development of a bus transit system, a possible future light rail system, and development of a Heritage Education Campus. The CLR was intended to guide park staff in their efforts to preserve the district’s character balanced with planning for appropriate and compatible new interventions and rehabilitated resources.

Historic Jamestowne Cultural Landscape Report, Colonial National Historical Park, Virginia*

Principal-in-Charge

CLIENT: Heritage Partners, Inc.

In preparation for the 400th anniversary of the founding of the first permanent English settlement in America, the National Park Service—working with the Association for the Preservation of Virginia Antiquities—commissioned a Cultural Landscape Report for Jamestown Island, Neck of Land, and Glasshouse Point. In addition to undertaking research and documentation of the historic landscape, the project included the preparation of design recommendations for surviving historic landscape resources and design guidelines for new development.

Independence Square, Independence National Historical Park, Philadelphia, Pennsylvania*

Principal-in-Charge

CLIENT: WRT

Independence Square – a World Heritage site – is the location where the Declaration of Independence was read publicly for the first time on July 8, 1776. Independence Square consists of the landscaped grounds stemming from 1730 legislation indicating that the land south of the State House, now known as Independence Hall, “be enclosed and remain a public open green and walks forever.” Independence Square’s cultural landscape reflects nearly three centuries of use and contains features from three principal landscape designs including the Vaughan Landscape of 1785–1874, the Centennial Landscape of 1875–1914, and the AIA Landscape spanning 1915–1951. Planting designs were prepared for the rehabilitation of the landscape as part of a program of security improvements under a design/build contract.

Indian Garden, Grand Canyon National Park, Arizona

Principal-in-Charge*

CLIENT: vWRL Architects

Indian Garden is a rest stop and campground along the Bright Angel Trail, approximately 3,200 feet below the South Rim. The site has been continually used as a stopping point for hikers, campers, and mule riders for over 100 years, although the fertile landscape of water-bearing creeks, springs, and seeps was used by American Indians, including Havasupai,

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Ancestral Puebloan, and Cohonina peoples, and miners for many years prior to the beginning of tourism. The need for the Cultural Landscape Report (CLR) arose from the identification of management issues and proposed projects that could affect the existing landscape and its associated cultural and natural resources. In addition to documentation of historic land use, the CLR included an evaluation of the project area's significance and integrity, and included landscape treatment recommendations.

Painted Desert Community Complex Cultural Landscape Report, Petrified Forest National Park, Arizona
Principal-in-Charge*
CLIENT: Woolpert, LLC
The complex has been nominated to the National Register as a nationally significant historic district for its association with the National Park Service's Mission 66 design initiative spanning the years 1956-1966. Selection of renowned modern architect Richard Neutra and his partner Robert Alexander in 1958 reflected the Mission 66 commitment to bringing progressive technology and functionalism into the parks. The 24-acre complex of buildings and structures organized around a central plaza and a series of courtyards was located on the new U.S. Route 66, signaling the influence of the motorists' experience on park landscape design. The scope of the project included documentation of the physical history of the designed landscape, an assessment of its significance, integrity, and condition, development of an overall treatment strategy for its long-term management, and schematic-level design for the rehabilitation of the landscape.

Tallgrass Prairie National Preserve Cultural Landscape Report, Strong City, Kansas*
Principal-in-Charge
CLIENT: Bahr Vermeer Haecker Architects
Tallgrass Prairie National Preserve encompasses more than 10,894 acres of some of the country's last remaining tallgrass prairie in the scenic Flint Hills of Kansas. Developed for cattle ranching for more than 100 years, in 1994 the site was under the joint management of the National Park Trust and National Park Service. The project involved existing conditions documentation and development of treatment recommendations and implementation projects.

Valley Forge National Historical Park Cultural Landscape Report, Valley Forge, Pennsylvania*
Principal-in-Charge
CLIENT: Heritage Partners
Valley Forge National Historical Park, formerly a state park, is a 3,400-acre park located twelve miles west of Philadelphia on the Schuylkill River. Renowned for its association with Revolutionary War encampments, the park also serves a variety of regional recreational users. The Cultural Landscape Report for the entire park provided existing conditions documentation, landscape assessment and evaluation, and preparation of conceptual-level rehabilitation, preservation, and development alternatives for the park.

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Wind Cave National Park Cultural Landscape Report, South Dakota
Project Manager*
CLIENT: Bahr Vermeer Haecker Architects
A Cultural Landscape Report was prepared for the entire 28,000 acres of Wind Cave National Park. The developed area of the park is listed in the National Register of Historic Places for its association with the Civilian Conservation Corps. The CLR addressed how park management can protect and manage natural and cultural resources including those associated with Wind Cave. According to the National Park Service, this is the first CLR to document, assess, and provide treatment recommendations for a cave environment.

Washington Dulles International Airport Landscape Master Plan, Dulles, Virginia*
Project Manager
CLIENT: Metropolitan Washington Airports Authority
The original landscape plan for the Main Terminal environs was designed by nationally-significant landscape architect Dan Kiley and partly implemented for the 1962 airport opening. This project involved planning-level design services required for preparing a programmatic and conceptual landscape master plan for the rehabilitation and expansion of landscapes within landside areas of the airport. The major activities incorporated in this contract included the following: landscape analysis; development of a landscape concept and design recommendations; preparation of planning-level budgets and implementation recommendations; and preparation of landscape design guidelines for incorporation in the Authority's Design Manual.

Main Terminal Environs Phase One Landscape Renovations, Washington Dulles International Airport, Dulles, Virginia
Project Manager*
CLIENT: Metropolitan Washington Airports Authority
This project involved the initial phase of renovations of the plantings fronting the Main Terminal designed by Eero Saarinen. Little of the original planting design remains of the Dan Kiley-designed early 1960s landscape. However, new plantings were specified that meet the special requirements of an airport landscape while approximating the character of the missing historic plants. New planting design challenges included avoiding plants that serve as hosts to Japanese beetles and bird habitat; slope stabilization; and, vehicular sight distance. They project area included almost 6 acres of irrigated planting beds.

Christ Church Cathedral, Cloister Garden and Landscape Improvements, Louisville, Kentucky*
Project Manager
CLIENT: John Milner Associates, Inc.
Established in 1822, the congregation and church buildings have been developed over time to serve as many as 500 parishioners. The Cathedral is the oldest surviving building and oldest house of worship in Louisville. Christ Church Cathedral required repair and rehabilitation to meet the needs of the congregation and to fulfill its mission. As a part of the rehabilitation of the exteriors and interiors of the historic buildings, the site required renovation as well. The needs of the parish included a private, reflective space for use by individuals and small gatherings; a welcoming

ROBERT MCGINNIS

space fronting South Second Street; a play yard for children; and, a new pedestrian access to afford the public and the parishioners. The new cloister garden is a quiet space with a pool and fountain surrounded by lush plantings providing shade, fragrance, and visual interest during each season. The long, linear space fronting South Second Street was opened to the public by the selective removal of an existing iron fence and the retention of the stone pylons forming gateways into the cloister garden and the primary public entrance at the Cathedral House.

McCormick Road Housing Landscape and Site Rehabilitation Phases 1 and 2, University of Virginia, Charlottesville, Virginia
Project Manager*
CLIENT: University of Virginia
The project area was developed in the 1950s and includes the environs of ten student dormitories including two quadrangles. Design through construction phase services were undertaken including meeting with students and collaboration with university personnel to arrive at an appropriate rehabilitation solution in order to accommodate new programmatic needs. The study uncovered problems associated with pedestrian and bicycle circulation conflicts, compacted soils, poor drainage, missing and over-mature plantings, and pavement failures.

Ohio State University Historic Building Survey and Preservation Management Plan, Columbus, Ohio*
Project Advisor
CLIENT: The Ohio State University
The project, funded in part through a Getty Campus Heritage Grant, included detailed preservation audits and assessments of selected historic buildings and landscapes constructed between 1890 and 1950 in and around the academic core of the campus. The information was incorporated into a preservation management database, and provided a plan with which to develop design guidelines, maintenance standards and specifications, and training programs to guide the University's future design and planning efforts and further the maintenance of historic buildings and landscapes on the campus. The preservation management plan provided the University with a system for correlating assessments of current conditions and materials conservation needs with financial resources and planning for new program requirements in existing buildings.

** Project completed while with another firm.*

RACHEL EVANS LLOYD

Associate

Landscape Designer / Cultural Landscape Specialist

Rachel Evans Lloyd is a landscape designer with ten years of planning, design, and cultural landscape preservation experience throughout the US. She focuses on park, educational, institutional, recreational, and civic and open space projects with cultural and historical significance. Ms. Lloyd serves as a project manager and project designer and specializes in historic landscape preservation, land planning, and sustainable design projects with an emphasis on national, state, local, and non-profit clients including the National Park Service, University of Virginia, the Garden Club of Virginia, and the Civil War Preservation Trust.

EDUCATION

M.L.A., University of Virginia, 1996

B.A., American History, University of Pennsylvania, 1991

AFFILIATIONS

CHART (Charlottesville/Albemarle Regional Transportation) Committee, Member and Chair, 2001-2003

Executive Committee Member, Virginia Chapter ASLA, 1999

Co-chair, Blue Ridge Section, Virginia Chapter ASLA, 1999

Charlottesville Area School-Business Alliance Career Day Presentation, 1998

Rivanna River Exploration, Charlottesville, VA, 1998

Moore's Creek Trail Advisory Committee, Charlottesville, VA, 1997

HONORS + AWARDS

Merit Award, Star Fort Resource Management and Interpretation Plan, Virginia Chapter of the American Society of Landscape Architects, 2005.

Honorable Mention, Star Fort Resource Management and Interpretation Plan, Virginia Chapter of the American Planning Association, 2001.

Merit Award, Charlottesville Parks Master Plan, Charlottesville, Virginia, American Society of Landscape Architects, 1998.

Honorable Mention, Ben Howland Memorial Competition, University of Virginia, 1996.

PRESENTATIONS + PUBLICATIONS

Restorations of the Garden Club of Virginia, University of Virginia Press, Illustrations for book, forthcoming (2009)

"The Good Fight," Landscape Architecture, Volume 90, Number 7, July 2000

"Landscapes of Virginia" Brochure, American Society of Landscape Architects, 1999

House for the New Millennium Garden Design, House Beautiful Magazine, 1998

Brochure, Environmental Studies Center, Oberlin College, Oberlin, Ohio 1997

"The Creation of Byxbee Park" Critiques of Built Works Vol. III. Louisiana State University, 1997

SELECTED PROJECT EXPERIENCE

Cultural Landscape Inventories of Four Component Landscapes, Valley Forge National Historical Park Valley Forge, Pennsylvania.

Project Designer

CLIENT: Heritage Partners, Inc.

In 1998, Cultural Landscape Inventories (CLIs) for four component landscapes located within Valley Forge National Historical Park were prepared in support of a park-wide inventory developed by the NPS. The CLIs summarized the landscape history for each site, evaluation of the sites according to National Register criteria, and provided important documentation and analysis regarding the resources that survive from various historic periods.

George Washington Birthplace National Monument Cultural Landscape Report, Westmoreland County, Virginia

Project Designer

CLIENT: National Park Service Northeast Region

The preparation of a Cultural Landscape Report for the park entailed intensive research and documentation of cultural, natural, and historic resources spanning multiple periods and areas of significance. These resources were examined as they occurred within a continuum of physical change dating from the earliest settlement of Tidewater Virginia through preservation initiatives—private, state, and Federal—culminating in the establishment of the George Washington Birthplace National.

Glendale and Malvern Hill Civil War Battlefields Cultural Landscape Report and Archeological Investigations, Richmond National Battlefield Park, Henrico County, Virginia

Project Designer

CLIENT: Heritage Partners, Inc.

A Cultural Landscape Report (CLR) was prepared for the Glendale and Malvern Hill battlefields including archeological investigations and geophysical prospecting to learn more about the domestic and slave landscapes within the Malvern Hill farm. The final CLR was used to guide the treatment of agricultural landscapes to support enhanced interpretation balanced with protection of sensitive ecological resources.

Grand Canyon Village National Historic Landmark District Cultural Landscape Report, Grand Canyon National Park, Arizona

Project Designer

CLIENT: SMA/JMA and VWRL Architects

A Cultural Landscape Report (CLR) was prepared for the Grand Canyon Village National Historic Landmark District which includes over 247 historic

RACHAEL EVANS LLOYD

buildings, 55 historic landscape structures, and three historic sites. The district has been experiencing General Management Plan-related changes to support increased visitation, and the CLR is intended to guide park staff in their efforts to preserve the district's character balanced with planning for appropriate and compatible new interventions and rehabilitated resources.

Hampton National Historic Site Agricultural Landscape History, Towson, Maryland
Project Designer
CLIENT: Heritage Partners, Inc.
The project included the documentation of the Hampton Farm history to support on-going management planning and interpretation. The study involved research and documentation of the original 1,500-acre Northampton tract including farm complexes, field systems and patterns of land use, roads, industrial enterprises, and natural features.

Historic Jamestown Cultural Landscape Report, Colonial National Historical Park, Virginia
Project Designer
CLIENT: Heritage Partners, Inc.
In preparation for the 400th anniversary of the founding of Jamestown, the National Park Service—working with the Association for the Preservation of Virginia Antiquities—commissioned a Cultural Landscape Report. The project included research and documentation of the historic landscape, the preparation of design recommendations for surviving historic landscape resources and design guidelines for new development.

Mumma House and Barn Rehabilitation, Antietam National Battlefield, Sharpsburg, Maryland
Project Designer
CLIENT: SMA/JMA
The Mumma House and barn burned during the September 17, 1862, Battle of Antietam, and were rebuilt in three phases over eighty years. This project included schematic design through construction documentation services for the rehabilitation of the site to accommodate new uses and to provide for visitor accessibility.

Nicodemus National Historic Site Cultural Landscape Report, Nicodemus, Kansas
Project Designer
CLIENT: Bahr Vermeer Haecker Architects
Located in the northwest region of Kansas, the town of Nicodemus is designated as a National Historic Landmark and a National Historic Site. The town and community of Nicodemus are historically significant as a continuously-occupied African American frontier settlement. A cultural landscape report was prepared for this traditional cultural property and included the five Nicodemus National Historic Site units in the town; the one square mile section of which the town is a part; and the Nicodemus Township comprised of 36 sections of Graham County, Kansas.

Rancho de las Cabras Cultural Landscape Report, San Antonio Missions National Historical Park, Wilson County, Texas
Project Designer
CLIENT: National Park Service
The 99-acre Rancho de las Cabras property was acquired by the federal government for inclusion in San Antonio Missions National Historical Park. A

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Cultural Landscape Report was prepared that identified landscape resources associated with Spanish Colonial use of the site and other historic periods. The study summarized the physical evolution of the landscape, provided existing conditions documentation, site analysis, a National Register evaluation, and a treatment plan for long-term management of the site and its resources.

Wilson's Creek National Battlefield Cultural Landscape Report, National Park Service, Republic, Missouri
Project Designer
CLIENT: National Park Service Midwest Region
The Cultural Landscape Report for Wilson's Creek National Battlefield in Missouri included historical documentation, assessment and evaluation of natural and cultural resources and systems, and conceptual-level recommendations for landscape improvements, and restoration of natural systems including prairie plant communities.

Christ Church Cathedral, Cloister Garden and Landscape Improvements, Louisville, Kentucky
Project Designer
CLIENT: John Milner Associates, Inc.
The Cathedral is the oldest surviving building and oldest house of worship in Louisville and required repair and rehabilitation to meet the needs of the congregation and to fulfill its mission. In addition to the rehabilitation of the historic buildings, the site required renovation as well. The needs of the parish included a private, reflective space for use by individuals and small gatherings; a welcoming space fronting South Second Street; a play yard for children; and a new pedestrian access for the public and the parishioners.

Garrett Hall Precinct Study, Historic Grounds, University of Virginia, Charlottesville, Virginia
Project Designer
CLIENT: University of Virginia
The Garrett Hall precinct at the University of Virginia is bordered by The Lawn, and is part of the historic grounds. The landscape study for the precinct focused on site analysis of existing infrastructure and access, and concept plan alternatives for incorporating improvements identified by the University.

Monument Terrace, Lynchburg, Virginia
Project Designer
CLIENT: VERSAR, Inc.
Monument Terrace includes steps, terraces, memorials, and extensive planted areas arranged on a steep slope extending one city block, and it is the focal point along the City's Ninth Street Corridor. Its rehabilitation was a vital component of Lynchburg's downtown revitalization efforts. The scope of landscape architectural services included landscape analysis and schematic design plan as well as final construction documents addressing drainage, slope stabilization, erosion and sediment controls, and plantings.

Pavilion Garden VI Restoration, University of Virginia
Charlottesville, Virginia
CLIENT: University of Virginia
The University of Virginia and the Garden Club of Virginia participated in the restoration of the pavilion gardens at The Lawn. The restoration included revision of plantings and walkways to reflect the intent of the Donald Parker design from the mid 1900s.

MONICA STRAUSS
Senior Project Archaeologist

SUMMARY
Twelve years of experience in southern California archaeology

Trained in CEQA and National Historic Preservation Act, Section 106 compliance

Lead archaeologist on numerous Los Angeles public agency projects

Directs cultural resources compliance projects of prehistoric and historic archaeological sites

Conducts historic resources significance evaluations

Develops monitoring, treatment and mitigation programs

Experience with Los Angeles area sites containing prehistoric and historic human remains

Experience with Native American consultation

EDUCATION
MA, Archaeology (Honors), California State University, Northridge, 2001

BA, Anthropology (Honors), California State University, Northridge, 1996

AA, Humanities, Los Angeles Pierce College, Woodland Hills, 1994

CERTIFICATIONS
Register of Professional Archaeologists

AFFILIATIONS
Society for American Archaeology

Society for California Archaeology

Monica Strauss is a senior project archaeologist with 12 years of experience in cultural resources management and has directed numerous archaeological investigations throughout southern California and the Channel Islands. Ms. Strauss earned her Master's Degree from California State University, Northridge and has spent the majority of her career working in the Los Angeles area.

As lead archaeologist for EDAW's Los Angeles office, Ms. Strauss directs prehistoric and historic field and research projects for public agencies and private developers throughout the area. She manages a staff of cultural resources specialists who conduct various types of cultural resources compliance including phase I surveys, construction monitoring, Native American consultation, archaeological testing and treatment, historic resource significance evaluations, and large-scale data recovery programs. Ms. Strauss prepares technical documents in support of CEQA and Section 106 compliance as well as cultural resources components for General and Specific Plans.

As a result of extensive project work in the Los Angeles area, Ms. Strauss is well-versed in the history of the city and the types of archaeological sites and artifacts common to the area. Her research interests include mid- to late- 19th century growth and development in Los Angeles and prehistoric maritime adaptation along the California coast. Ms. Strauss has specialized expertise in the analysis of groundstone tools and their ability to reflect shifts in resource exploitation.

REPRESENTATIVE EXPERIENCE

Central Los Angeles High School #9, Los Angeles, CA
Project Director

CLIENT: Los Angeles Unified School District

Directed staff of ten archaeologists in the data recovery of archaeological materials in connection with the 19th century Los Angeles City Cemetery in downtown Los Angeles. Coordinated with the Los Angeles County Coroner and office of Vital Statistics to obtain disinterment permits. Developed mitigation plan incorporating the components related to the future disposition of remains, artifact curation, and commemoration. Managed the laboratory analysis of artifacts and human remains. Currently directing the preparation of a technical report documenting the history of the cemetery, its role in 19th century Los Angeles, and the results of the osteological and artifact analysis. Project has also included construction monitoring, extensive historic research, and public relations and media involvement.

South Region Elementary School #1, Los Angeles, CA
Project Director

CLIENT: Los Angeles Unified School District

Directed archaeological/paleontological monitoring conducted during school site construction. Managed monitors, conducted client coordination, and responded to and evaluated discoveries including two early 20th century residential refuse deposits. Provided oversight to staff conducting artifact analysis and the preparation of an Archaeological Monitoring report documenting and evaluating the recovered materials. Archaeological monitoring currently continues.

Alameda Street Improvement Project, Los Angeles CA
Project Director

CLIENT: City of Los Angeles, Department of Public Works

Directed archaeological monitoring conducted during the construction of

MONICA STRAUSS

roadway improvements in downtown Los Angeles. Responded to discovery of historic resources including the Zanja Madre and the historic brick Alameda Street. Developed mitigation recommendations to address impacts to these resources from the project including an adaptive re-use of the recovered btick materials in the landsape design of the project. Presently overseeing artifact analysis and the preparation of an archaeological resources technical report.

Metro Universal, North Hollywood, CA
Project Director
CLIENT: Thomas Properties Group
Directed archaeological resources assessment for propose Metro Unoiversal project to be constructed adjacent the historic Campo de Cahuenga in North Hollywood. Conducted extensive literature review and archaeological survey and prepared archaeological technical report and EIR section. Developed scale of cultural resources sensitivity for various parts of project site and determined appropriate mitigation measures. Worked with engineers and landscape designers to inform the design to best enhance existing cultural resources. Attended monthly meetings with the Campo de Cahuenga Board of representatives and the Thomas Properties team to address cultural resources concerns.

First Street Trunk Line, Los Angeles CA
Project Director
CLIENT: City of Los Angeles, Department of Water and Power
Directed archaeological and paleontological monitoring of utilities installation. Responded to monitoring discoveries including historic-period utility pipes. Determined appropriate mitigation in the form of recordation. An archaeological monitoring report will be prepared at the conclusion of the project.

Main Street Archaeological/Paleontological Monitoring and Assessment, Los Angeles, CA
Project Director
CLIENT: City of Los Angeles, Department of Public Works
Directed archaeological/paleontological monitoring during the construction of a police parking facility in downtown Los Angeles. Managed monitors and conducted client coordination. Responded to discoveries of over a dozen in tact historic building basements and other refuse deposits to determine appropriate treatment. Presently overseeing artifact analysis and historic research of the historic features and the preparation of an archaeological resources technical report.

Olive View Medical Center Emergency Services Expansion, Los Angeles, CA
Project Director
CLIENT: City of Los Angeles, Department of Public Works
Directed Phase I cultural resources assessment in support of an EIR for medical Center expansion in Sylmar. Identified two historic resources and determined them not significant under CEQA. Responded to a discovery made by construction personnel and determined prehistoric artifacts were present in native soil within the project area. Archaeological monitoring conducted in areas of anticipated cultural resources sensitivity.

Temple Street Widening Project, Los Angeles, CA
Project Director
CLIENT: City of Los Angeles, Department of Public Works
Directed archaeological monitoring conducted during the widening of Temple Street in downtown Los Angeles. Extensive coordination with general conad sub contractors. Responded to discoveries including and segment of the zanja irrigation ditch and a large historic refuse deposit to determine appropriate

MONICA STRAUSS

treatment. Developed recommendations. Presently overseeing artifact analysis, historic research and the preparation of an archaeological resources technical report.

Expo Corridor Transit Project – Phase 2, Los Angeles CA
Project Director
CLIENT: DMJM Harris
Directed archaeological, historic architectural, and paleontological resources assessment in compliance with CEQA and Section 106 regulations. Project involved archaeological, paleontological, and historic architectural survey of 6-mile alignment, production of APE maps, consultation with SHPO and the preparation of technical reports and EIR sections.

Van Norman Chloramination Station, San Fernando CA
Project Director
CLIENT: City of Los Angeles, Department of Water and Power
Directed archaeological and Native American monitoring during project construction. An archaeological monitoring report will be prepared at the conclusion of the project.

State Route 90 Connector Road and the Admiralty Way Widening Projects, Marina del Rey, CA
Project Director
CLIENT: County of Los Angeles, Department of Public Works
Currently conducting Phase II investigations in compliance with Section 106 review. Designing research strategy, directing testing program, coordinating with Native American groups, and conducting evaluation pursuant to Caltrans guidelines.

Lang Ranch Community Park, Thousand Oaks, CA
Project Director
CLIENT: Conejo Park and Recreation District
Directed a Phase I archaeological survey of the 46-acre project area. Project work involved the archaeological testing at two artifact isolate locations to determine presence of sub-surface deposits. Prepared an Archaeological Resources Technical Report and EIR section with findings and recommendations for further work, pursuant to CEQA requirements.

Woodland Duck Farm, Avocado Heights, CA
Project Director
CLIENT: San Gabriel & Lower Los Angeles Rivers and Mountains Conservancy
Directed a Phase I cultural resources evaluation of the historic-era Woodland Duck Farm property. Conducted a California Register eligibility assessment for several duck farm buildings and archaeological features identified as a result of the survey. Conducted extensive background research concerning the history of the duck farm and poultry farming in general. Prepared a Cultural Resources Technical Report and MND section with findings and recommendations for further work, pursuant to CEQA requirements.

San Clemente Island, Los Angeles County, CA
Project Director
CLIENT: U.S. Navy, Southwest Division
Designed research strategy and directed testing program in strict accordance with guidelines set forth by the U.S. Navy and in compliance with Section 106. Authored comprehensive technical report which considers the results of the testing program in relation to current California coast and San Clemente Island research questions and evaluates the sites for eligibility for the National Register.

MONICA STRAUSS

San Gabriel River Discovery Center at Whittier Narrows, Los Angeles County, CA
Project Director
CLIENT: City of Los Angeles, Department of Public Works
Directed a Phase I cultural resources evaluation of the historic-era Discivery Center. Conducted a National Register and California Register eligibility assessment for several historic-era buildings identified as a result of the survey. Conducted background research concerning the history of the duck farm and poultry farming in general including consultation with local Native American representatives. Prepared a Cultural Resources Technical Report with findings and recommendations for further work, pursuant to NEPA and CEQA requirements.

Hellman Ranch Monitoring, Orange County, CA
Field Director
CLIENT: City of Seal Beach
Directed large-scale excavation and monitoring program under the terms of a Mitigation Plan. Coordinated twenty archaeological field personnel and worked closely with a staff of eight Native American monitors and construction crews. Field work included heavy-equipment monitoring, excavation of complex shell midden deposits and human remains, wet screening and artifact analysis.

Home Depot Monitoring – Lake Elsinore, Riverside County, CA
Project Director
CLIENT: Twining Laboratories, Fresno
Directed archaeological monitoring of Caltrans road-widening in vicinity of historic cemetery. Currently preparing negative report of findings. Coordinated with Caltrans.

Van Norman Reservoir Monitoring, Los Angeles County, CA
Project Director
CLIENT: City of Los Angeles, Department of Water and Power
Directed archaeological monitoring of geo-technical boring activities in the reservoir complex. Provided daily oversight of monitors and regular reports to client.

Public Safety Facilities Master Plan, Los Angeles County, CA
Project Director
CLIENT: City of Los Angeles, Department of Public Work
Directed a Phase I archaeological resources evaluation of an approximately five-square block area in downtown Los Angeles. Project work involved an extensive investigation of the area during the cities' early pueblo years and specifically the Zanja Madre irrigation system. Prepared technical report with findings and recommendations for further work, pursuant to CEQA requirements.

Ivy Street Bridge, Murrieta, CA
Project Director (Cultural Resources Assessment)
CLIENT: T.Y. Lin International for the City of Murrieta
Conductedg Extended Phase I study in compliance with Section 106 review. Designing research strategy, directing testing program, coordinating with Native American groups, and conducting evaluation pursuant to Caltrans guidelines.

Alhambra 127, County of Los Angeles, CA
Project Director (Cultural Resources Assessment)

MONICA STRAUSS

CLIENT: City of Alhambra
Conducted archival research in support of cultural resources assessment pursuant to CEQA requirements. Authored cultural resources technical section of Mitigated Negative Declaration.

Fire Station No. 13, Los Angeles, CA
Project Director
CLIENT: City of Los Angeles, Bureau of Engineering
Conducted archival research and historical architectural field survey in support of cultural resources assessment pursuant to CEQA requirements. Co-authored technical report.

Sepulveda Boulevard Reversible Lane, Los Angeles, CA
Project Director
CLIENT: City of Los Angeles, Bureau of Engineering
Directed built environment field survey and conducted archival research in support of cultural resources assessment in compliance with Section 106 and CEQA. Co-authored technical reports and consulted with Caltrans regarding effects to historical resources.

Lakewood Boulevard, Downey, CA
Project Director (Cultural Resources Assessment)
CLIENT: City of Downey
Directed field work and research in support of cultural resources assessment pursuant to CEQA requirements. Authored technical report.

Lake Hodges, San Diego County, CA
Research Assistant
CLIENT: San Diego County Water Authority
Conducted study of groundstone tool collection and authored analytical report of findings.

Mid City Police Station, Los Angeles, CA
Project Director
CLIENT: City of Los Angeles, Bureau of Engineering
Managed research and field survey for architectural evaluation of historic-era structure and prepared technical report in compliance with CEQA.

Haiwee Dam, Lone Pine, CA
Field Archaeologist
CLIENT: City of Los Angeles, Department of Water and Power
Participated in archaeological field survey involving the identification and recording of prehistoric and historic archaeological sites and structures in preparation for the construction of a new dam.

Gateway Cities, Los Angeles County, CA
Project Director
CLIENT: County of Los Angeles, Department of Public Works
Conducted 28 records searches and reported on findings, including site surveys, previously-recorded archaeological sites, and historic structures.

Riverside OHV
Research Assistant
CLIENT: State of California
Conducted field reconnaissance and documented historic-era Lockheed facility.

MONICA STRAUSS

Del Amo Blvd., Torrance, CA
Project Director (Cultural Resources Assessment)
CLIENT: City of Torrance
Conducted records search, archaeological field survey, historic structures documentation, historic research, and coauthored cultural resources assessment documentation in compliance with Section 106.

Arroyo Seco Bike Path, Los Angeles, CA
Project Director
CLIENT: County of Los Angeles, Department of Public Works
Managed all aspects of Section 106 review in accordance with Caltrans Cultural Resources Environmental guidelines. Orchestrated the research strategy, directed the field teams, and prepared cultural resources assessment documentation for approval by Caltrans and FHWA and cultural resources section for Mitigated Negative Declaration.

Hellman Ranch Monitoring, Orange County, CA
Field Archaeologist/Research Assistant
CLIENT: City of Seal Beach
Conducted archaeological monitoring and excavation of Native American burials discovered during construction of the Heron Point Development, a large housing development owned by John Laing Homes. Conducted research of prehistoric burials throughout southern California and performed comparative evaluation. Conducted in-depth analysis of large groundstone tool collection.

Malibu Creek State Park, Malibu, CA
Research Assistant
CLIENT: California Department of Parks and Recreation
Conducted records search and general research of prehistoric and historic resources within the park in preparation of General Plan. Prepared historical overview and report identifying the nature and location of cultural resources. Directed Native American consultation.

Los Angeles Reservoir, San Fernando, CA
Field Archaeologist/Research Assistant
CLIENT: City of Los Angeles, Department of Water and Power
Conducted records search and intensive archaeological survey of portions of the Van Norman Archaeological District. Conducted research on the history of the dam, reservoir, and aqueduct complex and prepared historical overview for portion of the report.

Ambassador College, Pasadena, CA
Research Assistant
CLIENT: Worldwide Church of God
Conducted intensive research at both libraries and museums on the history of Pasadena and the development of the city's "cultural fabric." Assisted in the preparation of posters for presentation to clients and at public meetings.

Chapman College, City of Orange, CA
Field Assistant/Research Assistant
CLIENT: Chapman University
Assisted with the in-field documentation of historic structures. Consulted historic databases and libraries to define the historical evolution of the neighborhood and the design of specific buildings.

MONICA STRAUSS

Vermont Avenue Relief Sewer, Los Angeles, CA
Project Director
CLIENT: City of Los Angeles, Bureau of Engineering
Conducted Phase I Archaeological Evaluation including records search, historic research, intensive site survey, and preparation of Technical Report.

Montrose Settlements Restoration Program, Los Angeles and Orange Counties, CA
Research Assistant
CLIENT: The National Oceanic and Atmospheric Administration
Conducted research and prepared report on the prehistory and history of the region along the coastlines of Los Angeles and Orange Counties and the eight Channel Islands with special attention to areas of cultural resource concentrations.

LMXU, San Diego County, CA
Research Assistant
CLIENT: Confidential
Conducted microlevel analysis of groundstone tool collection.

Cross Valley Connector, Los Angeles County, CA
Research Assistant
CLIENT: Caltrans
Conducted records search to identify prehistoric and historic cultural resources within the project area. Instigated contact with Native American groups to document concerns.

Taylor Yard, Los Angeles County, CA
Research Assistant
CLIENT: California Department of Parks and Recreation
Conducted records search to identify cultural resources within the project area.

I-5 Manchester, San Diego County, CA
Research Assistant
CLIENT: Dokken Engineering for the City of Encinitas
Compiled profiles on properties within project area using property description database.

North Baja Pipeline Project, Ehrenberg, Arizona to Mexican Border
Field Archaeologist
CLIENT: Pacific Gas and Electric
Excavated, surveyed, and mapped (using a submeter GPS) prehistoric sites for the installation of a natural gas pipeline going from Blythe, California, to Yuma, Arizona.

San Clemente Island Testing Project, Los Angeles County, CA
Field Archaeologist
CLIENT: ASM Affiliates for the U.S. Navy, Southwest Division
Conducted excavation; auger testing; and site mapping, recording, and relocating of archaeological sites.

San Clemente Island Site Relocation Project, Los Angeles County, CA
Field Archaeologist
CLIENT: KEA Environmental for the U.S. Navy, Southwest Division
Participated in relocation, survey, and recording of prehistoric and historic sites.

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San Clemente Island Eel Point Excavation, Los Angeles County, CA
Field Archaeologist/Research Assistant
CLIENT: In coordination with California State University, Northridge
Conducted excavation of multicomponent shell midden site and analysis of artifactual and ecofactual components.

Baja California Sur Site Survey Program, Baja California, Mexico
Field Assistant
CLIENT: In coordination with the University of Baja California Sur, La Paz
Participated in site survey and recording, including the illustration of rock art.

Center for Public Archaeology, California State University Northridge, California
Lab Assistant
Conducted shell, faunal, and lithic analysis, cataloging, and general curation.

PROFESSIONAL PAPERS

Strauss, M. 2000. Trans-Holocene Use of Milling Tools in a Maritime Environment, Eel Point, San Clemente Island. Oral Presentation at the Society for California Archaeology (SCA) Meeting, Riverside, California, April.

Strauss, M. and S. Dietler 2006. Bones, Beads and Bowls: Variation In Habitation And Ritual Contexts At Landing Hill. Oral Presentation at the Society for California Archaeology (SCA) Meeting, Ventura, California, April.

Strauss, M., S. Dietler, and C. Ehringer. 2008. Death Lends a Hand: Archaeological Excavations of Los Angeles's City Cemetery. Oral paper presentation at the Society for Historical Archaeology Annual Meeting, Albuquerque, NM.

Strauss, M. 2008. Unearthing City Cemetery: Archaeological Excavations at Los Angeles' First City-Operated Burial ground (1863-1890). Oral Presentation at the Society for American Archaeology (SAA) Meeting, Vancouver, Canada, March.

Strauss, M. 2008. Unearthing City Cemetery: Archaeological Excavations at Los Angeles' First City-Operated Burial ground (1863-1890). Oral Presentation at the Society for California Archaeology Meeting, Burbank, California, April.

Martinez, J. and M. Strauss. 2008. Reconstructing the Past with GIS technology: Los Angeles' City Cemetery. Oral Presentation at the Society for California Archaeology Meeting, Burbank, California, April.

SELECTED REPORTS

Central Los Angeles High School #9 Archaeological Excavation Report (in progress) (contributing author). Prepared for Los Angeles Unified School District. EDAW, Inc. (anticipated 2008).

Archaeological Resources Assessment for the Alameda Street Improvement Project (in progress). Prepared for City of Los Angeles, Department of Public Works. EDAW, Inc. (2008)

Archaeological Resources Assessment for the MTA Universal Project (with S. Dietler). Prepared for Thomas Properties Group. EDAW, Inc. (2008).

MONICA STRAUSS

Exposition Corridor Transit Project Phase 2 Archaeological Survey Report (with C. Ehringer). Prepared for Exposition Rail Transportation Authority. EDAW, Inc. (2008).

Archaeological Evaluation for the South Region Elementary School #1 Project (Demolition Phase of Construction), *City of Los Angeles, California* (with C. Ehringer). Prepared for Los Angeles Unified School District. EDAW, Inc. (2008).

Archaeological Resources Assessment and Evaluation of "Maintenance of Way" Building for the Asphalt Plant No. 1 Street Services Truck Route Project, *City of Los Angeles, California* (with C. Ehringer and A. Tomes). Prepared for City of Los Angeles, Bureau of Engineering. EDAW, Inc. (2008)

Cultural Resources Assessment for the Proposed Formosa Specific Plan at Santa Monica Boulevard, *West Hollywood, CA* (with A. Tomes and M. Strauss). Prepared for City of West Hollywood Community Development Department. EDAW, Inc. (2007).

Archaeological Evaluation Proposal (Phase II) of the Admiralty Site (CA-LAN047) for the State Route 90 Connector Road and the Admiralty Way Widening Projects, Marina del Rey, County of Los Angeles, CA (with J. Dietler and S. Dietler). Prepared for Caltrans District 7. EDAW, Inc. (2007).

Cultural Resources Assessment for the Proposed San Gabriel River Discovery Center at Whittier Narrows, Los Angeles County, CA (with A. Tomes and J. Dietler). Prepared for Los Angeles County Department of Public Works (2007).

Cultural Resources Assessment for the Woodland Duck Farm Project, Avocado Heights, Los Angeles County, CA (with A. Tomes and S. Dietler). Prepared for San Gabriel River & Lower Los Angeles Rivers and Mountains Conservancy (2007).

Archaeological Resources Assessment for the Olive View Medical Center Emergency Services Expansion, City of Los Angeles, CA. Prepared for Los Angeles County Department of Public Works (2006).

Archaeological Resources Assessment and Phase II Testing Program for the Proposed Lang Ranch Community Park Project, Thousand Oaks, CA. Prepared for Conejo Recreation and Park District (2006).

Archaeological Resources Assessment for the Proposed Public Safety Facilities Master Plan Project, City of Los Angeles, CA. Prepared for City of Los Angeles, Department of Public Works (2004).

An Archaeological Evaluation of Four Sites in the Quarry and Ridge Road Vicinities, San Clemente Island, California. Prepared for Southwest Division, Naval Facilities Engineering Command, NRO. (2004).

Cultural Resources Assessment for the Proposed Lakewood Boulevard Improvement Project, City of Downey, CA (with A. Tomes). Prepared for City of Downey. EDAW, Inc. (2003).

Proposal for Extended Phase I Testing of CA-RIV-1085 and CA-RIV-1086 for the Proposed Ivy Street Bridge Project, City of Murrieta, CA. Prepared for Caltrans District 8. EDAW, Inc. (2003).

Historic Property Survey Report: Sepulveda Boulevard Tunnel at Mulholland Drive in Connection with the Proposed Sepulveda Boulevard Reversible Lane and Bike Lanes Project, City of Los Angeles, CA (with A. Tomes). Prepared

MONICA STRAUSS

for City of Los Angeles. EDAW, Inc. (2003).
Historical Architectural Evaluation of the Sepulveda Boulevard Tunnel at Mulholland Drive in Connection with the Proposed Sepulveda Boulevard Reversible Lane and Bike Lanes Project, City of Los Angeles, CA (with A. Tomes). Prepared for City of Los Angeles. EDAW, Inc. (2003).

Cultural Resources Assessment for the Proposed Lakewood Boulevard Improvement Project, City of Downey, CA (with A. Tomes). Prepared for City of Downey. EDAW, Inc. (2003).

Lake Hodges: Milling Tool Analysis. San Diego County, CA (with R. Apple). Prepared for San Diego County Water Authority. EDAW, Inc. (2003).

Historical Architectural Survey and Evaluation for the Proposal Mid-City New Police Station Project, City of Los Angeles, CA (with C. Dolan). Prepared for City of Los Angeles. EDAW, Inc. (2003).

Historical Resources Evaluations Report for the Proposed Del Amo Boulevard Extension Project, City of Torrance, CA (with C. Dolan). Prepared for City of Torrance. EDAW, Inc. (2003).

Historical Resources Evaluation Report for the Proposed Arroyo Seco Bike Path Project, County of Los Angeles (with C. Dolan). Prepared for County of Los Angeles. EDAW, Inc. (2003).

Malibu Creek State Park General Plan, City of Calabasas, CA (with E. Wilson). Prepared for California Department of Parks and Recreation. EDAW, Inc. (2003).

Archaeological Survey for the Proposed Vermont Avenue Relief Sewer, City of Los Angeles, CA. Prepared for City of Los Angeles. EDAW, Inc. (2003).

Montrose Settlements Restoration Project: Preliminary Planning Report. (with K. Myers) Prepared for the National Oceanic and Atmospheric Administration. EDAW, Inc. (2003).

Taylor Yard State Park General Plan, Los Angeles, CA (with E. Wilson). Prepared of California State Parks and Recreation. EDAW, Inc. (2003).

PUBLIC OUTREACH AND EDUCATION

2008. Public Outreach speaker at Chinese Historical Society meeting. Project: Central Los Angeles High School #9. Client: Los Angels Unified School District.

2006. Guest lecturer at Laurel Hall Elementary and Middle School regarding archaeology in southern California, North Hollywood, CA.

2003. Volunteer lecturer and field advisor at San Clemente Island Field School.

2003. Key speaker at Seal Beach Historical Society community outreach meeting regarding findings from the Hellman Ranch Archaeological Sites, Seal Beach, CA.

2002. Guest lecturer at Rosemead Elementary School regarding career opportunities in cultural resources management, Rosemead, CA.

1998–2000. Appointment at California State University, Northridge, Anthropology Department. Directed undergraduate peer student advisement center, counseled students regarding course selection, graduation preparation, and employment opportunities.

CANDACE ROXANNE EHRINGER, RPA

Project Archaeologist

SUMMARY

10 years of experience in California archaeology

Authors technical reports in support of CEQA and Section 106 compliance

Expertise with Native American Consultation, including SB-18 consultation

Extensive knowledge of Los Angeles history

Skilled at excavation and analysis of historic and prehistoric cemeteries

Knowledge of General and Specific Plan requirements

EDUCATION

M.A. Anthropology, California State University, with distinction

B.A. Anthropology, East Carolina University, cum laude

AFFILIATIONS

Society for American Archaeology

Society for Historical Archaeology

Society for California Archaeology

CERTIFICATIONS

Register of Professional Archaeologists

HONORS AND ACHIEVEMENTS

Appointment as SCA Liaison to SAA in 2007

Gamma Beta Phi, academic honor society, East Carolina University, inducted 1989

Candace Ehringer is an archaeologist with over 10 years of experience in cultural resources management in Southern California, the Mojave Desert, and the California Great Basin. She has worked for the last five years principally in Los Angeles and Orange Counties gaining substantial experience with all aspects of cultural resources investigations, including managing field surveys and lab analysis. Candace authors technical reports and is familiar with requirements for CEQA and Section 106 compliance.

In her current position, Candace has developed extensive expertise with identification and classification of all types of historic materials including ceramics, glass bottles, garment-related items, and coffin hardware. Her present research interests include the historical development of Los Angeles, including its railroads and interurban mass-transit lines, construction techniques of Victorian garments, and 19th-century consumer practices.

RERESENTATIVE EXPERIENCE

Central Los Angeles High School #9, Los Angeles, CA

Lab Director, Contributing Report Author

CLIENT: Los Angeles Unified School District

The project involved identifying and excavating 171 burial features. The cemetery dated to the mid to late 19th century and reflected the growing Protestant population of Los Angeles. The majority of features was located in the private section of the cemetery, and was from upper-middle-class families. Analysis of this cemetery provides a rare opportunity to compare other excavated 19th-century cemeteries, which typically represent people of lower socioeconomic and/or marginalized status, to the presumed ideal of Victorian mortuary practices.

As lab director, responsibilities included assessing artifact conditions and conservation needs, developing and implementing artifact cleaning procedures, identifying historic coffin hardware and personal artifacts, creating a 19th-century coffin hardware typology, library research, developing and maintaining an artifact catalog using Excel and Access, and cataloging over 3000 artifacts. Other duties have included overseeing the cleaning of skeletal remains, as well as photo-documenting bone pathologies and traumas for the project osteologist. Candace is currently engaged in writing report chapters regarding coffin hardware, personal artifacts, and trends in 19th-century mortuary practices, and is a contributor to the report chapters dealing with field and lab methods and mortuary feature analysis.

Echo Park Lake Rehabilitation, Los Angeles, CA

Field Archaeologist, Research Assistant, Report Co-author

CLIENT: City of Los Angeles

Conducted field survey of 33-acre recreational park located in Echo Park and archival research at UCLA Aerial Photography Archive and Los Angeles Public Library. Authored historical context report section documenting the development of Echo Park. Echo Park was one of Los Angeles's earliest public parks, established in 1892. The design was implemented by Joseph Tomlinson, Los Angeles's first Superintendent of Parks, and modeled after the picturesque English style.

Sunset Time Specific Plan EIR, West Hollywood, CA

Project Manager, Report Author

CLIENT: City of West Hollywood

The applicant proposes to construct up to 149 hotel rooms, 40 residential condominium units, 5 low-income affordable housing units, and up to 35,456

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EHRINGER, RPA

square-feet of commercial and entertainment space. Historically, the area was a mix of residential housing and commercial uses. During the 1920s and 1930s, the area currently occupied by the House of Blues was the site of one of the many nightclubs that flourished along the Sunset Strip during that time period. Prepared a Cultural Resources Technical Report and EIR section with findings and recommendations for further work, pursuant to CEQA requirements.

Movietown Plaza Specific Plan EIR, West Hollywood, CA
Project Manager, Report Author
CLIENT: City of West Hollywood
The applicant proposes to construct approximately 371 residential units and approximately 32,300 square feet of retail/commercial uses on a site currently occupied by a strip mall. The site was first developed when film studios moved into the area. In the 1920s and 1930s, the site was occupied by Educational Films Studio, a producer of one-reel comedies. Shirley Temple began her film career at this location. The site was later occupied by Eagle-Lion Studios, which produced B-movies. Prepared a Cultural Resources Technical Report and EIR section with findings and recommendations for further work, pursuant to CEQA requirements.

Exposition Light Rail, Los Angeles County, CA
Field Archaeologist, Research Assistant, Report Co-author
CLIENT: DMJM-Harris
Participated in archaeological field survey of several proposed routes for the new Exposition Light Rail. Prepared DPR 523 forms for all historic resources observed, including the railroad right-of-way and railroad-related components such as switches and cantilevered signals. Conducted extensive research into the history Los Angeles's railroad systems and their role in the development of Santa Monica, West Los Angeles and Culver City. Historic railroads covered include the Los Angeles & Independence, the Southern Pacific, the Los Angeles Pacific, the Pacific Electric, and the Santa Monica Air Line.
Assisted in the preparation of an Archaeological Resources Technical Report and EIR section with findings and recommendations for further work, pursuant to CEQA and Section 106 requirements.

Temple Street Widening, Los Angeles, CA
Archaeological Monitor
CLIENT: City of Los Angeles, Bureau of Engineering
Served as an archaeological monitor during road construction and utilities relocation. The Zanja, part of Los Angeles's first irrigation system, was discovered during grading. Duties included documenting the Zanja segment and developing measures to insure its protection during on-going construction.

South Regional Elementary School #1, Los Angeles, CA
Lab Analyst, Research Assistant, Archaeological Monitor, Report Author
CLIENT: Los Angeles Unified School District
Conducted lab analysis and co-authored report on artifact assemblage recovered during archaeological monitoring of construction site in south-central Los Angeles. The area had been in use since 1909 and was the home of several domestic, religious, and retail establishments. The artifact assemblage consisted of early 20th-century domestic and vocational refuse. Prepared a Cultural Resources Technical Report with findings and recommendations for further work, pursuant to CEQA requirements.

Alameda Street, Los Angeles, CA
Lab Analyst, Archaeological Monitor
CLIENT: Excel Paving
Archaeological monitoring of street construction at Alameda Street in downtown Los Angeles resulted in the identification and recovery of over 300 historic-era artifacts. In addition, segments of both narrow-gauge and standard gauge rail lines, sections of brick foundations, and brick irrigation features were

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documented. A large section of late 19th to early 20th century brick pavement and part of the Zanja were also uncovered and documented during construction. Assisted with laboratory analysis of historic artifact collection.

Las Encinas Hospital, Pasadena, CA
Field Archaeologist, Research Assistant, Report Author
CLIENT: City of Pasadena
Conducted archaeological field survey and archival research of Las Encinas Hospital grounds. The hospital, once known as the Southern California Center for Nervous Diseases, has been in operation as a mental health facility since 1904. Prior to this, the area was part of the Sunny Slope Ranch owned by Leonard Rose. During the survey, several historic artifact scatters and buildings foundations associated with the ranch and hospital's early years were recorded. Prepared a Cultural Resources Technical Report with findings and recommendations for further work, pursuant to CEQA requirements. Developed mitigation measures to be implemented prior to construction.

Hellman Ranch Monitoring and Data Recovery, Orange County, CA
Crew Chief, Lab Analyst
CLIENT: City of Seal Beach
Supervised team of archaeologists charged with monitoring construction activities, archaeological testing, and excavation of over 30 Native American burials and associated features at Hellman Ranch in Seal Beach, CA. The Hellman Ranch area (Landing Hill) was occupied by the Gabrielino for over 6,000 years. Excavation revealed an extensive mortuary complex, including large amounts of cremated human remains and broken, or "killed," ground stone.

Responsible for implementing and overseeing work delegated by field directors. Contributed to lab analysis by sorting artifacts and beginning initial classification of lithic debitage. Assisted with artifact and osteological photo-documentation. Provided key support to visiting osteological and faunal specialists.

Coroner's Crypt, Los Angeles, CA
Research Assistant
CLIENT: County of Los Angeles, Department of Public Works
Conducted extensive historic research into the area now occupied by the Los Angeles County Corner and prepared cultural resources section of a Mitigated Negative Declaration (MND) for proposed additions to the current Medical Examiner's facility. The area was the location of Los Angeles's first county hospital, and has been in continuous use as medical facilities since the 1870s.

Asphalt Plant No. 1, Los Angeles, CA
Crew Chief, Report Co-author
CLIENT: City of Los Angeles, Bureau of Engineering
Led archaeological survey and co-authored report on the proposed modifications to an existing truck route and construction of new route. Assisted with the preparation of a Cultural Resources Technical Report with findings and recommendations for further work, pursuant to CEQA.

Morris Dam, Los Angeles County, CA
Field Archaeologist
CLIENT: County of Los Angeles, Department of Public Works
Conducted field survey and prepared cultural resources section of a Mitigated Negative Declaration (MND) for a proposed access route to Morris Dam, located in the San Gabriel Mountains.

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Western Bypass Bridge, Temecula, CA
Crew Chief
CLIENT: City of Temecula
Led Phase I survey of the one-acre project area. One previously recorded archaeological site was re-located.

Central Los Angeles High School #9, Los Angeles, CA
Field Archaeologist
CLIENT: Los Angeles Unified School District
Excavation and construction monitoring of an historic 19th-century cemetery. Tasks included directing grading to facilitate detection of soil changes indicative of burials, training incoming staff, excavating burial features, and maintaining a field specimen log. Served as one of the principal field photographers.

Lang Ranch, Thousand Oaks, CA
Field Archaeologist
CLIENT: Conejo Park and Recreation District
Participated in the archaeological testing of the 46-acre project area. Project work involved the archaeological testing at two artifact isolate locations to determine presence of sub-surface deposits.

El Toro, Tustin, CA
Archaeological Monitor
CLIENT: Twining Labs
Served as archaeological monitor during the grading of new roadways. Responsible for maintaining detailed daily reports and coordinating work schedules with on-site construction foreman.

Home Depot Center, Lake Elsinore, CA
Archaeological Monitor, Report Author
CLIENT: Twining Labs
Conducted on-site monitoring of controlled grading during the expansion of an existing roadway located next to a cemetery. Prepared daily monitoring logs and co-authored negative final report for the client.

Seep Spring, China Lake Naval Air Weapons Station, CA
Crew Chief
CLIENT: China Lake Naval Air Weapons Station
Led team of field archaeologists in locating, describing, and mapping archaeological sites. Responsible for creating field schedule, assigning tasks to crew, and collating site records, field notes, photographs and sketch maps. Responsible for completing and filing state-required forms.

Bierman Caves, China Lake Naval Air Weapons Station, CA
Field Archaeologist
CLIENT: China Lake Naval Air Weapons Station
Member of survey team entrusted with re-locating and recording previously discovered rock art sites, as well as recording any new, undiscovered rock art sites.

Santa Ysabel Ranch Testing and Data Recovery at CA-SLO-2084
Field Archaeologist
CLIENT: Santa Ysabel Ranch
Conducted archaeological testing, including excavation units.

Owens Valley PM10 Planning Area Demonstration of Attainment State
Field Archaeologist
CLIENT: State of California
Surveyed large portions of the Owens Valley Lake Bed. Located, recorded, and mapped several large lithic scatters. Responsible for completing and filing state-

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required forms.

Spangler Hills BLM Open Area, Kern County, CA
Field Archaeologist
CLIENT: Bureau of Land Management
Surveyed selected portions of Spangler Hills. Located, recorded, and mapped various types of archaeological sites.

The Grove at Farmers Market Monitoring Project
Archaeological Monitor
CLIENT: A.F. Gilmore Company
Served as archaeological monitor responsible for collecting historic artifact isolates, maintaining paperwork, and coordinating work schedule with on-site construction crews.

Ancient Searles Lake, Christmas Canyon ACEC, San Bernardino County, CA
Field Archaeologist
CLIENT: Bureau of Land Management
Member of survey team charged with locating, describing, and mapping archaeological sites. Several test units were conducted as part of the Phase I survey. Participated in lab analysis.

Dove Springs BLM Open Area
Field Archaeologist
CLIENT: Bureau of Land Management
Surveyed portions of a BLM open area to determine the effects of off-road vehicles on archaeological sites. Located, described, and mapped several archaeological sites.

PROFESSIONAL PAPERS AND PRESENTATIONS

Ehringer, C. 2008 Mortuary Consumerism in 19th-Century Los Angeles: Coffins, Caskets and Trimmings from City Cemetery. Oral paper presentation at the Society for American Archaeology 73rd Annual Meeting, Vancouver, BC.

Ehringer, C., L. Kry, S. Dietler, and M. Strauss. 2008. After the Bones Are Gone: The Role Of Personal Effects in Identifying Unmarked Historic Burials. Poster presentation at the Society for Historical Archaeology Annual Meeting, Albuquerque, NM.

Strauss, M., S. Dietler, and C. Ehringer. 2008. Death Lends a Hand: Archaeological Excavations of Los Angeles's City Cemetery. Oral paper presentation at the Society for Historical Archaeology Annual Meeting, Albuquerque, NM.

Ehringer, C. 2004. Roosters and Raptors: Cultural Continuity and Change at Big Dog Cave, San Clemente Island, California. Oral paper presentation at the Society for California Archaeology Annual Meeting, Riverside, CA.

Ehringer, C. 2000. Ceremony and Ritual at Big Dog Cave, San Clemente Island, California. Poster session, Student Research and Creative Activity Symposium, California State University, Northridge, CA.

Ehinger, C. 1992. Alternative Medicine and Herbal Remedies in Rural North Carolina. Oral presentation at the Southern Anthropological Society Annual Meeting, Saint Augustine, FL.

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SELECTED REPORTS

Central Los Angeles High School #9 Archaeological Excavation Report (in progress) (contributing author). Prepared for Los Angeles Unified School District. EDAW, Inc. (anticipated 2008).

Cultural Resources Assessment for the Proposed Sunset Time Specific Plan At Sunset Boulevard (with A. Tomes). Prepared for City of West Hollywood Community Development Department. EDAW, Inc. (2008).

Cultural Resources Assessment for the Proposed Movietown Plaza Project. Prepared for City of West Hollywood Community Development Department. EDAW, Inc. (2008).

Phase I Archaeological Resources Assessment For The Las Encinas Hospital Improvement Project. Prepared for City of Pasadena Planning and Development Department. EDAW, Inc. (2008).

Exposition Corridor Transit Project Phase 2 Archaeological Survey Report (with M. Strauss). Prepared for Exposition Rail Transportation Authority. EDAW, Inc. (2008).

Archaeological Evaluation for the South Region Elementary School #1 Project (Demolition Phase of Construction), City of Los Angeles, California (with M. Strauss). Prepared for Los Angeles Unified School District. EDAW, Inc. (2008).

Archaeological Resources Assessment and Evaluation of “Maintenance of Way” Building for the Asphalt Plant No. 1 Street Services Truck Route Project, City of Los Angeles, California (with M. Strauss and A. Tomes). Prepared for City of Los Angeles, Bureau of Engineering. EDAW, Inc. (2008)

Cultural Resources Assessment for the Proposed Formosa Specific Plan at Santa Monica Boulevard, West Hollywood, CA (with A. Tomes and M. Strauss). Prepared for City of West Hollywood Community Development Department. EDAW, Inc. (2007).

Final Archaeological Monitoring Report, Home Depot Center, City of Lake Elsinore, CA (with M. Strauss). Prepared for Twining Laboratories, Inc. EDAW, Inc. (2006).

PUBLIC OUTREACH AND EDUCATION

2007 to present. Society for California Archaeology liaison to the Society for American Archaeology. Ongoing duties include attending SAA meetings and preparing written reports for SCA newsletter, as well as writing articles for the Council of Affiliated Societies semi-annual newsletter.

2006. Guest lecturer at Santa Monica College. Gave a talk and led discussion on “The Archaeology of Religion” using the Gabrielino belief system as an example.

2004. Co-led and directed teams of volunteers surveying, mapping, and recording sites at Bierman Caves, China Lake Naval Air Weapons Station, CA.

APPENDIX B

Site Records

State of California — The Resources Agency
DEPARTMENT OF PARKS AND RECREATION
PRIMARY RECORD

Primary #
HRI #
Trinomial
NRHP Status Code

Other Listings
Review Code | Reviewer | Date

 ***Resource Name or #:** Echo Park

P1. Other Identifier: Echo Park Lake

***P2. Location:** ■ **Not for Publication** ☐ **Unrestricted** ***a. County:** Los Angeles

and (P2b and P2c or P2d. Attach a Location Map as necessary.)

***b. USGS 7.5' Quad:** Hollywood **Date:** 1966 (photorevised 1981) **T** 1S; **R** 13W; unsectioned**; S.B.B.M.**

c. Address: 751 Echo Park Ave. City: Los Angeles Zip: 90012

d. UTM: WGS 84 Zone: 11; NW corner 383626mE/3771299mN; NE corner 383844mE/3771166mN;
SW corner 383623mE/3770622mN; SE corner 383763mE/3770569mN (G.P.S.)

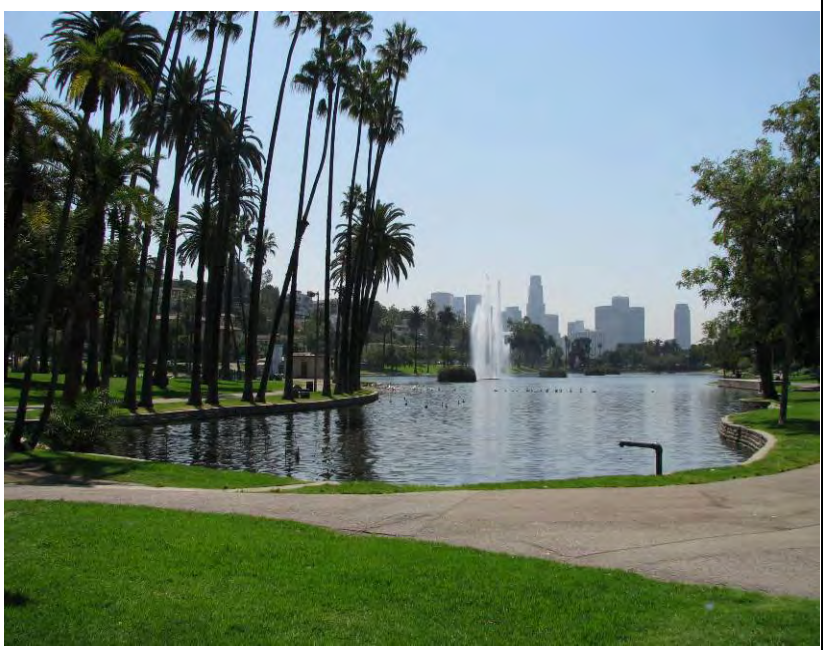
e. Other Locational Data: (e.g., parcel #, directions to resource, elevation, etc., as appropriate)
Unnumbered Lot on block 4 of the south part of the Montana tract in the city of Los Angeles, California, per Map No. 136-5A209;138A209 on file in the office of the city recorder of Los Angeles County. Echo Park is bounded on the south by Temple Street, on the north by Park Ave., on the east by Echo Park Ave., and on the west by Glendale Blvd.

***P3a. Description:** (Describe resource and its major elements. Include design, materials, condition, alterations, size, setting, and boundaries)
Echo Park Lake was constructed in 1892 and exhibits Spanish Colonial Revival style architecture and English style landscaping. Echo Park, which surrounds the lake, is bordered to the north by Park Avenue, to the south by Temple Street, to the east by Echo Park Avenue, and to the west by Glendale Blvd. Contributing elements include the Park Office Building, Boathouse, Park Recreation Structure, bridge to the island, boat docks, stormwater inlet in northeast lobe, some pathways, concrete steps along Glendale Blvd., historic trees, lotus beds, some ornamental plantings, the lake itself, the "Lady of the Lake" sculpture, and spatial organization and topography of the park. Non-contributing elements include the restroom buildings, the concrete block structure near the boathouse, the pump house, the circular play area and sandbox, masonry retaining walls, floating wetlands, the fountain, and various other features related to circulation, vegetation, and several small-scale features (see D3 of District Record for a complete description). Echo Park was designated Los Angeles Historic-Cultural Monument (HCM) No. 836 on March 1, 2006. The park was recommended for Monument status because "it embodies the distinguishing characteristics of an architectural and landscape type specimen, inherently valuable for a study of a period style or method of construction." (Cultural Heritage Commission 2005).

***P3b. Resource Attributes:** (List attributes and codes) HP21. Dam; HP22. Lake/river/reservoir; HP29. Landscape architecture; HP31. Urban open space; HP19. Bridge; HP9. Public Utility Building; HP13. Community Center/Social Hall; HP4. Ancillary Building; HP11. Engineering Structure

***P4. Resources Present:** ☐Building ☐Structure ☐Object ☐Site ■District ☐Element of District ☐Other (Isolates, etc.)

P5a. Photo or Drawing (Photo required for buildings, structures, and objects.)



P5b. Description of Photo: (View, date, accession #)
Echo Park Lake, view to the east. Taken 8/08.

***P6. Date Constructed/Age and Sources:**
■Historic ☐Prehistoric ☐Both

***P7. Owner and Address:**
City of Los Angeles Department of Recreation and Parks
1200 West 7th Street Suite 700
Los Angeles, CA 90017

***P8. Recorded by:** (Name, affiliation, and address)
M. Strauss, C. Ehringer, and R. Evans-Lloyd
EDAW Inc.
515 S. Flower Street, 9th Floor, Los Angeles, CA 90071
410 E. Water Street, #600, Charlottesville, VA 22902

***P9. Date Recorded:** July 31 and August 25, 2008

***P10. Survey Type:** (Describe)
Reconnaissance

***P11. Report Citation:** (Cite survey report and other sources, or enter "none.") McGinnis, Rob et al. Cultural Resources Phase I And Cultural Landscape Treatment Plan For The Proposed Echo Park Rehabilitation Project, City of Los Angeles, California. On file at EDAW, Inc.

***Attachments:** ☐NONE ■Location Map ■Sketch Map ■Continuation Sheet ☐Building, Structure, and Object Record ☐Archaeological Record ■District Record ☐Linear Feature Record ☐Milling Station Record ☐Rock Art Record ☐Artifact Record ☐Photograph Record ☐ Other (List):

Primary #
HRI #

DISTRICT RECORD

Trinomial

***NRHP Status Code:**

***Resource Name or #** (Assigned by recorder)**:** Echo Park

D1. Historic Name: Reservoir No. 4/ Echo Park Lake D2. Common Name: Same

***D3. Detailed Description** (Discuss overall coherence of the district, its setting, visual characteristics, and minor features. List all elements of district.): Echo Park is a 29-acre park consisting of a 13-acre urban lake surrounded by 16 acres of recreational park space. Echo Park is located at 751 Echo Park Avenue in the Echo Park/Silverlake community of Los Angeles. The lake is part of an existing storm drain system that provides hydraulic relief during storm events in the form of flood control before discharging to the Los Angeles River. Two city storm drains, housed in a large concrete structure, empty into the lake at the northeastern end, and the lake outlet is located at the southern end. On the west side of the lake, Los Angeles County maintains a flood control outfall, which is designed to flow into the lake during high flows and is diverted during low flows.

In 1867, the City of Los Angeles sold the rights to distribute city water to the Los Angeles City Water Company. Around the same time, the City contracted the Los Angeles Canal & Reservoir Company to construct a new canal and water storage system in the western part of the City. In return for doing so, the City conveyed a third of the City's original land grant to the company. The Los Angeles Canal & Reservoir Company completed the new canal system in 1870, diverting water from the Los Angeles River (at a point near present-day Griffith Park) and conveying it through an irrigation ditch in what was then known as the Arroyo de Los Reyes (present-day Echo Park Avenue) and into a new reservoir. The new reservoir (called Reservoir No. 4) was created by erecting a 20-foot dam. The dam was placed across the Arroyo de Los Reyes and a large basin at the location of present-day Bellevue Avenue. The dam is still located at the south end of Echo Park Lake in the vicinity of present-day Bellevue Avenue. Reservoir No. 4 was supplied with water from the diversion of the Los Angeles River and a spring-fed stream originating at Baxter Avenue (approximately one mile north-northeast of Echo Park Lake). The stream flowed down the Arroyo de Los Reyes (present-day Echo Park Avenue) (Historic Resources Group 2005a).

The population boom of the mid-1880s resulted in the development of new residential subdivisions in outlying areas to the west and northwest of downtown Los Angeles, including the area of Echo Park. Responding to criticism that Los Angeles did not have enough public parks for its increasing citizenry, in 1891 the City regained control of the 33 acre tract in northwest Los Angeles which was to become Echo Park. Echo Park, the city's seventh public park, was formally established one year later in 1892 (Historic Resources Group 2005a).

Once Echo Park was established, Joseph Henry Tomlinson, a landscape architect and Superintendent of the Department of Parks from 1889 to 1909, began the design, layout, and landscaping of the park. Tomlinson, a native of Derbyshire, England, created a park in the picturesque English style. Aspects of the English style which were evident in Echo Park's design are "use of the long lake and middle-distance plantings to create appealing vistas and the illusion of great distance, and open lawns defined by groves of trees with some set apart to emphasize their features, undulations in ground form, and winding, peripheral paths and drives to create interesting natural settings" (Historic Resources Group 2005a). (see continuation sheet for more information)

***D4. Boundary Description** (Describe limits of district and attach map showing boundary and district elements.):
The park is bordered to the north by Park Avenue, to the south by Temple Street, to the east by Echo Park Avenue, and to the west by Glendale Blvd. (see attached location map)

***D5. Boundary Justification:**
The boundary of the district is the boundary of the existing Echo Park.

***D6. Significance: Theme:** **Area:**
Period of Significance: **Applicable Criteria:** (Discuss district's importance in terms of its historical context as defined by theme, period of significance, and geographic scope. Also address the integrity of the district as a whole.)

(see continuation sheet)

***D7. References** (Give full citations including the names and addresses of any informants, where possible.):

(see continuation sheet)

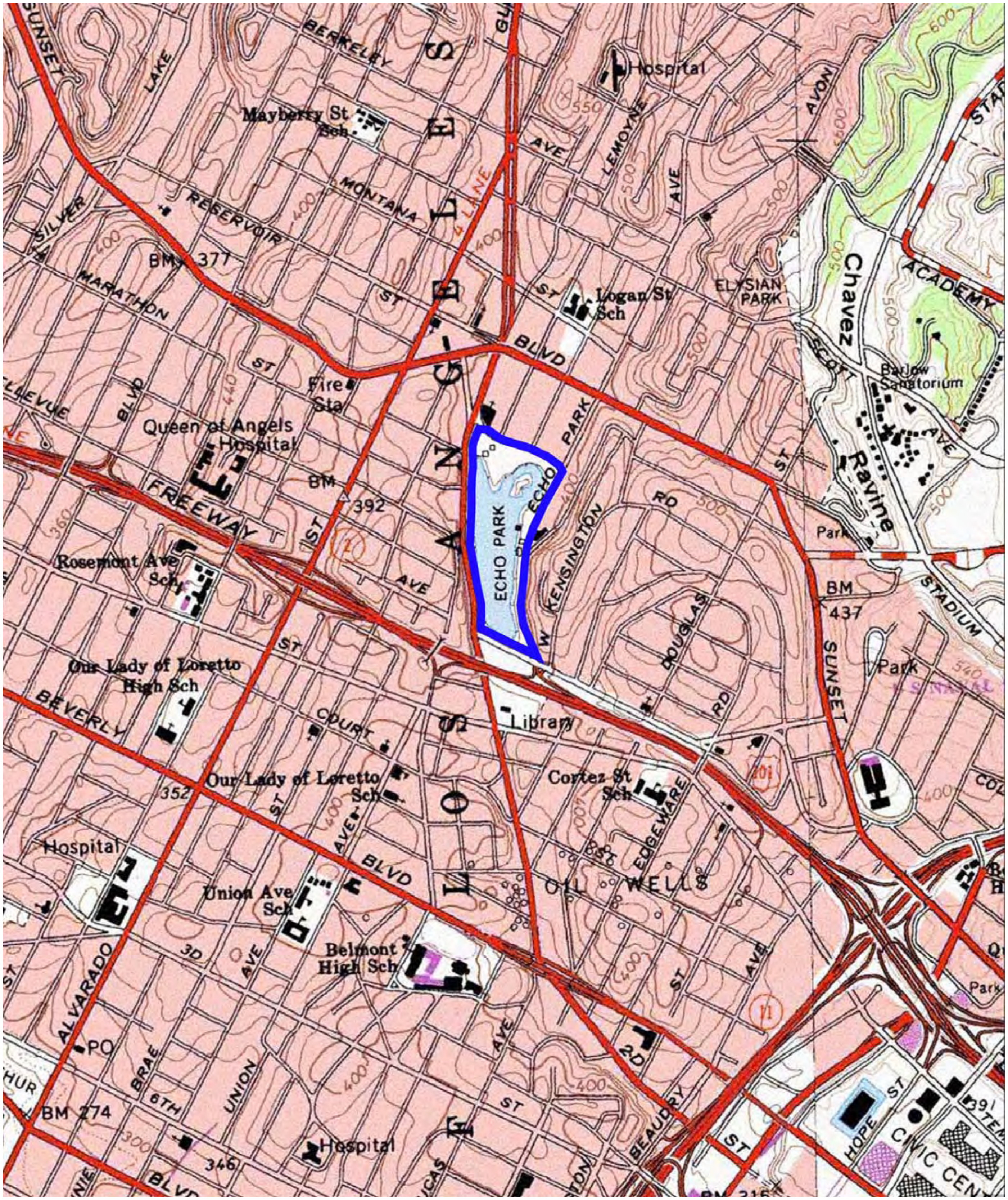
***D8. Evaluator:** Rob McGinnis and Rachel Evans-Lloyd **Date:** 10/07/08
Affiliation and Address: EDAW 410 East Water Street, Suite 600, Charlottesville, Virginia 22902

State of California — The Resources Agency
DEPARTMENT OF PARKS AND RECREATION
LOCATION MAP

Primary #
HRI#
Trinomial

***Resource Name or #:** Echo Park

***Map Name:** Hollywood 7.5”
***Scale:** 1:24,000
***Date of Map:** 1991



State of California — The Resources Agency **DEPARTMENT OF PARKS AND RECREATION**	**Primary #** **HRI#**
SKETCH MAP	**Trinomial**

Page 4 of 30 ***Resource Name or #** Echo Park
***Drawn By:** T. Harris ***Date:** 11/5/2008

***D3. Detailed Description** (continued)
Joseph Tomlinson and other Los Angeles landscape designers working during the turn-of-the-century were greatly inspired by the natural environment. Rustic benches, bridges and gazebos were constructed of natural materials with little modification, "so that people could keep in touch with the country" (Emler 1999). Plantings were selected for suitability to the Southern Californian climate and included acacia and eucalyptus. Some exotics, such as weeping willows, roses, hydrangea and spirea required special care (Laurie 1979).

Andrew Jackson Downing, a renowned American landscape designer, appears to have influenced Tomlinson (Emler 1999). Downing advocated creating lakes with "irregular outline[s]." Artificial islands would appear "most natural when sufficiently near the shore, on either side, to maintain in appearance some connexion with it." These islands could be made suitable to attracting waterfowl. The banks of the lake should contain "rocks of various size, forms, and colors, often projecting out of or holding up the bank in various places." Plantings should vary in height, and include various types of trees and shrubs. Native vegetation should be removed and replaced with exotic or rare varieties which "convey the idea of refined and elegant art" (Downing 1865 [1991]).

The park reputedly got its name when Tomlinson noticed an echo as he shouted across the arroyo. Work on the park began in 1892 when the reservoir was shut down. The stream at present-day Baxter Avenue was capped and a sixteen acre lake formed in the reservoir basin. Eucalyptus trees were planted on top of the dam. Willow trees, shrubs and blooming annuals were placed around the perimeter of the lake (Historic Resources Group 2005a). In 1893, 5,000 cubic yards of soil were excavated from the lake bottom to build an island in the northeast corner of the lake. About 275 loads of rock from Elysian Park were used to riprap the perimeter of the island (LAT 1893).

Contributing features:
Buildings
- Park Office Building (pre-1916) on peninsula near Park Avenue.
- Boathouse (1932) on east edge of lake.
- Park Recreation Structure (1925) south of Bellevue Avenue.

Structures
- Bridge to island with bridge abutments (c. 1930-1950).
- Boat Docks at Boathouse.
- Stormwater inlet structure at north east lobe of park.

Circulation
- Path sections on peninsula.
- Concrete steps from street-level pathway to park-level pathway (1920s-early 1930s).
- Pathway surrounding lake.
- Park entrance north of island.

Vegetation
- Historic Trees-pending evaluation by certified arborist, historic trees probably include many palm trees on the island, along the paths on the peninsula, north of the boathouse along the lake, some along Echo Park Avenue.
- Lotus beds.
- Possible historic ornamental plantings.

Water Features
- Lake (1892).

Small-scale Features
- *Reina de la Los Angeles* or "Lady of the Lake" sculpture (1935) moved to current location in 1999.

Spatial Organization
- Open lawns defined by groves of trees.
- Designed views from park into surrounding residential development, the nearby urban landscape and within the park and lake landscape.
- Island landscape.
- Peninsula landscape.

Topography
- Undulating groundplane at the north section of the park.
- Sections of exposed riprap that may survive from 1890s.
- Embankment on park edges near Glendale Boulevard and Echo Park Avenue.
- Island, surviving from 1895.

***D3. Detailed Description** (continued)

Non-contributing features:

Buildings

- Restroom near Park Office Building.
- Restroom near Boathouse.
- Concrete block structure near Boathouse.
- Pump house.

Structures

- Circular play area with sandbox.
- Masonry retaining walls with 3 built-in benches.
- Constructed floating wetlands (4).
- Storm water infrastructure inlet.
- Retaining wall/lake edge.
- Retaining walls near boathouse restroom.

Circulation

- Park entrances.
- Sidewalks surrounding park (at street level).
- Parking area at Park Office.
- Pathways on peninsula.
- Ramps near boathouse restrooms.

Vegetation

- Planting beds along southern side of lake.
- Shrubs along Glendale Boulevard.
- Ornamental planting beds.
- Planting beds at the base of the sculptures.
- Lakeside plantings.

Water Features

- Fountain.

Small-scale Features

- Lights.
- Benches (many types).
- Jose Marti Monument.
- Picnic tables and benches.
- Playground equipment.
- Trash receptacles.
- Fence.
- Dumpsters.

***Resource Name or #** Echo Park

***D3. Detailed Description** (continued)

Historic Buildings

Three historic buildings remain in the Echo Park landscape: the Park Maintenance Building (pre-1916) on peninsula near Park Avenue, the Boathouse (1932) on the east edge of the lake, and the Park Recreation Structure (1925) south of Bellevue Avenue.

Park Maintenance Building (pre-1916)

The Boathouse (1932)

The Park Recreation Structure (1925)

These buildings all remain from the period of significance, and the Boathouse and Park Recreation Structure reflect the significance of the Spanish Colonial Revival architecture theme through characteristics such as their stucco or brick cladding and tiled roofs. These buildings include small additions, such as a new accessibility ramp at the Park Recreation Structure, and the Boathouse has minor new additions of fencing/railing on its roof. The Park Office Building, a small, ivy-covered, brick maintenance building with a small shed addition, appears to have a new set of concrete steps on its west side. Missing historic buildings include the original Victorian boat house and earlier restroom buildings.

***Resource Name or #** Echo Park

***D3. Detailed Description** (continued)

Additional Buildings

Several buildings have been constructed in the park since the period of significance. These include; the restroom near the Park Office Building, the restroom near the Boathouse, a concrete block utility shed near the Boathouse, and a stuccoed pump house These buildings mimic many of the Spanish Colonial Revival design characteristics of the historic buildings, including the neutral colors, tiled roofs, and stucco/concrete or brick cladding.

Restroom near Park Office Building

Restroom near Boathouse

Concrete Block Utility Shed near Boathouse

Pump House

***D3. Detailed Description** (continued)

Historic Structures

The historic structures in the park are the bridge to the island in the lake and perhaps some sections of the lake edge wall. It is the second bridge in that location in the park's history (c. 1930–1950), and replaced the original rustic-style bridge. The bridge's abutments on both the island and the peninsula side appear to include the original riprap that was used to create the island and shore up the peninsula edges. The boat docks at the Boathouse may survive from the historic period as well. One stormwater inlet also appears to survive from the historic period. Missing structures include two historic bridges: one that occupied the location of the existing bridge, and one in the northwestern lobe of the lake crossing the lotus bed area.

Bridge to Island with Bridge Abutments (c. 1930–1950)

Boat Docks at Boathouse

Stormwater Inlet Structure

***D3. Detailed Description** (continued)

Additional Structures
Many additional structures have been added to the park since the 1940s. These include recreational structures such as the new circular play area on the peninsula, masonry retaining walls with built-in benches, four constructed floating wetlands, a storm water infrastructure inlet, sections of retaining wall/lake edge, the retaining walls near the Boathouse restroom.

Circular Play Area with Sandbox

Masonry Retaining Walls with Three Built-in Benches

Constructed Floating Wetlands (4)

Storm Water Infrastructure Inlet

Retaining Wall/Lake Edge

Retaining Walls Near Boathouse Restroom

 ***Resource Name or #** Echo Park

***D3. Detailed Description** (continued)

Historic Circulation

Surviving historic circulation systems include the approximate alignments of the pathways that encircle the lake and provide access to the peninsula. These paths remain in their approximate locations from the 1910s. The historic materials of the path system may have included crushed stone, sand, soil, and later, asphalt and concrete. In addition, two the concrete stairways installed along the sidewalk at Glendale Boulevard also survive from the historic period (one additional original stairway appears to have been reconstructed in place). Missing historic circulation systems include pathways around the island, and pathways in other locations such as the missing historic Boathouse.

Path Sections on Peninsula

Pathway Surrounding Lake

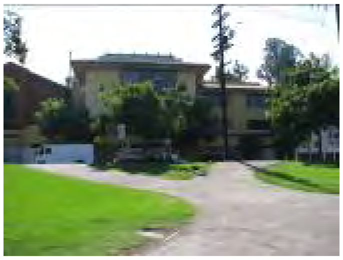
Park Entrance North of Island

Concrete Steps from Street-level Pathway to Park-level Pathway (1920s-early 1930s)

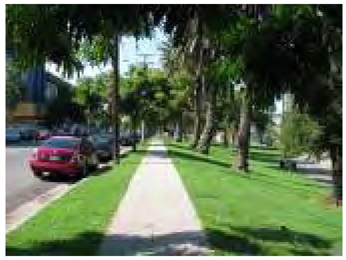
***D3. Detailed Description** (continued)

Additional Circulation

There have been changes and additions to the circulation system at the park since the period of significance including the addition of the parking and maintenance area at the office building; new park entrance locations (such as the entrances near the Boathouse, at the corner of Echo Park and Bellevue Avenues, and near the north end of the park at Glendale Boulevard); street-level sidewalks at Echo Park Avenue and Glendale Boulevard; and some sections of pathways on the peninsula.



Park Entrances



Sidewalks Surrounding Park (at Street Level)

Sidewalks Surrounding Park (at Street Level)

Parking Area at Park Office

Pathways on Peninsula

Ramps near Boathouse Restrooms

D3. Detailed Description (continued)

Historic Vegetation

Some trees at Echo Park survive from the earliest construction, such as the palm trees along the lake north of the Boathouse, palm trees lining paths on the peninsula, and other scattered trees on the island and along the lake and street edges. The lotus beds, the exact origins of which are unknown, have been growing at Echo Park Lake since the 1920s. The lotus plants are also the focus of the Lotus Festival, which has been taking place at the park since the 1970s. The lotus plants do not appear to be surviving in 2008. There are some plantings, such as a small grove of bamboo near the south east end of the park, and pampas grass on the island which may be remnants of historic plantings. Much of the historic vegetation, however—whether trees, shrubs, or perennials—is missing.

Trees

Lotus Beds

Bamboo Planting

***Resource Name or #** Echo Park

***D3. Detailed Description** (continued)

Additional Vegetation

Though substantial numbers of trees and shrubs have been cleared from the park—or died and have not been replaced—many new plantings have been added. These new plantings include ornamental, hardy shrubs such as lantana and plumbago in sloped or terraced areas such as along the retaining walls on the park's south side, or along the embankment at Glendale Boulevard. Other ornamental plantings include small planting beds at park entrances and at the two sculptures.

Planting Beds Along Southern Side of Lake

Shrubs along Glendale Boulevard

Ornamental Planting Beds

Planting Beds at the Base of the Sculptures

Lakeside Plantings

***D3. Detailed Description** (continued)

Historic Water Features

The most important feature of the park is the lake, which survives from the late 1870s when it was still a reservoir. The reservoir was modified during the site's creation as a park, though the lake continues to serve as a retarding basin for the city's storm water system. The precise configuration of the lake edge has changed, although the lake's outline remains much as it did over the last century. One section of the lake—its northwestern lobe—was partially filled in, and no longer remains as a water feature. Another historic water feature that is now missing is a small fountain formerly located south of the concrete block utility shed along the east side of the park.

Lake (1892)

Additional Water Features

The large fountain in the northern half of the lake is a new addition, possibly added during the Los Angeles Olympics in the early 1980s.

Fountain

Historic Small-scale Features

The Lady of the Lake, sculpted by Ada May Sharpless, was installed at Echo Park in 1935 at the tip of the peninsula. After being vandalized, the sculpture was removed and stored for many years before it was reinstalled in a different location on the east side of the lake. Missing small-scale historic features include park lights, benches, fencing and bollards, and a flagpole.

Reina de la Los Angeles or "Lady of the Lake" Sculpture (1935) Moved To Current Location in 1999

***Resource Name or #** Echo Park

***D3. Detailed Description** (continued)

Additional Small-scale Features

Many new small-scale features have been added to the park since its period of significance. These include many types of benches, trash receptacles, lights, fencing, playground equipment, and others. Some of these features, such as benches or lights, are replacements of older ones. Many, though, such as the new sculpture and new playground equipment are new additions.

Lights

Benches (Many Types)

Benches

Jose Marti Monument

Picnic Tables and Benches

Playground Equipment

Trash Receptacles

Dumpsters

***D3. Detailed Description** (continued)

Spatial Organization

The Picturesque design principles that guided the park's historic configuration are evident today, though less than they were in the first half of the 1900s. The spatial organization was defined primarily by the creation of views and vistas along the lake, and between the park and the surrounding neighborhood. Other designed spaces included open lawn areas surrounded by groves of trees. These lawn areas were located at the widest spaces between the lake and street, and also on the peninsula and on the island. The island and peninsula landscapes have a distinct spatial organization that is defined by water on all (or most) sides, and by groves of trees.

Open Lawns Defined by Groves of Trees

Designed Views from Park into Surrounding Residential Development, the Nearby Urban Landscape and Within the Park and Lake Landscape

Designed Views from Park into Surrounding Residential Development, the Nearby Urban Landscape and Within the Park and Lake Landscape

Island Landscape

Peninsula Landscape

***D3. Detailed Description** (continued)

Topography

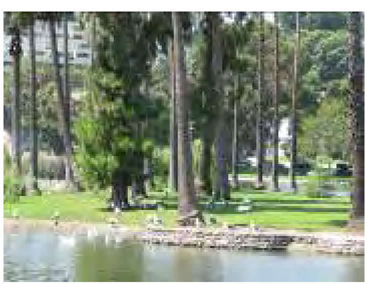
The topography at Echo Park appears to have remained remarkably intact to at least the 1910s; the original bowl-shaped lake bed, the embankments to the streets above, and the undulating groundplane at the northern end of the park still exist today. The constructed island, created from dredged soil and stones brought from Elysian Park, has had small sections of land added on its northern side. The original constructed lake edge, with its rip-rap walls, may also survive in some places. The northwestern lobe of the lake, north of the lotus bed, has been filled in to reduce the lake footprint. Additionally, some modification to the lakes southern edge may also have occurred.

Undulating Groundplane at the North Section of the Park

Sections of Exposed Riprap that May Survive from the 1890s

Embankment on Park Edges Near Glendale Boulevard and Echo Park Avenue

Embankment on Park Edges near Glendale Boulevard and Echo Park Avenue



Island, Surviving from 1895

***D6. Significance:**

Significance Criteria

National Register of Historic Places

The criteria for evaluation of cultural resources for inclusion in the National Register as historic properties are set forth in 36 CFR 60.4. The quality of significance in American history, architecture, archaeology, engineering, and culture is present in districts, sites, buildings, structures, and objects that possess integrity of location, design, setting, materials, workmanship, feeling, and association and

A. that are associated with events that have made a significant contribution to the broad patterns of our history; or

B. that are associated with the lives of persons significant in our past; or

C. that embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or

D. that have yielded, or may be likely to yield, information important in prehistory or history.

A resource meeting one or more of the National Register criteria must also retain the essential physical features that enable it to convey its historic identity. The quality of significance is present in districts, sites, buildings, structures, and objects that possess integrity of location, design, setting, materials, workmanship, feeling and association. To retain historic integrity a property will always possess several, and usually most, of the aspects.

California Register of Historical Resources

The California Register of Historical Resources (California Register) was created to identify resources deemed worthy of preservation on a state level and was modeled closely after the National Register. The criteria are nearly identical to those of the National Register but focus on resources of statewide, rather than national, significance. The California Register consists of properties that are listed automatically as well as those that must be nominated through an application and public hearing process.

The criteria for eligibility of listing in the California Register are based upon National Register criteria, but are identified as 1–4 instead of A-D. To be eligible for listing in the California Register, a property must be at least 50 years of age and possess significance at the local, state, or national level, under one or more of the following four criteria:

1. It is associated with events that have made a significant contribution to the broad patterns of local or regional history, or the cultural heritage of California or the United States; or
2. It is associated with the lives of persons important to local, California, or national history; or
3. It embodies the distinctive characteristics of a type, period, or method of construction or represents the work of a master, or possesses high artistic values; or
4. It has yielded, or has the potential to yield, information important in the prehistory or history of the local area, California, or the nation.

Historic resources eligible for listing in the California Register may include buildings, sites, structures, objects, and historic districts. A resource less than 50 years of age may be eligible if it can be demonstrated that sufficient time has passed to understand its historic importance. While the enabling legislation for the California Register is less rigorous with regard to the issue of integrity, there is the expectation that properties reflect their appearance during their period of significance.

Echo Park Eligibility Evaluation

As part of a previous evaluation of Echo Park as a Los Angeles Historic-Cultural Monument, Echo Park has design significance (Criterion C of the National Register), for its English-style park landscape and for the Spanish Colonial Revival Architectural Style of the buildings. The previous evaluation also concluded that Echo Park has historical significance (Criterion A of the National Register) as "one of Los Angeles' earliest parks and is the location of the city's second established, and oldest remaining, municipal playground. The history of Echo Park's creation and development represents significant trends in the provision of municipally funded parks and recreation facilities in Los Angeles during the early twentieth century. It is also significant as a remnant of Los Angeles' early water system and the trends and policies that shaped the city's distribution and use of public lands in the late nineteenth century" (Cultural Heritage Commission 2005; Historic Resources Group 2005a, 2005b).

Cultural Landscape Significance Evaluation

This significance statement was guided by current methodology and standards established by the NPS and landscape preservation professionals. *A Guide to Cultural Landscape Reports: Contents, Process, and Techniques* maintains that "defining the significance of a landscape involves relating findings from the site history and existing conditions to the historic context associated with the landscape" (Page et. al. 1998). As part of this process, individual landscape characteristics and features are identified with a particular historic context.

***D6. Significance:** (continued)

Theme: Themes significant in the history of Echo Park are correlated with relevant National Register and California Register Criteria below.

Themes associated with *Criterion A or 1: Events that have made a significant contribution to the broad patterns of our history* include:

- Development of Los Angeles' early water supply systems, by both public and private entities (c. 1860–1900)
- Development of Los Angeles municipal parks as part of a larger national City Beautiful Movement (c. 1850–1910)
- Development of Los Angeles recreational facilities as part of the Progressive-era Parks and Playgrounds Movement (c. 1890–1910)

Based upon the available research, it is recommended that the following additional areas of *local* cultural landscape significance be considered:

Echo Park was a "gateway" for immigrants into Los Angeles that resulted in its multi-cultural history. Echo Park continues to support the cultural activities of the neighborhood through the Lotus Festival, for example.

- Echo Park neighborhood functioned for a time as a community characterized by its leftist politics; it was referred to as "Red Gulch," and Echo Park playground was the home to one of its cooperative schools.

Themes associated with *Criterion B or 2: Associated with the lives of persons significant in our past* may include:

- Ada May Sharpless, a prolific artist in the Los Angeles area during the New Deal era (c. 1930s); *likely local significance only*.

Themes associated with *Criterion C or 3: Distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction* include:

- Picturesque-style municipal park design in the United States (c. 1840–1910)
- Spanish Colonial Revival architecture in California (c. 1910–1940)

There are no known themes associated with *Criterion D or 4: have yielded, or may be likely to yield information important in prehistory or history.*

The following statement of significance for Echo Park is organized around these themes.

Echo Park Statement of Significance

The Echo Park landscape is connected with significant historic events (Criterion A or 1) and design styles (Criterion C or 3). It is also connected with locally significant people (likely Criterion 2 only).

Significant historical events associated with the landscape include the development of Los Angeles' early water supply systems, by both public and private entities. These entities included the Los Angeles Canal and Reservoir Company which created the Reservoir No. 4—later to become Echo Park Lake—and the City of Los Angeles which retained overflow rights at the reservoir. Landscape features reflecting this association include the lake basin and the approximate location of the original dam, now largely obscured by Belleview Avenue.

After the reservoir property was transferred to the City, its design as a city park coincided with the development of Los Angeles' municipal parks system, inspired by the national City Beautiful Movement. Guided by a growing belief in the benefits of public parks for urban citizens, Los Angeles was increasing its public park land in the late 1880s and 1890s. Los Angeles was the first city in the United States to establish a Department of Parks, and Echo Park was one of its early creations. Landscape features associated with this significance theme include the lake, transformed from the former reservoir, some plantings, and the island. However, many landscape features are missing from this period, such as the first boathouse, the original arched bridge to the island, the bridge across the northwestern lobe of the lake, the driving lane, and many plantings, particularly understory plantings. The original outline of the lake has been manipulated over the years as well. The northwestern lobe of the lake has been shortened as well as possible modifications to the southern end of the lake.

Shortly after Echo Park was developed as a public park, the surrounding, growing neighborhood required additional public amenities, including a playground. The Echo Park playground is associated with the development of Los Angeles' recreational facilities as part of the Progressive-era Parks and Playgrounds Movement. The City of Los Angeles established a Department of Playgrounds and Recreation in 1904, and the Echo Park playground was its second established (and today, its oldest remaining) playground. The Echo Park playground occupied the land south of the former dam, and included several buildings and structures, a ball field, tennis and croquet courts, swing sets, and a wading pool. The original playground facilities were demolished for the construction of the Hollywood Freeway; however, new playground facilities were constructed south of the freeway.

***D6. Significance:** (continued)
The Echo Park landscape, and its buildings and structures, reflect the design principles of styles that include Picturesque and Spanish Colonial Revival. The landscape, as first created by Joseph Henry Tomlinson in 1892, originally displayed characteristics of Picturesque design such as the treatment of the lake as a park feature—its irregular outline, its peninsula and island—meandering paths, and plantings designed to frame views in the middle ground and distance. Rustic structures, such as a small bridge to the island, complemented the Picturesque style. That bridge was replaced with another sometime between the 1930 and 1950. Many of the earliest plantings at the park included eucalyptus and willows, and some may survive from that period. The lotus plants may also survive from the 1920s, although their exact origin is unknown. Existing landscape features that characterize this significance theme include some sections of the lake (those retaining the original outline), some plantings, sections of lawn, and topographic features such as the steeply sloping edges of the park at Glendale and Echo Park Avenues, and the gently sloping contours on the peninsula. However, many of the designed features such as the curving pathways and dense understory plants, are now gone.

Although the original structures in the park—the first boathouse and the park clubhouse—were designed in Victorian and "rough rustic style," the architectural style for the second phase of building was characterized by the Spanish Colonial Revival style. The Echo Park Recreation Center was designed by Allied Architect Association of Los Angeles in 1925, and was a brick clad building. The new Echo Park Boathouse, built in 1932 by the Department of Parks, also exhibited the Spanish Colonial Revival style and is one of the last surviving historic boathouse facilities in Los Angeles. The Spanish Colonial Revival style became popular in Los Angeles in the 1910s through 1940, especially after the 1915 Panama-California Exposition in San Diego and through the designs of California architect Bertram Grosvenor Goodhue (Historic Resources Group 2005a). Spanish Colonial Revival style is characterized by the use of stucco walls, tile roofs, and terra cotta ornamentation.

The park's "Lady of the Lake" sculpture may also provide local significance for its association with artist Ada May Sharpless. Originally entitled *Nuestra Reina de Los Angeles*, the sculpture was commissioned in 1934 by the Public Works of Art Project and was installed at Echo Park in 1935. It was one of two that Sharpless was commissioned to create by the Public Works of Art Project in 1934–35. Sharpless grew up in California and returned to the state in 1929 after studies in France. She exhibited extensively throughout the area, and was involved with arts organizations such as the California Art Club and the Los Angeles Art Association (Historic Resources Group 2005a). The sculpture has been restored and re-installed, though in a different location from its original site.

Period of Significance
The period of significance for Echo Park spans the years between 1870 (when the dam was completed for Reservoir No. 4) and 1943, when construction on the Hollywood Freeway began. Freeway construction resulted in the removal of many houses along the park's edge, and the removal of the historic playground (later replaced in the left-over space). Streetcar access to the park also disintegrated, and many of the historic houses adjacent to the park were razed. Crime and neglect later plagued the park, and resulted in renovations to some aspects of the park's design such as its vibrant understory of plantings.

Integrity Assessment
The assessment of a landscape's historic integrity is based on the presence and condition of historic physical features and systems remaining from the site's period of significance. The National Register lists seven qualities of integrity including: location, design, setting, materials, workmanship, feeling, and association.

Based on the significance evaluation, the Echo Park landscape maintains:

- A high degree of integrity of location.
- A moderate degree of integrity of design. Though many elements—particularly the lake, many buildings, some vegetation, open areas, some views, and approximate pathway alignments in some locations—remain from the period of significance, other important elements such as historic vegetation, have been lost. The addition of the Hollywood Freeway has substantially altered the southern end of the park south of the original dam.
- A moderate degree of integrity of setting. The surrounding neighborhood is largely intact and resembles its character during the period of significance. However, the addition of the Hollywood Freeway created a substantial change in the setting of the southern end of the park.
- A moderate to low degree of integrity of materials. Many sections of pathways, stairs, lake edging, vegetation, and small-scale features have been replaced over the years.
- A moderate to low degree of integrity of workmanship, as most of the evidence of the original construction work on the park has been lost.
- A high degree of integrity of feeling. The park's use as a place where people come to enjoy the lake, stroll around its perimeter, fish, and boat is entirely consistent with its original design. The lake, as the dominant feature of the park, creates a serene quality in the bustling neighborhood. Though the park is not as removed visually from the surrounding neighborhood as it once was due to the loss of many trees and shrubs, its topographic drop-off creates a sense of removal from the streets and buildings that surround it.
- A moderate degree of integrity of association. The lake continues its original use as a storm water retention basin, and the park continues its use as a recreational area for its neighborhood.

***D6. Significance:** (continued)

Comparative Analysis of Historic and Existing Conditions

The following comparison photographs demonstrate the similarities and differences between the historic and existing conditions in the landscape. The existing conditions photographs are, in some cases, only approximate replications of the historic photographs; many times, the historic photographs were taken from the island which is no longer accessible or from boats on the lake. The photographs shown below illustrate many of the landscape characteristics described in the historic survey, and depict the changes that have occurred at Echo Park. Many of the park's landscape characteristics have remained remarkably consistent, however. Many of the trees in the northern section of the park, the island, building such as the Boathouse, and the lake itself, remain much as they did during the period of significance.

Some island vegetation—ornamental grasses—and the palms that line the lake edge on its eastern side may remain from the period of significance. Though the palm trees in the existing conditions photograph appear to be the same trees shown in the historic photograph (1897), their growth has changed the spatial quality of the landscape.

Historic Photograph (1897)

Modern Photograph (2008)

***D6. Significance:** (continued)

These photographs show both of the bridges that have connected the island to the peninsula. The historic photograph (c. 1900) shows the original bridge, built in 1895, with its rustic character and arch. The bridge in the existing conditions photograph shows the second bridge, constructed sometime between 1930 and 1950.

Historic Photograph (c. 1900)

Modern Photograph (2008)

***D6. Significance:** (continued)

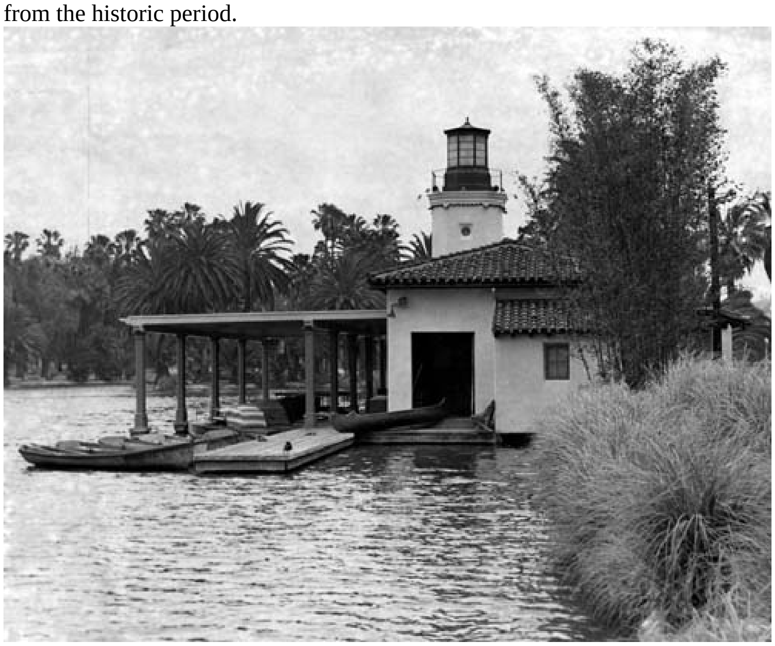
The Boathouse shown in these photographs has remained intact since the period of significance. Many of the trees in the historic photograph (1937) also remain, although some of the understory vegetation is now missing. The lake has also remained the same, with minor additions of the floating wetlands visible in the existing conditions photograph.

Historic Photograph (1937)

Modern Photograph (2008)

***D6. Significance:** (continued)

These photographs of the Boathouse demonstrate some minor changes to the Boathouse and its environs—the loss of windows and a door, and the loss of low vegetation such as the ornamental grasses that lined the lake edge. However, the palm trees in the background seem to remain from the historic period.



Historic Photograph

Modern Photograph (2008)

***D6. Significance:** (continued)

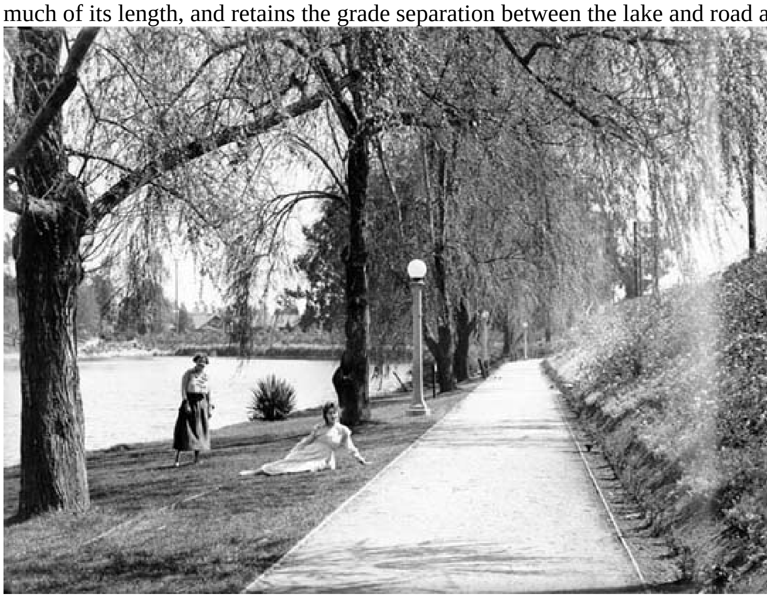
The tip of the peninsula has changed substantially since the period of significance. The Lady of the Lake, willows and ornamental plantings, the configuration of the original benches, and the alignment of the paths shown in the historic photograph (1937) are now missing from this location. However, with the removal of the pump house it would be possible to reverse the current condition to its historic appearance.

Historic Photograph (1937)

Modern Photograph (2008)

***D6. Significance:** (continued)

The pathway along Glendale Boulevard retains its long, straight character shown in the historic photograph (circa 1910s). It is tree-lined for much of its length, and retains the grade separation between the lake and road above.



Historic Photograph (1910s)

Modern Photograph (2008)

***D6. Significance:** (continued)

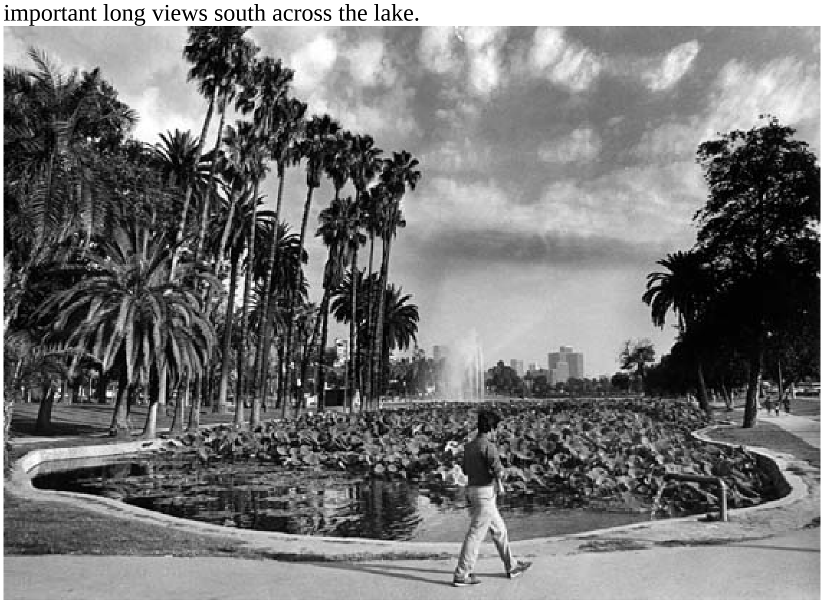
The historic photograph shown above was taken in 1965, when most of the understory vegetation had already been removed from the park or had died without being replaced. However, the grade change between the lake and the street above remain the same, as does the character of the setting of the park.

Historic Photograph (1965)

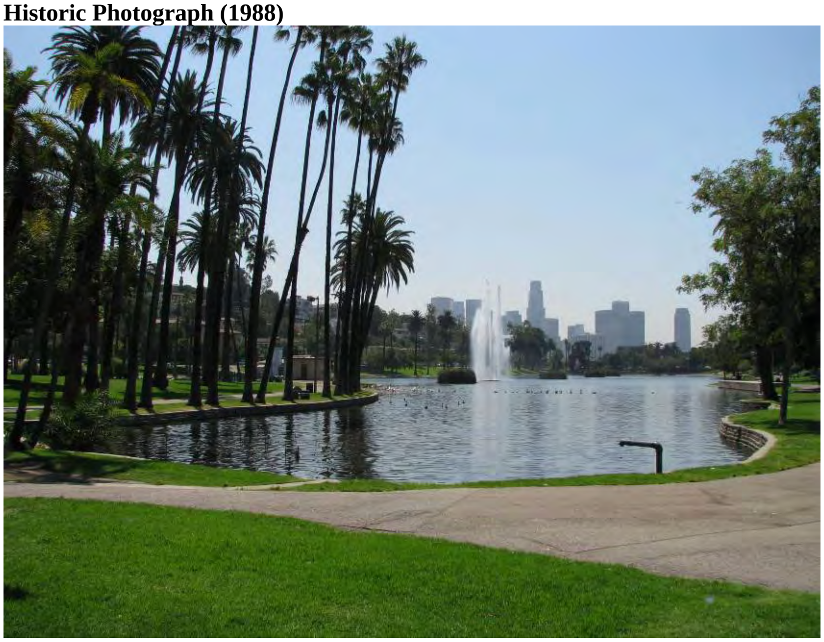
Modern Photograph (2008)

***D6. Significance:** (continued)

The lotus plants, in their full glory above (1988), have all but disappeared now. Other vegetation, such as the palms, remain to frame the important long views south across the lake.



Historic Photograph (1988)



Modern Photograph (2008)

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DRAFT ENVIRONMENTAL IMPACT REPORT
APPENDIX F

TRAFFIC STUDY

TRAFFIC STUDY FOR THE ECHO PARK LAKE REHABILITATION PROJECT

APRIL 2010

PREPARED FOR

AECOM

PREPARED BY

FEHR & PEERS
TRANSPORTATION CONSULTANTS

TRAFFIC STUDY

FOR THE

ECHO PARK LAKE REHABILITATION PROJECT

April 2010

Prepared for:

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1. INTRODUCTION

Fehr & Peers conducted a traffic impact analysis for the proposed Echo Park Lake Rehabilitation Project. This analysis assesses potentially adverse traffic impacts caused as a result of construction truck and worker trips to and from Echo Park Lake during construction of the proposed project.

PROJECT DESCRIPTION

The project site is located at 751 Echo Park Avenue in the Echo Park/Silver Lake community of the City of Los Angeles and is bound by Park Avenue on the north, Echo Park Avenue on the east, Bellevue Avenue on the south, and Glendale Boulevard on the west. The Hollywood Freeway (US 101) is located south of the project site. The project site includes a 24-acre portion of Echo Park Lake (Park), an open-space recreational facility. The lake occupies 13 acres and is surrounded by 11 acres of open recreational space. A two-acre portion of the Park is located on the south side of Bellevue Avenue and a five-acre portion of the Park is located further south on the south side of US 101. These seven acres are not part of the project site. Figure 1 shows the regional location and the project site location, respectively.

The City of Los Angeles is implementing a Clean Water Bond Program approved by voters in November 2004 as Proposition O (Prop O). Prop O authorized the City to issue a series of general obligation bonds for up to $500 million for projects to protect public health by cleaning up pollution in the City's watercourses, beaches, and ocean. The measure also funds improvements to protect water quality, provide flood protection, and increase water conservation, habitat protection, and open space.

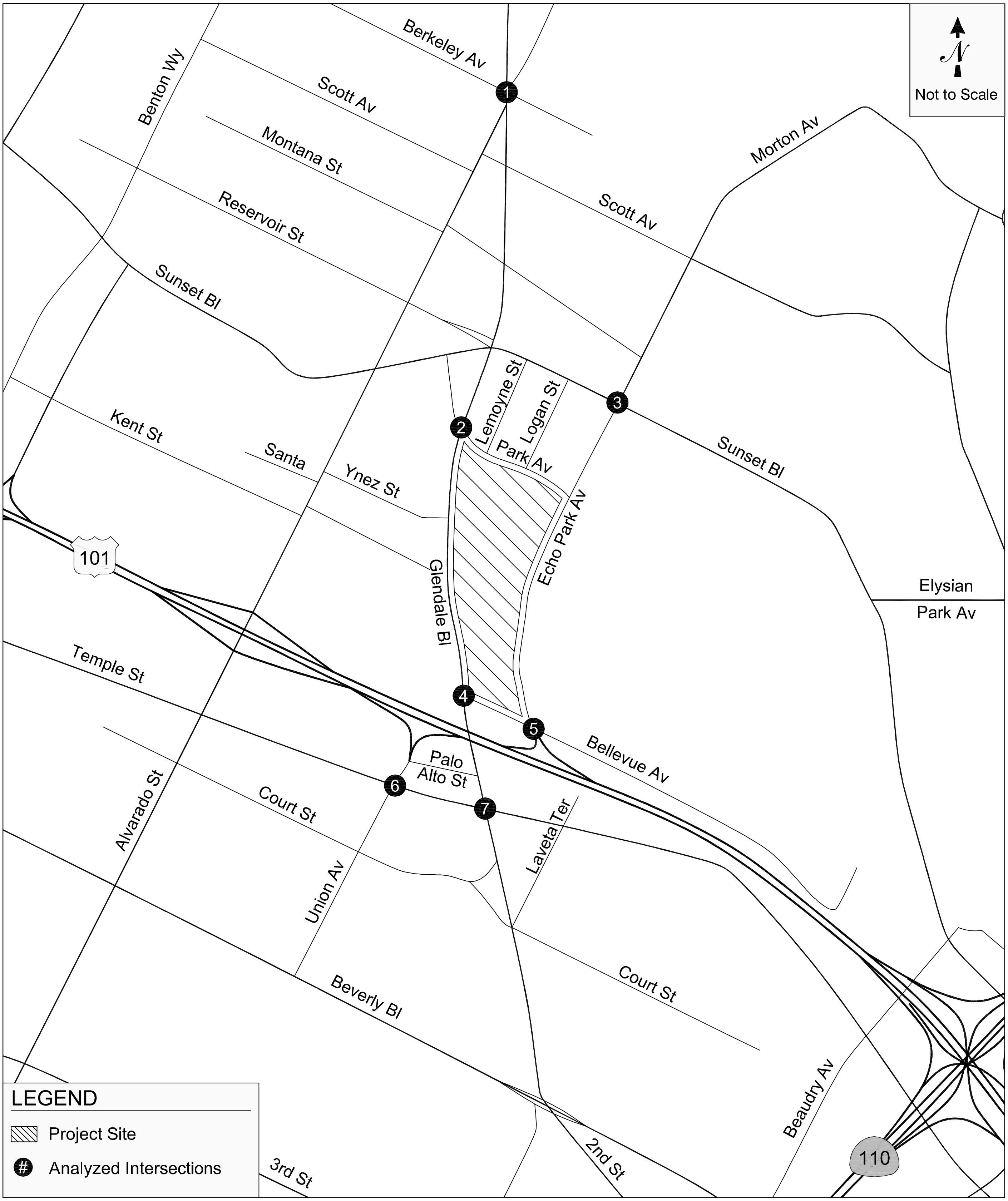
A component of the Prop O Program is the Echo Park Lake Rehabilitation Project (proposed project). A Pre-Design Report was prepared to identify and describe the proposed project, document the extensive investigations undertaken at the project site, discuss preliminary budget and schedule information, and present recommendations for proposed project implementation. The project description and analysis presented in this study is based on information presented in the Pre-Design Report and supplemental information provided by the project development team.

The main objectives of the proposed project are to:

- Improve the water quality in the lake and contribute to water quality improvement in the Los Angeles River Watershed
- Reduce the use of municipal water required to maintain the water level of the lake
- Comply with the Regional Water Quality Control Board's intent to restore the existing and potential beneficial water quality uses in the lake. The existing beneficial uses include non-contact water recreation (REC-2) and wildlife habitat (WILD). The potential beneficial uses include municipal and domestic water supply (MUN), warm freshwater habitat (WARM), and wetland habitat (WET).
- Assist the City in meeting the current and future total maximum daily load (TMDL) requirements
- Implement multi-purpose solutions at the lake, consistent with the Prop O objectives of water supply, water quality, flood reduction, flood protection, water conservation, and recreation

The proposed project includes the following key components:

- Install a new lake liner
- Construct wetland areas in the lake to help achieve water quality objectives in the lake



FEHR & PEERS
TRANSPORTATION CONSULTANTS

STUDY AREA AND ANALYZED INTERSECTIONS

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FIGURE 1

- Construct a new lake outlet
- Construct a partition berm in the lake to comply with California Division of Safety of Dams (DSOD) requirements
- Construct a recirculation pump and piping system to circulate the lake water
- Modify existing storm drains inletting to the lake to divert low flow urban runoff into the lake
- Place aquatic emergent plants at various points along the lake edge
- Various improvements to the lake's edge and areas adjacent to the lake's edge
- Replace a majority of the existing asphalt pathway around the lake perimeter with pervious materials
- Construct hydrodynamic separators in the existing storm drain systems to remove trash and debris
- Construct rain gardens and grassy swales around the lake
- Upgrade the irrigation system to improve its efficiency

STUDY SCOPE

This study evaluates the potential for construction period traffic impacts on the street system surrounding the project site. Due to the nature of the project, no increase in trips is anticipated during the operational phase of the project upon its completion. Peak hour traffic impacts for the project were evaluated during the peak hours of the typical weekday morning (7:00 to 9:00 AM) and afternoon (4:00 to 6:00 PM) peak periods. The following traffic scenarios were analyzed in the study:

- Existing Conditions (Year 2009) – This analysis of existing weekday AM and PM peak hour traffic conditions provided a basis for the assessment of future traffic conditions. The existing conditions analysis included a description of key area streets and highways, traffic volumes, current intersection and roadway operating conditions, and public transit service in the area.

- Cumulative Base (Year 2013) Conditions – This scenario projected the future traffic growth and intersection operating conditions that could be expected from regional growth and known "related projects" in the vicinity of the project site by year 2013. These analyses provided the "baseline" conditions against which project impacts were evaluated.

- Cumulative plus Project (Year 2013) Conditions – This analysis identified the temporary incremental impacts of the proposed project on future traffic operating conditions by adding the construction-related traffic expected to be generated by the project to the cumulative base traffic forecasts.

The study examined seven intersections in the vicinity of the project site for each of the above traffic scenarios. The study intersections are listed below and illustrated in Figure 1.

1. Alvarado Street/Glendale Boulevard & Berkeley Avenue
2. Glendale Boulevard & Park Avenue
3. Echo Park Avenue & Sunset Boulevard
4. Glendale Boulevard & Bellevue Avenue
5. Echo Park Avenue & Bellevue Avenue
6. Union Avenue & Temple Street
7. Glendale Boulevard & Temple Street

ORGANIZATION OF REPORT

This report is divided into six chapters, including this introduction. Chapter 2 describes the existing circulation system, traffic volumes, intersection and roadway operating conditions of the street system, as well as existing public transit service in the study area. Chapter 3 describes the methodologies used to develop future cumulative traffic forecasts and project traffic volumes. Chapter 4 presents an assessment of potential temporary traffic impacts on intersection operations in the vicinity of the project site. Chapter 5 contains the results of the Congestion Management Program (CMP) regional transportation system impact analysis for the project. Chapter 6 summarizes the conclusions of the study and the recommendations intended to mitigate the adverse impacts expected to occur during construction of the proposed project.

2. EXISTING CONDITIONS

A comprehensive data collection effort was undertaken to develop a detailed evaluation of existing transportation conditions in the study area. The assessment of existing conditions in the project study area includes a description of the street and highway system, traffic volumes on these facilities, operating conditions of the selected intersections and public transit services.

EXISTING HIGHWAY AND STREET SYSTEM

Primary regional access to the project site is provided by the Hollywood Freeway (US 101), the Glendale Freeway (SR 2), the Harbor Freeway/Pasadena Freeway (I-110) and the Golden State Freeway (I-5). The Hollywood Freeway runs in the east/west direction just south of the project site; the Glendale Freeway runs in the north/south direction, beginning approximately 1.5 miles north of the project site; the Harbor Freeway/Pasadena Freeway runs in the north/south direction approximately one mile east of the project site; and the Golden State Freeway runs north/south approximately three miles north of the project site.

The following is a brief description of the major streets serving the project site:

- Glendale Boulevard – Glendale Boulevard is a Major Highway Class II arterial running north/south in the study area. North of the project site, Glendale Boulevard joins the Glendale Freeway, and to the south provides regional access to the US 101. Just west of the project site, Glendale Boulevard provides two lanes in each direction. On-street parking is generally permitted on a time-limited basis on both sides of the street outside of the peak hours.

- Alvarado Street – Alvarado Street is a Major Highway Class II arterial that runs north/south and intersects Glendale Boulevard to the north of the project area. On-street parking is permitted on a time-limited basis on both sides of the street outside of the peak hours.

- Sunset Boulevard – Sunset Boulevard is a four-lane Major Highway Class II arterial that runs east/west just north of the project site. On-street metered parking is available on a time-limited basis on both sides of the street.

- Echo Park Avenue – Echo Park Avenue is a north/south Collector Street that provides one through lane per direction in the vicinity of the proposed project. On-street parking is available on both sides of the street within the project area.

- Park Avenue – Park Avenue is a Collector Street that runs east/west immediately north of the project site, with one through lane per direction. Between Glendale Boulevard and Sunset Boulevard, metered parking is available on the time-limited basis on broth sides of the street. East of Glendale Boulevard, unmetered parking is generally allowed on both sides of the street.

- Bellevue Avenue – Bellevue Avenue is a Collector Street that runs east/west immediately south of the project site with one lane eastbound and two lanes westbound. Unmetered on-street parking is available on both sides of the street within the project area.

- Temple Street – In the study area, Temple Street is a Secondary Highway running in the east/west direction and provides two through lanes per direction. Unmetered on-street parking is generally permitted on a time-limited basis on both sides of the street outside of the peak hours.

- Lemoyne Street – Lemoyne Street is a two-lane local street that runs north/south between Park Avenue and Sunset Boulevard just north of the project site. Unmetered on-street parking is permitted on a time-limited basis on both sides of the street.

- Logan Street – Logan Street is a two-lane local street that runs north/south between Park Avenue and Sunset Boulevard just north of the project site. Unmetered on-street parking is permitted on a time-limited basis on both sides of the street.

EXISTING TRAFFIC VOLUMES AND LEVELS OF SERVICE

The following sections describe the peak hour traffic volumes, the methodology used to analyze the intersection operating conditions, and the resulting levels of service (LOS) for the selected study intersections under existing conditions. Lane configurations at the study intersections are illustrated in Appendix A.

Existing Traffic Volumes

Traffic volumes at the seven study intersections were collected during the morning and afternoon peak periods (from 7:00 AM to 9:00 AM and 4:00 PM to 6:00 PM, respectively) in November 2009 and are included in Appendix B. Existing peak hour volumes are illustrated in Figure 2.

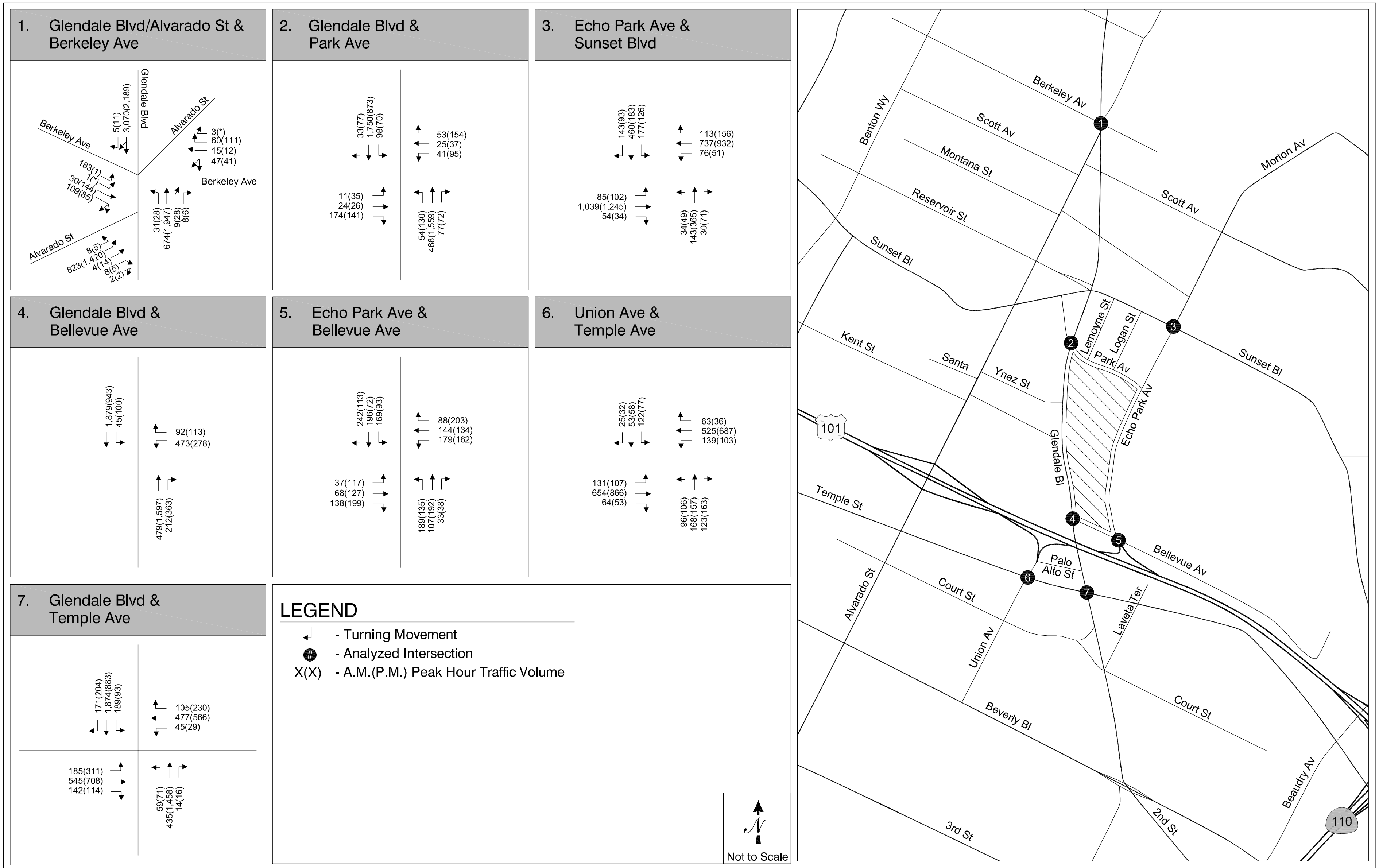
Level of Service Methodology

In accordance with City of Los Angeles Department of Transportation (LADOT) procedures, the "Critical Movement Analysis-Planning" (Transportation Research Board, 1980) method of intersection capacity analysis was used to determine the intersection volume-to-capacity (V/C) ratio and corresponding LOS for the turning movements and intersection characteristics at the five signalized study intersections. The Computer Assisted Level of Service Calculations and Database (CALCADB) software developed by LADOT was used to implement the Critical Movement Analysis (CMA) methodology. In accordance with LADOT practices, a 7% (0.07 V/C credit) increase in capacity was assumed on major and secondary street segments to reflect the benefits of the existing Automated Traffic Surveillance and Control (ATSAC) system. Additionally, all study intersections are assumed to operate under the Automated Traffic Control Systems (ATCS). In accordance with standard LADOT procedures, an additional capacity of 3% (0.03 V/C credit) was applied to reflect the benefits of ATCS at these intersections.

The ranges of V/C ratios and corresponding LOS for signalized intersections are included in Table 1. A detailed assessment of the existing operating conditions at the seven intersections, including the V/C ratio and corresponding LOS at each of the study intersections during the morning and afternoon peak hour can be found in Table 2.

Existing Levels of Service

Two of the seven analyzed intersections (Glendale Boulevard/Alvarado Street & Berkeley Avenue and Glendale Boulevard & Temple Street) are currently operating at LOS E or F during one or both peak hours, as shown in Table 2. Detailed LOS calculations are provided in Appendix C.



EXISTING (2009) PEAK HOUR TRAFFIC VOLUMES

FIGURE 2

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TABLE 1
LEVEL OF SERVICE DEFINITIONS FOR SIGNALIZED INTERSECTIONS

LEVEL OF SERVICE	VOLUME/CAPACITY RATIO (V/C)	DEFINITION
A	$\leq$ 0.600	EXCELLENT. No vehicle waits longer than one red light, and no approach phase is fully used.
B	> 0.600 $\leq$ 0.700	VERY GOOD. An occasional approach phase is fully utilized; many drivers begin to feel somewhat restricted within groups of vehicles.
C	> 0.700 $\leq$ 0.800	GOOD. Occasionally drivers may have to wait through more than one red light; backups may develop behind turning vehicles.
D	> 0.800 $\leq$ 0.900	FAIR. Delays may be substantial during portions of the rush hours, but enough lower volume periods occur to permit clearing of developing lines, preventing excessive backups.
E	> 0.900 $\leq$ 1.000	POOR. Represents the most vehicles intersection approaches can accommodate; may be long lines of waiting vehicles through several signal cycles.
F	> 1.000	FAILURE. Backups from nearby locations or on cross streets may restrict or prevent movement of vehicles out of the intersection approaches. Tremendous delays with continuously increasing queue lengths.

Source: Transportation Research Board, *Transportation Research Circular No. 212, Interim Materials on Highway Capacity*, 1980.

TABLE 2
EXISTING INTERSECTION LEVELS OF SERVICE

Intersection	Peak Hour	Existing (2009)	
		V/C	LOS
1. Glendale Blvd/Alvarado St & Berkeley Ave	**AM** **PM**	0.877 0.927	D E
2. Glendale Blvd & Park Ave	**AM** **PM**	0.663 0.648	B B
3. Echo Park Ave & Sunset Blvd	**AM** **PM**	0.645 0.735	B C
4. Glendale Blvd & Bellevue Ave	**AM** **PM**	0.742 0.638	C B
5. Echo Park Ave & Bellevue Ave	**AM** **PM**	0.444 0.456	A A
6. Union Ave & Temple St	**AM** **PM**	0.507 0.540	A A
7. Glendale Blvd & Temple St	**AM** **PM**	0.993 0.980	E E

EXISTING PUBLIC TRANSIT SERVICE

Public transit services operating in the project area are operated by the Los Angeles County Metropolitan Transportation Authority (Metro) system and LADOT's Downtown Area Shuttle (DASH). Bus routes and their frequencies during the weekday morning (7:00 – 9:00 AM) and weekday afternoon (4:00 – 6:00 PM) peak periods are detailed as follows:

- Metro Line 92 – This line is a local north/south line that travels from downtown Los Angeles to Burbank via Glenoaks Boulevard, Brand Boulevard, and Glendale Boulevard. Adjacent to the project site, this line travels along Glendale Boulevard and Bellevue Avenue with average AM and PM peak hour headways between 15 and 20 minutes.

- Metro Line 200 – This line is a local north/south line that travels from Exposition Park to Echo Park via Figueroa Street, Hoover Street, and Alvarado Street. In the vicinity of the project site, this line travels briefly along Sunset Boulevard (between Logan Street and Echo Park Avenue) with average AM and PM peak hour headways between five and seven minutes.

- Metro Line 603 – This line travels north/south from downtown Los Angeles to Glendale Galleria via Hoover Street, Rampart Boulevard, Alvarado Street, and San Fernando Road. In the vicinity of the project site, this line travels briefly along Sunset Boulevard and Glendale Boulevard with average AM and PM peak hour headways of 10 minutes.

- LADOT DASH – The Pico Union/Echo Park (PUEP) DASH Line runs north/south from the Grand Avenue Metro Blue Line Station to Echo Park via Union Avenue, 6th Street, and Echo Park Avenue. In the study area, this line runs along Echo Park Avenue, just east of the project site, with peak period headways of approximately 10 minutes. Northbound and southbound stops are located adjacent to the project site.

3. FUTURE TRAFFIC CONDITIONS

To evaluate the potential impacts of the proposed project on the surrounding street system, it was necessary to develop estimates of future traffic conditions in the area both without and with the proposed project's traffic. First, estimates of traffic growth were developed for the study area to forecast future conditions without the project. These forecasts included traffic increases as a result of both regional ambient traffic growth and traffic generated by specific developments in the vicinity of the project (related projects). These projected traffic volumes, identified herein as the cumulative base conditions, represent the future study year conditions without the proposed project. The traffic generated by the proposed project was then estimated and assigned to the surrounding street system. The project traffic was added to the cumulative base to form the cumulative plus project traffic conditions, which were analyzed to determine the incremental traffic impacts attributable to the project itself.

The assumptions and analysis methodology used to develop each of the future traffic scenarios discussed above are described in more detail in the following sections.

CUMULATIVE BASE TRAFFIC PROJECTIONS

The cumulative base traffic projections reflect growth in traffic from two primary sources: background or ambient growth in the existing traffic volumes to reflect the effects of overall regional growth both in and outside of the study area, and traffic generated by specific related projects within, or in the vicinity of, the study area.

Areawide Traffic Growth

Traffic volumes in the vicinity of the study area are assumed to increase at a rate of 1% per year. Future increases in background traffic volumes due to regional growth and development are expected to continue at this rate, at least through the year 2013. With the project construction schedule concluding in 2013, the existing 2009 traffic volumes were adjusted upward by 4% to reflect areawide regional growth.

Traffic Generation of Related Projects

Traffic expected to be generated by related projects within, or with the potential to affect, the study area was considered in addition to the ambient area wide traffic growth. For this study, related projects were identified by LADOT in October 2009.

Directional splits were prepared for the related projects using standard trip generation rates from *Trip Generation, 7th Edition* (Institute of Transportation Engineers, 2003), relevant traffic studies and/or environmental impact reports for specific projects. The list of related projects included in this analysis, including trip generation estimates for each, is included in Table 3 and has been depicted in Figure 3. These estimates are conservative, in that they may not in every case account for existing uses to be removed by the related projects.

Cumulative Development Project Traffic Distribution

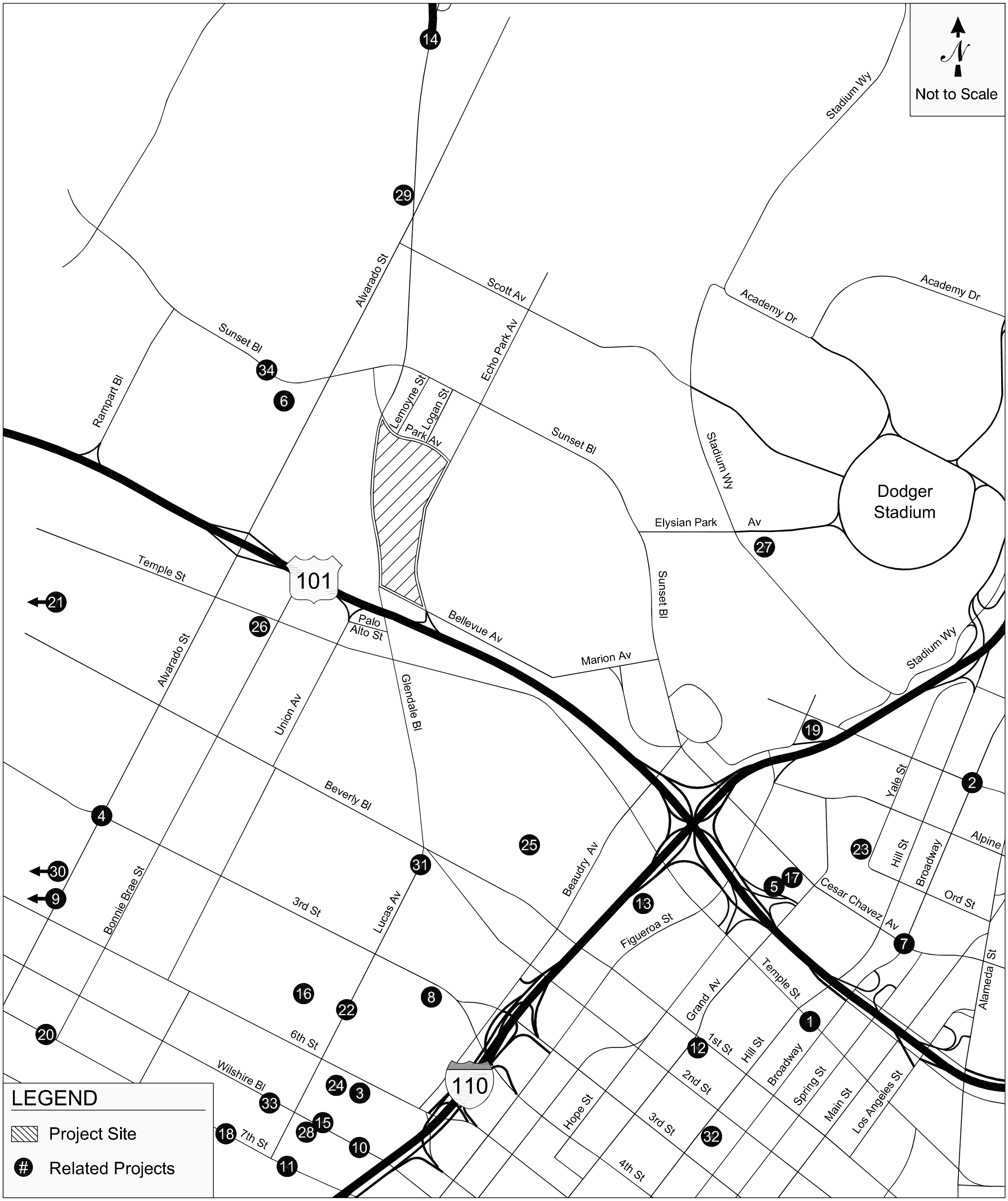
The geographic distribution of traffic generated by developments, such as those included in the list of related projects, depends on several factors. These factors include the type and density of the proposed land use, the geographic distribution of the population from which employees and potential patrons of proposed commercial related projects may be drawn, the geographic distribution of employment and activity centers to which residents of proposed residential related projects may be drawn, the location of

TABLE 3
RELATED PROJECTS TRIP GENERATION

Proj #	Project Name	Address	Size	Units	Description	Daily	AM Peak Hour			PM Peak Hour		
							In	Out	Total	In	Out	Total
1	Hall of Justice	211 W Temple St	[a]			1,052	26	126	152	98	48	146
2	Blossom Plaza - Mixed use project	900 N Broadway	223	du	Condominiums	2,823	84	78	162	123	61	184
			7.000	ksf	Cultural Center							
			22.008	ksf	Retail							
			175.000	ksf	Restaurant							
3	Piero II (Lorenzo Res Development)	1076 W 6th St	600	du	Residential	3,005	40	194	234	247	121	368
			20.000	ksf	Retail							
4	Medical office addition	2100 W 3rd St	24.075	du	Medical Office	870	47	13	60	24	66	90
5	Supermarket & Retail	500 N Bunker Hill Av	17.000	ksf	Supermarket	1,924	37	23	60	96	93	189
			4.200	ksf	Retail							
6	LAUSD - Cen Reg Elem School #14	1018 Mohawk St	275	st	Elementary School	910	152	125	277	0	0	0
7	Chinatown Gateway Project	Cesar E Chavez St /	280	du	Apartments	2,665	30	122	152	161	86	247
		Broadway	22.000	ksf	Retail							
8	Mixed-use	1234 W 3rd St	363	du	Apartments	1,691	23	90	113	92	49	141
			7.740	ksf	Retail							
9	Mixed-use development	2525 W Wilshire Bl	118	du	Condominiums	785	10	47	57	46	23	69
			3.000	ksf	Retail							
10	Mixed-use development	1027 W Wilshire Bl	402	du	Condominiums	1,498	19	94	113	91	45	136
			4.728	ksf	Retail							
11	Mixed-use development	1135 W 7th St	130	du	Condominiums	798	7	37	44	42	21	63
			7.037	ksf	Retail							
12	Grand Avenue Implementation Plan (mixed-use)	102 S Grand Av	1,648	du	Condominiums	0	225	1,101	1,326	1,521	749	2,270
			412	du	Apartments							
			275	rm	Hotel							
			68.000	ksf	County Office							
13	Mixed-use	327 N Fremont Av	600	st	Apartments	3,568	42	170	212	231	124	355
			30.000	ksf	Retail							
14	Mixed-use	1855 N Glendale Bl	65	du	Condominiums	543	8	37	45	31	15	46
15	Mixed-use	1111 W Wilshire Bl	800	st	Elementary School	2,900	80	66	146	137	126	263
			40.000	ksf	Retail							
16	Condos	456 S Witmer St	39	du	Condominiums	162	2	10	12	9	5	14
17	Bunker Hill Mixed-Use	720 W Cesar E Chavez Av	272	du	Condominiums	1,639	19	93	112	98	49	147
			6.431	ksf	Retail							
			8.000	ksf	Restaurant							
18	Witmer Project	1247 W 7th St	186	du	Condominiums	1,486	2	11	13	46	22	68
			6.200	ksf	Retail							
19	Condos (TT67738)	855 N Figueroa Terr	102	du	Condominiums	598	8	37	45	36	17	53
20	MacArthur Park/Alvarado Metro Project	1901 W 7th St	132	du	High-Rise Condominiums	1,504	17	73	90	82	51	133
			73	du	Condominiums							
			46	du	Apartments							
			19.103	ksf	Retail							
21	Mixed-Use	3200 W Beverly Bl	24	du	Condominiums	426	3	14	17	24	12	36
			8.338	ksf	Retail							
22	Affordable apartments	431 S Lucas Av	75	du	Affordable Housing	504	6	25	31	31	16	47
23	Apartments	715 N Yale St	65	du	Apartments	437	7	27	34	26	14	40
24	Good Samaritan Mixed-Use Project	1136 W 6th St	725	du	Apartments	3,800	46	184	230	222	119	341
			39.999	ksf	Retail							
25	LAUSD CLAHS #11 HRD/PDC	1200 W Colton St	25.500	ksf	Office & Exam Facility	653	81	11	92	16	79	95
26	Mixed-Use	1924 W Temple St	132	du	High-Rise Condominiums	1,350	12	52	64	64	39	103
			73	du	Condominiums							
			46	du	Apartments							
			19.103	ksf	Retail							
27	LA Dodger Stadium the Next 50 Years	1000 W Elysian Park Av	23.750	ksf	Specialty Retail	4,456	121	78	199	230	250	480
			38.490	ksf	Quality Restaurant							
			35.570	ksf	Museum							
			138.565	ksf	Office							
28	Office	1130 W Wilshire Bl	86.844	ksf	Office	530	91	12	103	14	69	83
29	Gas station with convenience store	1605 N Glendale Bl	12	pu	Gas Station with Conv Store	651	20	20	40	27	27	54
			-8	pu	Gas Station with Conv Store							
30	Wilshire Hoover Shopping Center	2908 W Wilshire Bl	156.000	ksf	Shopping Center	4,331	46	29	75	198	215	413
31	Beverly + Lucas Project	1430 W Beverly Bl	157	du	Apartments	867	13	53	66	52	28	80
32	Kawada Tower	250 S Hill St	800	st	Elementary School	1,551	68	56	124	72	66	138
			12.000	ksf	Retail/Restaurant							
33	New medical office building (Good Samaritan Hospital)	1239 W Wilshire Bl	56.450	ksf	Medical Office	2,040	111	29	140	57	153	210
34	Sunset Flats Mixed-Use	2225 W Sunset Bl	65	du	Residential Condos	1,283	17	83	100	72	35	107
			15.550	ksf	Retail/Restaurant							
TOTAL TRIPS						**53,300**	**1,520**	**3,220**	**4,740**	**4,316**	**2,893**	**7,209**

Source Data:
Data provided by LADOT December, 2009. Directional splits based on *Trip Generation, 7th Edition* (Institute of Transportation Engineers, 2003).

Note:
[a] Trip generation based on data provided by LADOT. No further information on trip generation by land use was provided.



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Jan 21, 2010 JS
\\Fpla1\Data\Jobs\Active\2300s\2377 – Echo Park Lake\Graphics\ACAD\2377 Related Projects.dwg

RELATED PROJECTS

FIGURE 3

each related project in relation to the surrounding street system, and the extent of the roadway network (e.g., its continuity).

Cumulative Base Traffic Volumes

Using the trip generation estimates and trip distribution patterns developed for this study, the resulting future year 2013 cumulative base traffic volumes are shown in Figure 4 for the analyzed peak hours.

PROJECT TRAFFIC PROJECTIONS

The traffic projections for the proposed project were developed using three steps: estimating the trip generation of the project, determining trip distribution, and assigning the project traffic to the roadway system based on assumptions made about construction methods.

Construction Assumptions

Construction for the proposed Echo Park Lake Rehabilitation Project is assumed to occur in the following five phases shown in Table 4 and listed below.

Phase A (29 weeks)
- Drying/Hauling Lake Slime
- Tree/Shrub Removal
- Clear and Grub
- Wildlife Relocation
- Pathway Demolishing

Phase B (57 weeks)
- Regrading/Bentonite Mixing for Lake Liner
- Demolish/Disposal of Existing Lake Edge
- Lake Edge Wooden Boardwalk
- Lake Edge Retaining Walls
- Lake Edge Ripraps
- Lake Edge Vegetated Slope
- Lake Edge Overlook

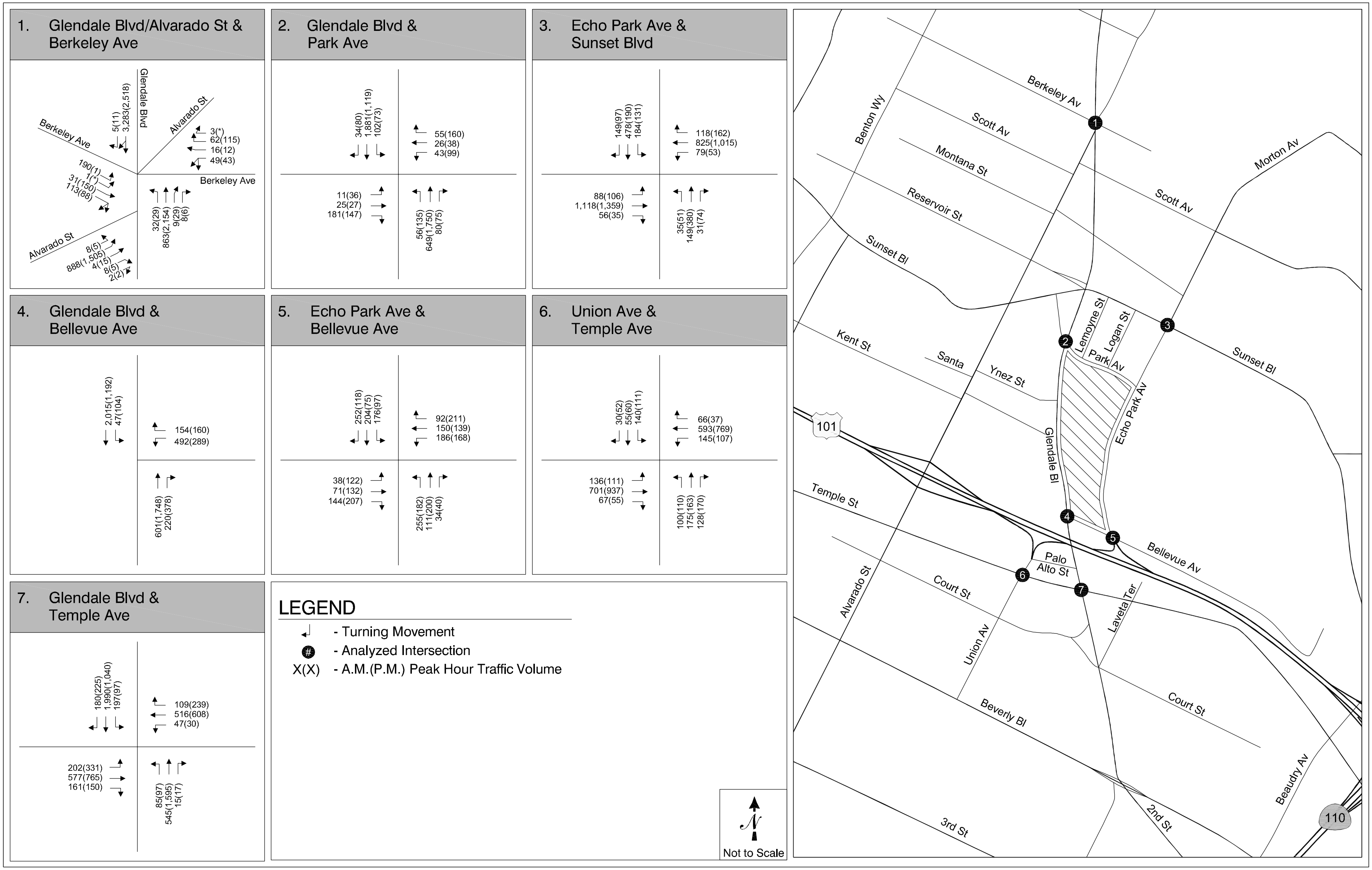
Phase C (69 weeks)
- Install DOSD Berm
- Place In-Lake Storm Drain Line
- Construct Wetland Edge/Ripraps
- Stormwater BMPs NE Area Site Preparation & Installation

Phase C (continued)
- Stormwater BMPs Park Site Preparation & Installation
- Installation of Piping System-centralized Lake Circulation & Fountain Piping
- Construct Pump Stations & Outlet Structure

Phase D (8 weeks)
- Fill Wetland Foundation
- Pathway Repave
- Retaining Walls/Seat Walls
- Fencing and Railing
- Light Fixtures
- Other Park Amenities (Benches, Trash Receptacles, Drinking Fountains, etc.)

Phase E (15 weeks)
- Wetland Vegetation
- Mulch/Amendment
- Plants (Shrubs/Trees)
- Lotus Bed Restoration

The above tasks and the estimated truck loads and durations per task per phase are shown in Table 4. For the purposes of this analysis, the two most intense phases of construction from a traffic perspective (Phases D and E) were analyzed for potential adverse impacts at the seven study intersections. Based on the information in Table 4, Phase D (lasting up to eight weeks and requiring up to 85 truckloads per day) and Phase E (lasting up to 15 weeks and requiring up to 36 truckloads per day) were selected for quantitative evaluation.



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CUMULATIVE BASE (2013) PEAK HOUR TRAFFIC VOLUMES

FIGURE 4

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TABLE 4
ESTIMATE OF LARGE TRUCK LOADS DURING CONSTRUCTION OF THE ECHO PARK LAKE REHABILITATION

Phase		Events:	Exported Soil (CY)	Imported Soil (CY)	Imported Concrete Mix (CY)	Disposed Material	Unit	Imported Materials	Unit	Estimated Truck Loads	Anticipated Duration (weeks)	Truck Load/Day
In-Lake Improvement	A	Drying/Hauling Lake Slime	22,253			90	CY			2,234	29	15
	B	Regrading/Bentonite Mixing for Lake Liner				710	CY	1,766	CY	248	57	1
	C	Install DOSD Berm		4,297	102			496	CY	492	28	4
	C	Replace In-lake Storm Drain Line (6'x2' RCB)			65		CY	7	TRK	14	8	0
	C	Construct Wetland Edge/Riprap		500			CY	20	TRK	70	9	2
	D	Fill Wetland Foundation		28,800			CY			2,880	8	72
	E	Wetland Vegetation		1,450				8,800	SF	146	15	2
	B	Demolish/Disposal Ex. Lake Edge	347					28	CY	38	57	0
	B	Lake Edge Wooden Boardwalk	347	28	157			2,100	SF	74		0
	B	Lake Edge Retain Walls	7,661	4,635	1,749					1,424		5
	B	Lake Edge Ripraps	1,824	102				3,628	CY	374		1
	B	Lake Edge Vegetated Slope	467	389						86		0
	B	Lake Edge Overlook	130	8	52					20		0
Stormwater BMPs	C	Stormwater BMPs NE Area Site Preparation & Installation	105	100		140	CY	20	TRK	37	32	0
	C	Stormwater BMPs Park Site Preparation & Installation	200	160		100	CY	2	TRK	25	8	1
	C	Installation of Piping System-centralized Lake Circulation & Fountain Piping	145	5	64			20	TRK	42	69	0
	C	Construct Pump Stations & Outlet Structure	193	416				5,086	SF	70	31	0
Park Improvement	A	Tree/Shrub Removal				306	CY			15	2	2
	A	Clear & grub				1,222	CY			61	2	6
	A	Wildlife Relocation								7	1	1
	A	Pathway Demolish				1,000	CY			50	2	5
	D	Pathway Repave						2,500	CY	125	3	8
	E	Mulch/amendment						2,600	CY	125	1	25
	E	Plants (shrubs/trees)								36	1	7
	D	Retaining Walls / seat walls						200	CY	25	2	3
	D	Fencing and Railing								4	2	0
	D	Light Fixtures				25	EA	46	EA	7	1	1
	E	Lotus Bed Restoration		2,500				300		126	15	2
	D	Other Park Amenity (Bench, Trash Receptacle, Drinking Fountain etc.)				40	EA	55	EA	4	1	1

Source: Black & Veatch, December 2009
NOTES:
CY = cubic yard
SF = square feet
TRK = truck
EA = each

Phase A Maximum Truckloads	A	**29**
Phase B Maximum Truckloads	B	**8**
Phase C Maximum Truckloads	C	**7**
Phase D Maximum Truckloads	D	**85**
Phase E Maximum Truckloads	E	**36**

Project Trip Generation

Information from Table 4 was used to estimate trip generation for the project. Based on information provided by the project engineering and design team, it was assumed that approximately 20 to 40 workers would be required for each phase of construction. A conservative assumption of 40 workers, arriving and departing within the AM and PM peak hours, for Phases D and E was used. For the purposes of this study, each truckload was assumed to make two trips per day (one inbound and one outbound) and was factored into the analysis as approximately 2.5 passenger car equivalents (PCE) (since truck trips create a greater impact on traffic operations than automobiles). Although construction truck trips may or may not occur during the peak hours, it was assumed that approximately one-quarter of truck trips would occur during the AM and PM peak hours to provide a conservative analysis. That is, the estimated daily truck trips were assumed to occur evenly over the work day.

Phase D Trip Generation

Under Phase D, it is assumed that the proposed project would generate approximately 505 daily trips (80 worker trips and 425 PCE truck trips). During the AM peak hour, the proposed project would generate approximately 40 inbound worker trips and 54 PCE truck trips (27 inbound, 27 outbound). During the PM peak hour, the proposed project would generate approximately 40 outbound worker trips and 54 PCE truck trips (27 inbound, 27 outbound).

Phase E Trip Generation

Under Phase D, it is assumed that the proposed project would generate approximately 260 daily trips (80 worker trips and 180 PCE truck trips). During the AM peak hour, the proposed project would generate approximately 40 inbound worker trips and 24 PCE truck trips (12 inbound, 12 outbound). During the PM peak hour, the proposed project would generate approximately 40 outbound worker trips and 24 PCE truck trips (12 inbound, 12 outbound).

Project Traffic Distribution

The geographic distribution of the traffic generated by the project depends on several factors, including the geographic distribution of population from which the construction workers are drawn, the locations of the construction material suppliers and soil disposal sites, and the location of the project site in relation to the surrounding street and regional freeway system.

The generalized regional trip distribution applied in the analysis for construction worker trips is approximately:

- 25% to and from the north via the SR-2 and US 101 Freeways
- 15% to and from the south via city streets
- 15% to and from the east via city streets
- 10% to and from the south and east via the US 101 Freeway
- 20% to and from the west via city streets
- 5% to and from the west via the US 101 Freeway

The generalized regional trip distribution applied in the analysis for construction truck trips is approximately:

- 25% to and from the north via the US 101 Freeway
- 25% to and from the south via the US 101 Freeway
- 25% to and from the east via the SR-2 and US 101 Freeways
- 25% to and from the west via the US 101 Freeway

Although the location of construction material suppliers and deposition sites for excavated materials are currently unknown, it is assumed that all truck deliveries would travel on the regional freeway networks and connect to the construction sites from the adjacent freeway ramps on US 101 and SR-2. The majority of truck trips, those transporting soil from the site, were assumed to utilize US 101, while other truck trips were assumed to utilize both US 101 and SR-2. Most of the construction workers would travel on the regional freeway network, while some portion of them would arrive from the local street network. The traffic expected to be generated by each of the project alignment alternatives given concurrent construction activities, as shown in Table 5, was assigned to the street network based on the application of the generalized trip distribution.

Project Traffic Assignment

Based on information from the project engineering and design team, it was assumed that all workers would park in the commercial parking lots along Glendale Boulevard north of Park Avenue. Construction truck trips for all phases were assumed to access the project site from the east via Echo Park Avenue. All construction truck trips exporting soil from the site (Phase A) would access the freeway via the US 101. Truck trips in the analyzed construction phases (Phases D and E) were assumed to utilize both SR 2 and US 101 to reach/depart the project site.

The City of Los Angeles allows major and secondary arterials to be used as truck routes. The City's policy is to allow trucks to travel in a "reasonable fashion" to and from a work site, including over collector and local streets. The City of Los Angeles reviews each haul-route permit for specific application of its general guidelines. Potential haul routes in the City of Los Angeles for construction of project include segments of Echo Park Avenue, Bellevue Avenue, Park Avenue, Glendale Boulevard and Temple Street. While the City of Los Angeles Municipal (LAMC) prohibits the use of certain segments of specific streets by vehicles over 6,000 gross weight (LAMC Section 80.36.1), none of the local streets in the vicinity of the project site have weight limitations or restrictions that would preclude their use by truck traffic.

CUMULATIVE PLUS PROJECT TRAFFIC PROJECTIONS

The temporary increase in traffic (as PCEs) that would occur during Phase D of the project was assigned to the street system, as shown in Figure 5, and added to the cumulative base traffic projections. The resulting traffic volumes represent the projected cumulative plus project weekday peak hour traffic volumes during Phase D are shown in Figure 6. They include the projected temporary construction traffic and are the basis of the analysis of the project's traffic-related impacts described in the following chapter. The temporary increase in traffic for Phase E is shown in Figure 7 and the resulting traffic volumes are shown in Figure 8.

TABLE 5
ESTIMATED CONSTRUCTION TRIPS (PASSENGER CAR EQUIVALENTS)

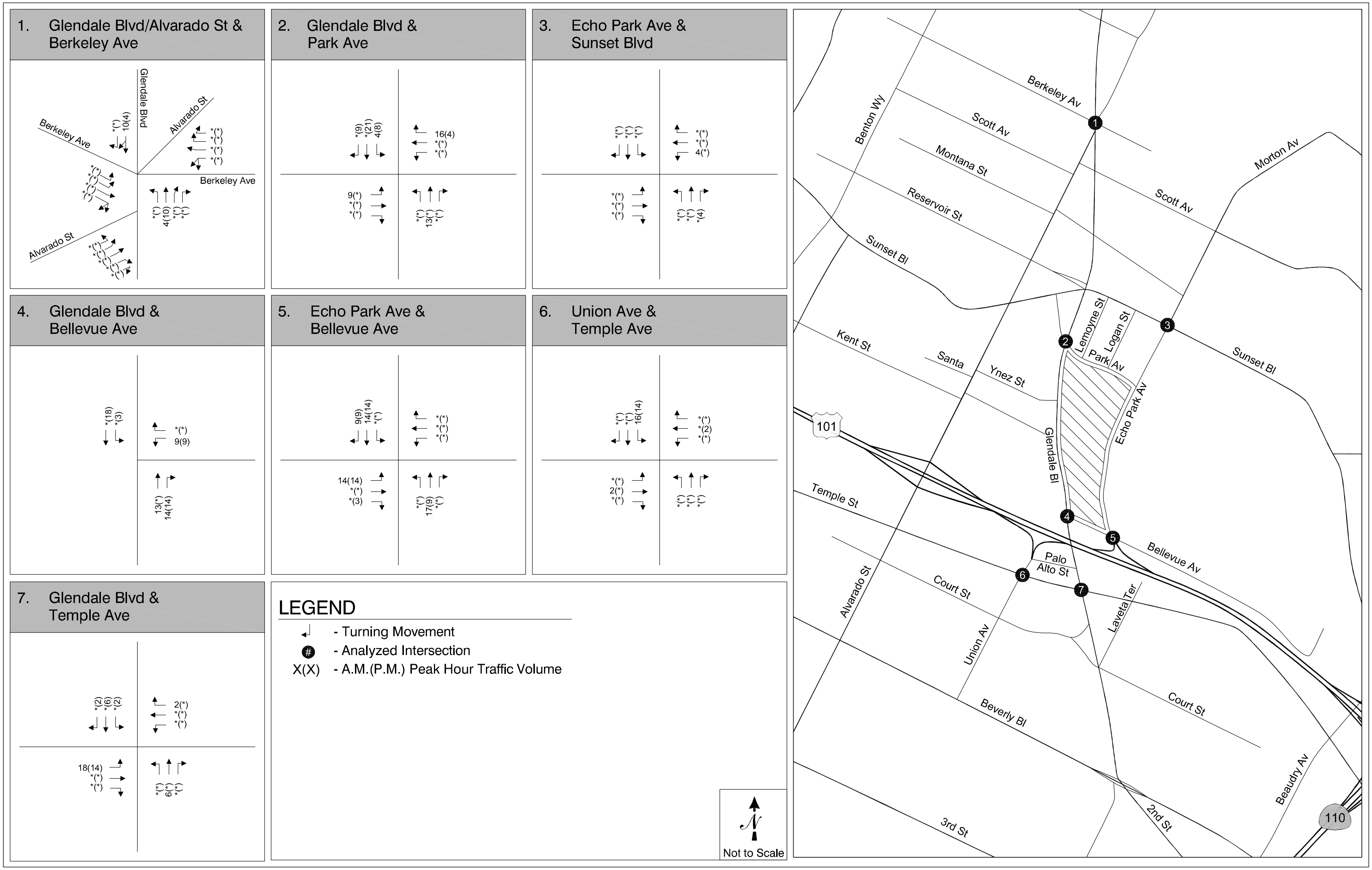
Phase[1]	Daily Worker Trips[2]	Daily Truck Trips[3]	Daily Total Construction Trips[3]	Worker Trips[2]				Truck Trips[3]				Total Trips [3]			
				AM Pk Hr		PM Pk Hr		AM Pk Hr		PM Pk Hr		AM Pk Hr		PM Pk Hr	
				In	Out	In	Out	In	Out	In	Out	In	Out	In	Out
Phase A Construction	80	145	225	40	0	0	40	9	9	9	9	49	9	9	49
Phase B Construction	80	40	120	40	0	0	40	3	3	3	3	43	3	3	43
Phase C Construction	80	35	115	40	0	0	40	3	3	3	3	43	3	3	43
Phase D Construction	80	425	505	40	0	0	40	27	27	27	27	67	27	27	67
Phase E Construction	80	180	260	40	0	0	40	12	12	12	12	52	12	12	52

NOTES:

[1] Phased construction to occur sequentially, not concurrently.

[2] For each phase of this project, between 20 to 40 workers would be required to complete construction. This study assumes 40 construction workers per phase.

[3] Information in this table based on estimates taken from Table 4. Daily truck trips are assumed to occur evenly over an 8-hour work day (12.5% per peak hour). To provide a worst-case analysis, it was assumed that truck trips would occur during the AM and PM peak hours. Truck trips have been converted to Passenger Car Equivalent (PCE) trips using a PCE factor of 2.5 to 1. Thus 1 truck trip is equivalent to 2.5 passenger car trips.



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PHASE D PROJECT ONLY PEAK HOUR TRAFFIC VOLUMES

FIGURE 5

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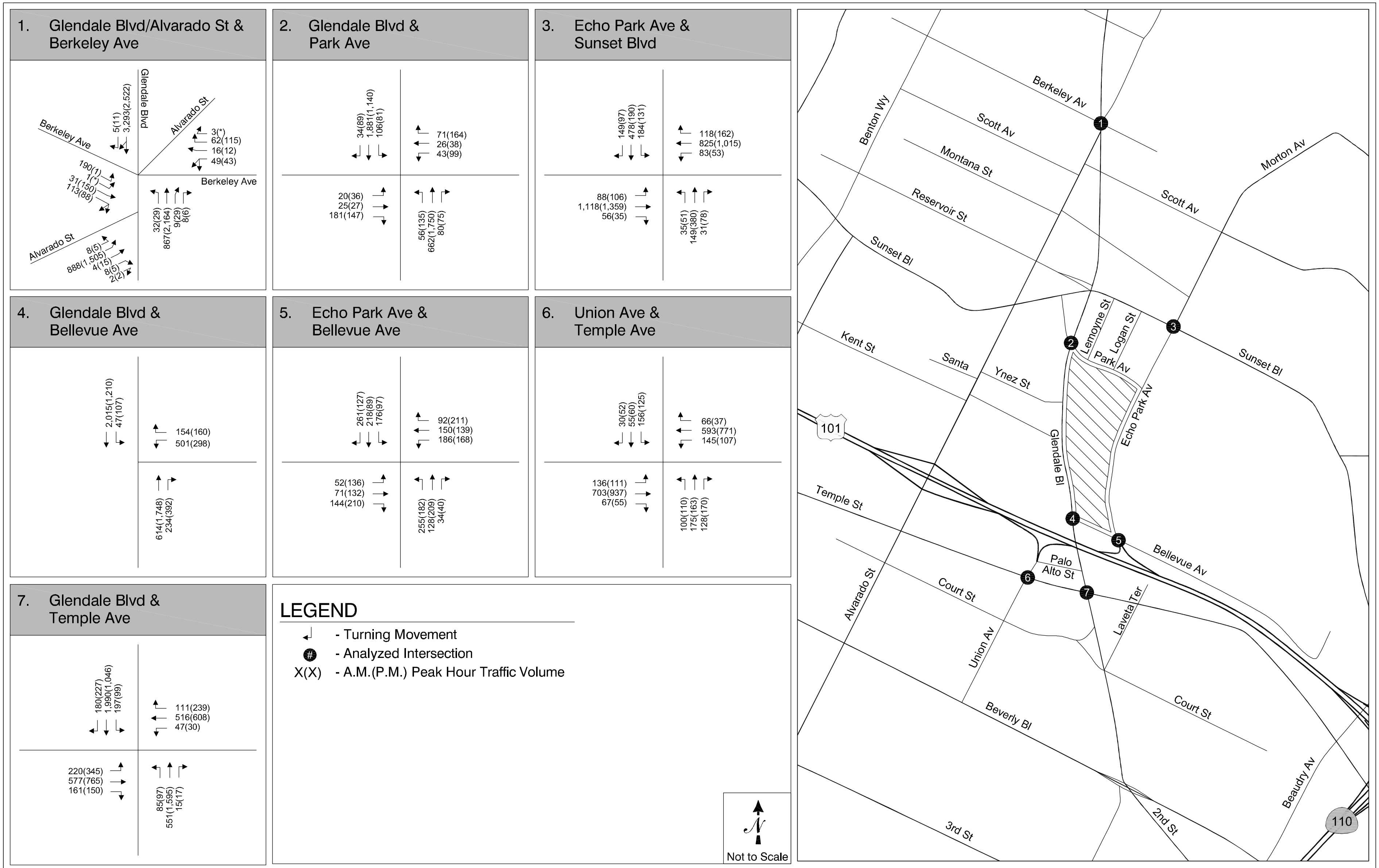

CUMULATIVE PLUS PROJECT PHASE D (2013) PEAK HOUR TRAFFIC VOLUMES

FIGURE 6

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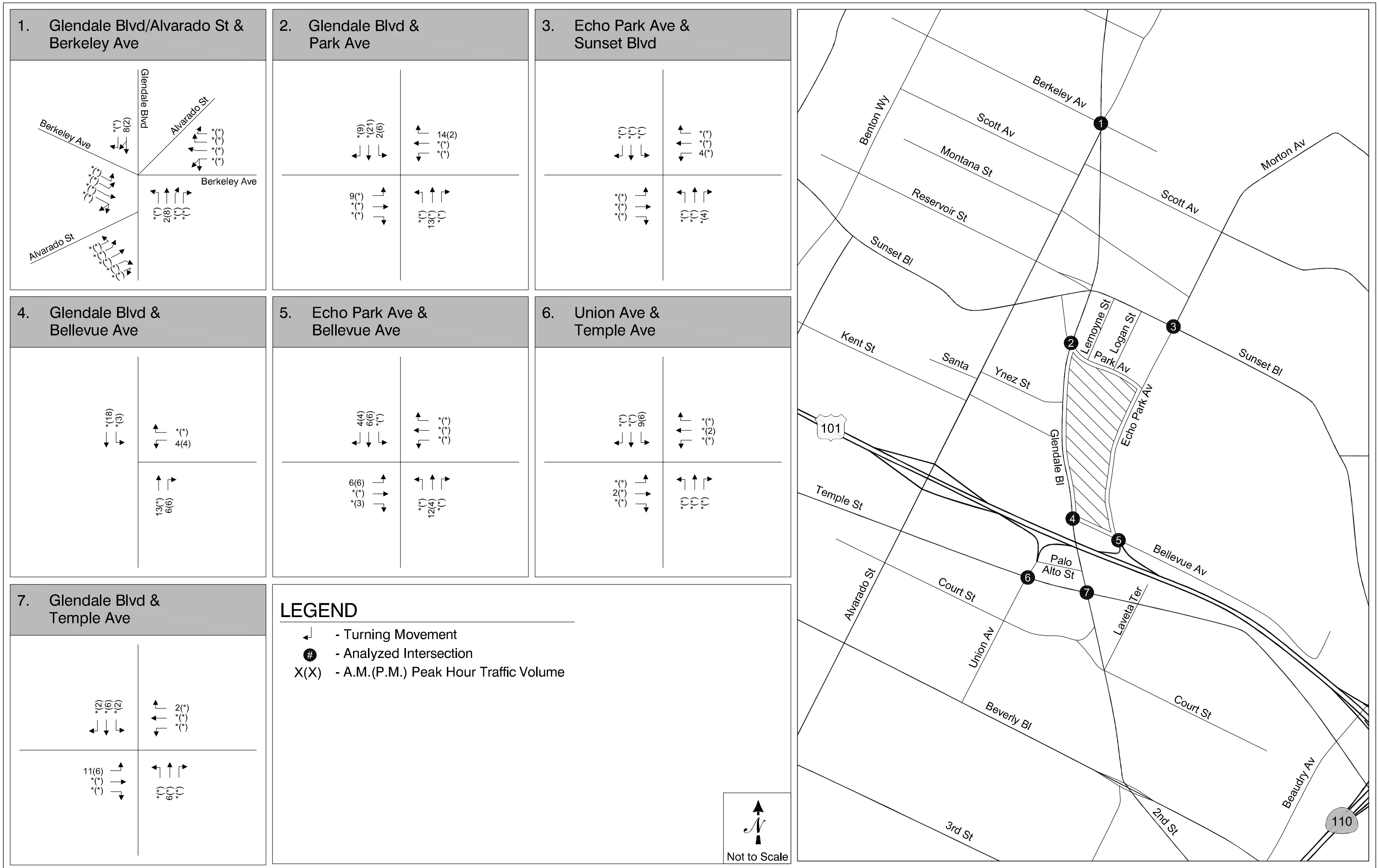

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PHASE E PROJECT ONLY PEAK HOUR TRAFFIC VOLUMES

FIGURE 7

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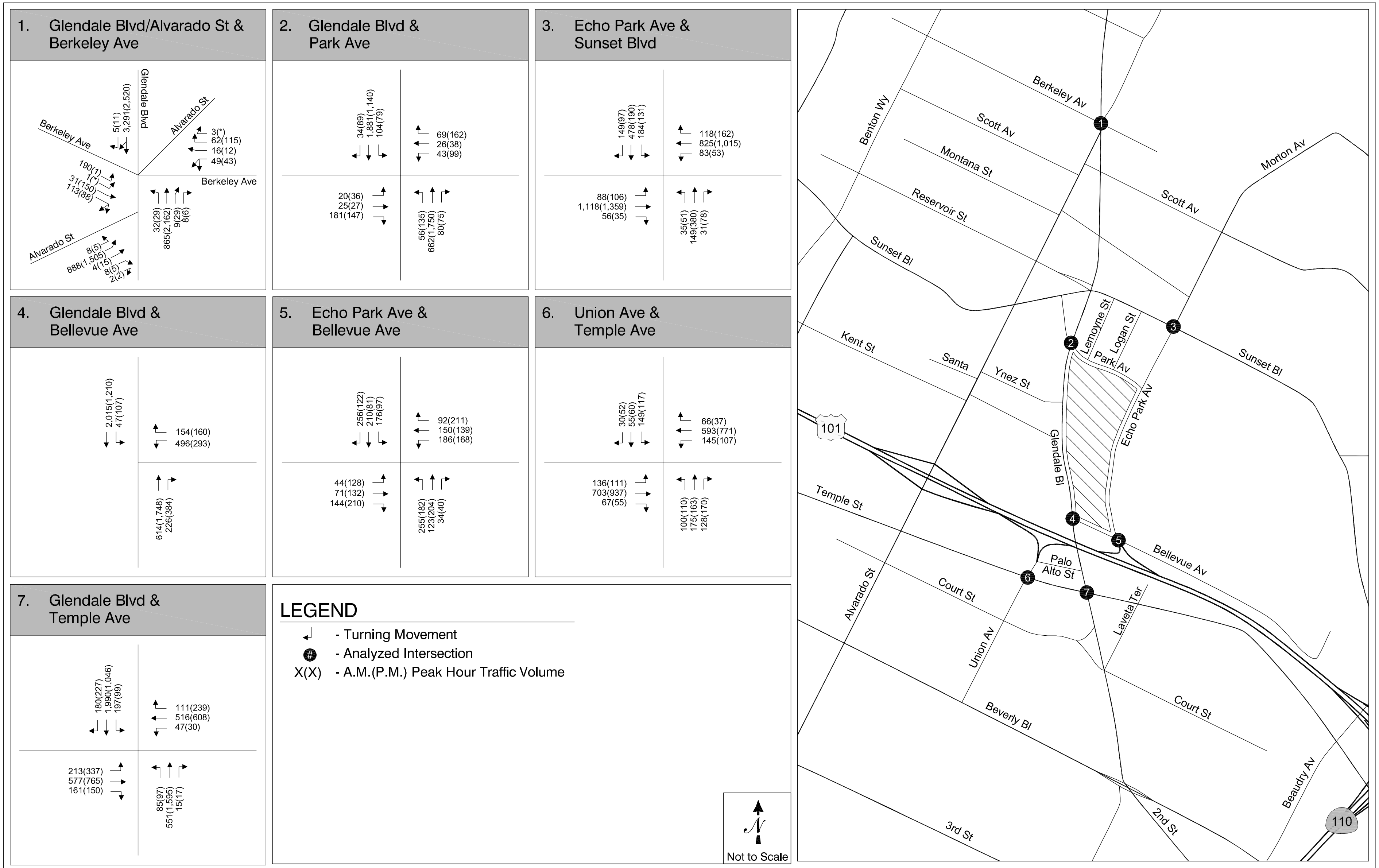

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CUMULATIVE PLUS PROJECT PHASE E (2013) PEAK HOUR TRAFFIC VOLUMES

FIGURE 8

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4. TRAFFIC IMPACT ANALYSIS

The projected year 2013 cumulative base and cumulative plus project traffic volume forecasts, as projected in the previous chapter, were analyzed both to determine the forecast baseline operating conditions of the study intersections and to identify the potential impacts of the proposed project on the surrounding street system. This chapter provides a discussion of the criteria and methodology used and summarizes the results of the analysis.

CRITERIA FOR DETERMINATION OF TEMPORARY ADVERSE TRAFFIC IMPACT

Although the methodologies and the criteria to calculate V/C ratios for intersections are intended by LADOT to identify potential traffic impacts during operation, they can also be applied to construction. During project construction, however, LADOT considers such impacts as adverse but not significant since, while they introduce inconvenience for vehicular traffic, those impacts are only temporary. Where determinations of adverse impacts are made, motorists would experience inconveniences that range in intensity from slight to substantial.

A temporary adverse impact would occur if the project would increase the V/C ratio of applicable intersections beyond the limits established by LADOT, including the V/C ratio along Congestion Management Program (CMP) designated roads. LADOT has established operational traffic impact criteria for the assessment of potential impacts of a project on the local street system after completion and during operation. Those operational standards indicate that a project is considered to have a temporary adverse traffic impact if the increase in V/C ratio attributed to the project exceeds a specific threshold for each level of service. Construction period impacts are considered adverse but not significant.

A sliding scale has been established under which the maximum allowable increase in the V/C ratio decreases as the V/C ratio increases using the following scale:

Intersection Conditions with Project Traffic		Project-Related Increase in V/C Ratio
LOS	V/C Ratio	
C	0.701 - 0.800	Equal to or greater than 0.040
D	0.801 - 0.900	Equal to or greater than 0.020
E, F	> 0.901	Equal to or greater than 0.010

Using these criteria, a project would not have a temporary adverse impact at an analyzed intersection if it were operating at LOS A or B after the addition of project operational traffic. Also, a project would not have a temporary adverse impact on an analyzed intersection if it were operating at LOS C and the incremental change in the V/C ratio were less than 0.04, or if it were operating at LOS D and the incremental change in the V/C ratio were less than 0.02. If the intersection were operating at LOS E or F after the addition of project operational traffic and the incremental change in the V/C ratio were greater than or equal to 0.01, a project would be considered to have a temporary adverse impact.

CUMULATIVE BASE OPERATING CONDITIONS

The year 2013 cumulative base (without project) peak hour traffic volumes shown in Figure 4 were analyzed using the LOS methodologies described in Chapter 2 to project future LOS at the study intersections during the AM and PM peak hours. The results of this analysis are summarized in Table 5 for the analyzed peak hours. The table provides a summary of the cumulative base scenario. Detailed LOS calculations are provided in Appendix C.

As shown in Table 6, five of the seven study intersections are projected to operate at LOS D or better during the AM and PM peak hours, using CMA methodology. The intersection of Glendale Boulevard/Alvarado Street & Berkeley Avenue is projected to operate at LOS E in the AM peak hour and LOS F in the PM peak hour. The intersection of Glendale Boulevard & Temple Street is projected to operate at LOS F during the both peak hours.

PROJECT TRAFFIC IMPACT ANALYSIS

The year 2013 cumulative plus project peak hour traffic volumes shown in Figures 6 and 8 were analyzed to project future operating conditions at the study intersections and to identify specific traffic impacts resulting from the addition of project-generated traffic for construction during Phases D and E (the phases with the highest level of construction traffic). Future LOS calculations include the additional project-generated trips that would be necessary during the construction period. Because the proposed project would only affect traffic operations in the vicinity during the period when it is under construction, the impacts are considered to be adverse but not significant. The overall construction schedule is approximately two years. As described above on page 14, the project would be constructed in phases, rather than all at once. Thus the duration of the impact identified during Phase D (approximately eight weeks) would be less than the duration of the entire project construction. The results of the intersection analysis are summarized in Table 6 and compared with the cumulative base intersection conditions.

Construction Phase D

According to the City of Los Angeles' intersection traffic impact significance criteria described above, the proposed project would have a temporary adverse impact at the intersection of Glendale Boulevard & Temple Street during both the AM and PM peak hours. The duration of Phase D, when this impact is identified, is estimated to be eight weeks.

Construction Phase E

According to the City of Los Angeles' intersection traffic impact significance criteria described above, the proposed project would not result in temporary adverse impacts at any of the seven study intersections.

Construction Phases A through C

Since the construction trips occurring under Phases A through C would be lower than those of Phase E, it is assumed that the project would not result in temporary adverse impacts at any of the seven study intersections.

PROPOSED MITIGATION PROGRAM

Proposed mitigation consists of the following measures to reduce the temporary adverse impacts associated with construction-period activity at and in the vicinity of the project site. The implementation of these measures would fully mitigate temporary project traffic impacts for all construction phases.

TABLE 6
FUTURE (2013) INTERSECTION LEVELS OF SERVICE

Intersection	Peak Hour	Cumulative Base		Cumulative plus Project (Phase D)				Cumulative plus Project (Phase E)			
		V/C	LOS	V/C	LOS	Project Increase in V/C	Adverse Project Impact?	V/C	LOS	Project Increase in V/C	Adverse Project Impact?
1. Glendale Blvd/Alvarado St & Berkeley Ave	**AM** **PM**	0.939 1.007	E F	0.941 1.009	E F	0.002 0.002	NO NO	0.941 1.008	E F	0.002 0.001	NO NO
2. Glendale Blvd & Park Ave	**AM** **PM**	0.714 0.721	C C	0.714 0.727	C C	0.000 0.006	NO NO	0.714 0.725	C C	0.000 0.004	NO NO
3. Echo Park Ave & Sunset Blvd	**AM** **PM**	0.686 0.790	B C	0.689 0.793	B C	0.003 0.003	NO NO	0.689 0.793	B C	0.003 0.003	NO NO
4. Glendale Blvd & Bellevue Ave	**AM** **PM**	0.798 0.698	C B	0.801 0.704	D C	0.003 0.006	NO NO	0.799 0.701	C C	0.001 0.003	NO NO
5. Echo Park Ave & Bellevue Ave	**AM** **PM**	0.487 0.479	A A	0.499 0.494	A A	0.012 0.015	NO NO	0.494 0.487	A A	0.007 0.008	NO NO
6. Union Ave & Temple St	**AM** **PM**	0.548 0.598	A A	0.559 0.607	A B	0.011 0.009	NO NO	0.555 0.602	A B	0.007 0.004	NO NO
7. Glendale Blvd & Temple St	**AM** **PM**	1.082 1.064	F F	1.096 1.075	F F	0.014 0.011	**YES** **YES**	1.091 1.069	F F	0.009 0.005	NO NO

NOTE:
The proposed project would be implemented in five phases (A through E). The two most intense phases were analyzed to identify the potential for the project to result in temporary adverse impacts. Phase D would last for up to eight weeks. Phase E would last for up to 15 weeks.

The traffic impact analysis documented in this report represents a conservative scenario in that it assumes that both construction workers and truck trips will occur during the peak traffic hours on the surrounding streets (7:00 to 9:00 AM and 4:00 to 6:00 PM). With this assumption, a potentially adverse impact was identified during the most intense phase of project construction (Phase D, for up to eight weeks) at one study intersection during both the AM and the PM peak hours. A potential measure to avoid that adverse impact would be to schedule truck trips during that phase of the project to occur outside the peak periods. Based on this analysis, it does not appear necessary to implement this measure during the other phases of construction to avoid the identified adverse impact.

A construction traffic management plan should be prepared and submitted to LADOT for review and approval prior to the start of any construction work. This plan would include such elements as the designation of haul routes for construction-related trucks, the location of access to the construction site, any driveway turning movement restrictions, temporary traffic control devices or flagmen, travel time restrictions for construction-related traffic to avoid peak travel periods on selected roadways, and designated staging and parking areas for workers and equipment.

Where construction activities would occur within a public street right-of-way around the project site, the following mitigation measures would also apply:

- A site-specific construction work site traffic control plan shall be prepared for each construction phase and submitted to LADOT for review and approval prior to the start of any construction work. This plan shall include such elements as the location of any lane closures, restricted hours during which lane closures (if any) would not be allowed, local traffic detours (if any), protective devices and traffic controls (such as barricades, cones, flagmen, lights, warning beacons, temporary traffic signals, warning signs), access limitations for abutting properties (if any), and provisions to maintain emergency access through construction work areas.

- Provide signage indicating alternative pedestrian and bicycle access routes where existing facilities would be affected. This would include the sidewalks and pedestrian pathways around the perimeter of the project site.

- Provide advance notice of planned construction activities to any affected residents, businesses and property owners in the vicinity of the construction site.

- Coordinate with emergency service providers (police, fire, ambulance and paramedic services) to provide advance notice of ongoing construction activity and construction hours.

- Coordinate with pubic transit providers (Metro, LADOT DASH) to provide advance notice of ongoing construction, construction hours and, where necessary, to identify sites for temporary bus stops within a reasonable walking distance of any displaced bus stops. It may be necessary or desirable to temporarily relocate the southbound Pico Union/Echo Park DASH stop adjacent to the project site from the east side of Echo Park Avenue.

Construction of the proposed project could result in temporary adverse traffic impacts in the immediate vicinity of the project site, leading to localized congestion. Because the impacts would be of limited duration, however, they are considered to be adverse but not significant. Feasible mitigation measures have been identified to minimize these temporary impacts.

Unavoidable Adverse Impacts

In-street construction associated with each of the project alternatives could result in adverse traffic and parking impacts in the immediate vicinity of each active construction site, leading to localized congestion and increased competition for available parking. Because these impacts would be of limited duration, however, they are considered to be less than significant. Feasible mitigation measures have been identified to minimize these temporary impacts.

5. REGIONAL TRANSPORTATION SYSTEM ANALYSIS

This chapter presents the regional transportation system impact analysis for the proposed project. This analysis was conducted in accordance with the transportation impact analysis procedures outlined in *2004 Congestion Management Program for Los Angeles County* (Metro, July 2004). The CMP requires that, when an environmental impact report is prepared for a project, traffic and transit impact analyses be conducted for select regional facilities based on the quantity of project traffic expected to use these facilities.

CMP TRAFFIC IMPACT ANALYSIS

The CMP guidelines require that the first issue addressed is the determination of the geographic scope of the study area. The criteria for determining the study area for CMP arterial monitoring intersections and for freeway monitoring locations are:

- All CMP arterial monitoring intersections where the proposed project will add 50 or more trips during either the AM or PM weekday peak hours of adjacent street traffic.
- All CMP mainline freeway monitoring locations where the proposed project will add 150 or more trips, in either direction, during either the AM or PM weekday peak hours.

The CMP arterial monitoring intersection nearest to the project site is Alvarado Street & Sunset Boulevard. Based on the project trip generation estimates previously presented and a review of the project traffic volumes shown in Figure 5 for the most intense phase of construction (Phase D), the proposed project is not expected to add more than 50 vehicles per hour (vph) at any CMP monitoring intersections during the peak hours. As a result, no further CMP arterial monitoring analysis is required.

The mainline freeway monitoring location nearest to the project site is US 101 south of Santa Monica Boulevard. Based on the incremental project trip generation estimates for Phase D and the project trip assignment, the proposed project would not add sufficient new traffic to exceed the freeway analysis criteria at this location. Because total estimated project-related traffic in any direction during either weekday peak hour is projected to be below the minimum criterion of 150 vph, no further CMP freeway analysis is required.

CMP TRANSIT IMPACT ANALYSIS

The trip generation estimates used in this study include both worker trips and truck trips during each construction phase of the proposed project. It was conservatively assumed that each worker would travel alone to and from the work site and a maximum of 40 workers would be needed during each construction phase of the project. By applying the CMP guidelines described above (that is, by converting the vehicle trips to person trips by multiplying by a 1.4 AVR and assuming 10% transit use), it is estimated that the project could potentially add up to six new transit person trips in both the AM and the PM peak hours. As discussed in Chapter 2, the project site is served by several established public transit routes providing connectivity to public transit services throughout the surrounding area, potentially distributing project transit trips across multiple routes. Given the magnitude of the estimated increase in project-related trips, as well as the temporary nature of any increase, it is concluded that no significant impact on the regional transit system would occur.

6. SUMMARY AND CONCLUSIONS

Fehr & Peers conducted the traffic impact analysis for the Environmental Impact Report (EIR) for the Echo Park Lake Rehabilitation Project. The project would determine the potentially adverse impacts caused as a result of construction truck and worker trips to and from Echo Park Lake during construction of the proposed project. The key findings and conclusions of the study are summarized below:

- The proposed project consists of improvements Echo Park Lake, bounded by Glendale Avenue, Park Avenue, Echo Park Avenue and Bellevue Avenue. The project site excludes the portions of the park located south of Bellevue Avenue and south of US 101.

- New baseline traffic data was collected for use in this study in December 2009. Detailed level of service analysis was conducted at seven intersections in the vicinity of the project site for weekday AM and PM peak hours (between 7:00 and 9:00 AM and 4:00 and 6:00 PM, respectively). Two of the seven analyzed intersections are currently operating at LOS E during one or both peak hours (Glendale Boulevard/Alvarado Street & Berkeley Avenue and Glendale Boulevard & Temple Street).

- Future traffic conditions in the study area were forecast for the year 2013 based on cumulative development projects in formation and ambient traffic growth. The cumulative base analyses (conditions without project construction) show that two of the seven study intersections will operate at poor levels of service in one or both of the analyzed peak hours are projected to continue operating at poor levels of service (i.e., LOS E or F).

- Project construction activities would occur over five phases (Phases A through E). The most intense construction phases in terms of traffic (Phase D, up to eight weeks, and E, up to 15 weeks) were fully analyzed to identify potentially adverse traffic impacts. A PCE factor of 2.5 was applied to the estimated truck volumes and the adjusted number of PCE trips was used in the traffic impact analysis.

- During Phase D, the most intense phase of construction, it is estimated that the project would generate approximately 505 daily PCE trips (80 worker trips and 425 PCE truck trips). During the AM peak hour, the proposed project would generate approximately 40 inbound worker trips and 54 PCE truck trips (27 inbound, 27 outbound). During the PM peak hour, this phase of the project would generate approximately 40 outbound worker trips and 54 PCE truck trips (27 inbound, 27 outbound).

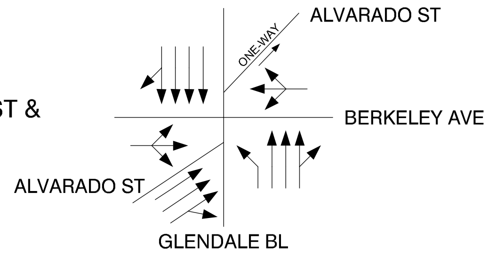
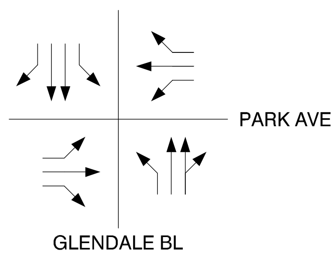
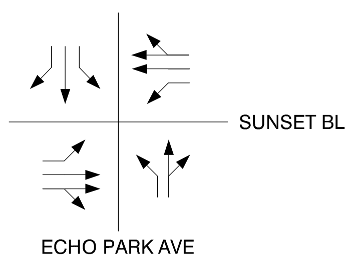
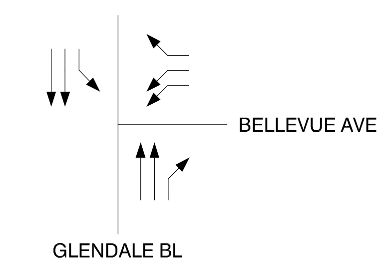
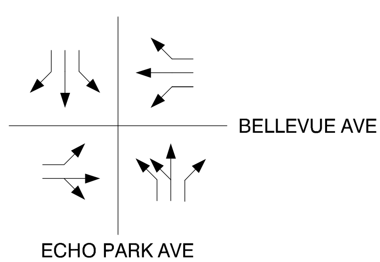
- During Phase E, the second most intense phase of construction, it is estimated that the proposed project would generate approximately 260 daily PCE trips (80 worker trips and 180 PCE truck trips). During the AM peak hour, the proposed project would generate approximately 40 inbound worker trips and 24 PCE truck trips (12 inbound, 12 outbound). During the PM peak hour, the proposed project would generate approximately 40 outbound worker trips and 24 PCE truck trips (12 inbound, 12 outbound).

- According to the City of Los Angeles' impact criteria, the proposed project would adversely impact one study intersection during one construction phase lasting approximately eight weeks:
    - Phases A through C: no adverse impacts are expected at any study intersections
    - Phase D: Glendale Boulevard & Temple Street (AM and PM peak hours)

   - Phase E: no adverse impacts are expected at any study intersections

- A mitigation program was developed to address the identified temporary adverse impacts. By its nature, the proposed project would result in only temporary traffic impacts. The overall construction schedule is approximately two years, with the most intense phase of construction occurring for up to eight weeks.

APPENDIX A:
INTERSECTION LANE CONFIGURATIONS

	EXISTING CONDITIONS	FUTURE CONDITIONS
1. GLENDALE BL/ALVARADO ST & BERKELEY AVE		SAME AS EXISTING CONDITIONS
2. GLENDALE BL & PARK AVE		SAME AS EXISTING CONDITIONS
3. ECHO PARK AVE & SUNSET BL		SAME AS EXISTING CONDITIONS
4. GLENDALE BL & BELLEVUE AVE		SAME AS EXISTING CONDITIONS
5. ECHO PARK AVE & BELLEVUE AVE		SAME AS EXISTING CONDITIONS

FEHR & PEERS
TRANSPORTATION CONSULTANTS

INTERSECTION LANE CONFIGURATIONS

APPENDIX A

Jan 21, 2010 AN
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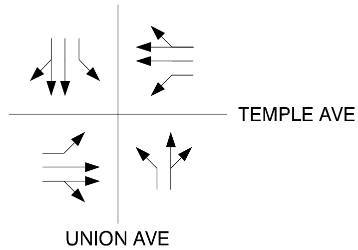
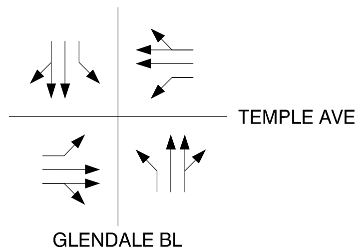
	EXISTING CONDITIONS	FUTURE CONDITIONS
6. UNION AVE & TEMPLE AVE		SAME AS EXISTING CONDITIONS
7. GLENDALE BL & TEMPLE AVE		SAME AS EXISTING CONDITIONS

FEHR & PEERS
TRANSPORTATION CONSULTANTS

INTERSECTION LANE CONFIGURATIONS

APPENDIX A

Jan 21, 2010 AN
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APPENDIX B:
TRAFFIC COUNTS

INTERSECTION TURNING MOVEMENT COUNT SUMMARY

CLIENT: FEHR & PEERS / KAKU ASSOCIATES, INC.
PROJECT: ECHO PARK LAKE REHABILITATION PROJECT - LOS ANGELES
DATE: WEDNESDAY, NOVEMBER 18, 2009
PERIOD: 07:00 AM TO 09:00 AM
INTERSECTION: N/S GLENDALE BOULEVARD / ALVARADO STREET
E/W BERKELEY AVENUE
FILE NUMBER: 1-AM

	FROM GLENDALE BLVD N			FROM BERKELEY AVE E					FROM GLENDALE BLVD S				FROM ALVARADO ST S					FROM BERKELEY AVE W				
15 MINUTE	1	2	3	4	5	6	7	8	9	10	11	12	14	15	16	17	18	19	20	21	22	23
TOTALS	BERKELEY W	ALVARADO S	GLENDALE S	ALVARADO N	GLENDALE N	BERKELEY W	ALVARADO S	GLENDALE S	BERKELEY E	ALVARADO N	GLENDALE N	BERKELEY W	GLENDALE S	BERKELEY E	ALVAVRADO N	GLENDALE N	BERKELEY W	ALVARADO S	GLENDALE S	BERKELEY E	ALVARADO N	GLENDALE N
700-715	2	342	432	0	14	2	6	9	2	2	140	8	0	0	2	199	2	16	13	2	0	41
715-730	0	288	454	0	14	4	10	8	0	3	129	10	0	0	3	194	3	17	9	5	0	39
730-745	2	246	448	0	12	7	11	9	2	1	167	6	0	0	3	174	2	11	15	7	0	49
745-800	0	322	469	2	16	4	6	6	3	3	182	9	0	3	3	217	1	8	16	10	0	62
800-815	2	289	466	0	15	2	6	5	2	4	173	10	0	3	0	206	3	12	17	11	0	44
815-830	1	303	436	1	14	5	7	6	2	2	149	7	1	0	0	178	1	8	16	5	1	46
830-845	2	310	475	0	15	4	4	7	1	0	170	5	1	2	1	222	3	7	25	4	0	31
845-900	0	265	393	0	15	2	3	4	3	1	148	8	0	1	3	212	4	10	16	3	1	44

	FROM GLENDALE BLVD N			FROM BERKELEY AVE E					FROM GLENDALE BLVD S				FROM ALVARADO ST S					FROM BERKELEY AVE W					
1 HOUR	1	2	3	4	5	6	7	8	9	10	11	12	14	15	16	17	18	19	20	21	22	23	
TOTALS	BERKELEY W	ALVARADO S	GLENDALE S	ALVARADO N	GLENDALE N	BERKELEY W	ALVARADO S	GLENDALE S	BERKELEY E	ALVARADO N	GLENDALE N	BERKELEY W	GLENDALE S	BERKELEY E	ALVAVRADO N	GLENDALE N	BERKELEY W	ALVARADO S	GLENDALE S	BERKELEY E	ALVARADO N	GLENDALE N	TOTALS
700-800	4	1198	1803	2	56	17	33	32	7	9	618	33	0	3	11	784	8	52	53	24	0	191	4938
715-815	4	1145	1837	2	57	17	33	28	7	11	651	35	0	6	9	791	9	48	57	33	0	194	4974
730-830	5	1160	1819	3	57	18	30	26	9	10	671	32	1	6	6	775	7	39	64	33	1	201	4973
745-845	5	1224	1846	3	60	15	23	24	8	9	674	31	2	8	4	823	8	35	74	30	1	183	5090
800-900	5	1167	1770	1	59	13	20	22	8	7	640	30	2	6	4	818	11	37	74	23	2	165	4884

THE TRAFFIC SOLUTION
329 DIAMOND STREET
ARCADIA, CALIFORNIA 91006
626.446.7978

INTERSECTION TURNING MOVEMENT COUNT SUMMARY

CLIENT: FEHR & PEERS / KAKU ASSOCIATES, INC.
PROJECT: ECHO PARK LAKE REHABILITATION PROJECT - LOS ANGELES
DATE: WEDNESDAY, NOVEMBER 18, 2009
PERIOD: 04:00 PM TO 06:00 PM
INTERSECTION: N/S GLENDALE BOULEVARD / ALVARADO STREET
E/W BERKELEY AVENUE
FILE NUMBER: 1-PM

	FROM GLENDALE BLVD N			FROM BERKELEY AVE E					FROM GLENDALE BLVD S				FROM ALVARADO ST S					FROM BERKELEY AVE W				
15 MINUTE	1	2	3	4	5	6	7	8	9	10	11	12	14	15	16	17	18	19	20	21	22	23
TOTALS	BERKELEY W	ALVARADO S	GLENDALE S	ALVARADO N	GLENDALE N	BERKELEY W	ALVARADO S	GLENDALE S	BERKELEY E	ALVARADO N	GLENDALE N	BERKELEY W	GLENDALE S	BERKELEY E	ALVAVRADO N	GLENDALE N	BERKELEY W	ALVARADO S	GLENDALE S	BERKELEY E	ALVARADO N	GLENDALE N
400-415	5	222	231	0	21	5	5	9	1	7	435	12	0	4	4	363	7	8	11	21	0	0
415-430	3	287	283	0	22	7	6	6	1	5	485	11	0	2	3	307	4	8	17	21	0	0
430-445	1	241	240	2	26	4	7	8	1	6	503	7	0	1	6	325	1	6	14	31	0	0
445-500	1	230	291	0	22	2	3	7	1	8	484	8	0	3	3	333	1	8	11	30	0	0
500-515	3	278	315	0	25	5	4	5	0	8	520	8	0	1	4	352	2	13	15	48	0	0
515-530	4	256	264	0	39	3	6	8	3	6	468	6	1	0	5	399	2	10	10	39	0	1
530-545	3	268	287	0	25	2	3	5	2	6	475	6	1	1	2	336	0	5	13	27	0	0
545-600	2	227	259	0	39	4	4	4	0	9	424	7	0	2	3	362	0	8	8	30	0	0

	FROM GLENDALE BLVD N			FROM BERKELEY AVE E					FROM GLENDALE BLVD S				FROM ALVARADO ST S					FROM BERKELEY AVE W					
1 HOUR	1	2	3	4	5	6	7	8	9	10	11	12	14	15	16	17	18	19	20	21	22	23	
TOTALS	BERKELEY W	ALVARADO S	GLENDALE S	ALVARADO N	GLENDALE N	BERKELEY W	ALVARADO S	GLENDALE S	BERKELEY E	ALVARADO N	GLENDALE N	BERKELEY W	GLENDALE S	BERKELEY E	ALVAVRADO N	GLENDALE N	BERKELEY W	ALVARADO S	GLENDALE S	BERKELEY E	ALVARADO N	GLENDALE N	TOTALS
400-500	10	980	1045	2	91	18	21	30	4	26	1907	38	0	10	16	1328	13	30	53	103	0	0	5725
415-515	8	1036	1129	2	95	18	20	26	3	27	1992	34	0	7	16	1317	8	35	57	130	0	0	5960
430-530	9	1005	1110	2	112	14	20	28	5	28	1975	29	1	5	18	1409	6	37	50	148	0	1	6012
445-545	11	1032	1157	0	111	12	16	25	6	28	1947	28	2	5	14	1420	5	36	49	144	0	1	6049
500-600	12	1029	1125	0	128	14	17	22	5	29	1887	27	2	4	14	1449	4	36	46	144	0	1	5995

NOTE: EBLT PROHIBITED 4:00 PM TO 7:00 PM

THE TRAFFIC SOLUTION
329 DIAMOND STREET
ARCADIA, CALIFORNIA 91006
626.446.7978

INTERSECTION TURNING MOVEMENT COUNT SUMMARY

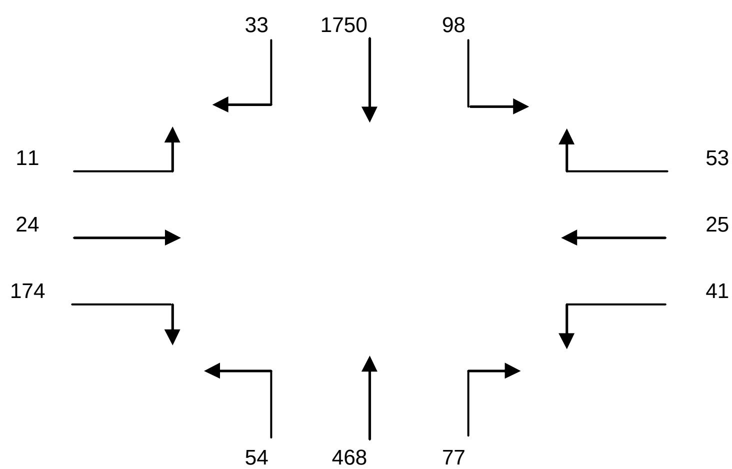
CLIENT: FEHR & PEERS / KAKU ASSOCIATES, INC.
PROJECT: ECHO PARK LAKE REHABILITATION PROJECT - LOS ANGELES
DATE: WEDNESDAY, NOVEMBER 18, 2009
PERIOD: 07:00 AM TO 09:00 AM
INTERSECTION: N/S GLENDALE BOULEVARD
E/W PARK AVENUE
FILE NUMBER: 2-AM

15 MINUTE	1	2	3	4	5	6	7	8	9	10	11	12
TOTALS	SBRT	SBTH	SBLT	WBRT	WBTH	WBLT	NBRT	NBTH	NBLT	EBRT	EBTH	EBLT
700-715	6	388	22	9	1	5	7	96	10	28	2	1
715-730	5	422	21	11	3	5	5	93	7	37	2	1
730-745	6	446	16	11	4	8	12	113	14	49	3	2
745-800	6	435	20	14	4	9	21	122	12	48	4	5
800-815	7	453	20	16	5	13	20	130	12	48	7	2
815-830	12	420	29	11	9	12	23	106	16	40	5	3
830-845	8	442	29	12	7	7	13	110	14	38	8	1
845-900	11	393	18	15	5	10	16	102	14	59	9	1

1 HOUR	1	2	3	4	5	6	7	8	9	10	11	12	
TOTALS	SBRT	SBTH	SBLT	WBRT	WBTH	WBLT	NBRT	NBTH	NBLT	EBRT	EBTH	EBLT	TOTALS
700-800	23	1691	79	45	12	27	45	424	43	162	11	9	2571
715-815	24	1756	77	52	16	35	58	458	45	182	16	10	2729
730-830	31	1754	85	52	22	42	76	471	54	185	19	12	2803
745-845	33	1750	98	53	25	41	77	468	54	174	24	11	2808
800-900	38	1708	96	54	26	42	72	448	56	185	29	7	2761

A.M. PEAK HOUR
0745-0845

PARK AVENUE



GLENDALE BOULEVARD

THE TRAFFIC SOLUTION
329 DIAMOND STREET
ARCADIA, CALIFORNIA 91006
626.446.7978

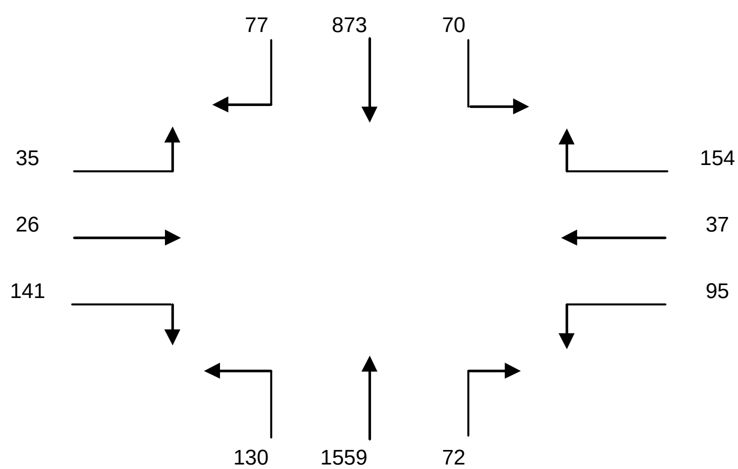
INTERSECTION TURNING MOVEMENT COUNT SUMMARY

CLIENT: FEHR & PEERS / KAKU ASSOCIATES, INC.
PROJECT: ECHO PARK LAKE REHABILITATION PROJECT - LOS ANGELES
DATE: WEDNESDAY, NOVEMBER 18, 2009
PERIOD: 04:00 PM TO 06:00 PM
INTERSECTION: N/S GLENDALE BOULEVARD
E/W PARK AVENUE
FILE NUMBER: 2-PM

15 MINUTE	1	2	3	4	5	6	7	8	9	10	11	12
TOTALS	SBRT	SBTH	SBLT	WBRT	WBTH	WBLT	NBRT	NBTH	NBLT	EBRT	EBTH	EBLT
400-415	18	223	12	31	11	19	22	378	27	38	4	11
415-430	14	216	19	28	9	14	23	392	35	29	6	11
430-445	16	235	15	38	12	25	21	408	36	26	6	11
445-500	17	224	19	39	11	20	23	384	27	27	8	10
500-515	23	219	18	32	8	28	15	400	21	32	6	11
515-530	16	221	17	32	11	26	19	381	32	30	4	8
530-545	15	223	19	40	7	20	17	395	39	44	6	8
545-600	23	210	16	50	11	21	21	383	38	35	10	8

1 HOUR	1	2	3	4	5	6	7	8	9	10	11	12	
TOTALS	SBRT	SBTH	SBLT	WBRT	WBTH	WBLT	NBRT	NBTH	NBLT	EBRT	EBTH	EBLT	TOTALS
400-500	65	898	65	136	43	78	89	1562	125	120	24	43	3248
415-515	70	894	71	137	40	87	82	1584	119	114	26	43	3267
430-530	72	899	69	141	42	99	78	1573	116	115	24	40	3268
445-545	71	887	73	143	37	94	74	1560	119	133	24	37	3252
500-600	77	873	70	154	37	95	72	1559	130	141	26	35	3269

P.M. PEAK HOUR
0500-0600



PARK AVENUE

GLENDALE BOULEVARD

THE TRAFFIC SOLUTION
329 DIAMOND STREET
ARCADIA, CALIFORNIA 91006
626.446.7978

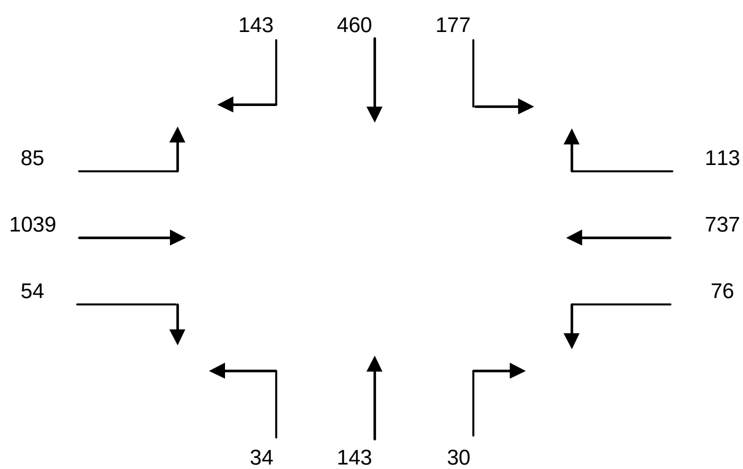
INTERSECTION TURNING MOVEMENT COUNT SUMMARY

CLIENT: FEHR & PEERS / KAKU ASSOCIATES, INC.
PROJECT: ECHO PARK LAKE REHABILITATION PROJECT - LOS ANGELES
DATE: WEDNESDAY, NOVEMBER 18, 2009
PERIOD: 07:00 AM TO 09:00 AM
INTERSECTION: N/S ECHO PARK AVENUE
E/W SUNSET BOULEVARD
FILE NUMBER: 3-AM

15 MINUTE TOTALS	1 SBRT	2 SBTH	3 SBLT	4 WBRT	5 WBTH	6 WBLT	7 NBRT	8 NBTH	9 NBLT	10 EBRT	11 EBTH	12 EBLT
700-715	25	70	33	17	150	9	4	24	6	5	157	9
715-730	36	78	24	27	149	15	6	28	8	8	172	15
730-745	35	92	33	28	193	12	7	30	10	12	226	25
745-800	38	123	53	38	194	17	7	36	10	13	277	23
800-815	40	141	49	27	180	26	10	43	7	18	292	20
815-830	30	104	42	20	170	21	6	34	7	11	244	17
830-845	23	88	39	16	123	18	7	35	5	8	221	20
845-900	28	90	41	18	132	10	9	33	4	8	214	22

1 HOUR TOTALS	1 SBRT	2 SBTH	3 SBLT	4 WBRT	5 WBTH	6 WBLT	7 NBRT	8 NBTH	9 NBLT	10 EBRT	11 EBTH	12 EBLT	TOTALS
700-800	134	363	143	110	686	53	24	118	34	38	832	72	2607
715-815	149	434	159	120	716	70	30	137	35	51	967	83	2951
730-830	143	460	177	113	737	76	30	143	34	54	1039	85	3091
745-845	131	456	183	101	667	82	30	148	29	50	1034	80	2991
800-900	121	423	171	81	605	75	32	145	23	45	971	79	2771

A.M. PEAK HOUR
0730-0830



SUNSET BOULEVARD

ECHO PARK AVENUE

THE TRAFFIC SOLUTION
329 DIAMOND STREET
ARCADIA, CALIFORNIA 91006
626.446.7978

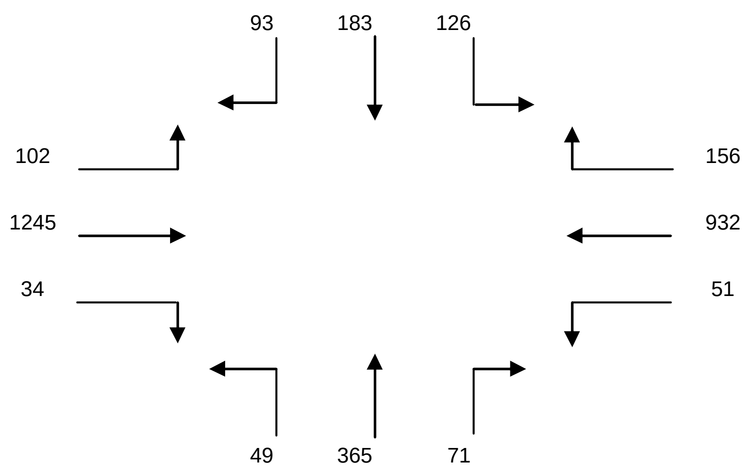
INTERSECTION TURNING MOVEMENT COUNT SUMMARY

CLIENT: FEHR & PEERS / KAKU ASSOCIATES, INC.
PROJECT: ECHO PARK LAKE REHABILITATION PROJECT - LOS ANGELES
DATE: WEDNESDAY, NOVEMBER 18, 2009
PERIOD: 04:00 PM TO 06:00 PM
INTERSECTION: N/S ECHO PARK AVENUIE
E/W SUNSET BOULEVARD
FILE NUMBER: 3-PM

15 MINUTE	1	2	3	4	5	6	7	8	9	10	11	12
TOTALS	SBRT	SBTH	SBLT	WBRT	WBTH	WBLT	NBRT	NBTH	NBLT	EBRT	EBTH	EBLT
400-415	16	48	30	41	235	19	16	61	12	12	270	29
415-430	21	40	40	34	224	14	17	65	11	19	233	22
430-445	31	39	34	30	191	11	17	72	12	15	249	16
445-500	26	40	24	46	188	8	15	83	8	10	265	22
500-515	20	49	34	32	210	12	14	97	15	8	339	23
515-530	21	41	36	42	248	10	18	82	12	11	324	25
530-545	24	43	25	41	241	15	18	96	11	9	304	22
545-600	28	50	31	41	233	14	21	90	11	6	278	32

1 HOUR	1	2	3	4	5	6	7	8	9	10	11	12	
TOTALS	SBRT	SBTH	SBLT	WBRT	WBTH	WBLT	NBRT	NBTH	NBLT	EBRT	EBTH	EBLT	TOTALS
400-500	94	167	128	151	838	52	65	281	43	56	1017	89	2981
415-515	98	168	132	142	813	45	63	317	46	52	1086	83	3045
430-530	98	169	128	150	837	41	64	334	47	44	1177	86	3175
445-545	91	173	119	161	887	45	65	358	46	38	1232	92	3307
500-600	93	183	126	156	932	51	71	365	49	34	1245	102	3407

P.M. PEAK HOUR
0500-0600



SUNSET BOULEVARD

ECHO PARK AVENUIE

THE TRAFFIC SOLUTION
329 DIAMOND STREET
ARCADIA, CALIFORNIA 91006
626.446.7978

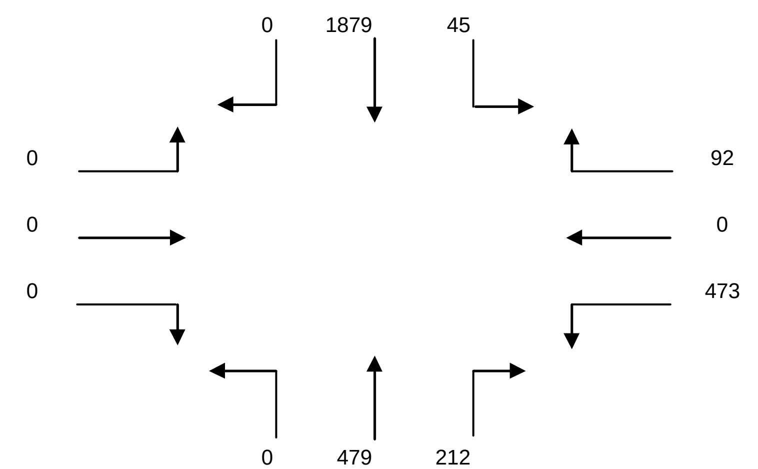
INTERSECTION TURNING MOVEMENT COUNT SUMMARY

CLIENT: FEHR & PEERS / KAKU ASSOCIATES, INC.
PROJECT: ECHO PARK LAKE REHABILITATION PROJECT - LOS ANGELES
DATE: WEDNESDAY, NOVEMBER 18, 2009
PERIOD: 07:00 AM TO 09:00 AM
INTERSECTION: N/S GLENDALE BOULEVARD
E/W BELLEVUE AVENUE
FILE NUMBER: 4-AM

15 MINUTE TOTALS	1 SBRT	2 SBTH	3 SBLT	4 WBRT	5 WBTH	6 WBLT	7 NBRT	8 NBTH	9 NBLT	10 EBRT	11 EBTH	12 EBLT
700-715	0	479	6	20	0	75	20	79	0	0	0	0
715-730	0	495	9	21	0	84	30	98	0	0	0	0
730-745	0	464	8	24	0	100	45	104	0	0	0	0
745-800	0	445	10	23	0	118	59	117	0	0	0	0
800-815	0	478	12	22	0	132	58	137	0	0	0	0
815-830	0	492	15	23	0	123	50	121	0	0	0	0
830-845	0	450	11	20	0	92	35	107	0	0	0	0
845-900	0	421	14	16	0	90	48	98	0	0	0	0

1 HOUR TOTALS	1 SBRT	2 SBTH	3 SBLT	4 WBRT	5 WBTH	6 WBLT	7 NBRT	8 NBTH	9 NBLT	10 EBRT	11 EBTH	12 EBLT	TOTALS
700-800	0	1883	33	88	0	377	154	398	0	0	0	0	2933
715-815	0	1882	39	90	0	434	192	456	0	0	0	0	3093
730-830	0	1879	45	92	0	473	212	479	0	0	0	0	3180
745-845	0	1865	48	88	0	465	202	482	0	0	0	0	3150
800-900	0	1841	52	81	0	437	191	463	0	0	0	0	3065

A.M. PEAK HOUR
0730-0830



BELLEVUE AVENUE

GLENDALE BOULEVARD

THE TRAFFIC SOLUTION
329 DIAMOND STREET
ARCADIA, CALIFORNIA 91006
626.446.7978

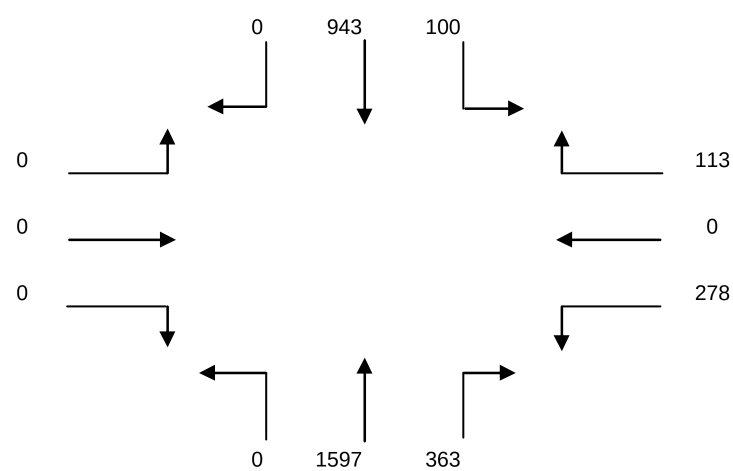
INTERSECTION TURNING MOVEMENT COUNT SUMMARY

CLIENT: FEHR & PEERS / KAKU ASSOCIATES, INC.
PROJECT: ECHO PARK LAKE REHABILITATION PROJECT - LOS ANGELES
DATE: WEDNESDAY, NOVEMBER 18, 2009
PERIOD: 04:00 PM TO 06:00 PM
INTERSECTION: N/S GLENDALE BOULEVARD
E/W BELLEVUE AVENUE
FILE NUMBER: 4-PM

15 MINUTE	1	2	3	4	5	6	7	8	9	10	11	12
TOTALS	SBRT	SBTH	SBLT	WBRT	WBTH	WBLT	NBRT	NBTH	NBLT	EBRT	EBTH	EBLT
400-415	0	252	20	34	0	53	89	368	0	0	0	0
415-430	0	248	28	52	0	62	89	386	0	0	0	0
430-445	0	230	24	50	0	64	71	429	0	0	0	0
445-500	0	241	21	37	0	64	92	377	0	0	0	0
500-515	0	213	26	38	0	77	87	380	0	0	0	0
515-530	0	267	27	23	0	66	89	387	0	0	0	0
530-545	0	222	23	30	0	70	102	413	0	0	0	0
545-600	0	241	24	22	0	65	85	417	0	0	0	0

1 HOUR	1	2	3	4	5	6	7	8	9	10	11	12	
TOTALS	SBRT	SBTH	SBLT	WBRT	WBTH	WBLT	NBRT	NBTH	NBLT	EBRT	EBTH	EBLT	TOTALS
400-500	0	971	93	173	0	243	341	1560	0	0	0	0	3381
415-515	0	932	99	177	0	267	339	1572	0	0	0	0	3386
430-530	0	951	98	148	0	271	339	1573	0	0	0	0	3380
445-545	0	943	97	128	0	277	370	1557	0	0	0	0	3372
500-600	0	943	100	113	0	278	363	1597	0	0	0	0	3394

P.M. PEAK HOUR
0500-0600



BELLEVUE AVENUE

GLENDALE BOULEVARD

THE TRAFFIC SOLUTION
329 DIAMOND STREET
ARCADIA, CALIFORNIA 91006
626.446.7978

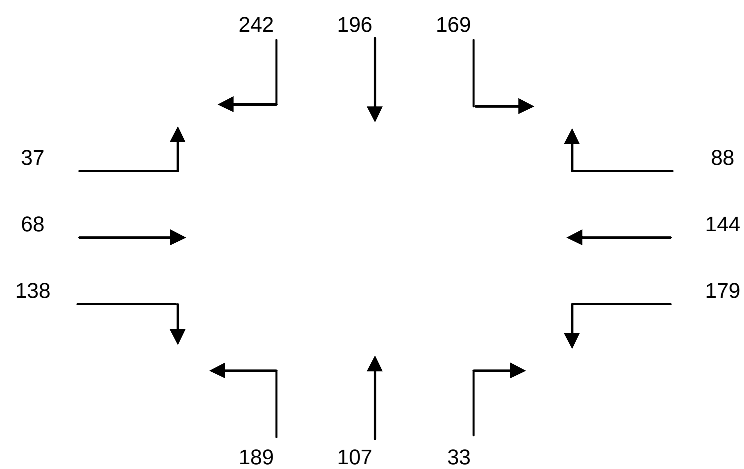
INTERSECTION TURNING MOVEMENT COUNT SUMMARY

CLIENT: FEHR & PEERS / KAKU ASSOCIATES, INC.
PROJECT: ECHO PARK LAKE REHABILITATION PROJECT - LOS ANGELES
DATE: WEDNESDAY, NOVEMBER 18, 2009
PERIOD: 07:00 AM TO 09:00 AM
INTERSECTION: N/S ECHO PARK AVENUE / US 101 NB RAMPS
E/W BELLEVUE AVENUE
FILE NUMBER: 5-AM

15 MINUTE	1	2	3	4	5	6	7	8	9	10	11	12
TOTALS	SBRT	SBTH	SBLT	WBRT	WBTH	WBLT	NBRT	NBTH	NBLT	EBRT	EBTH	EBLT
700-715	20	23	22	10	16	20	5	18	35	16	10	4
715-730	38	38	34	13	25	34	12	22	31	27	19	5
730-745	63	51	28	18	39	55	9	31	40	39	13	7
745-800	72	40	53	19	37	54	8	32	59	27	17	11
800-815	50	59	56	20	38	40	9	24	47	30	23	9
815-830	57	46	32	18	30	30	7	20	43	42	15	10
830-845	43	58	36	13	29	33	5	25	41	30	14	11
845-900	53	48	29	11	31	30	8	20	38	28	13	9

1 HOUR	1	2	3	4	5	6	7	8	9	10	11	12	
TOTALS	SBRT	SBTH	SBLT	WBRT	WBTH	WBLT	NBRT	NBTH	NBLT	EBRT	EBTH	EBLT	TOTALS
700-800	193	152	137	60	117	163	34	103	165	109	59	27	1319
715-815	223	188	171	70	139	183	38	109	177	123	72	32	1525
730-830	242	196	169	75	144	179	33	107	189	138	68	37	1577
745-845	222	203	177	70	134	157	29	101	190	129	69	41	1522
800-900	203	211	153	62	128	133	29	89	169	130	65	39	1411

A.M. PEAK HOUR
0730-0830



BELLEVUE AVENUE

ECHO PARK AVENUE / US 101 NB RAMPS

THE TRAFFIC SOLUTION
329 DIAMOND STREET
ARCADIA, CALIFORNIA 91006
626.446.7978

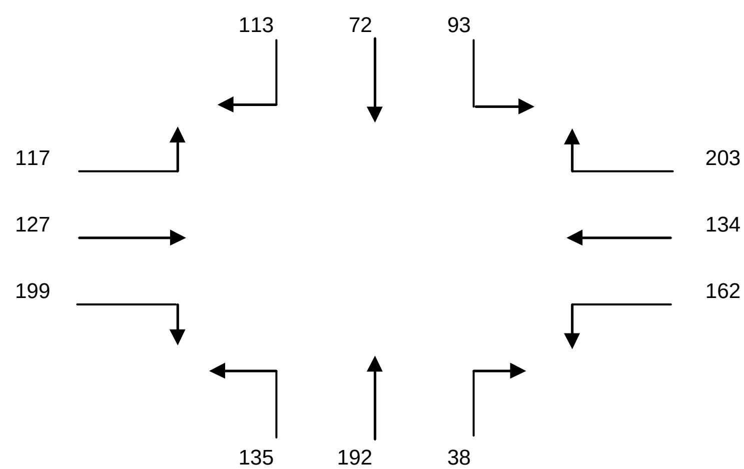
INTERSECTION TURNING MOVEMENT COUNT SUMMARY

CLIENT: FEHR & PEERS / KAKU ASSOCIATES, INC.
PROJECT: ECHO PARK LAKE REHABILITATION PROJECT - LOS ANGELES
DATE: WEDNESDAY, NOVEMBER 18, 2009
PERIOD: 04:00 PM TO 06:00 PM
INTERSECTION: N/S ECHO PARK AVENUE / US 101 NB RAMPS
E/W BELLEVUE AVENUE
FILE NUMBER: 5-PM

15 MINUTE	1	2	3	4	5	6	7	8	9	10	11	12
TOTALS	SBRT	SBTH	SBLT	WBRT	WBTH	WBLT	NBRT	NBTH	NBLT	EBRT	EBTH	EBLT
400-415	31	29	18	30	32	37	15	37	41	61	28	19
415-430	31	29	23	37	27	34	16	52	56	50	38	23
430-445	33	24	17	34	27	35	17	47	58	49	28	21
445-500	26	16	16	39	23	34	15	49	52	68	32	23
500-515	25	18	24	44	37	40	10	53	39	40	28	20
515-530	26	14	21	56	26	56	8	47	29	54	33	28
530-545	38	20	21	50	30	30	11	50	39	56	32	30
545-600	24	20	27	53	41	36	9	42	28	49	34	39

1 HOUR	1	2	3	4	5	6	7	8	9	10	11	12	
TOTALS	SBRT	SBTH	SBLT	WBRT	WBTH	WBLT	NBRT	NBTH	NBLT	EBRT	EBTH	EBLT	TOTALS
400-500	121	98	74	140	109	140	63	185	207	228	126	86	1577
415-515	115	87	80	154	114	143	58	201	205	207	126	87	1577
430-530	110	72	78	173	113	165	50	196	178	211	121	92	1559
445-545	115	68	82	189	116	160	44	199	159	218	125	101	1576
500-600	113	72	93	203	134	162	38	192	135	199	127	117	1585

P.M. PEAK HOUR
0500-0600



BELLEVUE AVENUE

ECHO PARK AVENUE / US 101 NB RAMPS

THE TRAFFIC SOLUTION
329 DIAMOND STREET
ARCADIA, CALIFORNIA 91006
626.446.7978

INTERSECTION TURNING MOVEMENT COUNT SUMMARY

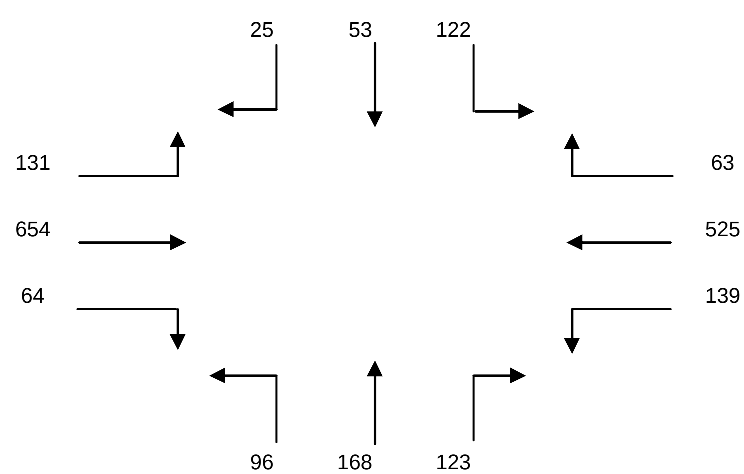
CLIENT: FEHR & PEERS / KAKU ASSOCIATES, INC.
PROJECT: ECHO PARK LAKE REHABILITATION PROJECT - LOS ANGELES
DATE: WEDNESDAY, NOVEMBER 18, 2009
PERIOD: 07:00 AM TO 09:00 AM
INTERSECTION: N/S UNION AVENUE
E/W TEMPLE STREET
FILE NUMBER: 6-AM

15 MINUTE TOTALS	1 SBRT	2 SBTH	3 SBLT	4 WBRT	5 WBTH	6 WBLT	7 NBRT	8 NBTH	9 NBLT	10 EBRT	11 EBTH	12 EBLT
700-715	6	11	24	11	70	22	28	32	17	12	121	20
715-730	4	8	26	10	91	31	22	43	19	13	130	28
730-745	7	13	28	15	121	35	31	45	20	10	144	39
745-800	8	17	37	16	153	39	33	50	35	19	161	29
800-815	4	10	37	16	128	33	39	40	23	18	199	31
815-830	6	13	20	16	123	32	20	33	18	17	150	32
830-845	5	12	16	10	138	20	21	21	14	12	135	24
845-900	4	13	15	11	130	22	27	26	16	9	147	19

1 HOUR TOTALS	1 SBRT	2 SBTH	3 SBLT	4 WBRT	5 WBTH	6 WBLT	7 NBRT	8 NBTH	9 NBLT	10 EBRT	11 EBTH	12 EBLT	TOTALS
700-800	25	49	115	52	435	127	114	170	91	54	556	116	1904
715-815	23	48	128	57	493	138	125	178	97	60	634	127	2108
730-830	25	53	122	63	525	139	123	168	96	64	654	131	2163
745-845	23	52	110	58	542	124	113	144	90	66	645	116	2083
800-900	19	48	88	53	519	107	107	120	71	56	631	106	1925

A.M. PEAK HOUR
0730-0830

TEMPLE STREET



UNION AVENUE

THE TRAFFIC SOLUTION
329 DIAMOND STREET
ARCADIA, CALIFORNIA 91006
626.446.7978

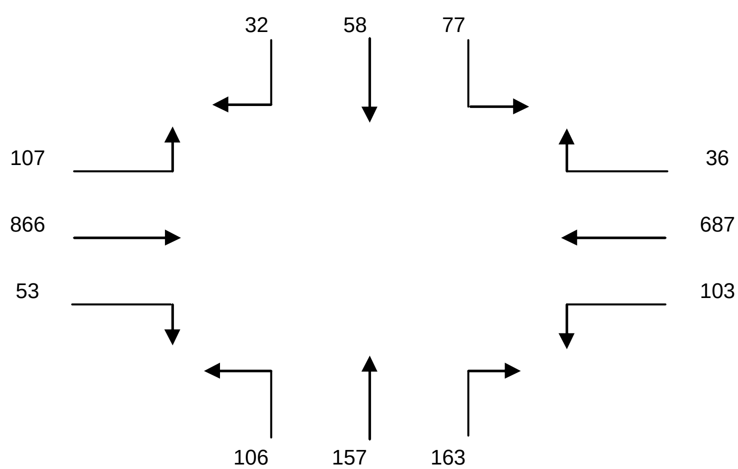
INTERSECTION TURNING MOVEMENT COUNT SUMMARY

CLIENT:		FEHR & PEERS / KAKU ASSOCIATES, INC.
PROJECT:		ECHO PARK LAKE REHABILITATION PROJECT - LOS ANGELES
DATE:		WEDNESDAY, NOVEMBER 18, 2009
PERIOD:		04:00 PM TO 06:00 PM
INTERSECTION:	N/S	UNION AVENUE
	E/W	TEMPLE STREET
FILE NUMBER:		6-PM

15 MINUTE TOTALS	1 SBRT	2 SBTH	3 SBLT	4 WBRT	5 WBTH	6 WBLT	7 NBRT	8 NBTH	9 NBLT	10 EBRT	11 EBTH	12 EBLT
400-415	7	14	27	8	144	23	33	39	22	11	169	31
415-430	12	14	23	10	136	19	38	33	22	11	185	26
430-445	7	15	25	8	153	25	34	48	24	8	194	20
445-500	8	19	30	11	147	37	39	40	20	12	205	26
500-515	11	15	24	12	157	28	35	47	26	14	202	24
515-530	9	16	23	7	178	29	49	43	33	12	221	28
530-545	5	12	19	7	182	24	42	31	26	12	211	28
545-600	7	15	11	10	170	22	37	36	21	15	232	27

1 HOUR TOTALS	1 SBRT	2 SBTH	3 SBLT	4 WBRT	5 WBTH	6 WBLT	7 NBRT	8 NBTH	9 NBLT	10 EBRT	11 EBTH	12 EBLT	TOTALS
400-500	34	62	105	37	580	104	144	160	88	42	753	103	2212
415-515	38	63	102	41	593	109	146	168	92	45	786	96	2279
430-530	35	65	102	38	635	119	157	178	103	46	822	98	2398
445-545	33	62	96	37	664	118	165	161	105	50	839	106	2436
500-600	32	58	77	36	687	103	163	157	106	53	866	107	2445

P.M. PEAK HOUR
0500-0600



TEMPLE STREET

UNION AVENUE

THE TRAFFIC SOLUTION
329 DIAMOND STREET
ARCADIA, CALIFORNIA 91006
626.446.7978

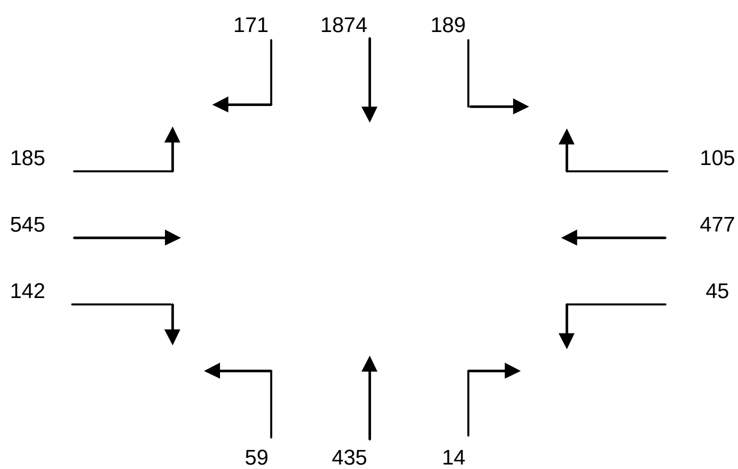
INTERSECTION TURNING MOVEMENT COUNT SUMMARY

CLIENT: FEHR & PEERS / KAKU ASSOCIATES, INC.
PROJECT: ECHO PARK LAKE REHABILITATION PROJECT - LOS ANGELES
DATE: WEDNESDAY, NOVEMBER 18, 2009
PERIOD: 07:00 AM TO 09:00 AM
INTERSECTION: N/S GLENDALE BOULEVARD
E/W TEMPLE STREET
FILE NUMBER: 7-AM

15 MINUTE TOTALS	1 SBRT	2 SBTH	3 SBLT	4 WBRT	5 WBTH	6 WBLT	7 NBRT	8 NBTH	9 NBLT	10 EBRT	11 EBTH	12 EBLT
700-715	25	375	63	21	77	6	1	57	6	25	75	40
715-730	43	453	57	20	84	9	3	78	12	32	106	43
730-745	39	503	50	23	105	10	5	99	10	37	128	47
745-800	54	469	54	28	120	17	3	117	14	43	141	45
800-815	40	450	46	25	126	12	3	115	18	34	159	55
815-830	38	452	39	29	126	6	3	104	17	28	117	38
830-845	42	483	37	18	105	11	3	101	11	36	102	36
845-900	51	478	30	11	77	7	6	106	17	43	101	52

1 HOUR TOTALS	1 SBRT	2 SBTH	3 SBLT	4 WBRT	5 WBTH	6 WBLT	7 NBRT	8 NBTH	9 NBLT	10 EBRT	11 EBTH	12 EBLT	TOTALS
700-800	161	1800	224	92	386	42	12	351	42	137	450	175	3872
715-815	176	1875	207	96	435	48	14	409	54	146	534	190	4184
730-830	171	1874	189	105	477	45	14	435	59	142	545	185	4241
745-845	174	1854	176	100	477	46	12	437	60	141	519	174	4170
800-900	171	1863	152	83	434	36	15	426	63	141	479	181	4044

A.M. PEAK HOUR
0730-0830



GLENDALE BOULEVARD

GLENDALE BOULEVARD

THE TRAFFIC SOLUTION
329 DIAMOND STREET
ARCADIA, CALIFORNIA 91006
626.446.7978

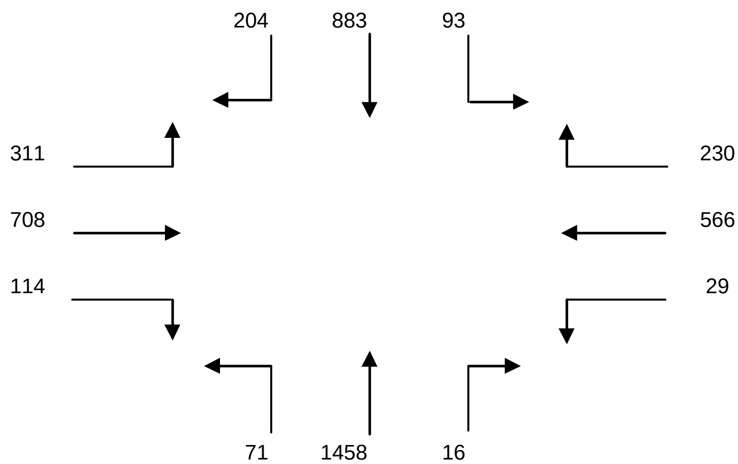
INTERSECTION TURNING MOVEMENT COUNT SUMMARY

CLIENT: FEHR & PEERS / KAKU ASSOCIATES, INC.
PROJECT: ECHO PARK LAKE REHABILITATION PROJECT - LOS ANGELES
DATE: WEDNESDAY, NOVEMBER 18, 2009
PERIOD: 04:00 PM TO 06:00 PM
INTERSECTION: N/S GLENDALE BOULEVARD
E/W TEMPLE STREET
FILE NUMBER: 7-PM

15 MINUTE	1	2	3	4	5	6	7	8	9	10	11	12
TOTALS	SBRT	SBTH	SBLT	WBRT	WBTH	WBLT	NBRT	NBTH	NBLT	EBRT	EBTH	EBLT
400-415	51	225	25	62	97	11	5	319	13	17	133	94
415-430	40	183	20	57	118	10	4	396	19	24	156	77
430-445	53	222	17	58	114	7	3	343	14	26	172	62
445-500	62	249	25	68	146	6	3	321	12	20	162	80
500-515	44	210	24	60	124	9	3	366	13	25	164	81
515-530	62	202	22	53	155	5	3	370	13	38	194	78
530-545	52	223	24	57	127	6	5	356	20	25	173	78
545-600	46	248	23	60	160	9	5	366	25	26	177	74

1 HOUR	1	2	3	4	5	6	7	8	9	10	11	12	
TOTALS	SBRT	SBTH	SBLT	WBRT	WBTH	WBLT	NBRT	NBTH	NBLT	EBRT	EBTH	EBLT	TOTALS
400-500	206	879	87	245	475	34	15	1379	58	87	623	313	4401
415-515	199	864	86	243	502	32	13	1426	58	95	654	300	4472
430-530	221	883	88	239	539	27	12	1400	52	109	692	301	4563
445-545	220	884	95	238	552	26	14	1413	58	108	693	317	4618
500-600	204	883	93	230	566	29	16	1458	71	114	708	311	4683

P.M. PEAK HOUR
0500-0600



TEMPLE STREET

GLENDALE BOULEVARD

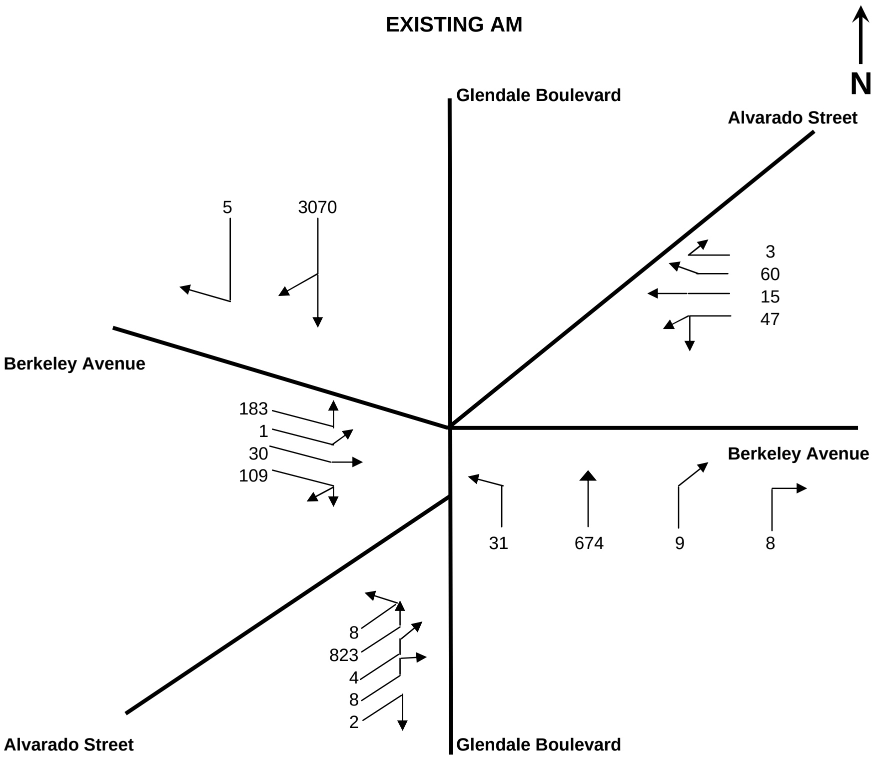
THE TRAFFIC SOLUTION
329 DIAMOND STREET
ARCADIA, CALIFORNIA 91006
626.446.7978

APPENDIX C:
INTERSECTION LEVEL OF SERVICE WORKSHEETS

EXISTING

Intersection 1

EXISTING AM



Phase 1) $\dfrac{5 + 3070}{4}$

&

$\dfrac{674 + 9 + 8}{3}$

= **769**

Phase 2) $\left\{ \dfrac{674 + 9 + 8}{3} \right\} - 769$

or

$\dfrac{31}{1}$

= **31**

Phase 3) $\dfrac{8 + 823 + 4 + 8 + 2}{3}$

= **282**

Phase 4) $\dfrac{3 + 60 + 15}{1} + \dfrac{1 + 183}{1}$

or

$\dfrac{30 + 109}{1} + \dfrac{47}{1}$

= **262**

Critical Volumes = 769 + 31 + 282 + 262

= 1344

V/C = $\mathbf{\dfrac{1344}{1375} - 0.10 = 0.877}$ **LOS D**

EX_AM

CalcaDB

January 19, 2010 ,Tuesday 11:16:30 AM

INTERSECTION DATA SUMMARY SHEET

N/S: Glendale Bl | W/E: Park Av | I/S No: 2

AM/PM: AM | Comments: 2009 Existing Conditions

COUNT DATE: | STUDY DATE: | GROWTH FACTOR:

Volume/Lane/Signal Configurations

	NORTHBOUND LT	NORTHBOUND TH	NORTHBOUND RT	SOUTHBOUND LT	SOUTHBOUND TH	SOUTHBOUND RT	WESTBOUND LT	WESTBOUND TH	WESTBOUND RT	EASTBOUND LT	EASTBOUND TH	EASTBOUND RT
EXISTING	54	468	77	98	1750	33	41	25	53	11	24	174
AMBIENT												
RELATED												
PROJECT												
TOTAL	54	468	77	98	1750	33	41	25	53	11	24	174

LANE							
NORTHBOUND	1		1		1		
SOUTHBOUND	1		2			1	
WESTBOUND	1		1			1	
EASTBOUND	1		1			1	

SIGNAL	NORTHBOUND	SOUTHBOUND	WESTBOUND	EASTBOUND
Phasing	Perm	Perm	Perm	Perm
RTOR	Auto	Free	Auto	Auto

Critical Movements Diagram

	A:	B:
SouthBound	875	98
EastBound	174	11
WestBound	53	41
NorthBound	273	54

V/C RATIO	LOS
0.00 - 0.60	A
0.61 - 0.70	B
0.71 - 0.80	C
0.81 - 0.90	D
0.91 - 1.00	E

A = Adjusted Through/Right Volume
B = Adjusted Left Volume
* = ATSAC Benefit

Results

North/South Critical Movements = B(N/B) + A(S/B)

West/East Critical Movements = B(W/B) + A(E/B)

$$V/C = \frac{54 + 875 + 41 + 174}{*1500} = 0.693$$

LOS = B

Developed by Chun Wong, 12/94

CalcaDB

January 19, 2010 ,Tuesday 11:16:30 AM

INTERSECTION DATA SUMMARY SHEET

N/S: Echo Park Av W/E: Sunset Bl I/S No: 3

AM/PM: AM Comments: 2009 Existing Conditions

COUNT DATE: STUDY DATE: GROWTH FACTOR:

Volume/Lane/Signal Configurations

	NORTHBOUND			SOUTHBOUND			WESTBOUND			EASTBOUND		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
EXISTING	34	143	30	177	460	143	76	737	113	85	1039	54
AMBIENT												
RELATED												
PROJECT												
TOTAL	34	143	30	177	460	143	76	737	113	85	1039	54

LANE							
NORTHBOUND	1				1		
SOUTHBOUND	1		1			1	
WESTBOUND	1		1		1		
EASTBOUND	1		1		1		

SIGNAL	NB Phasing	NB RTOR	SB Phasing	SB RTOR	WB Phasing	WB RTOR	EB Phasing	EB RTOR
	Perm	Auto	Perm	Auto	Perm	Auto	Perm	Auto

Critical Movements Diagram

	A:	B:
SouthBound	460	177
EastBound	547	85
WestBound	425	76
NorthBound	173	34

A = Adjusted Through/Right Volume
B = Adjusted Left Volume
* = ATSAC Benefit

V/C RATIO	LOS
0.00 - 0.60	A
0.61 - 0.70	B
0.71 - 0.80	C
0.81 - 0.90	D
0.91 - 1.00	E

Results

North/South Critical Movements = B(N/B) + A(S/B)

West/East Critical Movements = B(W/B) + A(E/B)

$$V/C = \frac{34 + 460 + 76 + 547}{*1500} = 0.675$$

LOS = B

EX_AM

January 19, 2010 ,Tuesday 11:16:30 AM

CalcaDB

INTERSECTION DATA SUMMARY SHEET

N/S:	Glendale Bl	W/E:	Bellevue Av	I/S No:	4
AM/PM:	AM	Comments:	2009 Existing Conditions		
COUNT DATE:		STUDY DATE:		GROWTH FACTOR:	

Volume/Lane/Signal Configurations

	NORTHBOUND			SOUTHBOUND			WESTBOUND			EASTBOUND		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
EXISTING	0	479	212	45	1879	0	473	0	92	0	0	0
AMBIENT												
RELATED												
PROJECT												
TOTAL	0	479	212	45	1879	0	473	0	92	0	0	0

	NB							SB							WB							EB						
LANE			2			1		1		2					2					1								

	Phasing	RTOR	Phasing	RTOR	Phasing	RTOR	Phasing	RTOR
SIGNAL	Perm	Auto	Prot-Fix	<none>	Split	Auto		

Critical Movements Diagram

	A	B
SouthBound	940	45
EastBound	0	0
WestBound	69	260
NorthBound	240	0

A = Adjusted Through/Right Volume
B = Adjusted Left Volume
* = ATSAC Benefit

V/C RATIO	LOS
0.00 - 0.60	A
0.61 - 0.70	B
0.71 - 0.80	C
0.81 - 0.90	D
0.91 - 1.00	E

Results

North/South Critical Movements = B(N/B) + A(S/B)

West/East Critical Movements = B(W/B) + A(E/B)

$$V/C = \frac{0 + 940 + 260 + 0}{*1425} = 0.772$$

LOS = C

Developed by Chun Wong, 12/94

EX_AM

CalcaDB

January 19, 2010 ,Tuesday 11:16:30 AM

INTERSECTION DATA SUMMARY SHEET

N/S:	Echo Park Av	W/E:	Bellevue Av	I/S No:	5
AM/PM:	AM	Comments:	2009 Existing Conditions		
COUNT DATE:		STUDY DATE:		GROWTH FACTOR:	

Volume/Lane/Signal Configurations

	NORTHBOUND			SOUTHBOUND			WESTBOUND			EASTBOUND		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
EXISTING	189	107	33	169	196	242	179	144	88	37	68	138
AMBIENT												
RELATED												
PROJECT												
TOTAL	189	107	33	169	196	242	179	144	88	37	68	138

LANE	NORTHBOUND	SOUTHBOUND	WESTBOUND	EASTBOUND
	1 | 1 | | | | 1 |	1 | | 1 | | | 1 |	1 | | 1 | | | 1 |	1 | | | | 1 | |

SIGNAL	Phasing	RTOR	Phasing	RTOR	Phasing	RTOR	Phasing	RTOR
	Split	Auto	Split	Auto	Perm	<none>	Perm	<none>

Critical Movements Diagram

	A:	B:
SouthBound	242	169
EastBound	206	37
WestBound	144	179
NorthBound	148	148

A = Adjusted Through/Right Volume
B = Adjusted Left Volume
* = ATSAC Benefit

V/C RATIO	LOS
0.00 - 0.60	A
0.61 - 0.70	B
0.71 - 0.80	C
0.81 - 0.90	D
0.91 - 1.00	E

Results

North/South Critical Movements = A(N/B) + A(S/B)

West/East Critical Movements = B(W/B) + A(E/B)

$$V/C = \frac{148 + 242 + 179 + 206}{*1425} = 0.474$$

LOS = A

Developed by Chun Wong, 12/94

EX_AM

CalcaDB

January 19, 2010 ,Tuesday 11:16:30 AM

INTERSECTION DATA SUMMARY SHEET

N/S: Union Av | W/E: Temple St | I/S No: 6

AM/PM: AM | Comments: 2009 Existing Conditions

COUNT DATE: | STUDY DATE: | GROWTH FACTOR:

Volume/Lane/Signal Configurations

	NORTHBOUND			SOUTHBOUND			WESTBOUND			EASTBOUND		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
EXISTING	96	168	123	122	53	25	139	525	63	131	654	64
AMBIENT												
RELATED												
PROJECT												
TOTAL	96	168	123	122	53	25	139	525	63	131	654	64

LANE

	NB	SB	WB	EB
LT	1	1	1	1
LT-TH				
TH		1	1	1
LT-TH-RT				
TH-RT	1	1	1	1
RT				
LT-RT				

SIGNAL

	NORTHBOUND	SOUTHBOUND	WESTBOUND	EASTBOUND
Phasing	Perm	Perm	Perm	Perm
RTOR	Auto	Auto	Auto	Auto

Critical Movements Diagram

	A	B
SouthBound	39	122
EastBound	359	131
WestBound	294	139
NorthBound	291	96

A = Adjusted Through/Right Volume
B = Adjusted Left Volume
* = ATSAC Benefit

V/C RATIO	LOS
0.00 - 0.60	A
0.61 - 0.70	B
0.71 - 0.80	C
0.81 - 0.90	D
0.91 - 1.00	E

Results

North/South Critical Movements = A(N/B) + B(S/B)

West/East Critical Movements = B(W/B) + A(E/B)

$$V/C = \frac{291 + 122 + 139 + 359}{*1500} = 0.537$$

LOS = A

Developed by Chun Wong, 12/94

CalcaDB

January 19, 2010 ,Tuesday 11:16:30 AM

INTERSECTION DATA SUMMARY SHEET

N/S: Glendale Bl | W/E: Temple St | I/S No: 7

AM/PM: AM | Comments: 2009 Existing Conditions

COUNT DATE: | STUDY DATE: | GROWTH FACTOR:

Volume/Lane/Signal Configurations

	NORTHBOUND			SOUTHBOUND			WESTBOUND			EASTBOUND		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
EXISTING	59	435	14	189	1874	171	45	477	105	185	545	142
AMBIENT												
RELATED												
PROJECT												
TOTAL	59	435	14	189	1874	171	45	477	105	185	545	142

LANE	1		1		1			1		1		1			1		1		1			1		1		1		

	NORTHBOUND Phasing	NORTHBOUND RTOR	SOUTHBOUND Phasing	SOUTHBOUND RTOR	WESTBOUND Phasing	WESTBOUND RTOR	EASTBOUND Phasing	EASTBOUND RTOR
SIGNAL	Perm	Auto	Perm	Auto	Prot-Fix	Auto	Prot-Fix	Auto

Critical Movements Diagram

	A	B
SouthBound	1023	189
EastBound	344	185
WestBound	291	45
NorthBound	225	59

A = Adjusted Through/Right Volume
B = Adjusted Left Volume
* = ATSAC Benefit

V/C RATIO	LOS
0.00 - 0.60	A
0.61 - 0.70	B
0.71 - 0.80	C
0.81 - 0.90	D
0.91 - 1.00	E

Results

North/South Critical Movements = B(N/B) + A(S/B)

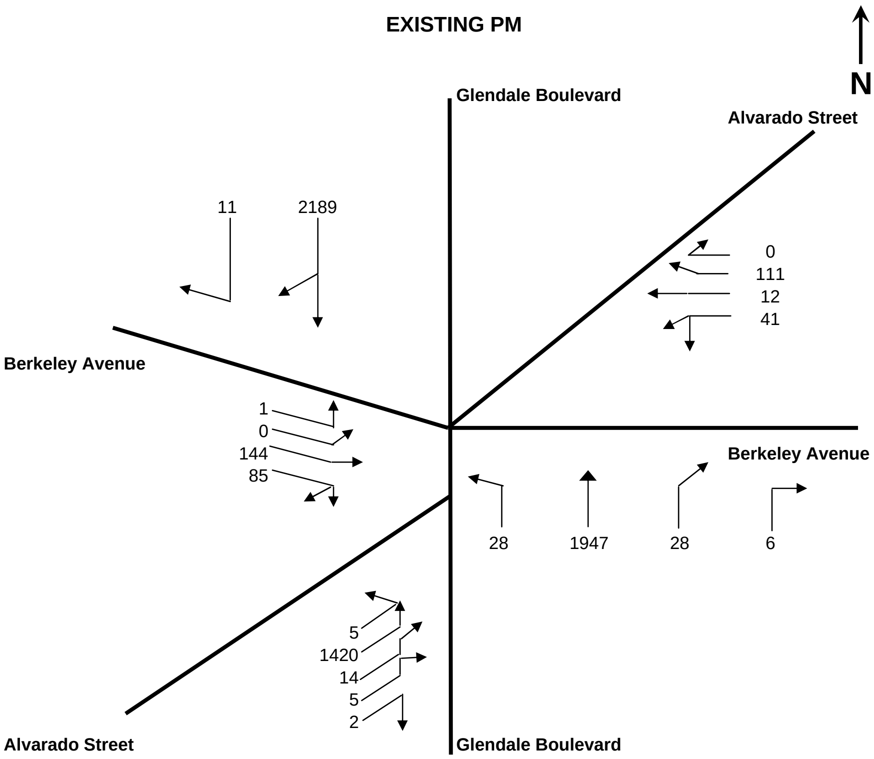
West/East Critical Movements = A(W/B) + B(E/B)

$$V/C = \frac{59 + 1023 + 291 + 185}{*1425} = 1.023$$

LOS = F

Intersection 1

EXISTING PM



Phase 1)

$$\frac{11 + 2189}{4}$$

&

$$\frac{1947 + 28 + 6}{3}$$

= **550**

Phase 2)

$$\left\{\frac{1947 + 28 + 6}{3}\right\} - 550$$

or

$$\frac{28}{1}$$

= **110**

Phase 3)

$$\frac{5 + 1420 + 14 + 5 + 2}{3}$$

= **482**

Phase 4)

$$\frac{0 + 111 + 12}{1} + \frac{0 + 1}{1}$$

or

$$\frac{144 + 85}{1} + \frac{41}{1}$$

= **270**

Critical Volumes = 550 + 110 + 482 + 270

= 1412

V/C = $\frac{\mathbf{1412}}{\mathbf{1375}}$ **- 0.10 = 0.927 LOS E**

EX_PM

January 19, 2010 ,Tuesday 11:18:24 AM

CalcaDB

INTERSECTION DATA SUMMARY SHEET

N/S: Glendale Bl   W/E: Park Av   I/S No: 2

AM/PM: PM   Comments: 2009 Existing Conditions

COUNT DATE: STUDY DATE: GROWTH FACTOR:

Volume/Lane/Signal Configurations

	NORTHBOUND			SOUTHBOUND			WESTBOUND			EASTBOUND		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
EXISTING	130	1559	72	70	873	77	95	37	154	35	26	141
AMBIENT												
RELATED												
PROJECT												
TOTAL	130	1559	72	70	873	77	95	37	154	35	26	141

	NORTHBOUND							SOUTHBOUND							WESTBOUND							EASTBOUND						
LANE	1		1		1			1		2			1		1		1			1		1		1			1	

	NORTHBOUND		SOUTHBOUND		WESTBOUND		EASTBOUND	
	Phasing	RTOR	Phasing	RTOR	Phasing	RTOR	Phasing	RTOR
SIGNAL	Perm	Auto	Perm	Free	Perm	Auto	Perm	Auto

Critical Movements Diagram

SouthBound
A: 437
B: 70

EastBound
A: 141
B: 35

WestBound
A: 154
B: 95

NorthBound
A: 816
B: 130

V/C RATIO	LOS
0.00 - 0.60	A
0.61 - 0.70	B
0.71 - 0.80	C
0.81 - 0.90	D
0.91 - 1.00	E

A = Adjusted Through/Right Volume
B = Adjusted Left Volume
* = ATSAC Benefit

Results

North/South Critical Movements = A(N/B) + B(S/B)

West/East Critical Movements = B(W/B) + A(E/B)

$$V/C = \frac{816 + 70 + 95 + 141}{*1500} = 0.678$$

LOS = B

Developed by Chun Wong, 12/94

EX_PM

CalcaDB

January 19, 2010 ,Tuesday 11:18:24 AM

INTERSECTION DATA SUMMARY SHEET

N/S:	Echo Park Av	W/E:	Sunset Bl	I/S No:	3
AM/PM:	PM	Comments:	2009 Existing Conditions		
COUNT DATE:		STUDY DATE:		GROWTH FACTOR:	

Volume/Lane/Signal Configurations

	NORTHBOUND			SOUTHBOUND			WESTBOUND			EASTBOUND		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
EXISTING	49	365	71	126	183	93	51	932	156	102	1245	34
AMBIENT												
RELATED												
PROJECT												
TOTAL	49	365	71	126	183	93	51	932	156	102	1245	34

LANE	NB	SB	WB	EB
LT	1	1	1	1
LT-TH				
TH		1	1	1
LT-TH-RT				
TH-RT	1		1	1
RT		1		
LT-RT				

SIGNAL	NB	SB	WB	EB
Phasing	Perm	Perm	Perm	Perm
RTOR	Auto	Auto	Auto	Auto

Critical Movements Diagram

	A	B
SouthBound	183	126
EastBound	640	102
WestBound	544	51
NorthBound	436	49

A = Adjusted Through/Right Volume
B = Adjusted Left Volume
* = ATSAC Benefit

V/C RATIO	LOS
0.00 - 0.60	A
0.61 - 0.70	B
0.71 - 0.80	C
0.81 - 0.90	D
0.91 - 1.00	E

Results

North/South Critical Movements = A(N/B) + B(S/B)

West/East Critical Movements = B(W/B) + A(E/B)

$$V/C = \frac{436 + 126 + 51 + 640}{*1500} = 0.765$$

LOS = C

Developed by Chun Wong, 12/94

CalcaDB

January 19, 2010 ,Tuesday 11:18:24 AM

INTERSECTION DATA SUMMARY SHEET

N/S: Glendale Bl | W/E: Bellevue Av | I/S No: 4

AM/PM: PM | Comments: 2009 Existing Conditions

COUNT DATE: | STUDY DATE: | GROWTH FACTOR:

Volume/Lane/Signal Configurations

	NORTHBOUND			SOUTHBOUND			WESTBOUND			EASTBOUND		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
EXISTING	0	1597	363	100	943	0	278	0	113	0	0	0
AMBIENT												
RELATED												
PROJECT												
TOTAL	0	1597	363	100	943	0	278	0	113	0	0	0

LANE

	NB							SB							WB							EB						
LANE			2			1		1		2					2					1								

	Phasing	RTOR	Phasing	RTOR	Phasing	RTOR	Phasing	RTOR
SIGNAL	Perm	Auto	Prot-Fix	<none>	Split	Auto		

Critical Movements Diagram

SouthBound
A: 472
B: 100

EastBound
A: 0
B: 0

WestBound
A: 63
B: 153

NorthBound
A: 799
B: 0

A = Adjusted Through/Right Volume
B = Adjusted Left Volume
* = ATSAC Benefit

V/C RATIO	LOS
0.00 - 0.60	A
0.61 - 0.70	B
0.71 - 0.80	C
0.81 - 0.90	D
0.91 - 1.00	E

Results

North/South Critical Movements = A(N/B) + B(S/B)

West/East Critical Movements = B(W/B) + A(E/B)

$$V/C = \frac{799 + 100 + 153 + 0}{*1425} = 0.668$$

LOS = B

EX_PM

January 19, 2010 ,Tuesday 11:18:24 AM

CalcaDB

INTERSECTION DATA SUMMARY SHEET

N/S: Echo Park Av   W/E: Bellevue Av   I/S No: 5

AM/PM: PM   Comments: 2009 Existing Conditions

COUNT DATE: STUDY DATE: GROWTH FACTOR:

Volume/Lane/Signal Configurations

	NORTHBOUND			SOUTHBOUND			WESTBOUND			EASTBOUND		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
EXISTING	135	192	38	93	72	113	162	134	203	117	127	199
AMBIENT												
RELATED												
PROJECT												
TOTAL	135	192	38	93	72	113	162	134	203	117	127	199

LANE	LT	LT/TH	TH	LT/TH/RT	TH/RT	RT	LT/RT
NORTHBOUND	1	1				1	
SOUTHBOUND	1		1			1	
WESTBOUND	1		1			1	
EASTBOUND	1				1		

SIGNAL	Phasing	RTOR
NORTHBOUND	Split	Auto
SOUTHBOUND	Split	Auto
WESTBOUND	Perm	<none>
EASTBOUND	Perm	<none>

Critical Movements Diagram

	A	B
SouthBound	113	93
EastBound	326	117
WestBound	203	162
NorthBound	192	135

A = Adjusted Through/Right Volume
B = Adjusted Left Volume
* = ATSAC Benefit

V/C RATIO	LOS
0.00 - 0.60	A
0.61 - 0.70	B
0.71 - 0.80	C
0.81 - 0.90	D
0.91 - 1.00	E

Results

North/South Critical Movements = A(N/B) + A(S/B)

West/East Critical Movements = B(W/B) + A(E/B)

$$V/C = \frac{192 + 113 + 162 + 326}{*1425} = 0.486$$

LOS = A

Developed by Chun Wong, 12/94

CalcaDB

January 19, 2010 ,Tuesday 11:18:24 AM

INTERSECTION DATA SUMMARY SHEET

N/S: Union Av | W/E: Temple St | I/S No: 6

AM/PM: PM | Comments: 2009 Existing Conditions

COUNT DATE: | STUDY DATE: | GROWTH FACTOR:

Volume/Lane/Signal Configurations

	NORTHBOUND			SOUTHBOUND			WESTBOUND			EASTBOUND		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
EXISTING	106	157	163	77	58	32	103	687	36	107	866	53
AMBIENT												
RELATED												
PROJECT												
TOTAL	106	157	163	77	58	32	103	687	36	107	866	53

LANE

	NB							SB							WB							EB						
LANE	1				1			1		1		1			1		1		1			1		1		1		

	NB Phasing	NB RTOR	SB Phasing	SB RTOR	WB Phasing	WB RTOR	EB Phasing	EB RTOR
SIGNAL	Perm	Auto	Perm	Auto	Perm	Auto	Perm	Auto

Critical Movements Diagram

	A	B
SouthBound	45	77
EastBound	460	107
WestBound	362	103
NorthBound	320	106

V/C RATIO	LOS
0.00 - 0.60	A
0.61 - 0.70	B
0.71 - 0.80	C
0.81 - 0.90	D
0.91 - 1.00	E

A = Adjusted Through/Right Volume
B = Adjusted Left Volume
* = ATSAC Benefit

Results

North/South Critical Movements = A(N/B) + B(S/B)

West/East Critical Movements = B(W/B) + A(E/B)

$$V/C = \frac{320 + 77 + 103 + 460}{*1500} = 0.570$$

LOS = A

EX_PM

January 19, 2010 ,Tuesday 11:18:24 AM

CalcaDB

INTERSECTION DATA SUMMARY SHEET

N/S:	Glendale Bl	W/E:	Temple St	I/S No:	7
AM/PM:	PM	Comments:	2009 Existing Conditions		
COUNT DATE:		STUDY DATE:		GROWTH FACTOR:	

Volume/Lane/Signal Configurations

	NORTHBOUND LT	NORTHBOUND TH	NORTHBOUND RT	SOUTHBOUND LT	SOUTHBOUND TH	SOUTHBOUND RT	WESTBOUND LT	WESTBOUND TH	WESTBOUND RT	EASTBOUND LT	EASTBOUND TH	EASTBOUND RT
EXISTING	71	1458	16	93	883	204	29	566	230	311	708	114
AMBIENT												
RELATED												
PROJECT												
TOTAL	71	1458	16	93	883	204	29	566	230	311	708	114

	NB							SB							WB							EB						
LANE	1		1		1			1		1		1			1		1		1			1		1		1		

	NB Phasing	NB RTOR	SB Phasing	SB RTOR	WB Phasing	WB RTOR	EB Phasing	EB RTOR
SIGNAL	Perm	Auto	Perm	Auto	Prot-Fix	Auto	Prot-Fix	Auto

Critical Movements Diagram

	A	B
SouthBound	544	93
EastBound	411	311
WestBound	398	29
NorthBound	737	71

A = Adjusted Through/Right Volume
B = Adjusted Left Volume
* = ATSAC Benefit

V/C RATIO	LOS
0.00 - 0.60	A
0.61 - 0.70	B
0.71 - 0.80	C
0.81 - 0.90	D
0.91 - 1.00	E

Results

North/South Critical Movements = A(N/B) + B(S/B)

West/East Critical Movements = A(W/B) + B(E/B)

$$V/C = \frac{737 + 93 + 398 + 311}{*1425} = 1.010$$

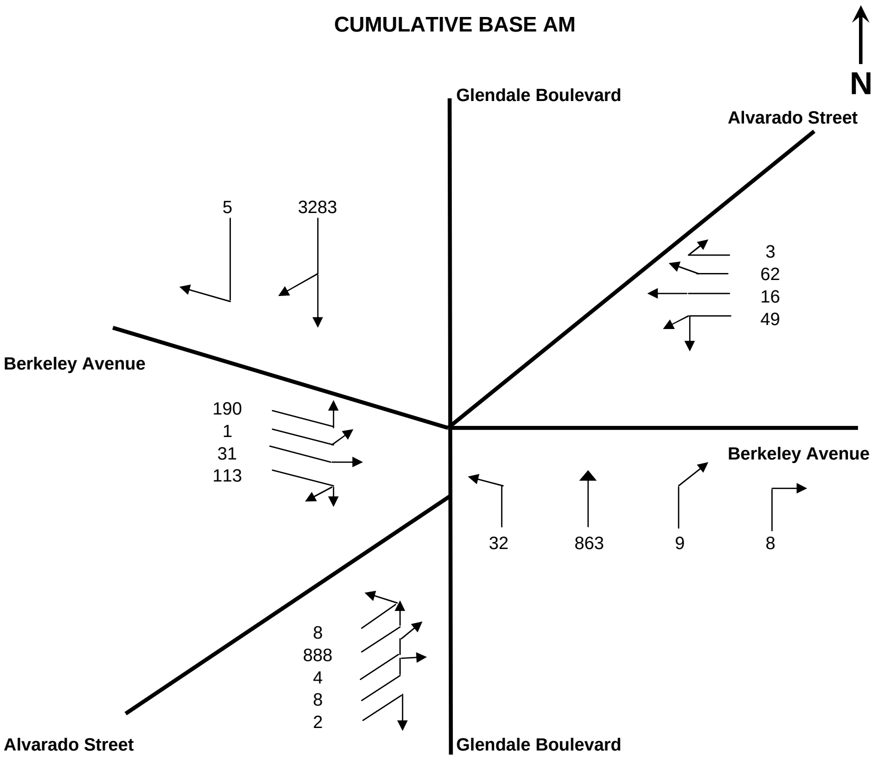
LOS = F

Developed by Chun Wong, 12/94

CUMULATIVE BASE

Intersection 1

CUMULATIVE BASE AM



Phase 1) $\frac{5 + 3283}{4}$

&

$\frac{863 + 9 + 8}{3}$

= **822**

Phase 2) $\left\{ \frac{863 + 9 + 8}{3} \right\} - 822$

or

$\frac{32}{1}$

= **32**

Phase 3) $\frac{8 + 888 + 4 + 8 + 2}{3}$

= **303**

Phase 4) $\frac{3 + 62 + 16}{1} + \frac{1 + 190}{1}$

or

$\frac{31 + 113}{1} + \frac{49}{1}$

= **272**

Critical Volumes = 822 + 32 + 303 + 272

= 1429

V/C = $\frac{\mathbf{1429}}{\mathbf{1375}}$ **- 0.10 = 0.939** **LOS E**

CB_AM

CalcaDB

January 19, 2010 ,Tuesday 11:19:06 AM

INTERSECTION DATA SUMMARY SHEET

N/S:	Glendale Bl	W/E:	Park Av	I/S No:	2
AM/PM:	AM	Comments:	2013 Cum Base Conditions		
COUNT DATE:		STUDY DATE:		GROWTH FACTOR:	

Volume/Lane/Signal Configurations

	NORTHBOUND			SOUTHBOUND			WESTBOUND			EASTBOUND		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
EXISTING	56	649	80	102	1881	34	43	26	55	11	25	181
AMBIENT												
RELATED												
PROJECT												
TOTAL	56	649	80	102	1881	34	43	26	55	11	25	181

LANE																												
	1		1		1			1		2			1		1		1			1		1		1			1	

	NORTHBOUND Phasing	NORTHBOUND RTOR	SOUTHBOUND Phasing	SOUTHBOUND RTOR	WESTBOUND Phasing	WESTBOUND RTOR	EASTBOUND Phasing	EASTBOUND RTOR
SIGNAL	Perm	Auto	Perm	Free	Perm	Auto	Perm	Auto

Critical Movements Diagram

	SouthBound	EastBound	WestBound	NorthBound
A:	941	181	55	365
B:	102	11	43	56

A = Adjusted Through/Right Volume
B = Adjusted Left Volume
* = ATSAC Benefit

V/C RATIO	LOS
0.00 - 0.60	A
0.61 - 0.70	B
0.71 - 0.80	C
0.81 - 0.90	D
0.91 - 1.00	E

Results

North/South Critical Movements = B(N/B) + A(S/B)

West/East Critical Movements = B(W/B) + A(E/B)

$$V/C = \frac{56 + 941 + 43 + 181}{*1500} = 0.744$$

LOS = C

Developed by Chun Wong, 12/94

CB_AM

CalcaDB

January 19, 2010 ,Tuesday 11:19:06 AM

INTERSECTION DATA SUMMARY SHEET

N/S:	Echo Park Av	W/E:	Sunset Bl	I/S No:	3
AM/PM:	AM	Comments:	2013 Cum Base Conditions		
COUNT DATE:		STUDY DATE:		GROWTH FACTOR:	

Volume/Lane/Signal Configurations

	NORTHBOUND			SOUTHBOUND			WESTBOUND			EASTBOUND		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
EXISTING	35	149	31	184	478	149	79	825	118	88	1118	56
AMBIENT												
RELATED												
PROJECT												
TOTAL	35	149	31	184	478	149	79	825	118	88	1118	56

	NB							SB							WB							EB						
LANE	1				1			1		1			1		1		1		1			1		1		1		

	NORTHBOUND		SOUTHBOUND		WESTBOUND		EASTBOUND	
	Phasing	RTOR	Phasing	RTOR	Phasing	RTOR	Phasing	RTOR
SIGNAL	Perm	Auto	Perm	Auto	Perm	Auto	Perm	Auto

Critical Movements Diagram

	A	B
SouthBound	478	184
EastBound	587	88
WestBound	472	79
NorthBound	180	35

V/C RATIO	LOS
0.00 - 0.60	A
0.61 - 0.70	B
0.71 - 0.80	C
0.81 - 0.90	D
0.91 - 1.00	E

A = Adjusted Through/Right Volume
B = Adjusted Left Volume
* = ATSAC Benefit

Results

North/South Critical Movements = B(N/B) + A(S/B)

West/East Critical Movements = B(W/B) + A(E/B)

$$V/C = \frac{35 + 478 + 79 + 587}{*1500} = 0.716$$

LOS = C

Developed by Chun Wong, 12/94

CB_AM

January 19, 2010 ,Tuesday 11:19:06 AM

CalcaDB

INTERSECTION DATA SUMMARY SHEET

N/S:	Glendale Bl	W/E:	Bellevue Av	I/S No:	4
AM/PM:	AM	Comments:	2013 Cum Base Conditions		
COUNT DATE:		STUDY DATE:		GROWTH FACTOR:	

Volume/Lane/Signal Configurations

	NORTHBOUND			SOUTHBOUND			WESTBOUND			EASTBOUND		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
EXISTING	0	601	220	47	2015	0	492	0	154	0	0	0
AMBIENT												
RELATED												
PROJECT												
TOTAL	0	601	220	47	2015	0	492	0	154	0	0	0

LANE							
NORTHBOUND			2			1	
SOUTHBOUND	1		2				
WESTBOUND	2					1	
EASTBOUND							

SIGNAL	NORTHBOUND		SOUTHBOUND		WESTBOUND		EASTBOUND	
	Phasing	RTOR	Phasing	RTOR	Phasing	RTOR	Phasing	RTOR
	Perm	Auto	Prot-Fix	<none>	Split	Auto		

Critical Movements Diagram

	A	B
SouthBound	1008	47
EastBound	0	0
WestBound	130	271
NorthBound	301	0

A = Adjusted Through/Right Volume
B = Adjusted Left Volume
* = ATSAC Benefit

V/C RATIO	LOS
0.00 - 0.60	A
0.61 - 0.70	B
0.71 - 0.80	C
0.81 - 0.90	D
0.91 - 1.00	E

Results

North/South Critical Movements = B(N/B) + A(S/B)

West/East Critical Movements = B(W/B) + A(E/B)

$$V/C = \frac{0 + 1008 + 271 + 0}{*1425} = 0.828$$

LOS = D

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CB_AM

CalcaDB

January 19, 2010 ,Tuesday 11:19:06 AM

INTERSECTION DATA SUMMARY SHEET

N/S: Echo Park Av W/E: Bellevue Av I/S No: 5

AM/PM: AM Comments: 2013 Cum Base Conditions

COUNT DATE: STUDY DATE: GROWTH FACTOR:

Volume/Lane/Signal Configurations

	NORTHBOUND			SOUTHBOUND			WESTBOUND			EASTBOUND		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
EXISTING	255	111	34	176	204	252	186	150	92	38	71	144
AMBIENT												
RELATED												
PROJECT												
TOTAL	255	111	34	176	204	252	186	150	92	38	71	144

	NB							SB							WB							EB						
LANE	1	1				1		1		1			1		1		1			1		1				1		

	Phasing	RTOR	Phasing	RTOR	Phasing	RTOR	Phasing	RTOR
SIGNAL	Split	Auto	Split	Auto	Perm	<none>	Perm	<none>

Critical Movements Diagram

SouthBound
A: 252
B: 176

EastBound
A: 215
B: 38

WestBound
A: 150
B: 186

NorthBound
A: 183
B: 183

A = Adjusted Through/Right Volume
B = Adjusted Left Volume
* = ATSAC Benefit

V/C RATIO	LOS
0.00 - 0.60	A
0.61 - 0.70	B
0.71 - 0.80	C
0.81 - 0.90	D
0.91 - 1.00	E

Results

North/South Critical Movements = A(N/B) + A(S/B)

West/East Critical Movements = B(W/B) + A(E/B)

$$V/C = \frac{183 + 252 + 186 + 215}{*1425} = 0.517$$

LOS = A

Developed by Chun Wong, 12/94

CB_AM

January 19, 2010 ,Tuesday 11:19:06 AM

CalcaDB

INTERSECTION DATA SUMMARY SHEET

N/S: Union Av W/E: Temple St I/S No: 6

AM/PM: AM Comments: 2013 Cum Base Conditions

COUNT DATE: STUDY DATE: GROWTH FACTOR:

Volume/Lane/Signal Configurations

	NORTHBOUND LT	NORTHBOUND TH	NORTHBOUND RT	SOUTHBOUND LT	SOUTHBOUND TH	SOUTHBOUND RT	WESTBOUND LT	WESTBOUND TH	WESTBOUND RT	EASTBOUND LT	EASTBOUND TH	EASTBOUND RT
EXISTING	100	175	128	140	55	30	145	593	66	136	701	67
AMBIENT												
RELATED												
PROJECT												
TOTAL	100	175	128	140	55	30	145	593	66	136	701	67

	NB 1	NB 2	NB 3	NB 4	NB 5	NB 6	NB 7	SB 1	SB 2	SB 3	SB 4	SB 5	SB 6	SB 7	WB 1	WB 2	WB 3	WB 4	WB 5	WB 6	WB 7	EB 1	EB 2	EB 3	EB 4	EB 5	EB 6	EB 7
LANE	1				1			1		1		1			1		1		1			1		1		1		

	NB Phasing	NB RTOR	SB Phasing	SB RTOR	WB Phasing	WB RTOR	EB Phasing	EB RTOR
SIGNAL	Perm	Auto	Perm	Auto	Perm	Auto	Perm	Auto

Critical Movements Diagram

SouthBound A: 43 B: 140

EastBound A: 384 B: 136

WestBound A: 330 B: 145

NorthBound A: 303 B: 100

V/C RATIO	LOS
0.00 - 0.60	A
0.61 - 0.70	B
0.71 - 0.80	C
0.81 - 0.90	D
0.91 - 1.00	E

A = Adjusted Through/Right Volume
B = Adjusted Left Volume
* = ATSAC Benefit

Results

North/South Critical Movements = A(N/B) + B(S/B)

West/East Critical Movements = B(W/B) + A(E/B)

$$V/C = \frac{303 + 140 + 145 + 384}{*1500} = 0.578$$

LOS = A

Developed by Chun Wong, 12/94

CalcaDB

INTERSECTION DATA SUMMARY SHEET

N/S: Glendale Bl | W/E: Temple St | I/S No: 7

AM/PM: AM | Comments: 2013 Cum Base Conditions

COUNT DATE: | STUDY DATE: | GROWTH FACTOR:

Volume/Lane/Signal Configurations

	NORTHBOUND			SOUTHBOUND			WESTBOUND			EASTBOUND		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
EXISTING	85	545	15	197	1990	180	47	516	109	202	577	161
AMBIENT												
RELATED												
PROJECT												
TOTAL	85	545	15	197	1990	180	47	516	109	202	577	161

	NORTHBOUND							SOUTHBOUND							WESTBOUND							EASTBOUND						
LANE	1		1		1			1		1		1			1		1		1			1		1		1		

	NORTHBOUND Phasing	NORTHBOUND RTOR	SOUTHBOUND Phasing	SOUTHBOUND RTOR	WESTBOUND Phasing	WESTBOUND RTOR	EASTBOUND Phasing	EASTBOUND RTOR
SIGNAL	Perm	Auto	Perm	Auto	Prot-Fix	Auto	Prot-Fix	Auto

Critical Movements Diagram

	A	B
SouthBound	1085	197
EastBound	369	202
WestBound	313	47
NorthBound	280	85

A = Adjusted Through/Right Volume
B = Adjusted Left Volume
* = ATSAC Benefit

V/C RATIO	LOS
0.00 - 0.60	A
0.61 - 0.70	B
0.71 - 0.80	C
0.81 - 0.90	D
0.91 - 1.00	E

Results

North/South Critical Movements = B(N/B) + A(S/B)

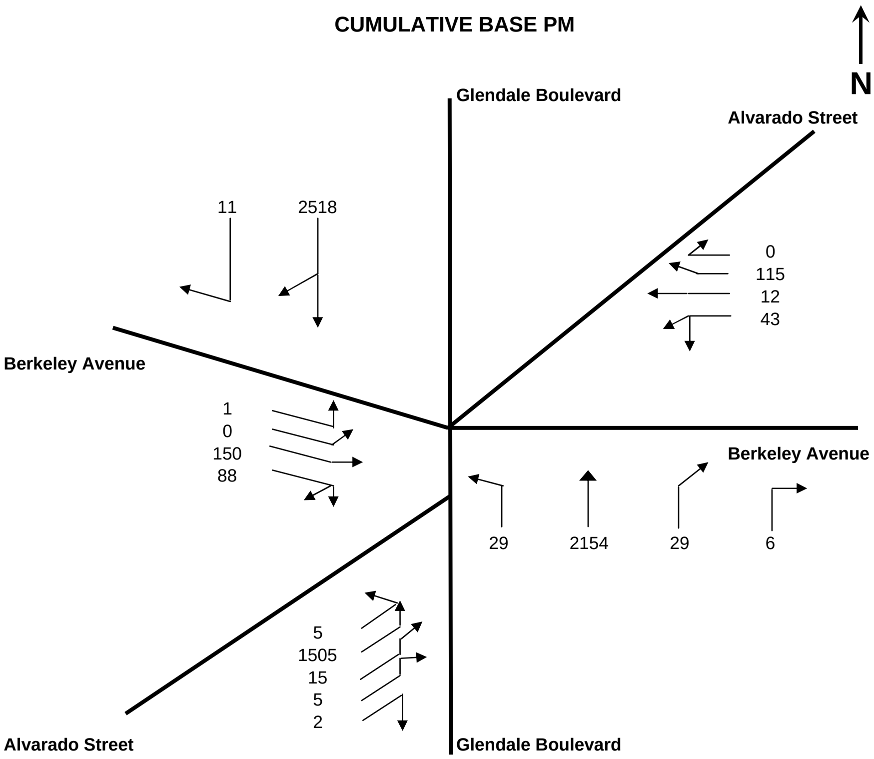
West/East Critical Movements = A(W/B) + B(E/B)

$$V/C = \frac{85 + 1085 + 313 + 202}{*1425} = 1.112$$

LOS = F

Intersection 1

CUMULATIVE BASE PM



Phase 1) $\dfrac{11 + 2518}{4}$

&

$\dfrac{2154 + 29 + 6}{3}$

= **632**

Phase 2) $\left\{\dfrac{2154 + 29 + 6}{3}\right\} - 632$

or

$\dfrac{29}{1}$

= **98**

Phase 3) $\dfrac{5 + 1505 + 15 + 5 + 2}{3}$

= **511**

Phase 4) $\dfrac{0 + 115 + 12}{1} + \dfrac{0 + 1}{1}$

or

$\dfrac{150 + 88}{1} + \dfrac{43}{1}$

= **281**

Critical Volumes = 632 + 98 + 511 + 281

= 1522

V/C = $\mathbf{\dfrac{1522}{1375} - 0.10 = 1.007}$ **LOS F**

CB_PM

CalcaDB

January 19, 2010 ,Tuesday 11:19:50 AM

INTERSECTION DATA SUMMARY SHEET

N/S: Glendale Bl | W/E: Park Av | I/S No: 2

AM/PM: PM | Comments: 2009 Cum Base Conditions

COUNT DATE: | STUDY DATE: | GROWTH FACTOR:

Volume/Lane/Signal Configurations

	NORTHBOUND			SOUTHBOUND			WESTBOUND			EASTBOUND		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
EXISTING	135	1750	75	73	1119	80	99	38	160	36	27	147
AMBIENT												
RELATED												
PROJECT												
TOTAL	135	1750	75	73	1119	80	99	38	160	36	27	147

LANE	1		1		1			1		2			1		1		1			1		1		1			1		1			1	

	NORTHBOUND		SOUTHBOUND		WESTBOUND		EASTBOUND	
	Phasing	RTOR	Phasing	RTOR	Phasing	RTOR	Phasing	RTOR
SIGNAL	Perm	Auto	Perm	Free	Perm	Auto	Perm	Auto

Critical Movements Diagram

	A	B
SouthBound	560	73
EastBound	147	36
WestBound	160	99
NorthBound	913	135

V/C RATIO	LOS
0.00 - 0.60	A
0.61 - 0.70	B
0.71 - 0.80	C
0.81 - 0.90	D
0.91 - 1.00	E

A = Adjusted Through/Right Volume
B = Adjusted Left Volume
* = ATSAC Benefit

Results

North/South Critical Movements = A(N/B) + B(S/B)

West/East Critical Movements = B(W/B) + A(E/B)

$$V/C = \frac{913 + 73 + 99 + 147}{*1500} = 0.751$$

LOS = C

Developed by Chun Wong, 12/94

CB_PM

CalcaDB

January 19, 2010 ,Tuesday 11:19:50 AM

INTERSECTION DATA SUMMARY SHEET

N/S: Echo Park Av
W/E: Sunset Bl
I/S No: 3
AM/PM: PM
Comments: 2009 Cum Base Conditions
COUNT DATE:
STUDY DATE:
GROWTH FACTOR:

Volume/Lane/Signal Configurations

	NORTHBOUND LT	NORTHBOUND TH	NORTHBOUND RT	SOUTHBOUND LT	SOUTHBOUND TH	SOUTHBOUND RT	WESTBOUND LT	WESTBOUND TH	WESTBOUND RT	EASTBOUND LT	EASTBOUND TH	EASTBOUND RT
EXISTING	51	380	74	131	190	97	53	1015	162	106	1359	35
AMBIENT												
RELATED												
PROJECT												
TOTAL	51	380	74	131	190	97	53	1015	162	106	1359	35

LANE

	NB							SB							WB							EB						
LANE	1				1			1		1			1		1		1		1			1		1		1		

	NB Phasing	NB RTOR	SB Phasing	SB RTOR	WB Phasing	WB RTOR	EB Phasing	EB RTOR
SIGNAL	Perm	Auto	Perm	Auto	Perm	Auto	Perm	Auto

Critical Movements Diagram

SouthBound
A: 190
B: 131

EastBound
A: 697
B: 106

WestBound
A: 589
B: 53

NorthBound
A: 454
B: 51

V/C RATIO	LOS
0.00 - 0.60	A
0.61 - 0.70	B
0.71 - 0.80	C
0.81 - 0.90	D
0.91 - 1.00	E

A = Adjusted Through/Right Volume
B = Adjusted Left Volume
* = ATSAC Benefit

Results

North/South Critical Movements = A(N/B) + B(S/B)

West/East Critical Movements = B(W/B) + A(E/B)

$$V/C = \frac{454 + 131 + 53 + 697}{*1500} = 0.820$$

LOS = D

CalcaDB

January 19, 2010 ,Tuesday 11:19:50 AM

INTERSECTION DATA SUMMARY SHEET

N/S: Glendale Bl | W/E: Bellevue Av | I/S No: 4

AM/PM: PM | Comments: 2009 Cum Base Conditions

COUNT DATE: | STUDY DATE: | GROWTH FACTOR:

Volume/Lane/Signal Configurations

	NORTHBOUND LT	NORTHBOUND TH	NORTHBOUND RT	SOUTHBOUND LT	SOUTHBOUND TH	SOUTHBOUND RT	WESTBOUND LT	WESTBOUND TH	WESTBOUND RT	EASTBOUND LT	EASTBOUND TH	EASTBOUND RT
EXISTING	0	1748	378	104	1192	0	289	0	160	0	0	0
AMBIENT												
RELATED												
PROJECT												
TOTAL	0	1748	378	104	1192	0	289	0	160	0	0	0

LANE

	NB							SB							WB							EB						
LANE			2			1		1		2					2					1								

	NORTHBOUND Phasing	NORTHBOUND RTOR	SOUTHBOUND Phasing	SOUTHBOUND RTOR	WESTBOUND Phasing	WESTBOUND RTOR	EASTBOUND Phasing	EASTBOUND RTOR
SIGNAL	Perm	Auto	Prot-Fix	<none>	Split	Auto		

Critical Movements Diagram

SouthBound
A: 596
B: 104

EastBound
A: 0
B: 0

WestBound
A: 108
B: 159

NorthBound
A: 874
B: 0

A = Adjusted Through/Right Volume
B = Adjusted Left Volume
* = ATSAC Benefit

V/C RATIO	LOS
0.00 - 0.60	A
0.61 - 0.70	B
0.71 - 0.80	C
0.81 - 0.90	D
0.91 - 1.00	E

Results

North/South Critical Movements = A(N/B) + B(S/B)

West/East Critical Movements = B(W/B) + A(E/B)

$$V/C = \frac{874 + 104 + 159 + 0}{*1425} = 0.728$$

LOS = C

CalcaDB

INTERSECTION DATA SUMMARY SHEET

N/S: Echo Park Av | W/E: Bellevue Av | I/S No: 5

AM/PM: PM | Comments: 2009 Cum Base Conditions

COUNT DATE: | STUDY DATE: | GROWTH FACTOR:

Volume/Lane/Signal Configurations

	NORTHBOUND			SOUTHBOUND			WESTBOUND			EASTBOUND		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
EXISTING	182	200	40	97	75	118	168	139	211	122	132	207
AMBIENT												
RELATED												
PROJECT												
TOTAL	182	200	40	97	75	118	168	139	211	122	132	207

LANE	1	2	3	4	5	6	7
NORTHBOUND	1	1				1	
SOUTHBOUND	1		1			1	
WESTBOUND	1		1			1	
EASTBOUND	1				1		

SIGNAL	NB Phasing	NB RTOR	SB Phasing	SB RTOR	WB Phasing	WB RTOR	EB Phasing	EB RTOR
	Split	Auto	Split	Auto	Perm	<none>	Perm	<none>

Critical Movements Diagram

	A	B
SouthBound	118	97
EastBound	339	122
WestBound	211	168
NorthBound	200	182

A = Adjusted Through/Right Volume
B = Adjusted Left Volume
* = ATSAC Benefit

V/C RATIO	LOS
0.00 - 0.60	A
0.61 - 0.70	B
0.71 - 0.80	C
0.81 - 0.90	D
0.91 - 1.00	E

Results

North/South Critical Movements = A(N/B) + A(S/B)

West/East Critical Movements = B(W/B) + A(E/B)

$$V/C = \frac{200 + 118 + 168 + 339}{*1425} = 0.509$$

LOS = A

CB_PM

CalcaDB

January 19, 2010 ,Tuesday 11:19:50 AM

INTERSECTION DATA SUMMARY SHEET

N/S: Union Av | W/E: Temple St | I/S No: 6

AM/PM: PM | Comments: 2009 Cum Base Conditions

COUNT DATE: | STUDY DATE: | GROWTH FACTOR:

Volume/Lane/Signal Configurations

	NORTHBOUND			SOUTHBOUND			WESTBOUND			EASTBOUND		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
EXISTING	110	163	170	111	60	52	107	769	37	111	937	55
AMBIENT												
RELATED												
PROJECT												
TOTAL	110	163	170	111	60	52	107	769	37	111	937	55

LANE

NORTHBOUND	1				1		
SOUTHBOUND	1		1		1		
WESTBOUND	1		1		1		
EASTBOUND	1		1		1		

SIGNAL	NORTHBOUND	SOUTHBOUND	WESTBOUND	EASTBOUND
Phasing	Perm	Perm	Perm	Perm
RTOR	Auto	Auto	Auto	Auto

Critical Movements Diagram

	A:	B:
SouthBound	56	111
EastBound	496	111
WestBound	403	107
NorthBound	333	110

A = Adjusted Through/Right Volume
B = Adjusted Left Volume
* = ATSAC Benefit

V/C RATIO	LOS
0.00 - 0.60	A
0.61 - 0.70	B
0.71 - 0.80	C
0.81 - 0.90	D
0.91 - 1.00	E

Results

North/South Critical Movements = A(N/B) + B(S/B)

West/East Critical Movements = B(W/B) + A(E/B)

$$V/C = \frac{333 + 111 + 107 + 496}{*1500} = 0.628$$

LOS = B

Developed by Chun Wong, 12/94

CB_PM

January 19, 2010 ,Tuesday 11:19:50 AM

CalcaDB

INTERSECTION DATA SUMMARY SHEET

N/S: Glendale Bl W/E: Temple St I/S No: 7

AM/PM: PM Comments: 2009 Cum Base Conditions

COUNT DATE: STUDY DATE: GROWTH FACTOR:

Volume/Lane/Signal Configurations

	NORTHBOUND			SOUTHBOUND			WESTBOUND			EASTBOUND		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
EXISTING	97	1595	17	97	1040	225	30	608	239	331	765	150
AMBIENT												
RELATED												
PROJECT												
TOTAL	97	1595	17	97	1040	225	30	608	239	331	765	150

	NORTHBOUND							SOUTHBOUND							WESTBOUND							EASTBOUND						
LANE	1		1		1			1		1		1			1		1		1			1		1		1		

	NORTHBOUND		SOUTHBOUND		WESTBOUND		EASTBOUND	
	Phasing	RTOR	Phasing	RTOR	Phasing	RTOR	Phasing	RTOR
SIGNAL	Perm	Auto	Perm	Auto	Prot-Fix	Auto	Prot-Fix	Auto

Critical Movements Diagram

SouthBound
A: 633
B: 97

EastBound
A: 458
B: 331

WestBound
A: 424
B: 30

NorthBound
A: 806
B: 97

A = Adjusted Through/Right Volume
B = Adjusted Left Volume
* = ATSAC Benefit

V/C RATIO	LOS
0.00 - 0.60	A
0.61 - 0.70	B
0.71 - 0.80	C
0.81 - 0.90	D
0.91 - 1.00	E

Results

North/South Critical Movements = A(N/B) + B(S/B)

West/East Critical Movements = A(W/B) + B(E/B)

$$V/C = \frac{806 + 97 + 424 + 331}{*1425} = 1.094$$

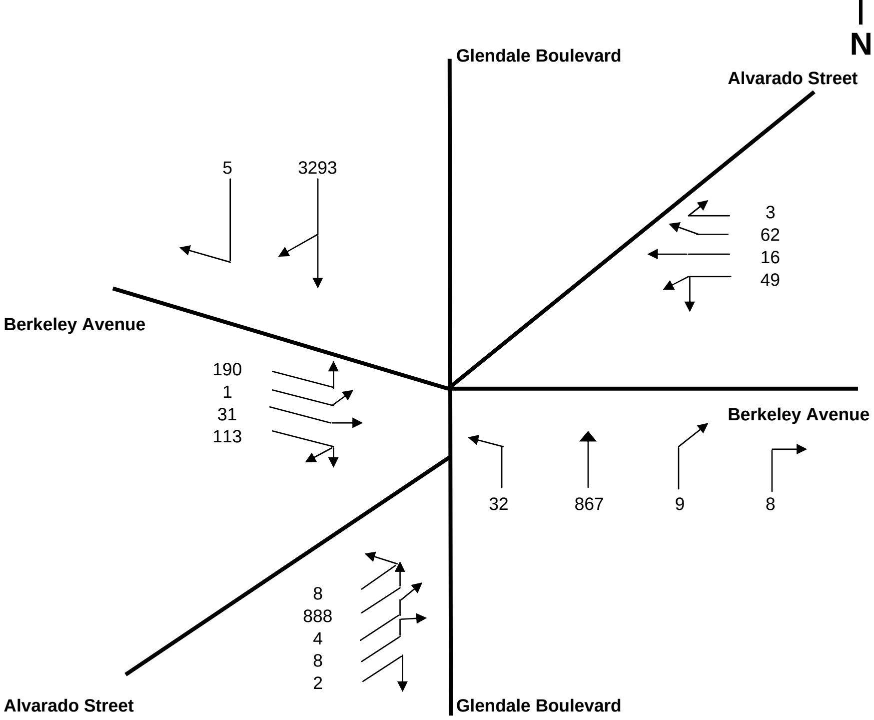
LOS = F

Developed by Chun Wong, 12/94

CUMULATIVE PLUS PROJECT (PHASE D)

Intersection 1

CUMULATIVE PLUS PROJECT (PHASE D) AM



Phase 1) $\frac{5 + 3293}{4}$

&

$\frac{867 + 9 + 8}{3}$

= **825**

Phase 2) $\left\{ \frac{867 + 9 + 8}{3} \right\} - 825$

or

$\frac{32}{1}$

= **32**

Phase 3) $\frac{8 + 888 + 4 + 8 + 2}{3}$

= **303**

Phase 4) $\frac{3 + 62 + 16}{1} + \frac{1 + 190}{1}$

or

$\frac{31 + 113}{1} + \frac{49}{1}$

= **272**

Critical Volumes = 825 + 32 + 303 + 272

= 1432

V/C = $\frac{1432}{1375}$ - 0.10 = 0.941 LOS E

CalcaDB

INTERSECTION DATA SUMMARY SHEET

N/S: Glendale Bl W/E: Park Av I/S No: 2

AM/PM: AM Comments: 2009 Cum Proj Conditions

COUNT DATE: STUDY DATE: GROWTH FACTOR:

Volume/Lane/Signal Configurations

	NORTHBOUND LT	NORTHBOUND TH	NORTHBOUND RT	SOUTHBOUND LT	SOUTHBOUND TH	SOUTHBOUND RT	WESTBOUND LT	WESTBOUND TH	WESTBOUND RT	EASTBOUND LT	EASTBOUND TH	EASTBOUND RT
EXISTING	56	662	80	106	1881	34	43	26	71	20	25	181
AMBIENT												
RELATED												
PROJECT												
TOTAL	56	662	80	106	1881	34	43	26	71	20	25	181

LANE	L	LT	T	LTR	TR	R	LR
NORTHBOUND	1		1		1		
SOUTHBOUND	1		2			1	
WESTBOUND	1		1			1	
EASTBOUND	1		1			1	

SIGNAL	NB Phasing	NB RTOR	SB Phasing	SB RTOR	WB Phasing	WB RTOR	EB Phasing	EB RTOR
	Perm	Auto	Perm	Free	Perm	Auto	Perm	Auto

Critical Movements Diagram

	A	B
SouthBound	941	106
EastBound	181	20
WestBound	71	43
NorthBound	371	56

A = Adjusted Through/Right Volume
B = Adjusted Left Volume
* = ATSAC Benefit

V/C RATIO	LOS
0.00 - 0.60	A
0.61 - 0.70	B
0.71 - 0.80	C
0.81 - 0.90	D
0.91 - 1.00	E

Results

North/South Critical Movements = B(N/B) + A(S/B)

West/East Critical Movements = B(W/B) + A(E/B)

$$V/C = \frac{56 + 941 + 43 + 181}{*1500} = 0.744$$

LOS = C

CP_AM_H

CalcaDB

January 19, 2010 ,Tuesday 11:20:23 AM

INTERSECTION DATA SUMMARY SHEET

N/S: Echo Park Av W/E: Sunset Bl I/S No: 3

AM/PM: AM Comments: 2009 Cum Proj Conditions

COUNT DATE: STUDY DATE: GROWTH FACTOR:

Volume/Lane/Signal Configurations

	NORTHBOUND			SOUTHBOUND			WESTBOUND			EASTBOUND		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
EXISTING	35	149	31	184	478	149	83	825	118	88	1118	56
AMBIENT												
RELATED												
PROJECT												
TOTAL	35	149	31	184	478	149	83	825	118	88	1118	56

	NORTHBOUND							SOUTHBOUND							WESTBOUND							EASTBOUND						
LANE	1				1			1		1			1		1		1		1			1		1		1		

	NORTHBOUND		SOUTHBOUND		WESTBOUND		EASTBOUND	
	Phasing	RTOR	Phasing	RTOR	Phasing	RTOR	Phasing	RTOR
SIGNAL	Perm	Auto	Perm	Auto	Perm	Auto	Perm	Auto

Critical Movements Diagram

SouthBound
A: 478
B: 184

EastBound
A: 587
B: 88

WestBound
A: 472
B: 83

NorthBound
A: 180
B: 35

V/C RATIO	LOS
0.00 - 0.60	A
0.61 - 0.70	B
0.71 - 0.80	C
0.81 - 0.90	D
0.91 - 1.00	E

A = Adjusted Through/Right Volume
B = Adjusted Left Volume
* = ATSAC Benefit

Results

North/South Critical Movements = B(N/B) + A(S/B)

West/East Critical Movements = B(W/B) + A(E/B)

$$V/C = \frac{35 + 478 + 83 + 587}{*1500} = 0.719$$

LOS = C

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INTERSECTION DATA SUMMARY SHEET

N/S: Glendale Bl   W/E: Bellevue Av   I/S No: 4

AM/PM: AM   Comments: 2009 Cum Proj Conditions

COUNT DATE: STUDY DATE: GROWTH FACTOR:

Volume/Lane/Signal Configurations

	NORTHBOUND LT	NORTHBOUND TH	NORTHBOUND RT	SOUTHBOUND LT	SOUTHBOUND TH	SOUTHBOUND RT	WESTBOUND LT	WESTBOUND TH	WESTBOUND RT	EASTBOUND LT	EASTBOUND TH	EASTBOUND RT
EXISTING	0	614	234	47	2015	0	501	0	154	0	0	0
AMBIENT												
RELATED												
PROJECT												
TOTAL	0	614	234	47	2015	0	501	0	154	0	0	0

LANE

	NORTHBOUND							SOUTHBOUND							WESTBOUND							EASTBOUND						
LANE			2			1		1		2					2					1								

	NORTHBOUND Phasing	NORTHBOUND RTOR	SOUTHBOUND Phasing	SOUTHBOUND RTOR	WESTBOUND Phasing	WESTBOUND RTOR	EASTBOUND Phasing	EASTBOUND RTOR
SIGNAL	Perm	Auto	Prot-Fix	<none>	Split	Auto		

Critical Movements Diagram

	A	B
SouthBound	1008	47
EastBound	0	0
WestBound	130	276
NorthBound	307	0

A = Adjusted Through/Right Volume
B = Adjusted Left Volume
* = ATSAC Benefit

V/C RATIO	LOS
0.00 - 0.60	A
0.61 - 0.70	B
0.71 - 0.80	C
0.81 - 0.90	D
0.91 - 1.00	E

Results

North/South Critical Movements = B(N/B) + A(S/B)

West/East Critical Movements = B(W/B) + A(E/B)

$$V/C = \frac{0 + 1008 + 276 + 0}{*1425} = 0.831$$

LOS = D

CP_AM_H

CalcaDB

January 19, 2010 ,Tuesday 11:20:23 AM

INTERSECTION DATA SUMMARY SHEET

N/S: Echo Park Av W/E: Bellevue Av I/S No: 5

AM/PM: AM Comments: 2009 Cum Proj Conditions

COUNT DATE: STUDY DATE: GROWTH FACTOR:

Volume/Lane/Signal Configurations

	NORTHBOUND			SOUTHBOUND			WESTBOUND			EASTBOUND		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
EXISTING	255	128	34	176	218	261	186	150	92	52	71	144
AMBIENT												
RELATED												
PROJECT												
TOTAL	255	128	34	176	218	261	186	150	92	52	71	144

LANE							
NORTHBOUND	1	1				1	
SOUTHBOUND	1		1			1	
WESTBOUND	1		1			1	
EASTBOUND	1				1		

SIGNAL	NORTHBOUND		SOUTHBOUND		WESTBOUND		EASTBOUND	
	Phasing	RTOR	Phasing	RTOR	Phasing	RTOR	Phasing	RTOR
	Split	Auto	Split	Auto	Perm	<none>	Perm	<none>

Critical Movements Diagram

SouthBound
A: 261
B: 176

EastBound
A: 215
B: 52

WestBound
A: 150
B: 186

NorthBound
A: 192
B: 192

V/C RATIO	LOS
0.00 - 0.60	A
0.61 - 0.70	B
0.71 - 0.80	C
0.81 - 0.90	D
0.91 - 1.00	E

A = Adjusted Through/Right Volume
B = Adjusted Left Volume
* = ATSAC Benefit

Results

North/South Critical Movements = A(N/B) + A(S/B)

West/East Critical Movements = B(W/B) + A(E/B)

$$V/C = \frac{192 + 261 + 186 + 215}{*1425} = 0.529$$

LOS = A

Developed by Chun Wong, 12/94

CP_AM_H

January 19, 2010 ,Tuesday 11:20:23 AM

CalcaDB

INTERSECTION DATA SUMMARY SHEET

N/S: Union Av | W/E: Temple St | I/S No: 6

AM/PM: AM | Comments: 2009 Cum Proj Conditions

COUNT DATE: | STUDY DATE: | GROWTH FACTOR:

Volume/Lane/Signal Configurations

	NORTHBOUND LT	NORTHBOUND TH	NORTHBOUND RT	SOUTHBOUND LT	SOUTHBOUND TH	SOUTHBOUND RT	WESTBOUND LT	WESTBOUND TH	WESTBOUND RT	EASTBOUND LT	EASTBOUND TH	EASTBOUND RT
EXISTING	100	175	128	156	55	30	145	593	66	136	703	67
AMBIENT												
RELATED												
PROJECT												
TOTAL	100	175	128	156	55	30	145	593	66	136	703	67

LANE

	NB	SB	WB	EB
LANE	1, , , , 1, ,	1, , 1, , 1, ,	1, , 1, , 1, ,	1, , 1, , 1, ,

	NB Phasing	NB RTOR	SB Phasing	SB RTOR	WB Phasing	WB RTOR	EB Phasing	EB RTOR
SIGNAL	Perm	Auto	Perm	Auto	Perm	Auto	Perm	Auto

Critical Movements Diagram

	A	B
SouthBound	43	156
EastBound	385	136
WestBound	330	145
NorthBound	303	100

A = Adjusted Through/Right Volume
B = Adjusted Left Volume
* = ATSAC Benefit

V/C RATIO	LOS
0.00 - 0.60	A
0.61 - 0.70	B
0.71 - 0.80	C
0.81 - 0.90	D
0.91 - 1.00	E

Results

North/South Critical Movements = A(N/B) + B(S/B)

West/East Critical Movements = B(W/B) + A(E/B)

$$V/C = \frac{303 + 156 + 145 + 385}{*1500} = 0.589$$

LOS = A

CalcaDB

January 19, 2010 ,Tuesday 11:20:23 AM

INTERSECTION DATA SUMMARY SHEET

N/S: Glendale Bl	W/E: Temple St	I/S No: 7	
AM/PM: AM	Comments: 2009 Cum Proj Conditions		
COUNT DATE:	STUDY DATE:	GROWTH FACTOR:	

Volume/Lane/Signal Configurations

	NORTHBOUND LT	NORTHBOUND TH	NORTHBOUND RT	SOUTHBOUND LT	SOUTHBOUND TH	SOUTHBOUND RT	WESTBOUND LT	WESTBOUND TH	WESTBOUND RT	EASTBOUND LT	EASTBOUND TH	EASTBOUND RT
EXISTING	85	551	15	197	1990	180	47	516	111	220	577	161
AMBIENT												
RELATED												
PROJECT												
TOTAL	85	551	15	197	1990	180	47	516	111	220	577	161

LANE	NB	SB	WB	EB
LT	1	1	1	1
LT/TH				
TH	1	1	1	1
LT/TH/RT				
TH/RT	1	1	1	1
RT				
LT/RT				

SIGNAL	NB	SB	WB	EB
Phasing	Perm	Perm	Prot-Fix	Prot-Fix
RTOR	Auto	Auto	Auto	Auto

Critical Movements Diagram

	A	B
SouthBound	1085	197
EastBound	369	220
WestBound	314	47
NorthBound	283	85

A = Adjusted Through/Right Volume
B = Adjusted Left Volume
* = ATSAC Benefit

V/C RATIO	LOS
0.00 - 0.60	A
0.61 - 0.70	B
0.71 - 0.80	C
0.81 - 0.90	D
0.91 - 1.00	E

Results

North/South Critical Movements = B(N/B) + A(S/B)

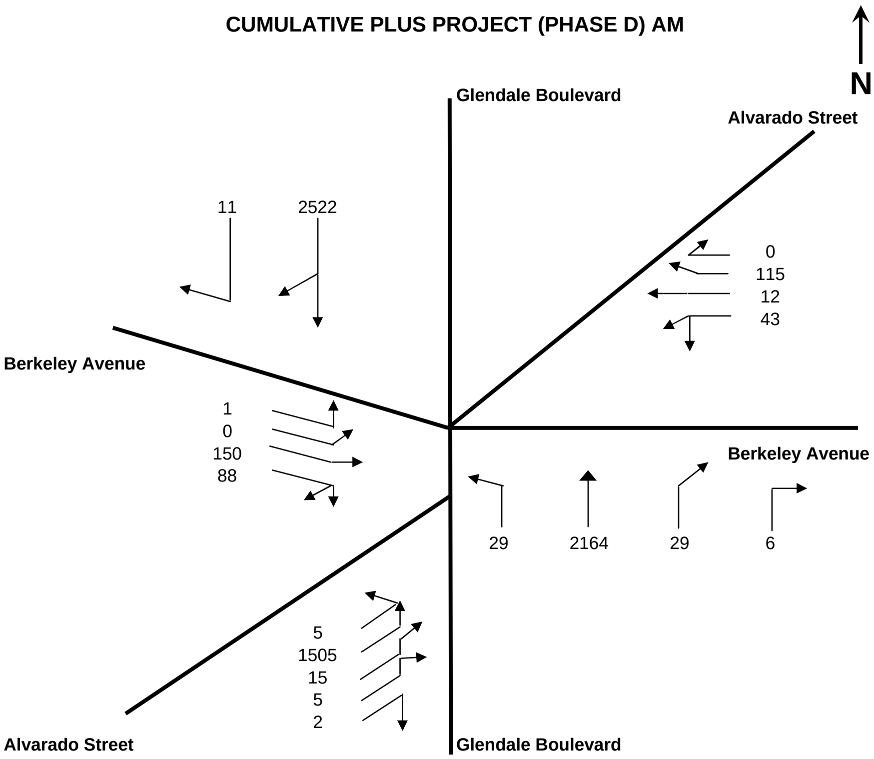
West/East Critical Movements = A(W/B) + B(E/B)

$$V/C = \frac{85 + 1085 + 314 + 220}{*1425} = 1.126$$

LOS = F

Intersection 1

CUMULATIVE PLUS PROJECT (PHASE D) AM



Phase 1) $$\frac{11 + 2522}{4}$$

&

$$\frac{2164 + 29 + 6}{3}$$

= **633**

Phase 2) $$\left\{\frac{2164 + 29 + 6}{3}\right\} - 633$$

or

$$\frac{29}{1}$$

= **100**

Phase 3) $$\frac{5 + 1505 + 15 + 5 + 2}{3}$$

= **511**

Phase 4) $$\frac{0 + 115 + 12}{1} + \frac{0 + 1}{1}$$

or

$$\frac{150 + 88}{1} + \frac{43}{1}$$

= **281**

Critical Volumes = 633 + 100 + 511 + 281

= 1525

V/C = $$\frac{1525}{1375} - 0.10 = 1.009$$ **LOS F**

CalcaDB

January 21, 2010 ,Thursday 11:28:43 AM

INTERSECTION DATA SUMMARY SHEET

N/S:	Glendale Bl	W/E:	Park Av	I/S No:	2
AM/PM:	PM	Comments:	2009 Cum Proj Conditions		
COUNT DATE:		STUDY DATE:		GROWTH FACTOR:	

Volume/Lane/Signal Configurations

	NORTHBOUND LT	NORTHBOUND TH	NORTHBOUND RT	SOUTHBOUND LT	SOUTHBOUND TH	SOUTHBOUND RT	WESTBOUND LT	WESTBOUND TH	WESTBOUND RT	EASTBOUND LT	EASTBOUND TH	EASTBOUND RT
EXISTING	135	1750	75	81	1140	89	99	38	164	36	27	147
AMBIENT												
RELATED												
PROJECT												
TOTAL	135	1750	75	81	1140	89	99	38	164	36	27	147

LANE	LT	LT/TH	TH	LT/TH/RT	TH/RT	RT	LT/RT
NORTHBOUND	1		1		1		
SOUTHBOUND	1		2			1	
WESTBOUND	1		1			1	
EASTBOUND	1		1			1	

SIGNAL	Phasing	RTOR
NORTHBOUND	Perm	Auto
SOUTHBOUND	Perm	Free
WESTBOUND	Perm	Auto
EASTBOUND	Perm	Auto

Critical Movements Diagram

	A	B
SouthBound	570	81
EastBound	147	36
WestBound	164	99
NorthBound	913	135

A = Adjusted Through/Right Volume
B = Adjusted Left Volume
* = ATSAC Benefit

V/C RATIO	LOS
0.00 - 0.60	A
0.61 - 0.70	B
0.71 - 0.80	C
0.81 - 0.90	D
0.91 - 1.00	E

Results

North/South Critical Movements = A(N/B) + B(S/B)

West/East Critical Movements = B(W/B) + A(E/B)

$$V/C = \frac{913 + 81 + 99 + 147}{*1500} = 0.757$$

LOS = C

CP_PM_H

January 21, 2010 ,Thursday 11:28:43 AM

CalcaDB

INTERSECTION DATA SUMMARY SHEET

N/S:	Echo Park Av	W/E:	Sunset Bl	I/S No:	3
AM/PM:	PM	Comments:	2009 Cum Proj Conditions		
COUNT DATE:		STUDY DATE:		GROWTH FACTOR:	

Volume/Lane/Signal Configurations

	NORTHBOUND			SOUTHBOUND			WESTBOUND			EASTBOUND		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
EXISTING	51	380	78	131	190	97	53	1015	162	106	1359	35
AMBIENT												
RELATED												
PROJECT												
TOTAL	51	380	78	131	190	97	53	1015	162	106	1359	35

	NORTHBOUND							SOUTHBOUND							WESTBOUND							EASTBOUND						
LANE	1				1			1		1			1		1		1		1			1		1		1		

	NORTHBOUND		SOUTHBOUND		WESTBOUND		EASTBOUND	
	Phasing	RTOR	Phasing	RTOR	Phasing	RTOR	Phasing	RTOR
SIGNAL	Perm	Auto	Perm	Auto	Perm	Auto	Perm	Auto

Critical Movements Diagram

	A	B
SouthBound	190	131
EastBound	697	106
WestBound	589	53
NorthBound	458	51

A = Adjusted Through/Right Volume
B = Adjusted Left Volume
* = ATSAC Benefit

V/C RATIO	LOS
0.00 - 0.60	A
0.61 - 0.70	B
0.71 - 0.80	C
0.81 - 0.90	D
0.91 - 1.00	E

Results

North/South Critical Movements = A(N/B) + B(S/B)

West/East Critical Movements = B(W/B) + A(E/B)

$$V/C = \frac{458 + 131 + 53 + 697}{*1500} = 0.823$$

LOS = D

Developed by Chun Wong, 12/94

CalcaDB

January 21, 2010 ,Thursday 11:28:43 AM

INTERSECTION DATA SUMMARY SHEET

N/S: Glendale Bl
W/E: Bellevue Av
I/S No: 4

AM/PM: PM
Comments: 2009 Cum Proj Conditions

COUNT DATE:
STUDY DATE:
GROWTH FACTOR:

Volume/Lane/Signal Configurations

	NORTHBOUND			SOUTHBOUND			WESTBOUND			EASTBOUND		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
EXISTING	0	1748	392	107	1210	0	298	0	160	0	0	0
AMBIENT												
RELATED												
PROJECT												
TOTAL	0	1748	392	107	1210	0	298	0	160	0	0	0

LANE

	NORTHBOUND							SOUTHBOUND							WESTBOUND							EASTBOUND						
LANE			2			1		1		2					2					1								

	NORTHBOUND		SOUTHBOUND		WESTBOUND		EASTBOUND	
	Phasing	RTOR	Phasing	RTOR	Phasing	RTOR	Phasing	RTOR
SIGNAL	Perm	Auto	Prot-Fix	<none>	Split	Auto		

Critical Movements Diagram

SouthBound
A: 605
B: 107

EastBound
A: 0
B: 0

WestBound
A: 106
B: 164

NorthBound
A: 874
B: 0

V/C RATIO	LOS
0.00 - 0.60	A
0.61 - 0.70	B
0.71 - 0.80	C
0.81 - 0.90	D
0.91 - 1.00	E

A = Adjusted Through/Right Volume
B = Adjusted Left Volume
* = ATSAC Benefit

Results

North/South Critical Movements = A(N/B) + B(S/B)

West/East Critical Movements = B(W/B) + A(E/B)

$$V/C = \frac{874 + 107 + 164 + 0}{*1425} = 0.734$$

LOS = C

CalcaDB

INTERSECTION DATA SUMMARY SHEET

N/S:	Echo Park Av	W/E:	Bellevue Av	I/S No:	5
AM/PM:	PM	Comments:	2009 Cum Proj Conditions		
COUNT DATE:		STUDY DATE:		GROWTH FACTOR:	

Volume/Lane/Signal Configurations

	NORTHBOUND			SOUTHBOUND			WESTBOUND			EASTBOUND		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
EXISTING	182	209	40	97	89	127	168	139	211	136	132	210
AMBIENT												
RELATED												
PROJECT												
TOTAL	182	209	40	97	89	127	168	139	211	136	132	210

LANE	LT	LT/TH	TH	LT/TH/RT	TH/RT	RT	LT/RT
NORTHBOUND	1	1				1	
SOUTHBOUND	1		1			1	
WESTBOUND	1		1			1	
EASTBOUND	1				1		

SIGNAL	Phasing	RTOR
NORTHBOUND	Split	Auto
SOUTHBOUND	Split	Auto
WESTBOUND	Perm	<none>
EASTBOUND	Perm	<none>

Critical Movements Diagram

	A:	B:
SouthBound	127	97
EastBound	342	136
WestBound	211	168
NorthBound	209	182

A = Adjusted Through/Right Volume
B = Adjusted Left Volume
* = ATSAC Benefit

V/C RATIO	LOS
0.00 - 0.60	A
0.61 - 0.70	B
0.71 - 0.80	C
0.81 - 0.90	D
0.91 - 1.00	E

Results

North/South Critical Movements = A(N/B) + A(S/B)

West/East Critical Movements = B(W/B) + A(E/B)

$$V/C = \frac{209 + 127 + 168 + 342}{*1425} = 0.524$$

LOS = A

CalcaDB

January 21, 2010 ,Thursday 11:28:43 AM

INTERSECTION DATA SUMMARY SHEET

N/S:	Union Av	W/E:	Temple St	I/S No:	6
AM/PM:	PM	Comments:	2009 Cum Proj Conditions		
COUNT DATE:		STUDY DATE:		GROWTH FACTOR:	

Volume/Lane/Signal Configurations

	NORTHBOUND			SOUTHBOUND			WESTBOUND			EASTBOUND		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
EXISTING	110	163	170	125	60	52	107	771	37	111	937	55
AMBIENT												
RELATED												
PROJECT												
TOTAL	110	163	170	125	60	52	107	771	37	111	937	55

LANE	NB							SB							WB							EB						
	1				1			1		1		1			1		1		1			1		1		1		

SIGNAL	NB Phasing	NB RTOR	SB Phasing	SB RTOR	WB Phasing	WB RTOR	EB Phasing	EB RTOR
	Perm	Auto	Perm	Auto	Perm	Auto	Perm	Auto

Critical Movements Diagram

	A:	B:
SouthBound	56	125
EastBound	496	111
WestBound	404	107
NorthBound	333	110

A = Adjusted Through/Right Volume
B = Adjusted Left Volume
* = ATSAC Benefit

V/C RATIO	LOS
0.00 - 0.60	A
0.61 - 0.70	B
0.71 - 0.80	C
0.81 - 0.90	D
0.91 - 1.00	E

Results

North/South Critical Movements = A(N/B) + B(S/B)

West/East Critical Movements = B(W/B) + A(E/B)

$$V/C = \frac{333 + 125 + 107 + 496}{*1500} = 0.637$$

LOS = B

CalcaDB

INTERSECTION DATA SUMMARY SHEET

N/S: Glendale Bl | W/E: Temple St | I/S No: 7

AM/PM: PM | Comments: 2009 Cum Proj Conditions

COUNT DATE: | STUDY DATE: | GROWTH FACTOR:

Volume/Lane/Signal Configurations

	NORTHBOUND			SOUTHBOUND			WESTBOUND			EASTBOUND		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
EXISTING	97	1595	17	99	1046	227	30	608	239	345	765	150
AMBIENT												
RELATED												
PROJECT												
TOTAL	97	1595	17	99	1046	227	30	608	239	345	765	150

LANE	1		1		1		
Northbound	1		1		1		
Southbound	1		1		1		
Westbound	1		1		1		
Eastbound	1		1		1		

SIGNAL	Phasing	RTOR
Northbound	Perm	Auto
Southbound	Perm	Auto
Westbound	Prot-Fix	Auto
Eastbound	Prot-Fix	Auto

Critical Movements Diagram

	A	B
SouthBound	637	99
EastBound	458	345
WestBound	424	30
NorthBound	806	97

A = Adjusted Through/Right Volume
B = Adjusted Left Volume
* = ATSAC Benefit

V/C RATIO	LOS
0.00 - 0.60	A
0.61 - 0.70	B
0.71 - 0.80	C
0.81 - 0.90	D
0.91 - 1.00	E

Results

North/South Critical Movements = A(N/B) + B(S/B)

West/East Critical Movements = A(W/B) + B(E/B)

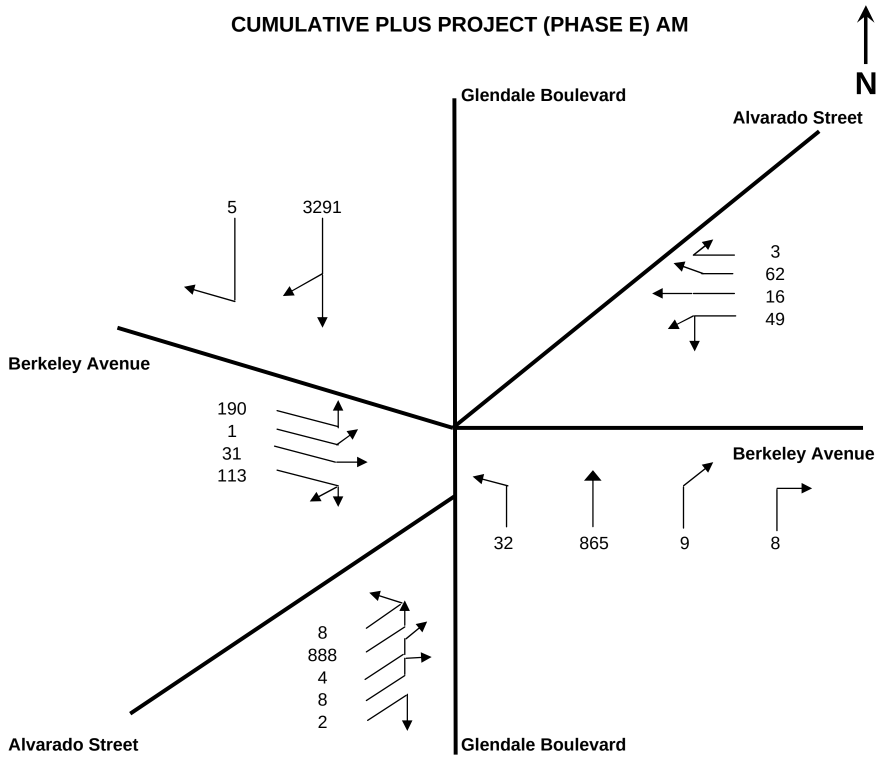
$$V/C = \frac{806 + 99 + 424 + 345}{*1425} = 1.105$$

LOS = F

CUMULATIVE PLUS PROJECT (PHASE E)

Intersection 1

CUMULATIVE PLUS PROJECT (PHASE E) AM



Phase 1) $\dfrac{5 + 3291}{4}$

&

$\dfrac{865 + 9 + 8}{3}$

$= \mathbf{824}$

Phase 2) $\left\{\dfrac{865 + 9 + 8}{3}\right\} - 824$

or

$\dfrac{32}{1}$

$= \mathbf{32}$

Phase 3) $\dfrac{8 + 888 + 4 + 8 + 2}{3}$

$= \mathbf{303}$

Phase 4) $\dfrac{3 + 62 + 16}{1} + \dfrac{1 + 190}{1}$

or

$\dfrac{31 + 113}{1} + \dfrac{49}{1}$

$= \mathbf{272}$

Critical Volumes = 824 + 32 + 303 + 272

= 1431

V/C = $\mathbf{\dfrac{1431}{1375} - 0.10 = 0.941}$ **LOS E**

CP_AM_L

CalcaDB

January 21, 2010 ,Thursday 11:29:09 AM

INTERSECTION DATA SUMMARY SHEET

N/S: Glendale Bl | W/E: Park Av | I/S No: 2

AM/PM: AM | Comments: 2009 Cum Proj Conditions

COUNT DATE: | STUDY DATE: | GROWTH FACTOR:

Volume/Lane/Signal Configurations

	NORTHBOUND			SOUTHBOUND			WESTBOUND			EASTBOUND		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
EXISTING	56	662	80	104	1881	34	43	26	69	20	25	181
AMBIENT												
RELATED												
PROJECT												
TOTAL	56	662	80	104	1881	34	43	26	69	20	25	181

	NORTHBOUND							SOUTHBOUND							WESTBOUND							EASTBOUND						
LANE	1		1		1			1		2			1		1		1			1		1		1			1	

	NORTHBOUND		SOUTHBOUND		WESTBOUND		EASTBOUND	
	Phasing	RTOR	Phasing	RTOR	Phasing	RTOR	Phasing	RTOR
SIGNAL	Perm	Auto	Perm	Free	Perm	Auto	Perm	Auto

Critical Movements Diagram

SouthBound
A: 941
B: 104

EastBound
A: 181
B: 20

WestBound
A: 69
B: 43

NorthBound
A: 371
B: 56

A = Adjusted Through/Right Volume
B = Adjusted Left Volume
* = ATSAC Benefit

V/C RATIO	LOS
0.00 - 0.60	A
0.61 - 0.70	B
0.71 - 0.80	C
0.81 - 0.90	D
0.91 - 1.00	E

Results

North/South Critical Movements = B(N/B) + A(S/B)

West/East Critical Movements = B(W/B) + A(E/B)

$$V/C = \frac{56 + 941 + 43 + 181}{*1500} = 0.744$$

LOS = C

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January 21, 2010 ,Thursday 11:29:09 AM

INTERSECTION DATA SUMMARY SHEET

N/S: Echo Park Av | W/E: Sunset Bl | I/S No: 3

AM/PM: AM | Comments: 2009 Cum Proj Conditions

COUNT DATE: | STUDY DATE: | GROWTH FACTOR:

Volume/Lane/Signal Configurations

	NORTHBOUND			SOUTHBOUND			WESTBOUND			EASTBOUND		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
EXISTING	35	149	31	184	478	149	83	825	118	88	1118	56
AMBIENT												
RELATED												
PROJECT												
TOTAL	35	149	31	184	478	149	83	825	118	88	1118	56

LANE	1				1			1		1			1		1		1		1			1		1		1		

	Phasing	RTOR	Phasing	RTOR	Phasing	RTOR	Phasing	RTOR
SIGNAL	Perm	Auto	Perm	Auto	Perm	Auto	Perm	Auto

Critical Movements Diagram

SouthBound
A: 478
B: 184

EastBound
A: 587
B: 88

WestBound
A: 472
B: 83

NorthBound
A: 180
B: 35

A = Adjusted Through/Right Volume
B = Adjusted Left Volume
* = ATSAC Benefit

V/C RATIO	LOS
0.00 - 0.60	A
0.61 - 0.70	B
0.71 - 0.80	C
0.81 - 0.90	D
0.91 - 1.00	E

Results

North/South Critical Movements = B(N/B) + A(S/B)

West/East Critical Movements = B(W/B) + A(E/B)

$$V/C = \frac{35 + 478 + 83 + 587}{*1500} = 0.719$$

LOS = C

Developed by Chun Wong, 12/94

CP_AM_L

January 21, 2010 ,Thursday 11:29:09 AM

CalcaDB

INTERSECTION DATA SUMMARY SHEET

N/S:	Glendale Bl	W/E:	Bellevue Av	I/S No:	4
AM/PM:	AM	Comments:	2009 Cum Proj Conditions		
COUNT DATE:		STUDY DATE:		GROWTH FACTOR:	

Volume/Lane/Signal Configurations

	NORTHBOUND LT	NORTHBOUND TH	NORTHBOUND RT	SOUTHBOUND LT	SOUTHBOUND TH	SOUTHBOUND RT	WESTBOUND LT	WESTBOUND TH	WESTBOUND RT	EASTBOUND LT	EASTBOUND TH	EASTBOUND RT
EXISTING	0	614	226	47	2015	0	496	0	154	0	0	0
AMBIENT												
RELATED												
PROJECT												
TOTAL	0	614	226	47	2015	0	496	0	154	0	0	0

LANE							
NORTHBOUND			2			1	
SOUTHBOUND	1		2				
WESTBOUND	2					1	
EASTBOUND							

SIGNAL	NORTHBOUND	SOUTHBOUND	WESTBOUND	EASTBOUND
Phasing	Perm	Prot-Fix	Split	
RTOR	Auto	<none>	Auto	

Critical Movements Diagram

	A	B
SouthBound	1008	47
EastBound	0	0
WestBound	130	273
NorthBound	307	0

A = Adjusted Through/Right Volume
B = Adjusted Left Volume
* = ATSAC Benefit

V/C RATIO	LOS
0.00 - 0.60	A
0.61 - 0.70	B
0.71 - 0.80	C
0.81 - 0.90	D
0.91 - 1.00	E

Results

North/South Critical Movements = B(N/B) + A(S/B)

West/East Critical Movements = B(W/B) + A(E/B)

$$V/C = \frac{0 + 1008 + 273 + 0}{*1425} = 0.829$$

LOS = D

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INTERSECTION DATA SUMMARY SHEET

N/S: Echo Park Av W/E: Bellevue Av I/S No: 5

AM/PM: AM Comments: 2009 Cum Proj Conditions

COUNT DATE: STUDY DATE: GROWTH FACTOR:

Volume/Lane/Signal Configurations

	NORTHBOUND LT	NORTHBOUND TH	NORTHBOUND RT	SOUTHBOUND LT	SOUTHBOUND TH	SOUTHBOUND RT	WESTBOUND LT	WESTBOUND TH	WESTBOUND RT	EASTBOUND LT	EASTBOUND TH	EASTBOUND RT
EXISTING	255	123	34	176	210	256	186	150	92	44	71	144
AMBIENT												
RELATED												
PROJECT												
TOTAL	255	123	34	176	210	256	186	150	92	44	71	144

LANE

	Lane 1	Lane 2	Lane 3	Lane 4	Lane 5	Lane 6	Lane 7
NORTHBOUND	1	1				1	
SOUTHBOUND	1		1			1	
WESTBOUND	1		1			1	
EASTBOUND	1				1		

SIGNAL

	Phasing	RTOR
NORTHBOUND	Split	Auto
SOUTHBOUND	Split	Auto
WESTBOUND	Perm	<none>
EASTBOUND	Perm	<none>

Critical Movements Diagram

	A	B
SouthBound	256	176
EastBound	215	44
WestBound	150	186
NorthBound	189	189

A = Adjusted Through/Right Volume
B = Adjusted Left Volume
* = ATSAC Benefit

V/C RATIO	LOS
0.00 - 0.60	A
0.61 - 0.70	B
0.71 - 0.80	C
0.81 - 0.90	D
0.91 - 1.00	E

Results

North/South Critical Movements = A(N/B) + A(S/B)

West/East Critical Movements = B(W/B) + A(E/B)

$$V/C = \frac{189 + 256 + 186 + 215}{*1425} = 0.524$$

LOS = A

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CalcaDB

January 21, 2010 ,Thursday 11:29:09 AM

INTERSECTION DATA SUMMARY SHEET

N/S: Union Av | W/E: Temple St | I/S No: 6

AM/PM: AM | Comments: 2009 Cum Proj Conditions

COUNT DATE: | STUDY DATE: | GROWTH FACTOR:

Volume/Lane/Signal Configurations

	NORTHBOUND LT	NORTHBOUND TH	NORTHBOUND RT	SOUTHBOUND LT	SOUTHBOUND TH	SOUTHBOUND RT	WESTBOUND LT	WESTBOUND TH	WESTBOUND RT	EASTBOUND LT	EASTBOUND TH	EASTBOUND RT
EXISTING	100	175	128	149	55	30	145	593	66	136	703	67
AMBIENT												
RELATED												
PROJECT												
TOTAL	100	175	128	149	55	30	145	593	66	136	703	67

LANE	LT	LT/TH	TH	LT/TH/RT	TH/RT	RT	LT/RT
NORTHBOUND	1				1		
SOUTHBOUND	1		1		1		
WESTBOUND	1		1		1		
EASTBOUND	1		1		1		

SIGNAL	Phasing	RTOR
NORTHBOUND	Perm	Auto
SOUTHBOUND	Perm	Auto
WESTBOUND	Perm	Auto
EASTBOUND	Perm	Auto

Critical Movements Diagram

	A	B
SouthBound	43	149
EastBound	385	136
WestBound	330	145
NorthBound	303	100

A = Adjusted Through/Right Volume
B = Adjusted Left Volume
* = ATSAC Benefit

V/C RATIO	LOS
0.00 - 0.60	A
0.61 - 0.70	B
0.71 - 0.80	C
0.81 - 0.90	D
0.91 - 1.00	E

Results

North/South Critical Movements = A(N/B) + B(S/B)

West/East Critical Movements = B(W/B) + A(E/B)

$$V/C = \frac{303 + 149 + 145 + 385}{*1500} = 0.585$$

LOS = A

CalcaDB

January 21, 2010 ,Thursday 11:29:09 AM

INTERSECTION DATA SUMMARY SHEET

N/S: Glendale Bl W/E: Temple St I/S No: 7

AM/PM: AM Comments: 2009 Cum Proj Conditions

COUNT DATE: STUDY DATE: GROWTH FACTOR:

Volume/Lane/Signal Configurations

	NORTHBOUND			SOUTHBOUND			WESTBOUND			EASTBOUND		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
EXISTING	85	551	15	197	1990	180	47	516	111	213	577	161
AMBIENT												
RELATED												
PROJECT												
TOTAL	85	551	15	197	1990	180	47	516	111	213	577	161

LANE							
NORTHBOUND	1		1		1		
SOUTHBOUND	1		1		1		
WESTBOUND	1		1		1		
EASTBOUND	1		1		1		

SIGNAL	NORTHBOUND	SOUTHBOUND	WESTBOUND	EASTBOUND
Phasing	Perm	Perm	Prot-Fix	Prot-Fix
RTOR	Auto	Auto	Auto	Auto

Critical Movements Diagram

	A	B
SouthBound	1085	197
EastBound	369	213
WestBound	314	47
NorthBound	283	85

V/C RATIO	LOS
0.00 - 0.60	A
0.61 - 0.70	B
0.71 - 0.80	C
0.81 - 0.90	D
0.91 - 1.00	E

A = Adjusted Through/Right Volume
B = Adjusted Left Volume
* = ATSAC Benefit

Results

North/South Critical Movements = B(N/B) + A(S/B)

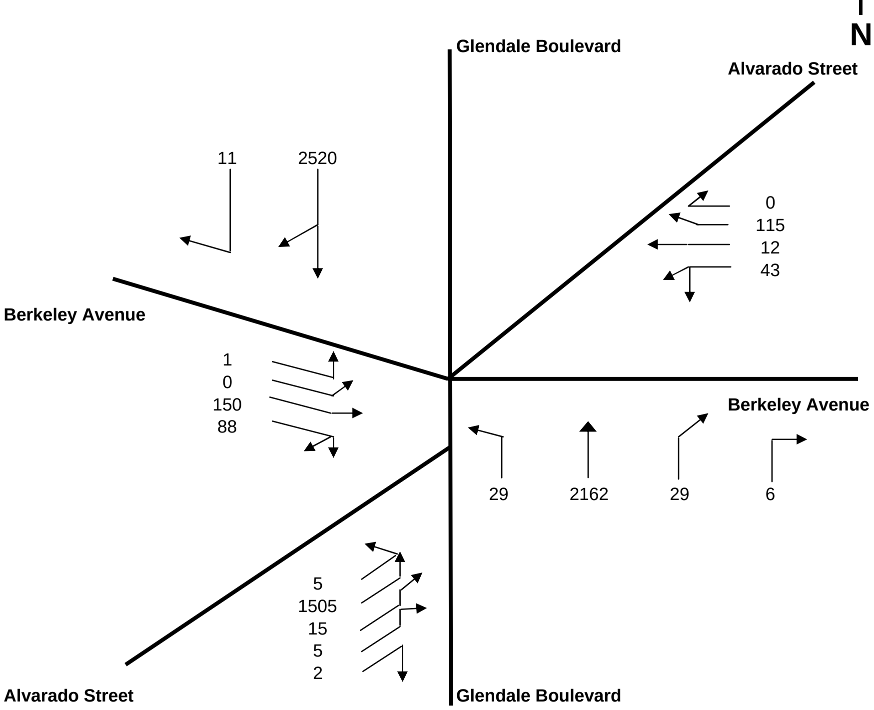
West/East Critical Movements = A(W/B) + B(E/B)

$$V/C = \frac{85 + 1085 + 314 + 213}{*1425} = 1.121$$

LOS = F

Intersection 1

CUMULATIVE PLUS PROJECT (PHASE E) PM



Phase 1) $\dfrac{11 + 2520}{4}$

&

$\dfrac{2162 + 29 + 6}{3}$

= **633**

Phase 2) $\left\{\dfrac{2162 + 29 + 6}{3}\right\} - 633$

or

$\dfrac{29}{1}$

= **99**

Phase 3) $\dfrac{5 + 1505 + 15 + 5 + 2}{3}$

= **511**

Phase 4) $\dfrac{0 + 115 + 12}{1} + \dfrac{0 + 1}{1}$

or

$\dfrac{150 + 88}{1} + \dfrac{43}{1}$

= **281**

Critical Volumes = 633 + 99 + 511 + 281

= 1524

V/C = $\dfrac{1524}{1375}$ - 0.10 = 1.008 LOS F

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January 21, 2010 ,Thursday 11:29:57 AM

INTERSECTION DATA SUMMARY SHEET

N/S: Glendale Bl   W/E: Park Av   I/S No: 2

AM/PM: PM   Comments: 2009 Cum Proj Conditions

COUNT DATE: STUDY DATE: GROWTH FACTOR:

Volume/Lane/Signal Configurations

	NORTHBOUND			SOUTHBOUND			WESTBOUND			EASTBOUND		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
EXISTING	135	1750	75	79	1140	89	99	38	162	36	27	147
AMBIENT												
RELATED												
PROJECT												
TOTAL	135	1750	75	79	1140	89	99	38	162	36	27	147

	NORTHBOUND							SOUTHBOUND							WESTBOUND							EASTBOUND						
LANE	1		1		1			1		2			1		1		1			1		1		1			1	

	NORTHBOUND		SOUTHBOUND		WESTBOUND		EASTBOUND	
	Phasing	RTOR	Phasing	RTOR	Phasing	RTOR	Phasing	RTOR
SIGNAL	Perm	Auto	Perm	Free	Perm	Auto	Perm	Auto

Critical Movements Diagram

SouthBound
A: 570
B: 79

EastBound
A: 147
B: 36

WestBound
A: 162
B: 99

NorthBound
A: 913
B: 135

A = Adjusted Through/Right Volume
B = Adjusted Left Volume
* = ATSAC Benefit

V/C RATIO	LOS
0.00 - 0.60	A
0.61 - 0.70	B
0.71 - 0.80	C
0.81 - 0.90	D
0.91 - 1.00	E

Results

North/South Critical Movements = A(N/B) + B(S/B)

West/East Critical Movements = B(W/B) + A(E/B)

$$V/C = \frac{913 + 79 + 99 + 147}{*1500} = 0.755$$

LOS = C

CalcaDB

INTERSECTION DATA SUMMARY SHEET

N/S: Echo Park Av W/E: Sunset Bl I/S No: 3

AM/PM: PM Comments: 2009 Cum Proj Conditions

COUNT DATE: STUDY DATE: GROWTH FACTOR:

Volume/Lane/Signal Configurations

	NORTHBOUND			SOUTHBOUND			WESTBOUND			EASTBOUND		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
EXISTING	51	380	78	131	190	97	53	1015	162	106	1359	35
AMBIENT												
RELATED												
PROJECT												
TOTAL	51	380	78	131	190	97	53	1015	162	106	1359	35

LANE

NORTHBOUND	1				1		
SOUTHBOUND	1		1			1	
WESTBOUND	1		1		1		
EASTBOUND	1		1		1		

SIGNAL

	NORTHBOUND		SOUTHBOUND		WESTBOUND		EASTBOUND	
	Phasing	RTOR	Phasing	RTOR	Phasing	RTOR	Phasing	RTOR
SIGNAL	Perm	Auto	Perm	Auto	Perm	Auto	Perm	Auto

Critical Movements Diagram

SouthBound
A: 190
B: 131

EastBound
A: 697
B: 106

WestBound
A: 589
B: 53

NorthBound
A: 458
B: 51

V/C RATIO	LOS
0.00 - 0.60	A
0.61 - 0.70	B
0.71 - 0.80	C
0.81 - 0.90	D
0.91 - 1.00	E

A = Adjusted Through/Right Volume
B = Adjusted Left Volume
* = ATSAC Benefit

Results

North/South Critical Movements = A(N/B) + B(S/B)

West/East Critical Movements = B(W/B) + A(E/B)

$$V/C = \frac{458 + 131 + 53 + 697}{*1500} = 0.823$$

LOS = D

CP_PM_L

CalcaDB

January 21, 2010 ,Thursday 11:29:57 AM

INTERSECTION DATA SUMMARY SHEET

N/S:	Glendale Bl	W/E:	Bellevue Av	I/S No:	4
AM/PM:	PM	Comments:	2009 Cum Proj Conditions		
COUNT DATE:		STUDY DATE:		GROWTH FACTOR:	

Volume/Lane/Signal Configurations

	NORTHBOUND			SOUTHBOUND			WESTBOUND			EASTBOUND		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
EXISTING	0	1748	384	107	1210	0	293	0	160	0	0	0
AMBIENT												
RELATED												
PROJECT												
TOTAL	0	1748	384	107	1210	0	293	0	160	0	0	0

LANE							
NORTHBOUND			2			1	
SOUTHBOUND	1		2				
WESTBOUND	2					1	
EASTBOUND							

SIGNAL	NB Phasing	NB RTOR	SB Phasing	SB RTOR	WB Phasing	WB RTOR	EB Phasing	EB RTOR
	Perm	Auto	Prot-Fix	<none>	Split	Auto		

Critical Movements Diagram

	A	B
SouthBound	605	107
EastBound	0	0
WestBound	106	161
NorthBound	874	0

A = Adjusted Through/Right Volume
B = Adjusted Left Volume
* = ATSAC Benefit

V/C RATIO	LOS
0.00 - 0.60	A
0.61 - 0.70	B
0.71 - 0.80	C
0.81 - 0.90	D
0.91 - 1.00	E

Results

North/South Critical Movements = A(N/B) + B(S/B)

West/East Critical Movements = B(W/B) + A(E/B)

$$V/C = \frac{874 + 107 + 161 + 0}{*1425} = 0.731$$

LOS = C

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CalcaDB

January 21, 2010 ,Thursday 11:29:57 AM

INTERSECTION DATA SUMMARY SHEET

N/S:	Echo Park Av	W/E:	Bellevue Av	I/S No:	5
AM/PM:	PM	Comments:	2009 Cum Proj Conditions		
COUNT DATE:		STUDY DATE:		GROWTH FACTOR:	

Volume/Lane/Signal Configurations

	NORTHBOUND LT	NORTHBOUND TH	NORTHBOUND RT	SOUTHBOUND LT	SOUTHBOUND TH	SOUTHBOUND RT	WESTBOUND LT	WESTBOUND TH	WESTBOUND RT	EASTBOUND LT	EASTBOUND TH	EASTBOUND RT
EXISTING	182	204	40	97	81	122	168	139	211	128	132	210
AMBIENT												
RELATED												
PROJECT												
TOTAL	182	204	40	97	81	122	168	139	211	128	132	210

LANE	LT	LT/TH	TH	LT/TH/RT	TH/RT	RT	LT/RT
NORTHBOUND	1	1				1	
SOUTHBOUND	1		1			1	
WESTBOUND	1		1			1	
EASTBOUND	1				1		

SIGNAL	NB Phasing	NB RTOR	SB Phasing	SB RTOR	WB Phasing	WB RTOR	EB Phasing	EB RTOR
	Split	Auto	Split	Auto	Perm	<none>	Perm	<none>

Critical Movements Diagram

	A	B
SouthBound	122	97
EastBound	342	128
WestBound	211	168
NorthBound	204	182

A = Adjusted Through/Right Volume
B = Adjusted Left Volume
* = ATSAC Benefit

V/C RATIO	LOS
0.00 - 0.60	A
0.61 - 0.70	B
0.71 - 0.80	C
0.81 - 0.90	D
0.91 - 1.00	E

Results

North/South Critical Movements = A(N/B) + A(S/B)

West/East Critical Movements = B(W/B) + A(E/B)

$$V/C = \frac{204 + 122 + 168 + 342}{*1425} = 0.517$$

LOS = A

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INTERSECTION DATA SUMMARY SHEET

N/S: Union Av | W/E: Temple St | I/S No: 6

AM/PM: PM | Comments: 2009 Cum Proj Conditions

COUNT DATE: | STUDY DATE: | GROWTH FACTOR:

Volume/Lane/Signal Configurations

	NORTHBOUND			SOUTHBOUND			WESTBOUND			EASTBOUND		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
EXISTING	110	163	170	117	60	52	107	771	37	111	937	55
AMBIENT												
RELATED												
PROJECT												
TOTAL	110	163	170	117	60	52	107	771	37	111	937	55

	NB							SB							WB							EB						
LANE	1				1			1		1		1			1		1		1			1		1		1		

	NORTHBOUND		SOUTHBOUND		WESTBOUND		EASTBOUND	
	Phasing	RTOR	Phasing	RTOR	Phasing	RTOR	Phasing	RTOR
SIGNAL	Perm	Auto	Perm	Auto	Perm	Auto	Perm	Auto

Critical Movements Diagram

	A	B
SouthBound	56	117
EastBound	496	111
WestBound	404	107
NorthBound	333	110

A = Adjusted Through/Right Volume
B = Adjusted Left Volume
* = ATSAC Benefit

V/C RATIO	LOS
0.00 - 0.60	A
0.61 - 0.70	B
0.71 - 0.80	C
0.81 - 0.90	D
0.91 - 1.00	E

Results

North/South Critical Movements = A(N/B) + B(S/B)

West/East Critical Movements = B(W/B) + A(E/B)

$$V/C = \frac{333 + 117 + 107 + 496}{*1500} = 0.632$$

LOS = B

CP_PM_L

CalcaDB

January 21, 2010 ,Thursday 11:29:57 AM

INTERSECTION DATA SUMMARY SHEET

N/S:	Glendale Bl	W/E:	Temple St	I/S No:	7
AM/PM:	PM	Comments:	2009 Cum Proj Conditions		
COUNT DATE:		STUDY DATE:		GROWTH FACTOR:	

Volume/Lane/Signal Configurations

	NORTHBOUND			SOUTHBOUND			WESTBOUND			EASTBOUND		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
EXISTING	97	1595	17	99	1046	227	30	608	239	337	765	150
AMBIENT												
RELATED												
PROJECT												
TOTAL	97	1595	17	99	1046	227	30	608	239	337	765	150

	NB							SB							WB							EB						
LANE	1		1		1			1		1		1			1		1		1			1		1		1		

	Phasing	RTOR	Phasing	RTOR	Phasing	RTOR	Phasing	RTOR
SIGNAL	Perm	Auto	Perm	Auto	Prot-Fix	Auto	Prot-Fix	Auto

Critical Movements Diagram

	A	B
SouthBound	637	99
EastBound	458	337
WestBound	424	30
NorthBound	806	97

V/C RATIO	LOS
0.00 - 0.60	A
0.61 - 0.70	B
0.71 - 0.80	C
0.81 - 0.90	D
0.91 - 1.00	E

A = Adjusted Through/Right Volume
B = Adjusted Left Volume
* = ATSAC Benefit

Results

North/South Critical Movements = A(N/B) + B(S/B)

West/East Critical Movements = A(W/B) + B(E/B)

$$V/C = \frac{806 + 99 + 424 + 337}{*1425} = 1.099$$

LOS = F

Developed by Chun Wong, 12/94