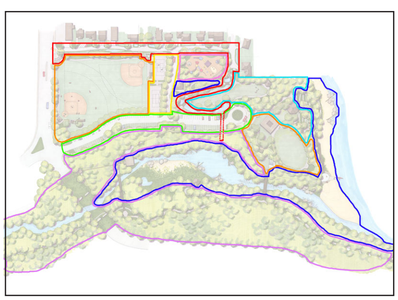
George Rogers Park | Master Plan

Lake Oswego, Oregon | Inventory & Analysis



Prepared for the City of Lake Oswego

June 2002

ATLAS

LANDSCAPE ARCHITECTURE

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Lake Oswego, Oregon | Inventory & Analysis

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Context | Overview

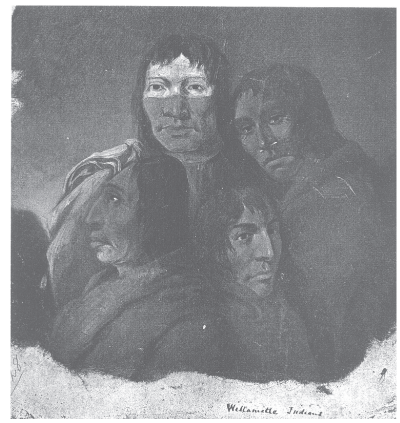
The City of Lake Oswego initiated the master planning process for George Rogers Park as the list of proposed improvements to the park became quite lengthy and unwieldy. A consultant team of landscape architects, historians, natural resource scientists, architects, and transportation engineers was engaged to facilitate a public master planning process for George Rogers Park with the final product to be a narrative plan for phased improvements and implementation recommendations. To best understand the park and its context, the consultant team led investigations to assess the park site's history, its features and structures, its natural resources, and transportation influences. This document is the summary of those investigations.

A series of focus group meetings accompanied the investigations, examining the social context of the park at a regional level, in the community, in the neighborhood, and with special interest groups that use the park. These meetings and the public involvement process used to develop the master plan recommendations are summarized in the *Plan Development* document of the *George Rogers Park Master Plan*.

View north of Willamette River and Oswego Point in George Rogers Park from the Old River Road Greenway Trail.

Context | Historical Research

The following narrative identifies the archaeological significance only partially documented at the mouth of Oswego Creek and fills in some details about the Clackamas Indians who resided in the area until the 1850s. The historical overview addresses pioneer settlement, industry, transportation, townsite development, and the changes which have occurred in George Rogers Park. The park, oldest in the City of Lake Oswego, has for more than 6,000 years been the site of human activity. Commencing in the early 1850s, lumbering and townsite development set a new course for the location. Construction of the works of the Oregon Iron Company in 1865-66 set the stage both for further development of the town as well as establishing Oswego's role in early Oregon industry.



Paul Kane's portraits in 1847 of four men from Clackamas River with facial paint, nose ornament, and flattened heads, (Harper 1971:cover).

Native Americans

Archaeological testing has confirmed the presence of 35CL96, a prehistoric site located immediately north of George Rogers Park. The consultants engaged in archaeological monitoring during sewer construction in this vicinity in 1994 suggested that the site "may also include all or part of George Rogers Park." Artifacts recovered during limited investigations at 35CL96 date to the Cascadia Phase, a culture found west of the Cascades dating from 6,000 to 9,000 years before the present (Burnett 1991; Burnett and Fagan 1994).

The Cascadia Phase takes its name from materials recovered at Cascadia Cave in the foothills along the South Santiam River. Occupants of that site engaged in hunting mammals and processing hazelnuts. The lowest deposit contained willow-leaf-shaped projectile points, the earliest dated type for the lower Willamette Valley. Because of its artifact typology and linkage to the Cascadia Phase, 35CL96 is thus of considerable antiquity. Because of Euro-American settlement and urbanization, the site has special rarity (Pettigrew 1990:525-527).

The record of prehistory at the mouth of Oswego Creek is incomplete because of the lack of major excavation and interpretation of cultural materials. Historical references suggest, however, that the area from Lakewood Center for the Arts to the Willamette River was once a site of Native American occupancy. This area thus includes both the site presently identified as 35CL96 and George Rogers Park. Mary Goodall, historian of Lake Oswego, wrote for example: " 'The old Indian cemetery' is the way old-timers in Oswego referred to the first cemetery, located on the ground south of the present Lakewood school. When the Pacific Highway was built, some remains were moved out Wilsonville Road to the 'new cemetery' (Goodall 1958:91).

The vicinity of Lake Oswego was thus, in the first half of the nineteenth century, the homeland of Upper Chinookans who spoke the Kiksht dialect. Collectively these people have been identified as Clackamas Indians, with special reference to the Clowewalla (among them) as residing at Willamette Falls. It is unclear whether the Clowewalla of the West Linn area had villages farther north along the west bank of the Willamette River. There is no documentary evidence of a village at the mouth of Oswego Creek in the early historic period, but the absence of such a settlement may be the consequence of the pandemic which, during the 1830s, decimated the Upper Chinookans and Kalapuyans.

As a consequence of depopulation through epidemics, a vacuum developed in the ability of the Upper Chinookans and Kalapuyans to hold onto their ages-old territories. Commencing in the mid-1830s a Klickitat incursion unfolded in western Oregon. These Sahaptin-speaking people from the Columbia Plateau and north bank of the Columbia River in the Gorge found opportunity to carve out new territory west of the mountains. Mobile because of their horse herds and skilled as warriors, they pushed into the Willamette and Umpqua valleys.

Clackamas fishery, 1841, at Willamette Falls, showing impact of trade on clothing of men yet engaged with both platform, dipnet as well as a canoe fishery (above the falls) (Wilkes 1845[4]:345).

Willamette Falls is a well-documented Indian eel fishery. It is likely that Oswego Creek was another and that, at least seasonally, the mouth of the stream and its rocky ascent to the nearby lake were occupied by Clackamas Indians and, possibly, the Tualatin from the nearby watershed to the west.
There is no direct historical evidence about the nature of the Indian fishery at Oswego Creek. Because of the conjunction of a fresh water lake, creek, and tidal estuary (lower Willamette River), it is possible that the lake once supported a run of steelhead. Far less speculative, however, is that the creek was a major fishery for anadromous lamprey eels. The original names "Sucker Creek" and "Sucker Lake," terms subsequently replaced by Oswego Creek and Lake Oswego, suggest the presence of suckers and lampreys in the watershed.

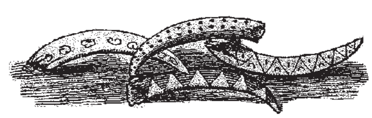
There are no reports of Native American burials at George Rogers Park in Lake Oswego. The absence of such reports, however, may be the consequence of the extensive industrial development of the site in the latter half of the nineteenth century and subsequent development of residential and commercial properties in the area north of Oswego Creek.

Federal Relations with the Clackamas Indians

The United States assumed sovereignty in the Pacific Northwest in 1846 in the Oregon Treaty. Great Britain withdrew to north of forty-nine degrees latitude. On August 14, 1848 (9 Stat. 323) the Organic Act provided for the establishment of territorial government in Oregon. The law initially assigned Indian affairs to the governor, appropriated $10,000 for presents for the tribes, and extended the "Utmost Good Faith Clause" of the Ordinance of 1787 to the Pacific Northwest. That measure affirmed aboriginal land title and set the stage for its diminution through a treaty program.

On June 5, 1850, Congress established the Willamette Valley Treaty Commission, appropriated $20,000 for its work, and extended the Indian Trade and Intercourse Act of 1834 to Oregon Territory. Before the Commission could secure any treaties, however, Congress on September 27, 1850, passed the Oregon Donation Land Act, providing for up to 320 acres per person over age eighteen who had settled in Oregon prior to the end of the year (Beckham 1990:180).

The anticipation of the donation land act had served as a powerful magnet through most of the 1840s to stimulate overland emigration. By 1850 more than 10,000 settlers had arrived in Oregon. Thousands of them had crossed the Oregon Trail and, between 1846 and 1850, perhaps as many as 4,000 had traveled the Barlow Road into the Clackamas watershed.



Indian dice, 1841.

The Willamette Valley Treaty Commission secured cession of the lands of the Molalla, Santiam, Yamhill, Tualatin, and Luckiamute in the spring of 1851. Its work proved meaningless. Congress had abrogated its powers prior to its first session and the Senate declined to ratify any of the agreements forwarded to Washington, D. C. In the fall of 1851 Anson Dart, Superintendent of Indian Affairs, reported to the Commissioner of Indian Affairs that he had negotiated a treaty with the Clackamas Indians:

> *I will now speak of the Clackamas treaty; the last, and decidedly the most important one concluded among the thirteen bands or tribes of Indians. It embraces a country more thickly settled than any portion of Oregon. The flourishing town of Milwaukee on the Willamette river is upon the purchase; and immediately on the southern border adjoining is Oregon City, the largest town in the Territory. Woodland and Prairie, conveniently situated for farms, make up the western portion of the tract, and upon the north, or Columbia side of the territory, as well as adjoining the Willamette on the west, are extensive and rich river bottoms. There is much of this kind of land also on a considerable stream, washing the base of the Cascade range of Mountains called 'Sandy river" (which joins the Columbia near the North East part of the purchase.*
>
> *The Clackamas river, which empties into the Willamette just below Oregon City, is a dashing, never failing stream, upon which are many mills, affording besides these, power for many more: there are now in operation about twenty mills in different parts of the tract. I will mention that instances have occurred when farming lands have been sold for fifty dollars per acre. This was of course upon the western or best settled portion of the purchase.*
>
> *The whole eastern side of the Clackamas lands is covered with a dense growth of Fir and Cedar timber, and that is not much explored; at least not sufficiently for me to give a minute description in these papers…*
>
> *…. At first many unsuccessful efforts were made to negotiate with them, owing to demands made by them, which were unreasonable, and even impossible to comply with; at several of our meetings, they refused to sell the most valuable part of their lands, but at length, came and expressed their willingness to be governed in their Sale entirely by my readiness to do them justice;*

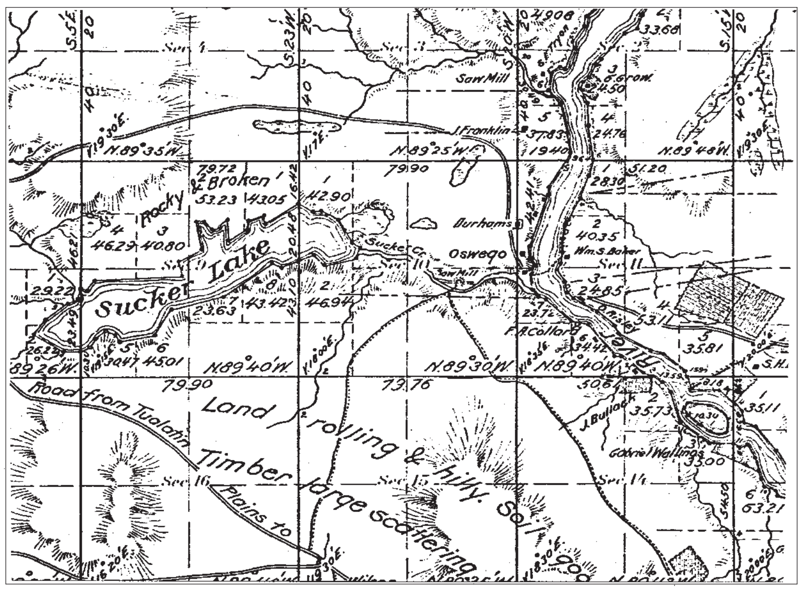
and would subject the matter entirely to me as to the reservations and other preliminaries connected with the sale. The same terms as contained the treaty were then submitted to them (Dart 1851b:14-15).

The agreement, along with Dart's other ten treaties with Oregon tribes, was not ratified by the U.S. Senate. The Clackamas treaty of 1851 was legally meaningless (Beckham 1990:181; O'Donnell 1991:140). The document is missing and not in the unratified treaty files or the Oregon Superintendency records in the National Archives.

Anson Dart, brother-in-law of George Catlin, the famed painter of Native Americans from the 1820s to the 1850s, liked the vicinity of Lake Oswego. In 1851 he selected lands at Elk Rock (in Dunthorpe) and hired carpenters to construct a residence-office for the Oregon Superintendent of Indian Affairs. The site was a approximately one mile downstream from the mouth of Tryon Creek.

Not until January 22, 1855, at a time when most of the Willamette Valley had been securely in the hold of Euro-Americans for five to ten years, did Joel Palmer, Superintendent of Indian Affairs, obtain agreement to the land cession treaty with the Confederated Bands of Kalapuya. Lumped into this wholesale taking of lands were those of the Upper Chinookans from the lowest sections of the Willamette River. Signatories included the following: (1) Clack-a-mas Tribe: Watch-a-no, Te-ap-i-neck, Wal-lah-pi-coto [Wal-lah-pi-cate]; (2) Clow-we-wal-la or Willamette Tum-water band: Lallak [Lal-bick, or John], Cuck-a-man-na, or David; and (3) Wah-lal-la band of Tum-waters: Tum-walth, O-ban-a-ap-i-nick [O-ban-a-hah](Kappler 1904[2]:665).

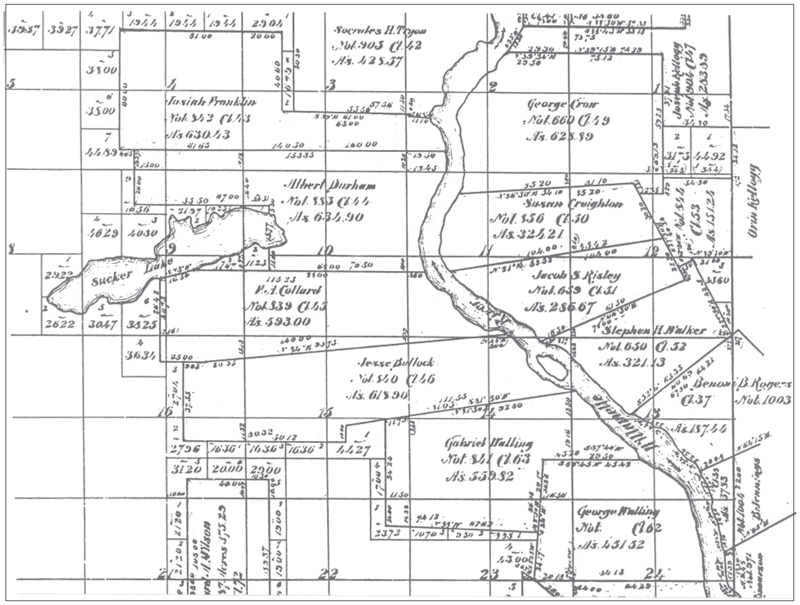
The treaty ceded to the United States the entire Willamette Valley, extending from the summit of the Coast Range to the summit of the Cascade Mountains then north to the Columbia River and down the middle of it from the Cascade Falls to Oak Point. The cession embraced the entire watershed of the Clackamas River and both banks of the Willamette to the river's mouth. The agreement, secured at Dayton, Oregon, was prelude to the removal of the Clackamas and other Indians of the Willamette Valley to the Grand Ronde Reservation (Kappler 1904[2]:665-669).



Portion of survey subdivision of Township 2 South, Range 1 East, Willamette Meridian (Ives 1852b)

Pioneer Settlement at Lake Oswego

On July 5, 1843, Oregon's Provisional Government, anticipating passage of a federal Donation Land Act (1850), created a system whereby settlers could file on lands. The law required "permanent improvements" within six months and residency within a year. It prohibited filing "upon city or town sites, extensive water privileges, or other situations necessary for the transaction of mercantile or manufacturing operations." Thus, though hundreds of provisional land claims were filed, there is no record of any at the mouth of Oswego Creek under the provisional land law (Genealogical Forum of Portland, Oregon 1982:i).



Configuration of Donation Land Claims to facilitate landings on the Willamette River in the vicinity of Sucker Lake, early 1850s (BLM n.d.)

A series of land claims, similar to those on the east bank of the river, confirmed that the Willamette was the primary highway of the 1840s and the 1850s. Each claim had a narrow frontage on the river and extended a considerable distance east and west. The Tryon claim thus reached nearly two miles up Tryon Creek; the Franklin claim extended from the river west to the present vicinity of SW Boones Ferry Road; the Durham claim extended up Sucker Creek to Sucker Lake and beyond.

Albert Alonzo Durham named and platted Oswego, Oregon, in 1852, conjuring up the place of his birth in New York. The population of the community was initially small. In 1860 Durham, a lumberman, was the wealthiest resident, estimating his real estate at $8,000 in value.

By 1852 a wagon road ran in an east-west direction (approximately the course of A Avenue and Country Club Road) and turned south to run parallel to the Willamette River with a terminus at the mouth of Sucker (Oswego) Creek. The road confirmed the use of the riverbank at the creek mouth as a steamboat landing (Ives 1852b). At this point Durham and his workers shipped out lumber cut at his nearby water-powered sawmill. The mill was in production as early as 1851 and continued in Durham's ownership until purchased by John Corse Trullinger (Corning 1973:171).

Oswego, Oregon, seemed a likely place, situated on a handsome bluff above the highest floods of the Willamette River. In 1856 the community became the site of the "Episcopal High School at Oswego," on a tract of 70 acres purchased from the Durhams. Established by the Protestant Episcopal Church in Oregon and Washington Territories, the school was "located on a beautiful eminence on the west bank of the Willamette river, two miles above Milwaukie" and was described as "accessible by steamboats passing, daily, from Portland to Oregon City." The school closed in 1865 and the property passed to the Oregon Iron Company (Anonymous 1859; Goodall 1958:100-101).

Trullinger's Sawmill and Transportation Developments

New energies came to Oswego in the mid-1860s. John Corse Trullinger was in part responsible for those developments. Born in 1828 in Indiana, he had emigrated to Oregon in 1848 with his family and, in 1849, joined a brother to seek gold in California. Trullinger returned to Oregon to operate a warehouse in Milwaukie. He purchased land in 1852 on the Tualatin River where he engaged in farming and operated a sawmill and grist mill. His success in these operations led Trullinger in 1863 to purchase Albert A. Durham's land and water rights at Oswego and the land of the Episcopal High School (Evans 1889[2]:609).

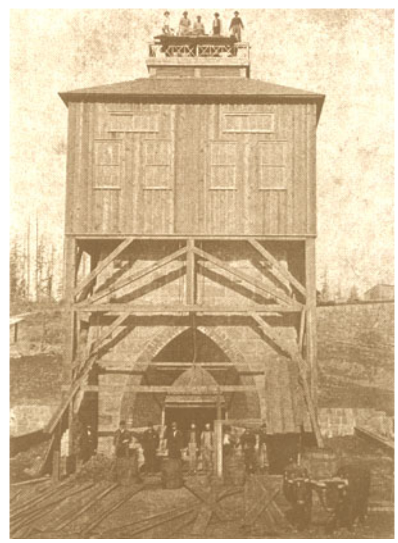
Trullinger brought both energy and capital to Oswego. He replatted the town on January 10, 1867, and promoted its settlement. He formed the Oswego Milling Company, a manufacturing and transportation enterprise. A short distance from his sawmill on Sucker Creek, Trullinger's employees built a steamboat, the *Minnehaha*, 70 feet long by 16 feet wide. The vessel was to run from the sawmill to the western end of the lake. There it connected with the Sucker Lake and Tualatin River Railroad, the investment of Jones, Vinson, and Wyatt which hauled logs from the Tualatin to Sucker Lake for cutting at the Durham and Trullinger sawmill. The railroad terminated at a landing where Joseph Kellogg's steamboat operated on the Tualatin River. On the east Trullinger operated a portage from the lake to the Willamette. These developments facilitated the shipment of agricultural products from the Tualatin Valley to the lower Willamette without use of the steep descent of the hills west of Portland. Trullinger also shipped freight from the landing at the mouth of Sucker Creek west via the lake and the Tualatin River (Corning 1973:171-172; Evans 1889[2]:609; Goodall 1958:35).

Howard McKinley Corning described the transportation connections Trullinger had partly established in the mid-1860s:

> *Portland passengers wishing to connect with the weekly upriver schedule on the* Onward *had to take the steamer* Senator *at the foot of what is now Ash Street. On Wednesday evening, the first night out, passengers stopped at Shade's Hotel, in Oswego. Early the next morning the steamer* Minnehaha *was boarded for the trip across Sucker Lake, passing en route the cliffs called Lover's Leap and Disaster Rock. From the dock at the head of the lake the portage railroad took the travelers to Colfax [the landing on the Tualatin] and the* Onward.

From Colfax the *Onward* followed the circuitous Tualatin upstream to Forest Grove, head of navigation, returning on Mondays (Corning 1973:174-175).

In 1865 Trullinger's employees rebuilt the Durham sawmill. The facility stood at the eastern end of Sucker Lake (its pond for logs) and tapped the waterpower generated by the fall of Sucker Creek to the Willamette River. The new sawmill was 150 feet by 42 feet. Its equipment included a Woodsworth's planer to grove and dress planks, saws for cutting pickets and lath, and two double, circular saws for cutting lumber. An overshot waterwheel, 36 feet in diameter, and a second miniature wheel, 10 inches in diameter, drove the sawmill with an estimated 12 horsepower created by the plunge of a 12-inch stream of water for 30 feet (Corning 1973:172).



Furnace, Oswego Iron Company, under construction, 1866 (Lake Oswego Public Library)

Tualatin River Navigation & Manufacturing Company

On March 28, 1869, investors formed the Tualatin River Navigation & Manufacturing Company. With capitalization at $100,000, the company paid Trullinger $26,000 for the Oswego townsite and an additional sum for his sawmill.

The Tualatin River Navigation & Manufacturing Company had big plans for expanding the commercial enterprises of John C. Trullinger. Its officers decided to abandon the short railroad between the head of Sucker Lake and the Tualatin and join the two with a canal. The argument was that by diverting part of the Tualatin into the lake, the increased head of water (standing 13 feet higher in the river than in the lake) would power more industry at the eastern terminus and also make feasible locks, to connect the eastern end of the lake with the Willamette. Workmen—many of them Chinese laborers—completed the canal in November, 1871. The increase in water was inadequate for the locks, but competition from rapidly expanding railroads suggested that the expense of a set of locks was not feasible. By 1873, however, the canal was sufficiently wide that the *Onward* passed through it into Sucker Lake (Corning 1973:176-177; Goodall 1958:36-37).

Buildings of Oregon Iron Company, 1867, at mouth of Sucker Creek, Carleton Watkins photo (Nickel 1999:121)

Oregon Iron Company, 1865-1881

As early as 1844, Bartholomew C. Kindred had found iron deposits near Sucker Lake. An overland emigrant of 1844, Kindred eventually settled in Clatsop County (Genealogical Forum of Portland, Oregon 1959:49; Goodall 1958:41). In 1852, during the subdivision of Township 2 South, Range 1 East, Willamette Meridian, the cadastral surveyors had noted: "interference with the magnetic compass" (Ives 1852a).

In the late 1850s Matthew Patton, a Virginian born in 1805, used some of his earnings from the California gold rush to purchase part of the Collard Donation land Claim. Patton opened a strip mine with a series of test holes. Although cave-ins led to abandonment of the mine, A. K. Olds and H. S. Jacobs made a miner's pick and horseshoe nails from the ore. The display of these products in Portland led to more prospecting and, on February 24, 1865, to incorporation of the Oswego Iron Company (Corning 1973:176; Evans 1889[2]:516; Goodall 1958:43).

The Oregon Iron Company purchased acreage at the landing at the mouth of Sucker Creek and hired G. D. Wilbur to construct a smelter. H. C. Leonard traveled to New York to purchase machinery for the plant. Richard Martin, an English stone mason, laid locally-quarried basalt for the massive furnace. The structure took form in 1865-67. The facilities consumed $126,000 (Goodall 1958:44). The "Condition Assessment

Blast-House (left) and Furnace (right) with stacks of wood for making charcoal, Carleton Watkins, photo, 1867 (Nickel 1999:131).

Report" (Peting, Walters and Pinyerd 2001) has described the furnace:

> *The furnace was 32 feet high and 34 feet square at its base. The stack tapered upward to a 26 foot square. At this point a square brick chimney rose another 50 feet. The bosh itself sat inside the furnace and was 9-1/2 feet in diameter. The pipes for the blast ran through each of the three tuyere arches. The arches also provided access for replacement of the bosh and maintenance of the tuyeres. A Roman arch window on the back side of the stack was most likely an early charging portal.*
>
> *Surrounding the entire furnace was the stack frame. It fit snugly to the furnace and provided a wooden support structure for the top house. The top house was a structure that enclosed the top of the furnace and extended another 20 feet above to encase half of the chimney. The top house was four feet larger than the chimney on each side allowing for a small work area. The square, brick chimney rose another 18 feet beyond the top house and was capped with hood* (Peting, Walters and Pinyerd 2001:5-6).

Casting building (left), Furnace (center), and Blast-House (right) at mouth of Sucker Creek, 1867, Carlton Watkins photo (Nickel 1999:127).

Oswego landing, Furnace, covered bridge on River Road over Sucker Creek, ca. 1912 (Lake Oswego Public Library).

By 1867 the Oregon Iron Company had several structures at the north side of the mouth of Sucker Creek:

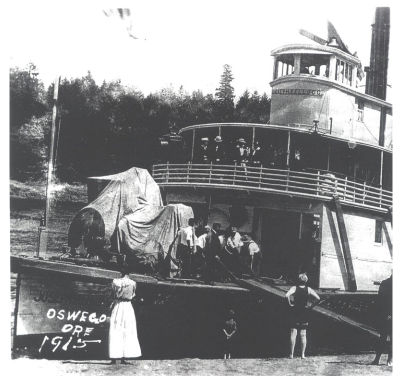

Charcoal storage building, Oregon Iron Company, 1867, Carlton Watkins photo (Nickel 1999:126).

- Furnace building, a multi-storied, wood-frame structure surrounding the furnace and chimney;
- Dwelling, a two-story building located south of the furnace possibly used as office and dwelling;
- Dwelling/river landing shelter, a small, wood building located south of the furnace on the sand spit at the mouth Sucker Creek;
- Shed, a small wood building with gable roof located on the bank of Sucker Creek;
- Blast-House, a square, wood frame building with hip roof with a long pipe connecting to the furnace; this structure stood on a stone foundation near the bank of Sucker Creek;
- Casting building, T-shaped, wood frame structure on stone foundation, located north of the furnace/smelter;
- Charcoal shed, a structure with open walls located on the hillside west of the furnace/smelter.

(Nickel 1999)

The smelter produced its first “pigs” on August 24, 1867. The ore came from deposits on the south side of Sucker Creek about 1.5 miles from the Willamette River. Limestone, used in the smelting, was imported from the San Juan Islands; sand, used in processing, came from the Sandy River delta. The iron found uses: in 1868 the plant produced cast iron water pipe for use in Portland and, in March, a cast iron stove installed at the Ladd and Tilton Bank (Goodall 1958:45).

The Oregon Iron Company then fell on hard times. Disputes arose about water rights; allegedly this conflict forced the closing of the plant in 1869 (Goodall 1958:46). In 1870 Oswego was again an ordinary, little community of 146 residents on the west bank of the Willamette. Its primary distinction was a rambling, deserted iron mill.

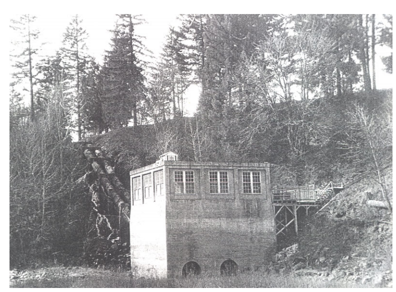


Joseph Kellogg, sternwheeler, at Oswego landing, 1915 (Lake Oswego Public Library).

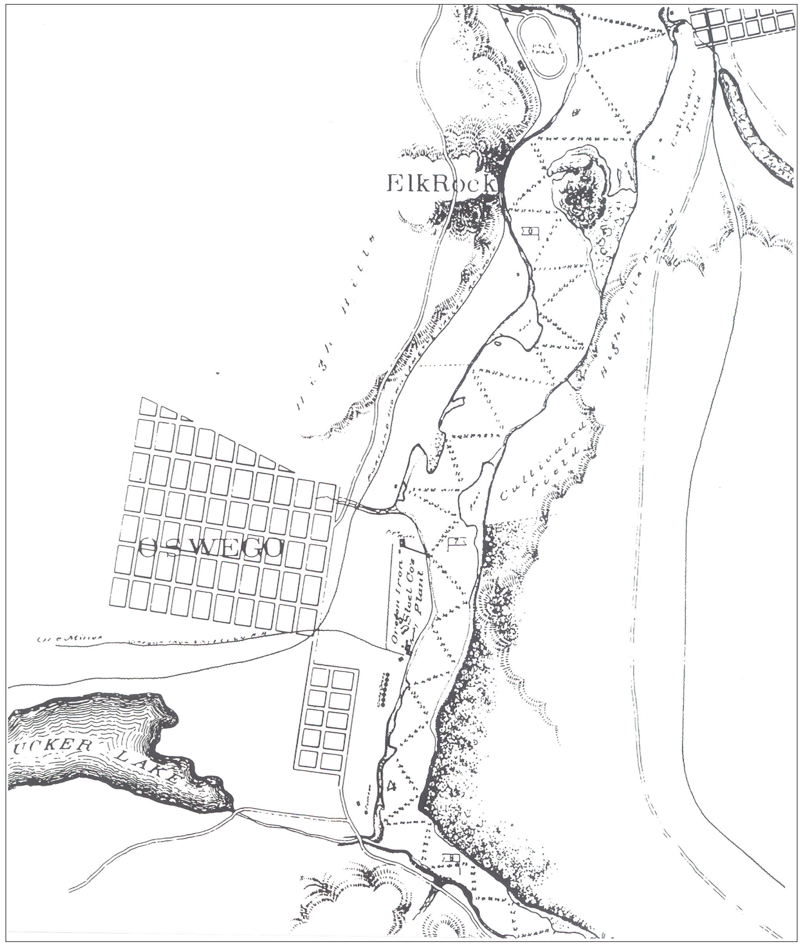
The furnace was re-ignited in 1874 to produce iron car wheels for the Central Pacific Railroad, but closed in September, 1876, with a total production of 5,075 tons of iron. L. B. Seeley and E. W. Chricton bought the plant at sheriff’s sale in 1877 and operated it for a number of years. The sale by Clackamas County suggests that subsequent to the Panic of 1873 and economic hard times gripping the nation, the owners cut their losses by abandoning the property for non-payment of taxes. In 1878-79 they extended the chimney another ten feet and tripled the capacity of the furnace. The new investors turned to the Prosser Mine in Iron Mountain. When this firm closed in 1881, it had produced 18,500 tons of iron (Goodall 1958:46-47; Peting, Walters and Pinyerd 2001:6).

Oswego Lake Water, Light & Power Company

Following incorporation of the Portland Cement Company in 1910 and its development of the riverfront property of the Oregon Iron and Steel Company, the need for electricity led to the construction of two, wooden penstocks and a concrete building to generate electricity on the banks of Sucker Creek in what is now George Rogers Park. The Oregon Iron and Steel Company completed the facility in 1911 to use its water rights and dam on the creek. The plant generated electricity to sell to the cement company and to local residential and commercial customers. Electricity from this facility served the W. S. Ladd farm, “View Villas,” Lake Grove, Dunthorpe, and Lake Oswego (McAllister n.d.:8)



Generator Building and penstocks, Oswego Lake Water, Light & Power Company (Janet Banks Collection).



Oswego town site, 1895, and location of River Road passing through former Oswego Iron Company site on Sucker Creek (Oregon Historical Society).

In February, 1941, Oregon Iron and Steel Company granted the lake bed to the Lake Oswego Shorefront Committee, but it retained ownership of the dam and generating facilities. In 1942 the Lake Corporation purchased the dam and powerhouse (Anonymous 1994; Goodall 1958:154).

George Rogers Park

For decades the lands at the mouth of Oswego Creek lay open and neglected. River Road bisected the property and crossed the creek over a covered bridge until it was replaced in 1920 by the concrete span on the Pacific Highway. Local residents sometimes went to the riverbank for picnics. On June 29, 1926, the city considered purchase of the property for a park but did not act. In 1936 local residents filed a petition with the council to buy the land for a park; no action occurred. From the 1920s to the 1940s gypsies camped annually for two to three weeks at the site, erecting tents (McAllister n.d.)

On March 17, 1945, the Oregon Iron and Steel Company sold for $13,234.60 to the City of Lake Oswego, the eastern portion of what was to become George Rogers Park. The land included the site of the former Oregon Iron Company facilities. Paul F. Murphy, vice-president, and William C. Foster, secretary, were the OI & S Company signatories on the deed. The tract was conveyed subjected to easements, roads, state holdings to the high water mark (on the navigable Willamette River), and a state wild bird and game refuge agreement (Anonymous n.d.a; Oregon Iron and Steel Company 1945).

In 1949 the Lake Oswego Garden Club began landscaping in the park. The work included leveling the grade and laying out paths and plantings. In 1951 the volunteers set out red roses, tamarix junipers, red barberry, camellias, and peonies (LaBrie 1982).

On January 24, 1955, School District No. 7, Clackamas County, sold to the City of Lake Oswego for $15,000 lands that became the western portion of George Rogers Park. The property was bordered by the Pacific Highway on the west. The deed required that "said premises shall be maintained and used by the grantee, its successors and assigns only as a municipal park and playground, for the use and enjoyment of the public" (School District No. 7 1955).


Concrete bridge on Pacific Highway, Oswego Creek, built in 1920 (Janet Banks Collection).

George Rogers, a Lake Oswego resident, grocer, and city council member, played a central role in the acquisition of these properties as a city park. In 1918 Rogers and his wife, Lottie, first purchased a home at 59 Wilbur Street, and in 1929 finished a new home at the same address, designed by Van Evera Bailey and erected at cost of $9,000. In 1923 Rogers opened a grocery on State Street, which he operated with his brother, August Rogers, (Anonymous 1994).

Born April 23, 1888, in Campanario in the Madeira Islands, in 1905 George Manuel Rodrigues left his home and traveled to British Guiana and then to New York. He found work at Wellsley College and mastered English in 1908-09. In 1911 Rogers moved to Portland and worked as gardener for Fred

Morey, developer for Glenmorrie. In the 1920s Rogers became a grocer in Lake Oswego and was first elected to the Lake Oswego City Council in 1949, where he was repeatedly re-elected. In 1952 the council named George Rogers Park in honor of Rogers (Anonymous n.d.b, 1994; Ryan 1960, 1961), to recognize his contributions which were recorded by the City Park Department in 1954: "Mr. Rogers has personally supervised each project at the park and with park friends and help from various organizations much has been accomplished" (City of Lake Oswego 1954).

View of Memorial Gardens toward the Willamette River, circa 1950, (Oswego Heritage Council Collection).

In 1949, during the widening of State Street, construction crews brought in truckloads of broken concrete and other debris, which were dumped, at the north side of the mouth of Oswego Creek to build up a terrace for plantings and a lawn. Charles H. Skinner is the reputed designer (Ryan 1960).

The Lake Oswego Kiwanis Club played an active role in development of recreation facilities in the park. Club members built picnic tables. The Lake Oswego Lions Club worked on the western portion of the park and helped secure the first lighting of the ball fields. In 1952 the city erected a footbridge across Oswego Creek (Ryan 1960).

Numerous local families planted rhododendrons and other flowers to honor deceased relatives. In 1964, for example, a portion of the grounds was dedicated to the memory of Drew Sherrard, longtime wild flower enthusiast and garden consultant to *The Oregonian* who died on March 22, 1960. John Herbst, Jr., a landscape architect, designed the path and bench for this event (Anonymous 1964). Nearing retirement, George Rogers acquired property on the southwest coast of Oregon and began raising Croft lily bulbs. Over the years, Rogers planted hundreds of Croft lilies in the park.

In 1965 the City of Lake Oswego, at the urging of Mary Goodall, considered rehabilitation of the furnace in the park. Goodall requested removal of a lily pond and cast iron deer that had been added at the base of the furnace. Project estimates ran to nearly $10,000, including $5,900 for stonework, $1,700 for the pool, and $300/400 for lighting (Anonymous 1965a). A "Save the Stack" effort led to a cake baking contest and other efforts to raise money (Anonymous 1965b). There is no evidence the project was carried out.

Context | Site Analysis

George Rogers Park is located just south of downtown Lake Oswego along the section of land that separates Oswego Lake from the Willamette River. As illustrated in Figure 1, State Street borders the park to the west and south, Ladd Street to the north, and the Willamette River to the east. A portion of the park extends west underneath the bridge of State Street and is accessed via recreational trails along Oswego Creek.

Land uses to the north of the park include an historic residential neighborhood and pockets of commercial use at the corner of State and Ladd Streets. In general, this portion of Lake Oswego serves as a transition from the mostly commercial downtown area to the mostly residential portion of south Lake Oswego.

Aerial Photograph of George Rogers Park, Lake Oswego, Oregon, (provided by the City of Lake Oswego, 2001).

Park Planning Context

George Rogers Park is a multi-use recreational park that consists of athletic fields, picnic shelters, a playground, tennis courts, memorial gardens, historic features, and hiking/nature trails along Oswego Creek and the Willamette River. Figure 1 provides a detailed illustration of the park's amenities.

View of athletic fields from corner of State and Ladd Streets.

Park Features

Athletic Fields

Two ball fields and a soccer field are located in the northwest corner of the park as it borders Ladd Street and State Street. The fields are soil with natural grass, are irrigated, and lit with floodlights around the perimeter. There are two grandstands located around the State Street field, and one adjacent to the Ladd Street field. A concessions building is located between the two fields. There is a dugout structure for the Ladd Street field; otherwise team areas are located behind fences. Field usage is summarized in Table1.

Table 1: Athletic Field Usage

Dates	Hours of Operation	Number of Users	Spectators	Total
March 1-June 30	M-F 3:30p-9:30p Sa/S 8:30a-8:00p	780	4200	4980
July 1-Aug 30	M-S Casual Use	800	200	450
Sept 1-Nov 15	M-F 4:00p-9:00p Sa/S 8:00a-8:00p	1600	5100	6700
Nov 16-March 1	Fields Closed	0	0	0

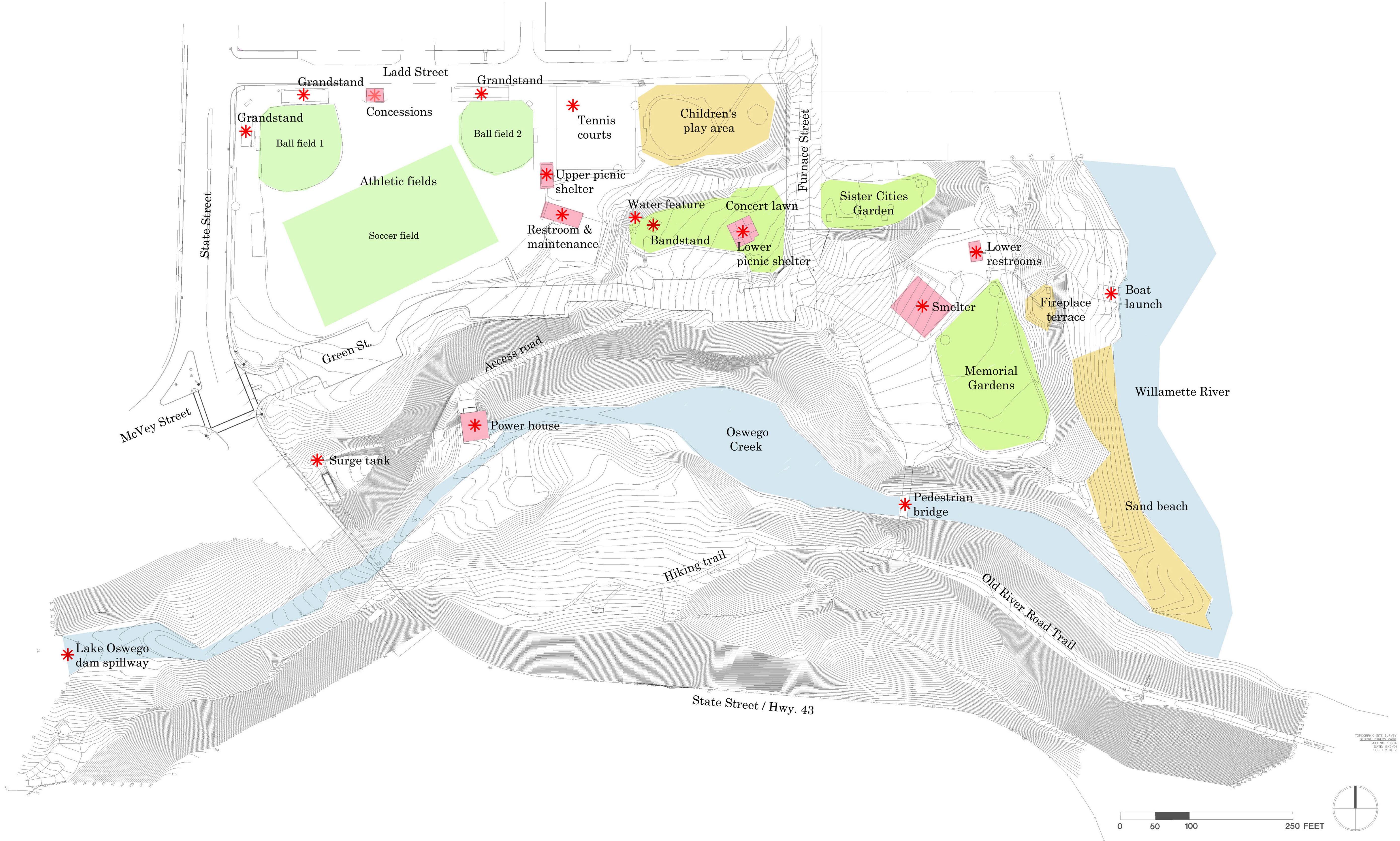


Fig. 1 Existing Land Use Plan

Concessions and Grandstands

A concessions/storage building is located between the two ball fields, approximately 300 s.f. in size. The two uses are physically separated in the building, with separate access to each. Grandstands are located at each of the fields, with two located parallel to Ladd Street being of fiberglass construction, and one parallel to State Street being of wood.

Tennis Courts, viewed from Ladd Street.

Tennis Courts

Two outdoor tennis courts are located between the athletic fields and the Children's Play Area, with frontage on Ladd Street. The courts are enclosed with chain link fencing, with north-south orientation. On the north side of the courts is a three-foot retaining wall up against Ladd Street.

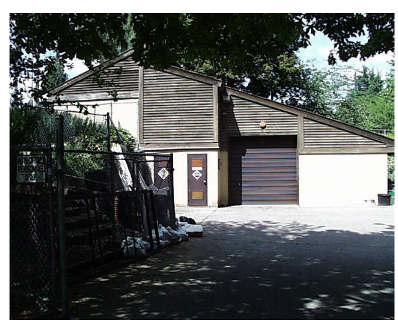
Upper Picnic Shelter

The upper picnic shelter is located on the east side of the playing fields adjacent to the tennis court and the restroom/ maintenance facility. Approximately 612 s.f. of covered area, the shelter has a capacity of 50 people and offers water and electrical service for picnic activities. The shelter averages thirty reservations per year, handling an estimated 750 people.

Children's playground structure, viewed from Ladd Street.

Children's Playground

The children's playground is a popular element of the park, and is a recently renovated facility. The play structure is targeted for children eight years and younger, and includes elevated platforms, walks, slides and climbing activities. The structure is accessible for disabled play. The playground area includes a sandbox and a concrete climbing structure, both of which are well used. There are two benches located at the perimeter of the playground structure, as well as two picnic tables, one fixed-mounted, and the other moveable.



Restroom / Maintenance Facility.

Restroom/Maintenance Facility

The restroom/maintenance facility is a two storey structure located on the southeast side of the athletic fields adjacent to the tennis court and upper picnic shelter. The upper level, which includes men's and women's restroom facilities, a mechanical chase and a storage area, is approximately 639 s.f. The lower level, which includes the maintenance area, two exterior storage rooms and access to the mechanical chase, is approximately 809 s.f. Total area of the building is 1,448 s.f., in a split-level design.

Concert Lawn

The concert lawn is located on a terrace below the children's playground and the athletic fields. Its northern and western perimeter is bordered by a large stand of evergreen trees, the south and east by Green Street and Furnace Street, respectively. The lawn is occupied by the lower picnic shelter, the bandstand, and the water feature.

Bandstand located at edge of concert lawn.

Band Stand

The bandstand is a freestanding structure located in the Concert Lawn and is approximately 200 s.f. in area. The building is open on all four sides and consists of a raised platform with exposed concrete support piers, a wood- framed floor, standard wood framing support columns, and a wood-framed shed roof with asphalt shingles. The platform is accessed via a ramp on the back of the structure.

Water feature below pathway.

Water Feature

Located behind the bandstand and below a pathway that curves down from the upper terrace of the playground and tennis courts to the lower concert lawn, is a water feature that appears to have been abandoned. The feature is a pond structure with a concrete lining and naturalized boulders around the perimeter. A vault for a circulation system is located adjacent to the pond.

Lower Picnic Shelter

The lower picnic shelter is located in the concert lawn, in close proximity to the bandstand. It provides 720 s.f. of covered area with a capacity for approximately 75 people. The shelter is open on all sides and consists of a slab on grade, heavy timber columns and roof framing members and a cedar shake roof. The plan is based on a nine-square pattern with the roof form consisting of a series of four shed roofs radiating from a central square opening in the roof. A fixed grilling area is provided in the center of the structure.

Lower picnic shelter located in concert lawn, viewed from playground terrace.

The shelter averages 59 reservations per year, handling an estimated 3,400 people, with peak usage June through September.

Sister Cities Garden

The Sister Cities Garden is located on an isolated hillside terrace off of Furnace Street, abutting a residential property to the north, and the historic smelter to the south, which is on a lower terrace. The garden has river frontage, although the river is not accessible due to significant grade changes. The garden consists of an elliptical lawn surrounded by dense trees, with four picnic tables in fixed locations located around the lawn perimeter.

View across Sister Cities Garden.

The garden's sister cities for which it is named include Mordialloch, Australia affiliated in 1988, Pucóu, Chile, designated in 1994, and Yoshikawa, Japan, affiliated in 1996. A sign relates this Sister City information.

Boat Launch

The boat launch is located on the Willamette River beach below the Sister City Garden. The access path is at the bottom of the Garden terrace, behind the Smelter, and is gated off to prevent vehicular access. The launch facility is closed to motorized boats, although kayaks, and canoes can still be put in the water if they are carried to the launch site. The access road to the boat launch is paved with asphalt, is about 8-10 feet wide, and steeply sloped. The launch site is concrete paved, although it is not currently in good repair.

Historic smelter remnant, viewed from Memorial Gardens.

Historic Smelter

The smelter is an artifact from the park site's industrial past, with tremendous significance to the story of the City of Lake Oswego's founding as well as industry in the State of Oregon. This history is described further in the historical research heading of this report.

The smelter is currently a special project with the City of Lake Oswego, with efforts being made to assess and stabilize the condition of the structure and to evaluate the archaeological resource potential of the remnant. The smelter is located at the northern end of the Memorial Gardens, with a chainlink fence enclosure and a planted garden at its base. It is not accessible to the general public, but is a notable presence in the garden.

Memorial Gardens

The memorial gardens are located on two hillside terraces above the sandy beach on the Willamette River, and below the Sister City Garden terrace. The gardens are historic to the park, playing a significant role in the park's origins as a volunteer effort by Lake Oswego Garden Clubs. The gardens are comprised of a lawn terrace with perimeter plantings of naturalized materials, as well as Rhododendrons, Japanese Maples, Camellias, and Magnolias. A two-foot wide asphalt path encircles the lawn terrace, and two benches are located off of the path, given as memorials as indicated by their brass plaques. Views of the Willamette River are restricted glimpses due to the height of the vegetative border that surrounds the lawn terrace.

View toward the park from the Memorial Gardens.

Lower Restrooms

The lower restroom building is located near the boat ramp, in close proximity to the historic smelter, in the eastern quadrant of the park. It includes men's and women's restroom facilities, as well as a mechanical chase/storage area and is approximately 364 s.f. in area. The building consists of a slab on grade, concrete masonry walls, wood roof framing members, and a hip cedar shake roof.

Barbecue Terrace

The barbeque terrace is located on a terrace below and east of the memorial gardens. It has a stonewall perimeter and three stone fireplaces for grilling. Views of the river are expansive from the barbecue terrace, and there is a staircase access to the river beach below.

View of Willamette River from the Barbeque Terrace.

Willamette River Beach

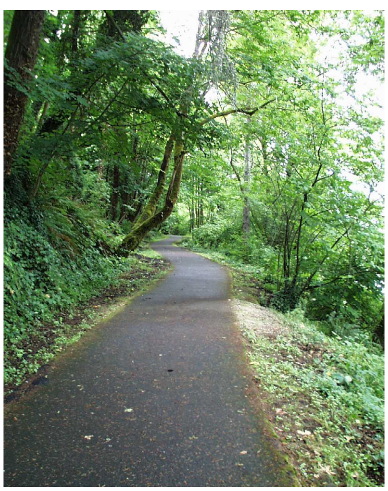
The eastern boundary of the park fronts on the Willamette River on a terrace that is approximately 20 feet below the memorial gardens and the fireplace terrace. The terrace is comprised of bedrock, sandy beach, and concrete fill material. Signs are posted to discourage swimming and to prohibit motorized boat launches. The boat launch is located to the north of the beach, and the confluence of the Oswego Creek is to the south, forming a sandy point.

Oswego Creek

Oswego Creek is part of the spillway for the dam at Lake Oswego, carrying waters from the Tualatin River to the Willamette River, as well as multiple overland stream drainages. The creek extends along the park's southern boundary, from the river back to the dam, approximately 2,000 linear feet in length. The creek is intermittent, depending on flow levels released from the lake. The creek's natural resource characteristics are described in the natural resource assessment of this document. The north side of the creek is comprised of a steeply sloping hillside, with access via a maintenance road to the Lake Corporation's concrete powerhouse building.

Oswego Creek looking towards Willamette River and pedestrian bridge.

The creek is crossed with a pedestrian/bicycle bridge that has historically been a covered bridge for the Old River Road that paralleled the Willamette River. To the south of the bridge landing, the pathway ends in a t-intersection, with an informal pathway paralleling the creek to the west, and the paved Old River Road trail going to the east to follow the Willamette River to the south.



Old River Road regional trail.

Pedestrian/Bicycle Bridge

The pedestrian/bicycle bridge connects the northern part of the park to its southern extent, crossing Oswego Creek and providing access to the Old River Road extension of the regional Willamette River Greenway Trail as well as to the natural area of Oswego Creek.

Old River Road Trail

The Old River Road trail extends from the southern landing of the pedestrian/bicycle bridge over Oswego Creek and connecting via bridge to River Road to the south. This trail connection is a vital link in the Willamette River Greenway Trail, which is a regional trail along the Willamette River. The trail is provided via an easement over private properties, primarily residences located 20-30 feet above the trail on a steeply sloping hillside.

Lake Corporation Dam and Powerhouse

The western boundary of George Rogers Park is defined by State Street and the Lake Oswego Dam. The park extends in a linear fashion beneath the bridge of Highway 43 (South State Street) along Oswego Creek to the foot of the dam below the bridge of McVey Street. The Lake Corporation uses the dam to regulate the water level of Lake Oswego, with excess water funneled off in a "penstock" or wooden slat pipe that runs first to a surge tank building, located at the corner of State Street and Green Street and then to a powerhouse concrete building located further in the park, to the north of Oswego Creek and below Green Street. The surge tank structure administers the flow of water to the powerhouse, and reduces the effects of water hammer in the penstock pipe. An overflow spillway from the surge tank drains to Oswego Creek.

The powerhouse generates hydroelectric power from the dam's water spill during winter months when water is abundant from rains. In the summer, the powerhouse is idle.

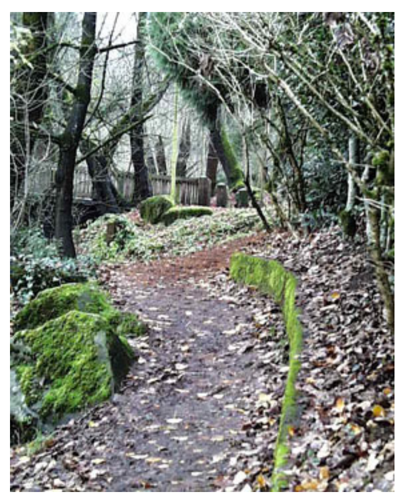
The Lake Corporation dam structure, the penstock pipe, surge tank building, and the powerhouse building are original structures dating to the earlier part of this century, when the dam was built in 1921.

Lake Oswego dam and surge tank.

Circulation

As previously described and illustrated in Figure 1, the park provides several different types of recreational facilities. For the most part, the athletic fields and playground facilities are grouped together in the western portion of the park with the hiking/nature trails and memorial gardens in the eastern portion of the park. The park lacks a formal circulation system that connects the park areas and parking lots:

- A paved pathway exists from the restroom/maintenance facility to the playground located south of the tennis courts. This path extends around the playground to Ladd Street.
- Disconnected from the playground pathway is a path that circles down to the concert lawn terrace, where it borders the southern edge of the concert lawn to a staircase down to the parking lot near the intersection of Green Street and Ladd Street, just south of the lower picnic shelter.
- Paved access is provided to the boat launch via the unused vehicular access road, and a paved pathway



Unpaved path south of Memorial Gardens.

passes in front of the smelter to encircle the memorial gardens and connect to the barbeque terrace, where it dead-ends.

- The bridge over Oswego Creek provides connection to the Old River Road paved trail, which has no further connection in the park.
- Informal gravel and dirt paths lead from the northern landing of the bridge to the sand beach on the river, as well as from the southern bridge landing to the west, to just below the dam spillway.
- A maintenance access road extends from Green Street down to the Lake Corporation's powerhouse, where it dead-ends.

Existing park circulation is illustrated in Fig. 2.

View of Highway 43 Bridge from Oswego Creek ravine.

Views, Vistas and Spatial Organization

The views, vistas and scenic qualities of the park are modulated by the second-growth vegetation, and the terraced terrain. There is more than 100 feet of grade change from the park corner at State Street and Ladd Street to the water level at the beach of the Willamette River and Oswego Creek. There are several scenic views available in the park, which are illustrated in Fig. 3:

- A long view from the intersection of Furnace and Green Streets, south of the concert lawn towards the Willamette River takes in the memorial gardens, historic smelter, and the bluff. This view is somewhat obscured by the perimeter vegetation on the riverbank east of the gardens.
- A significant view is obtained from the pedestrian bridge of both the Willamette River confluence with Oswego Creek, and the Oswego Creek ravine.
- Long views up and down the Willamette River are available from the beach waterfront of the park.
- A long view south from the memorial gardens includes the seasonal waterfall on the bluff above the Old River Road walking trail.
- Numerous short interior views in the park are enclosed and framed by the vegetation as well as the separation

View south of the Willamette River, from the beach.

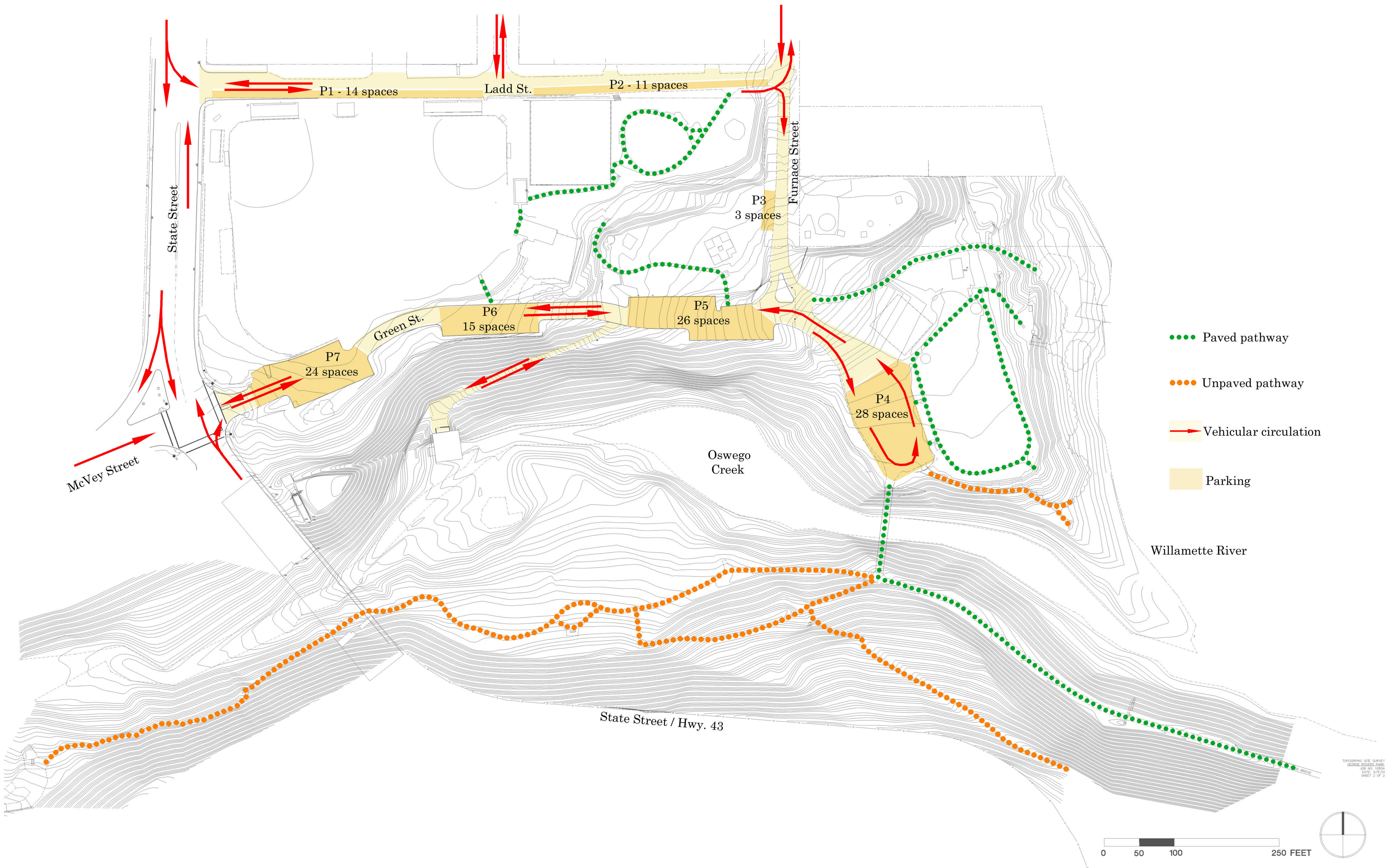


Fig. 2 Existing Circulation Plan

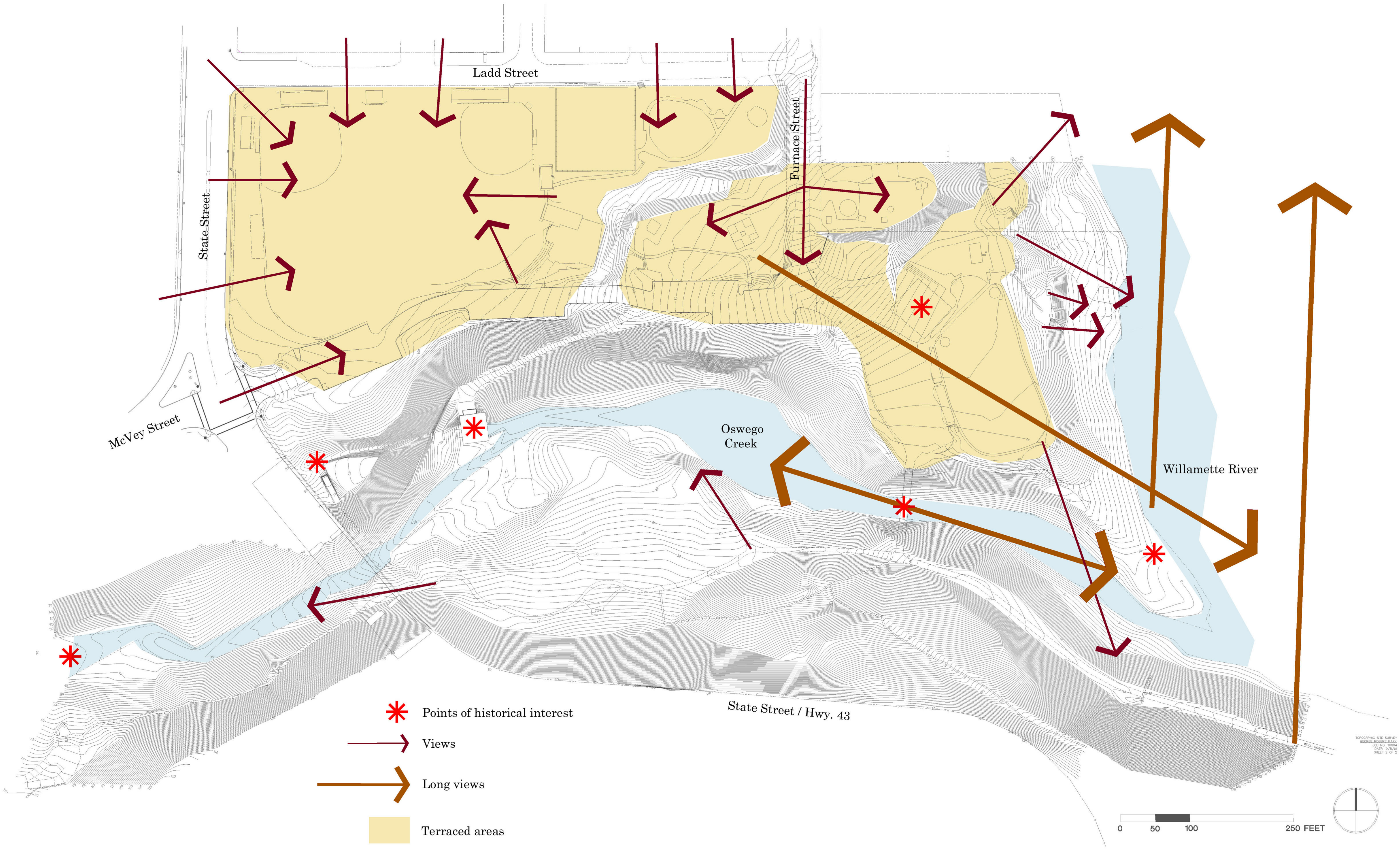


Fig. 3 Views, Vistas and Spatial Organization

Short interior view from Sister City Garden.

Several points of historical interest occur in the park as remnants of the property's industrial origins, though several of these are not accessible to the public for security and safety reasons:

- The penstocks and overflow structure that drains water from Lake Oswego to the Lake Corporation's power generator.
- The power generator remains in seasonal operation generating electricity, which is sold into the local power grid by the Lake Oswego Corporation.
- The present pedestrian bridge is very near the alignment of the original covered bridge over Oswego Creek to the Old River Road.
- The point of land just north of the confluence of Oswego Creek and the Willamette River remains as an historic point of landing for goods delivered to Oswego by steamboat.
- The most prominent historic feature in the park is, of course, the stone chimney of the smelter.

Penstock outlet at dam.

Slope at Children's Playground towards Furnace Street.

Hillside separating athletic fields from concert lawn.

of open spaces by the changes in the terrain.

Slope Analysis

George Rogers Park occupies a site, which is widely variable in terms of terrain. The park is comprised of a series of hillside terraces and steep slopes that step down towards Oswego Creek to the south and the Willamette River to the east. A number of the terraces on the site are underlain with bedrock, creating precipitous slopes between the terraces, the stream and the riverbanks.

View of hillside of Memorial Garden from lower beach terrace.

Fig. 4 depicts a slope analysis of the park, illustrating three ranges of slopes:

0-10%	Slopes deemed generally developable with minor grading and/or construction.
10-20%	Slopes that can be managed for access for pedestrians, bicycles, and motorized vehicles, some passive uses with moderate grading and/or construction.
20% +	Slopes that are too steep for development or regular activity.

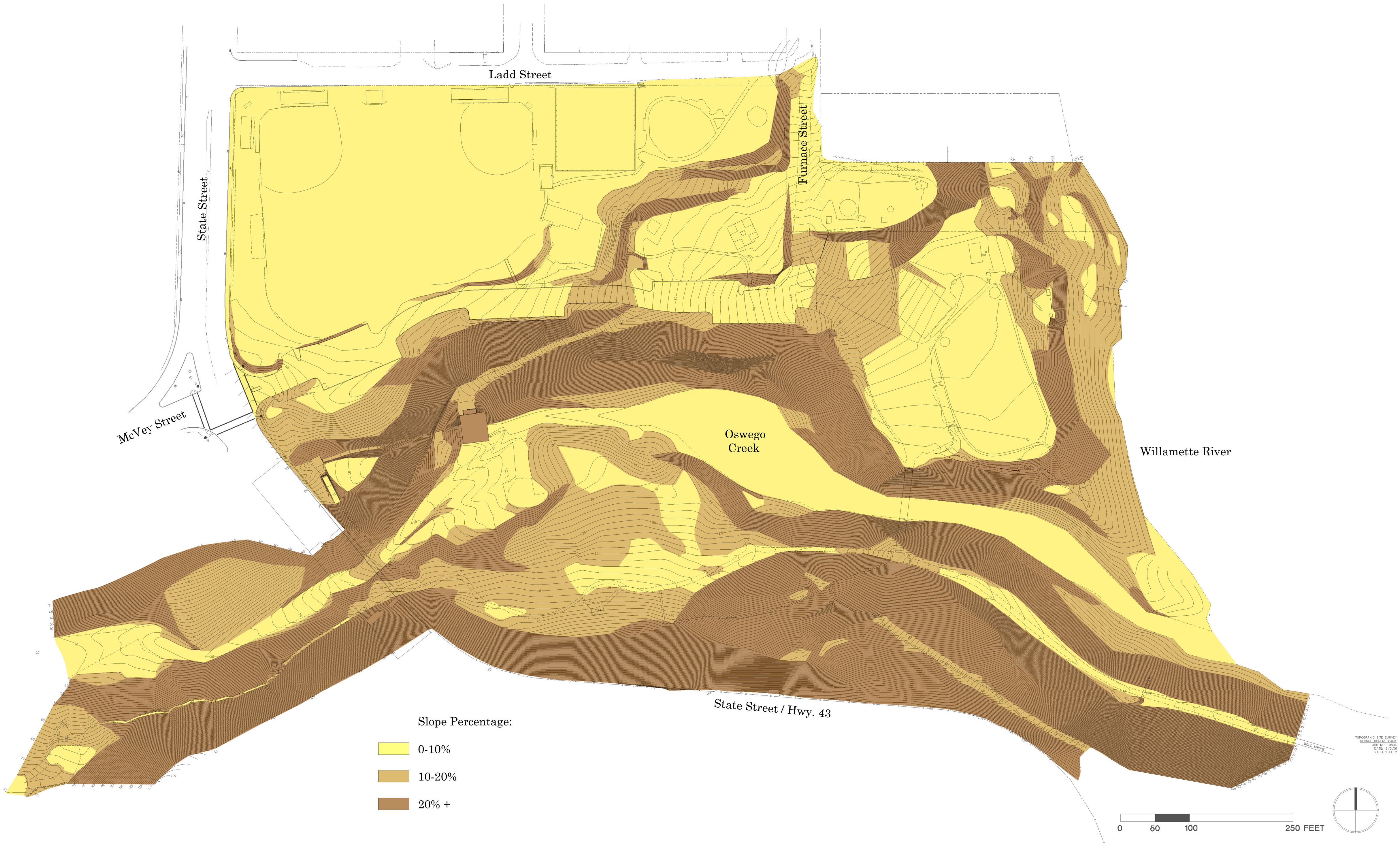


Fig. 4 Slope Analysis

Context | Natural Resource Assesment

George Rogers Park is located on the west bank of the Willamette River, and includes the mouth of Oswego Creek, below the Lake Oswego dam, as well as bluffs to the north and south of the creek (Township 2 South, Range 1 East, Sections 10 and 11). The park location is shown in Figure 5.

The Park provides the visitor the opportunity to experience a variety of habitats, ranging from mature upland conifer stands dominated by Douglas Fir; younger mixed stands of Bigleaf Maple, Western Red Cedar, and fir; bottomland riparian stands of Red Alder, Oregon Ash, and willows, emergent wetlands and open water, and landscaped gardens and open spaces. The Park's diversity of topography and plant communities is unusual for such a compact area in an historic urban setting.

Geology, Soils and Hydrology

Geology

The geology of the Lake Oswego area previous to 15 million years ago is largely unrecorded, although a pile (possibly an oceanic island) of Eocene volcanics and sediments approximately 40 million years old is exposed further north in Tryon Creek State Park and Elk Rock Park. The major rock features exposed within George Rogers Park are flows of the Columbia River basalts. The oldest flows are the Sentinel Bluffs unit exposed along the Willamette River just north of the Oswego Creek confluence. An argon date for these flows places them at approximately 15.6 million years ago. On top of these and forming most of the bedrock within the park are two Ginkgo flows, which lie on top of a thin sedimentary unit on top of the Sentinel Bluffs. On the hillside to the south in the portion of the park along the Willamette River are exposed flows of the Sand Hollow unit. These are dated at 15.3 million years.

The park lies in the splay zone of a series of faults trending along the axis of Oswego Lake and a series of faults trending along the west hills. The area of the park has probable small faults oblique to both these fault systems that form the south edge of the outlet to the Willamette River and cut across Oswego Creek between the State Street Bridge and the Stafford Road Bridge. The history of movement on these fault

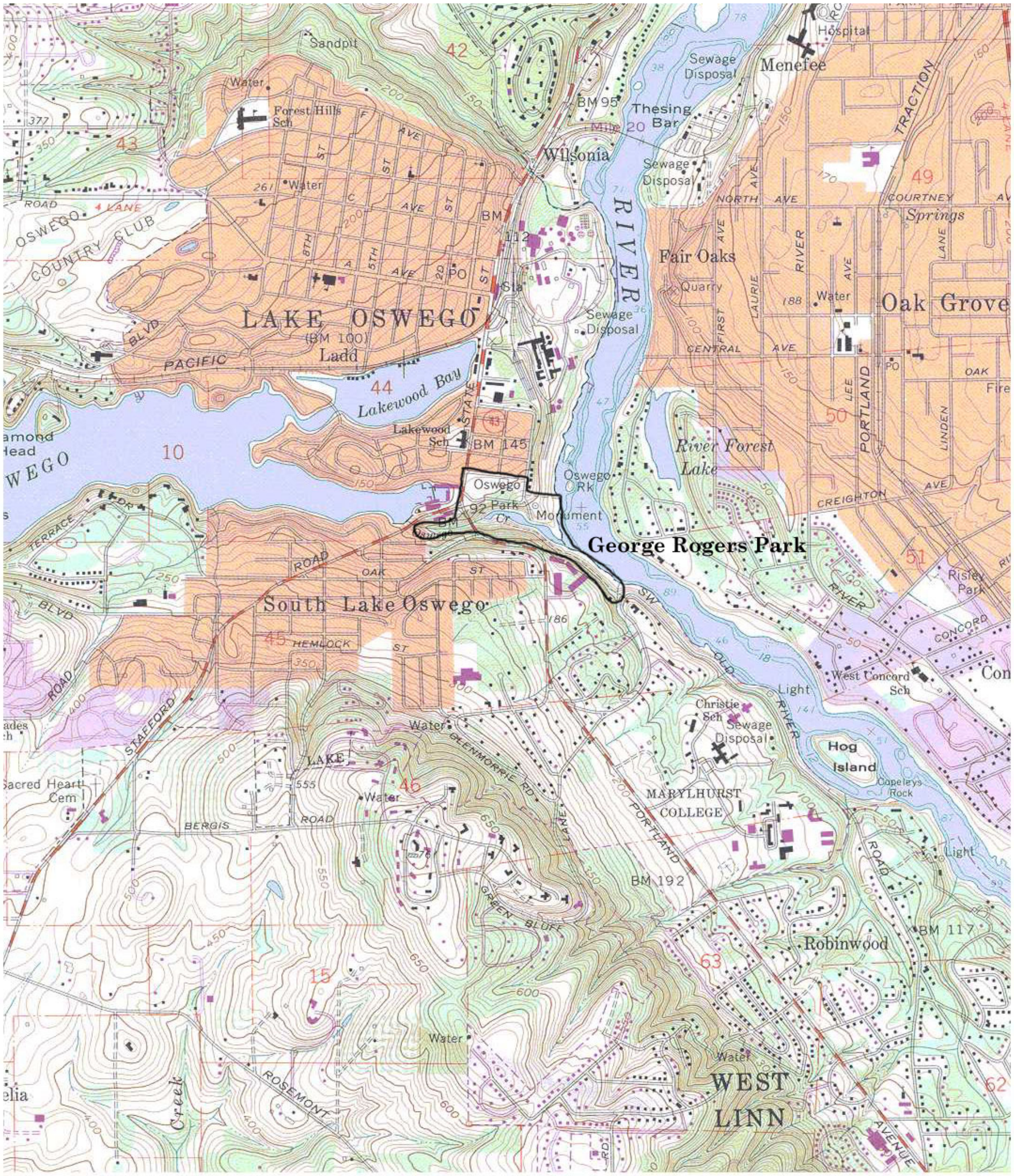


Fig. 5. Location and general topography for George Rogers Park in Lake Oswego, Oregon (USGS, Lake Oswego, Oregon quadrangle, 1961, photo-revised, 1984).

systems is largely unknown, but a fluvial channel fill deposit lies on Sand Hollow Basalt flows approximately 100 feet above the outlet of Oswego Creek southwest of State Street. This fluvial deposit contains weathered, rounded volcanic cobbles of Cascade origins and minor amounts of unweathered Columbia River Basalt cobbles, suggesting that the Willamette River did not have its present course and that a major river (proto-Clackamas River) from the Cascades flowed through the faulted area.

Local volcanic eruption did not occur within the immediate vicinity of the park, but eruptions of the Boring Basalts on Cooks Butte, Waluga Butte, and Mount Sylvania have probably had considerable effect on the west end of the lake. Reversed magnetism within these volcanics places the age of the volcanoes at greater than 0.7 million years.

The present shape of Lake Oswego and its outfall was formed in part by the massive glacial outbreak floods of Lake Missoula 15,000 to 13,000 years ago. The present lake formed the major hydraulic connection between the Portland Basin and the Tualatin Basin. Soils and colluvium from the surrounding hills were swept away by the initial large floods that apparently left bare basalt along most of the slopes around the lake. Deposition from later flood events left coarse and finer glacial flood deposits along the Willamette and Tualatin Rivers to an elevation of 300 feet. Figure 6 shows the geology of the park area.

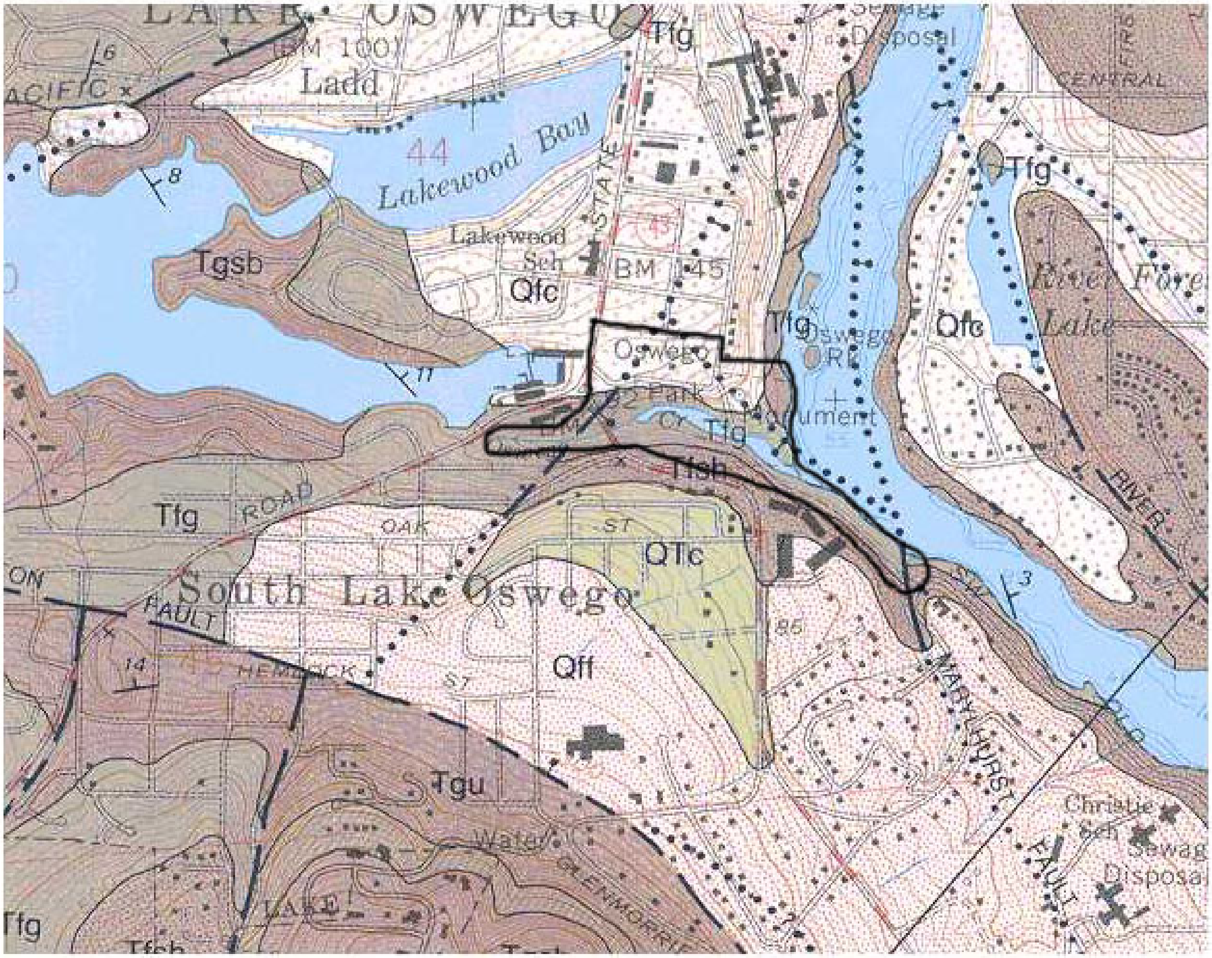


Fig. 6. Geologic Survey Map of the George Rogers Park vicinity in Lake Oswego, Oregon (USGS, Lake Oswego, Oregon Quadrangle, Clackamas, Multnomah, and Washington Counties, 1989).

Catastrophic flood deposits (Pleistocene) — Boulders, gravels, sandy gravels, and sands containing high percentages of Columbia River basalt clasts and representing high-energy, subfluvial deposition during catastrophic floods caused by the repeated failure of the glacial ice dam that impounded glacial Lake Missoula (see Bretz and others, 1956; Baker and Nummedal, 1978; Waitt, 1985; Allen and others, 1986). Date of most recent catastrophic flood is estimated to be 15,500 to 13,000 years B.P. (Mullineaux and others, 1978; Waitt, 1987). Within map area, flood sediments are subdivided into three facies listed below

Qfch — **Channel facies (Pleistocene)** — Sediments are complexly interlayered and variable silts, sands, and gravels deposited in major floodways by flood events. The channels are cut in earlier and/or contemporaneous fine and coarse flood sediments (units **Qff** and **Qfc**). The irregular post-flood surfaces of these deposits have been locally filled by bog or pond sediments and by over-bank alluvium from Johnson, Kellogg, and Crystal Springs Creeks

Qff — **Fine-grained facies (Pleistocene)** — Coarse sand to silt deposited by catastrophic floods. The finer sediments are predominantly quartz and feldspar and also contain white mica. The coarser sediments are predominantly Columbia River basalt fragments. Poorly defined beds of 1- to 3-ft thickness are observed in outcrop, and complex layering is recorded in boreholes. Soil development commonly introduces significant clay into the upper 6-15 ft of the deposits. The fine sediments are locally thick in the lower portions of the area and extend upslope as a mantle to an elevation between 300 and 350 ft

Qfc — **Coarse-grained facies (Pleistocene)** — Pebble to boulder gravel with silt and coarse sand matrix. The coarse sediments are poorly sorted and moderately to well rounded. The coarse deposits range from openwork gravel to gravel with considerable fine-grained matrix material. Clasts are largely basalt, but other lithologies may dominate downstream from bed-rock exposures

QTc — **Unnamed conglomerate (Pliocene to Pleistocene?)** — Well-rounded pebbles and cobbles of mainly andesite to dacite, with minor amounts of Columbia River basalt, in a poorly to moderately indurated lithic sandstone to sandy siltstone matrix. Andesite and dacite clasts often have weathering rinds, while Columbia River basalt clasts display little evidence of decomposition. Unit varies in thickness from <30 to >200 ft. Conglomerate of the same composition is exposed within the adjacent Gladstone quadrangle and represents part of a thick (>400-ft) channel fill. Clast and matrix lithologies of this unit differ from that of the Troutdale Formation (see Tolan and Beeson, 1984; Swanson, 1986) and probably represent deposits of Cascadian streams or an ancestral Clackamas River during late Troutdale time. Trimble (1963) previously mapped this unit as either the "sandy phase of lacustrine deposits" (catastrophic flood deposits) or "Gresham Formation"

Frenchman Springs Member, Wanapum Basalt (middle Miocene)

Tfsg — **Basalt of Sentinel Gap (middle Miocene)** — Consists of a single, blocky- to columnar-jointed flow within the map area. Fresh exposures are dark gray; weathered surfaces are typically brownish gray to dark gray. Fine- to medium-grained microphyric basalt, with acicular and equant plagioclase laths <0.1 cm in size; generally aphyric but can contain rare plagioclase phenocrysts <1 cm in size. Thickness of unit is variable, ranging from 25 to 50 ft. Compositionally similar to older Ginkgo flows (Table 1) but can be differentiated on the basis of stratigraphic position, lithology (lack of abundant plagioclase phenocrysts), and normal paleomagnetic polarity (Beeson and others, 1985)

Tfsh — **Basalt of Sand Hollow (middle Miocene)** — Four flows are present within the map area. Flows typically are blocky to columnar jointed, but occasionally display entablature/colonnade jointing style. Fresh exposures are dark gray to black; weathered surfaces are typically greenish gray to black. The three oldest flows ("+3, +4, and +5" units of Beeson and others [1975]) are fine to coarse grained, occasionally diktytaxitic, and sparsely plagioclase phyric, with phenocrysts <2 cm in size. The youngest Sand Hollow flow is typically diktytaxitic, medium to coarse grained, and plagioclase phyric, with phenocrysts and glomerocrysts that commonly range from 2 to 5 cm in size. Unit thickness is variable, ranging from <50 to >200 ft. Sand Hollow flows can be distinguished from both the Sentinel Gap and Ginkgo flows on the combined basis of stratigraphic position, lithology, and composition (Table 1). Both low- to intermediate-P_2O_5 compositional types (Beeson and others, 1985) are present within the map area. Beeson and others (1985) report a K-Ar date of 15.3 Ma for this unit

Tfg — **Basalt of Ginkgo (middle Miocene)** — Two flows are present within the map area. Flows are commonly blocky to columnar jointed, often displaying well-formed prismatic colonnades. Fresh exposures are dark gray to black; weathered surfaces are commonly reddish brown to gray. Both flows are typically medium-grained, plagioclase-microphyric basalt, with laths <0.1 cm in size, and abundantly plagioclase phyric, with phenocrysts and glomerocrysts ranging from 0.3 to 2 cm in size. The upper Ginkgo flow is commonly diktytaxitic. Thickness of this unit varies from 50 to >200 ft within the map area. Ginkgo flows can be distinguished from the plagioclase-phyric Sand Hollow flow on the combined basis of stratigraphic position, composition (Table 1), and excursional paleomagnetic polarity (Beeson and others, 1985). This unit commonly overlies a thin (commonly approximately 1-ft-thick), discontinuous, sedimentary interbed that ranges from fluvial arkosic, micaceous sandstone to paleosol. This sediment is equivalent to the Vantage Member of the Ellensburg Formation (Swanson and others, 1979; Beeson and others, 1985) and is not shown here as a separate map unit because of its relative thinness

Grande Ronde Basalt (middle Miocene)

Tgsb — **Sentinel Bluffs unit (middle Miocene)** — Within the map area, two flows that were formerly designated as "-1 and -2 flows" of Beeson and Moran (1979) are present. Flows typically display blocky to columnar jointing and rarely display an entablature/colonnade jointing pattern. Fresh exposures are light to dark gray; weathered surfaces are greenish gray to dark gray. The lower flow is typically fine- to medium-grained basalt and sparsely plagioclase phyric, with small (<0.5 cm) tabular plagioclase phenocrysts. The upper flow is fine to medium grained, commonly diktytaxitic, and aphyric. Unit thickness ranges from 25 to 150 ft within the map area. Sentinel Bluffs flows are distinguished from both younger Frenchman Springs units and older Grande Ronde units on the basis of stratigraphic position, composition (Table 1), lithology, and normal paleomagnetic polarity (see Reidel and others, 1989; Beeson and others, 1989). Long and Duncan (1982) report a $^{40}Ar/^{39}Ar$ date of approximately 15.6 Ma for the youngest flows of this unit on the Columbia Plateau

Fig. 6a. Geologic Survey Map of the George Rogers Park vicinity in Lake Oswego, Oregon (USGS, Lake Oswego, Oregon Quadrangle, Clackamas, Multnomah, and Washington Counties, 1989).

Soils

The scouring of late Pleistocene and perhaps later floods from Lake Oswego into the Willamette River has left the immediate park area largely bereft of older soils. Soils within the park are mapped as xerochrepts and haploxerolls (Figure 7), very steep in the lower portion of the park. The upper portion of Oswego Creek near the lake dam is mapped as xerochrepts-rock outcrops, moderately steep. An area of Willamette River sediments north of the Oswego Creek outlet is mapped as McBee silty clay loam (cumulic ultic haploxeroll). Slag deposits from the 19^{th} century iron smelting form the north bank of Oswego Creek in the vicinity of the footbridge.

Hydrology

The hydrology of Oswego Creek has been quite dependent on human engineering throughout recent historical time. The opening of the Oswego Canal at the west end of the lake in 1873 probably increased flood flows through Oswego Creek until the Oswego Dam was constructed in 1921. The construction of the present dam with its major outfall through a wooden pipe east of State Street probably considerably reduced flows through the upper portion of the channel. Gauging data from Oswego Creek at a location near the dam between May 8, 1958 and September 11, 1958 show maximum discharges of 7.5 cubic feet per second (cfs) and minimum discharges of 1 cfs through this period. The flows through Oswego Canal for the same period have a maximum flow of approximately 112 cfs and minimum flows of 12 cfs. Summer flows through Oswego Canal are currently limited to less than 29 cfs. This may mean that summer flows through the upper portion of Oswego Creek are lower than the measured flows in 1958. The lowest portion of Oswego Creek is backwatered from the Willamette River. The levels vary through the year depending on the river discharge, tides, and flows in the Columbia River.

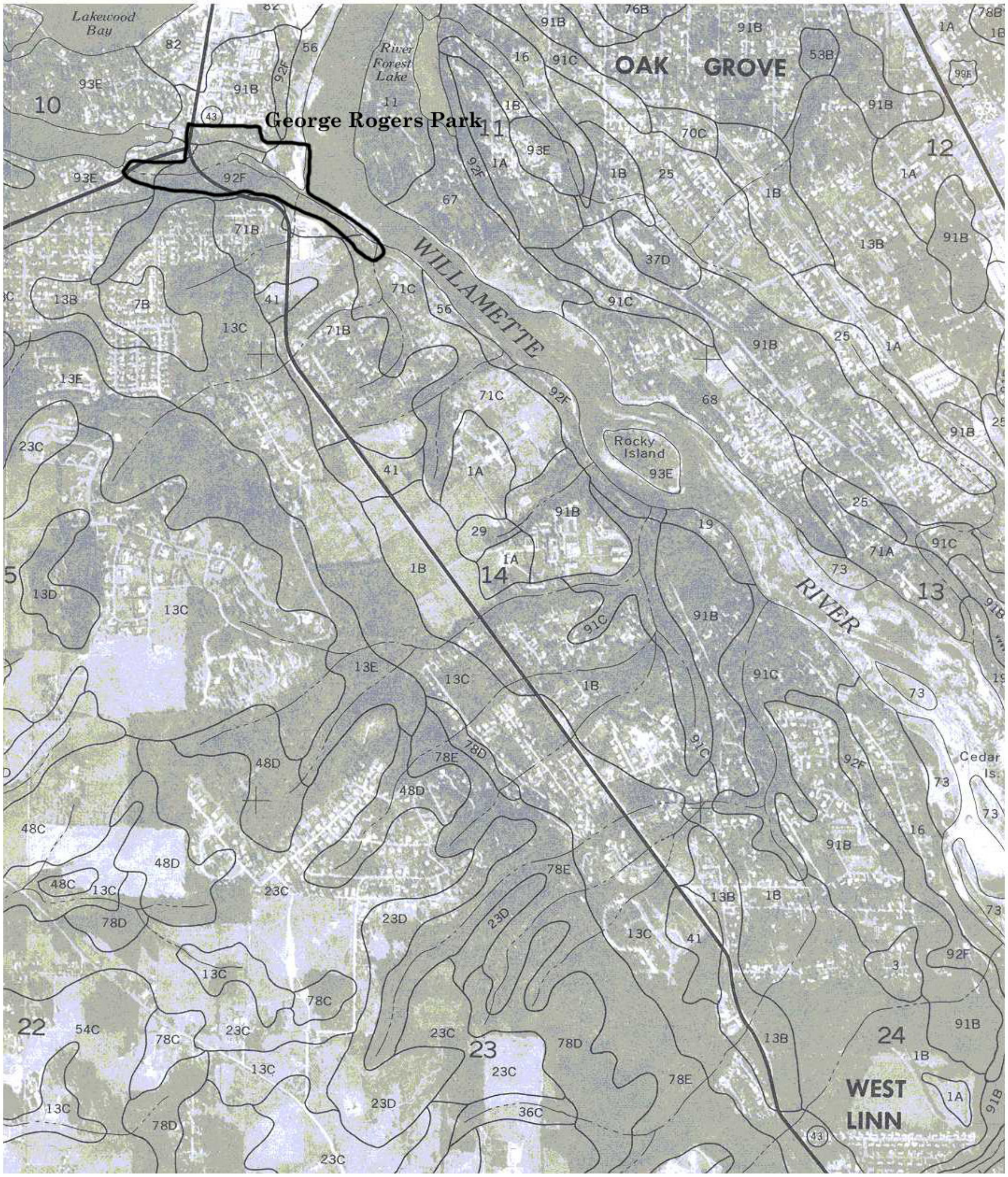


Fig. 7. Soils Series information for George Rogers Park in Lake Oswego, Oregon (Soil Survey of Clackamas County Area, Oregon , sheet 6, 1985).

Vegetation Communities

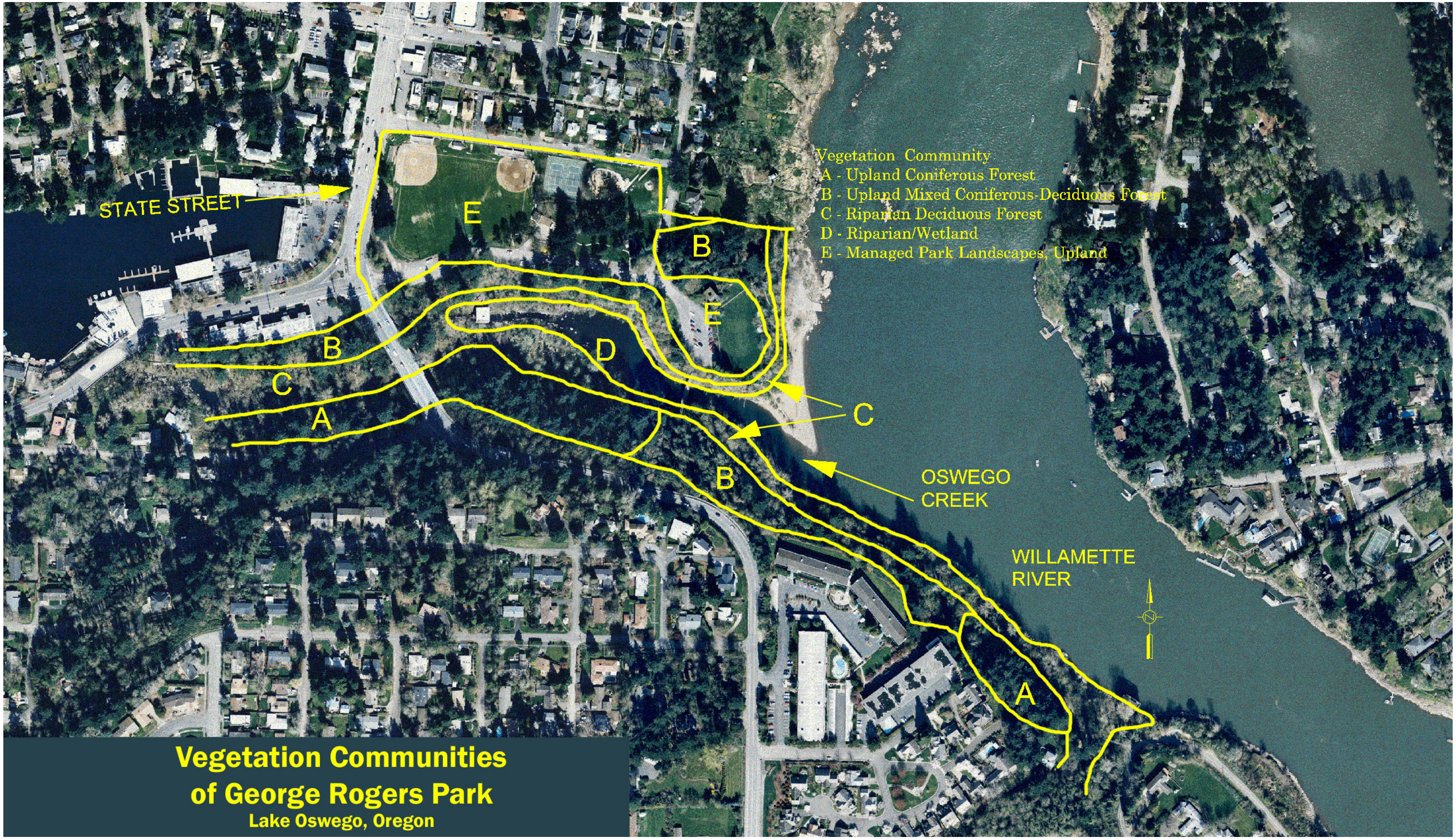
General Characteristics

George Rogers Park includes several plant communities that can be characterized by dominant species, landscape position, age, and recent land use. Portions of the study area have not been logged or disturbed for many years, allowing the development of mature evergreen to mixed woodland over much of the Park.

The plant communities described are broadly characterized: no one location will have all the understory shrubs listed for that community within view, nor will it necessarily have the same hydrology or soils as another location within that same community type. However, plant associations typically reflect similarities in growing conditions, such as availability of moisture, soil nutrients, sunlight, and competition from other species. Past clearing activities, competition from introduced species, and ongoing Park maintenance have played major roles in shaping the present plant communities. The following plant communities can be observed within the Park:

- A Upland Coniferous [Douglas Fir] Forest
- B Upland Mixed Coniferous-Deciduous [Douglas Fir-Bigleaf Maple] Forest
- C Riparian Deciduous Forest
- D Riparian Wetland (PSS/PEM)—including areas below OHW
- E Managed Park Landscapes, Upland

These communities are described below, and are mapped in Figure 8. In addition, a non-comprehensive listing of plant species encountered within the project area (along with their preferred habitat types, native/introduced status, and USFWS wetland indicators) is included in Appendix D.


Vegetation Community
A - Upland Coniferous Forest
B - Upland Mixed Coniferous-Deciduous Forest
C - Riparian Deciduous Forest
D - Riparian/Wetland
E - Managed Park Landscapes, Upland
STATE STREET
E
B
E
B
D
C
A
C
OSWEGO CREEK
B
WILLAMETTE RIVER
A
N
Vegetation Communities of George Rogers Park
Lake Oswego, Oregon

Upland Coniferous Forest (A)

The upland coniferous forest community is dominated by Douglas Fir (*Pseudotsuga menziesii*), with minor constituents of Bigleaf Maple *(Acer macrophyllum*), Grand Fir (*Abies grandis*), Western Red Cedar (*Thuja plicata*), and others. This community is most evident on the southern slopes above Oswego Creek, primarily upslope of the main trail. Douglas Fir on these slopes range from less than 12 inches diameter at breast height (dbh) up to at least 30 inches dbh; some of the trees are likely to be over 65 years old. The current structure probably results from limited disturbance (i.e. logging activity) for several decades at least, which has allowed the Douglas Fir to overtop any deciduous trees and dominate the stand.

The conifer stands typically have a multi-layered understory that includes such shrubs as Indian Plum (*Oemleria cerasiformis*), Beaked Hazelnut (*Corylus cornuta*), English Holly (*Ilex aquifolium*), Vine Maple (*Acer circinatum*), Thimbleberry (*Rubus parviflorus*), Oregon Grape (*Berberis nervosa*), California Dewberry (*Rubus ursinus*), and Red Elderberry (*Sambucus racemosa*). Both midstory and ground cover diversity and density has been compromised to some extent however, since extensive patches are infested with English Ivy (*Hedera helix*), a highly competitive invasive species. Herbaceous species present include Western Sword Fern (*Polystichum munitum*), Inside-out Flower (*Vancouveria hexandra*), Hookers Fairy-Bells (*Disporum hookeri*), Herb Robert (*Geranium robertianum*), Fringecup (*Tellima grandiflora*), and Dewey's Sedge (*Carex deweyana).*

Upland Mixed Coniferous-Deciduous Forest (B)

This upland mixed coniferous-deciduous forest community is dominated by Douglas Fir and Bigleaf Maple, along with occasional occurrences of Oregon White Oak (*Quercus garryana*) and Western Red Cedar, among others. Mixed stands are located primarily in relatively narrow strips along the upper slopes of the Park above the Willamette River, and along the northern slopes above Oswego Creek. This community has been subject to more recent logging or other disturbance, with insufficient time for conifers to dominate the overstory. Selective logging of conifers may have also contributed to this pattern by maintaining a more open deciduous canopy.

Understory species often include those found under the conifer forest type, though the more open mixed canopy favors a dominance by invasives. Both English Ivy and Himalayan Blackberry (*Rubus discolor*) have responded to understory disturbance, effectively out-competing most other understory species. Both English Ivy and Western Virgin's-Bower (*Clematis ligusticifolia*) can also be seen climbing up and over many trees and tall shrubs. Ivy, Himalayan Blackberry and Western Virgin's-Bower are considered nuisance plants by the City of Lake Oswego.

Riparian Deciduous Forest (C)

The riparian deciduous forest community includes a diverse mix of Oregon Ash (*Fraxinus latifolia*), Red Alder (*Alnus rubra*), Black Cottonwood (*Populus trichocarpa*), Bigleaf Maple, and Pacific Willow (*Salix lasiandra*). Occasional Western Red Cedar and Douglas Fir are also present. This community type is found along the lower slopes and bottom of the Oswego Creek ravine, as well as along the base of the slope facing the Willamette River. This plant community is influenced by the greater availability of groundwater and/or surface water flows, and by the limited soil depths in the ravine.

Tree size is greatest among maturing Black Cottonwood on the lower slopes, which in numerous cases exceed 24 inches dbh. Most other trees in this community are smaller in diameter, probably due both to poor substrate and relatively young age class (i.e. <40 years old).

Groundcover varies greatly due to the rocky substrate and past disturbance, which has favored the dense competitive growth of English Ivy and Himalayan Blackberry, nearly to the exclusion of herbaceous species. The few shrub species present include sapling Red Alder and ash, Pacific Ninebark (*Physocarpus capitatus*), Vine Maple, and Hardhack Spiraea *(Spiraea douglasii)*.

The herb layer is dominated by Reed Canarygrass (*Phalaris arundinacea*) in the lowest elevations along the creek's flood-plain, with Common Velvetgrass (*Holcus lanatus*), Creeping Buttercup (*Ranunculus repens*), Large-leaved Avens (*Geum macrophyllum*), and Giant Knotweed (*Polygonum sachalinense*) also present. Giant Knotweed is considered a nuisance plant by the City.

Riparian/Wetland (D)

The riparian wetland community is a narrow fringe along the lower reaches of Oswego Creek, where backwaters from the Willamette River and high flows from the Creek combine to limit most woody vegetation. This community grades to deep water habitat unable to support rooted vegetation.

With the exception of occasional hydrophytic woody species (i.e. Pacific Willow and spiraea), this community primarily supports stands of Reed Canarygrass. Other species present include Purple Loosestrife (*Lythrum salicaria*) and Yellow Iris (*Iris pseudacorus*), both non-natives. Purple Loosestrife and Reed Canarygrass are considered nuisance plants by the City.

Jurisdictional Wetlands/Waters of the State

Wetlands and water resources in Oregon are regulated by the Oregon Division of State Lands under the Removal-Fill Law (ORS 196.800-196.990) and by the US Army Corps of Engineers through Section 404 of the Clean Water Act.

A wetland is defined 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" (DSL, 1995).

Waters of the state are defined as "natural waterways including all tidal and nontidal bays, intermittent streams, constantly flowing streams, lakes, wetlands and other bodies of water in this state, navigable and nonnavigable...". "Natural waterways" is further defined as waterways created naturally by geological and hydrological processes, waterways that would be natural but for human-caused disturbances (e.g. channelized or culverted streams, impounded waters, partially drained wetlands or ponds created in wetlands)..."(DSL, 1995).

National Wetlands Inventory

The US Fish and Wildlife Service, as part of the National Wetlands Inventory (NWI) program, has not mapped Oswego Creek as different from the Willamette River. (Figure 10).

NWI maps are generated primarily on the basis of interpretation of color infrared aerial photographs (scale of 1:58,000), with limited "ground truthing" to confirm the interpretations. Forested drainages or wetlands are often missed during mapping. Based on our field work, the Oswego Creek drainage below the dam could be classified as a riverine, lower perennial, streambed (R2SB) body of water. The fringe of the creek is dominated by willows and could be classified as palustrine scrub shrub (PSS) with areas of Reed Canarygrass classified as palustrine emergent (PEM).

Wildlife

Wildlife Habitat

The location of George Rogers Park creates some unique opportunities for viewing wildlife species, especially those that are associated with aquatic habitats. Almost any species using the Willamette River as a travel corridor could be seen at George Rogers Park. The backwater area formed by Oswego Creek at its confluence with the Willamette River provides a calm water resting place for a variety of wildlife species, and a small beach located along the Willamette River is a popular resting place for various species of waterfowl and wading birds, such as Canada geese (*Branta canadensis)*, Mallards (*Anas platyrhynchos)*, cormorants, (*Phalacrocorax auritus),* and great blue herons (*Ardea herodias).*

Beyond the aquatic habitats, the use of George Rogers Park by wildlife is most likely limited to birds and small mammals. The park is not large enough to support species with large home range requirements, though coyote (*Canis latrans*)and deer (*Odocoileus hemionis columbianus*) have been anecdotally noted in the park. Raccoons (*Procyon lotor*), opossum (Didelphis virginiana), Douglas, western gray, and fox squirrels (*Tamiasciurus douglasii, Sciruus griseus, S. niger*), little brown bat (*Myosotis lucifugus*), big brown bat (*Eptesicus fuscus*), river otter (*Lutra canadensis*), striped skunk (*Mephitis mephitis*), nutria (*Myocastor coupu*), Townsend's chipmunk (*Eutamias townsendii*) and small rodents such as mice (*Mus* sp.) and voles (*Microtus* spp.)are also likely residents of the Park. A non-comprehensive list of wildlife is included in Appendix E.

The lack of habitat diversity within the park limits the opportunities for some wildlife species to use the park for nesting or denning purposes. This is especially true for species that would

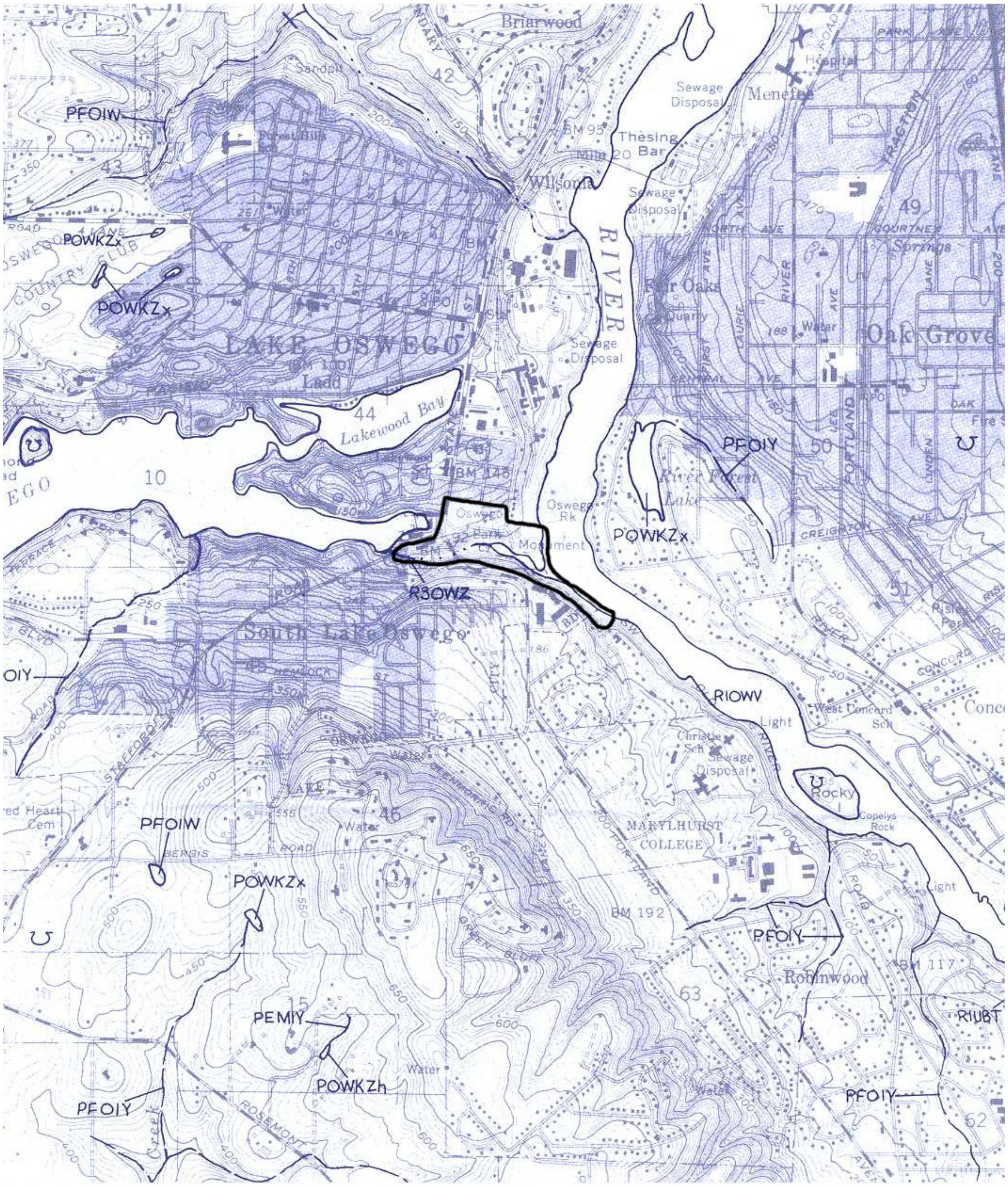


Fig. 9 National wetlands Inventory Information for GRP in Lake Owego (USFWS, National Wetlands Inventory, Lake Oswego, Oregon Quadrangle, 1981).

use large snags or downed logs, or shrub or herbaceous structures. Few large snags are found in the park and downed logs, if present, are covered by English Ivy. The shrub component is very limited and English Ivy dominates the herbaceous layer. The English Ivy hurts the health of the park in other ways. Downed logs and rock outcroppings used as foraging and denning sites by various species of wildlife are rendered inaccessible by the thick blanket of ivy.

The usefulness of George Rogers Park to wildlife is limited by its location in the landscape. An important aspect of wildlife habitat is the connectivity of one area of habitat with another. Developed neighborhoods surround the park on three sides and the Willamette River on the fourth. Species that travel through aquatic habitats can come and go from the Park with relative ease, however more terrestrial species access and movement are limited by roads and developed areas. Therefore the dominant wildlife within the park is avian species. Birds known to use the park include stellar (*Cyanocitta stelleri*) and scrub jays (*Aphelocoma insularis*), finches, wrens, pine siskins (*Carduelis pinus*), pileated woodpecker (*Dryocopus pileatus*), flickers (*Colaptes auratus*), chickadees (*Parus atricapillus*), western tanager (*Piranga ludoviciana*), and hummingbirds (pers. communication Candace Jochim, 2001). A barn owl (*Tyto alba*) is known to roost in the iron smelter.

A non-comprehensive list of species observed or expected is found in Appendix E. A list of birds observed during the 2000 Portland Audubon Society Christmas Bird Count in the Lake Oswego area is also presented. While the species on this list may not have been specifically observed in George Rogers Park this list is representative of the species that could be found in the park during the winter months.

Fisheries/Aquatic Resources

Aquatic Resources Assessment

Aquatic habitat characteristics of Oswego Creek were assessed on November 29th, 2001. A fishery biologist visited the site on November 30th, 2001 to assess the potential fish habitat present in Oswego Creek downstream of the Lake Oswego dam to the confluence with the Willamette river. The stream was walked in its entirety from the dam to the Willamette River. The slope for this section of the creek was obtained using a topographic map marked with 1 foot isoclines. The contour map did not cover the entire site area. Coverage ended approximately 420 feet up-stream of the road overpass. The habitat assessment was qualitative. Instream habitat and riparian vegetation was evaluated with an emphasis on potential fish habitat. Additional historical fishery information was solicited from Oregon Department of Fisheries and Wildlife biologists.

Riparian Zone

The creek sits in a steep sloped, constrained valley dominated by bedrock. Large blocks of rock that have fractured from the bedrock of adjacent slopes have slid down into the stream in several places. The slopes leading down to the creek are predominantly vegetated with an overstory of Douglas fir, particularly upslope of the foot trail on the south side of the creek. Downslope of the trail, a mixture of hardwoods including cottonwood, alder, ash, willow and maple is found. Immediately adjacent to the stream the most common plant is willow. The stream generally had an open overstory canopy along its length.

Historical Fish Information

Anecdotal fish information was provided by Jim Grimes and Greg Robart (ODFW fish biologists). Each suggested that returning salmonid adults have occasionally been found in the creek up to the base of the dam in previous years. It is likely that flow from the Tualatin River into Lake Oswego via the diversion canal might attract returning adult fish into Oswego Creek who are trying to return to the Tualatin River.
Species known to occur in Oswego Creek and this portion of the Willamette include winter steelhead (*Oncorhynchus mykiss irideus*), chinook (*Oncorhynchus tshawytscha*), coho (*Oncorhynchus kisutch*), cutthroat trout (*Oncorhynchus clarki clarki*), and Pacific lamprey (*Entosphenus tridentatus*). Other potential species include reticulate sculpin (*Cottus perplexus*), redside shiner(*Richardsonius balteatus*), largescale sucker (*Catostomus macrocheiluss*), carp (*Cyprinus carpio*), yellow bullhead (*Ictalurus natalis*),largemouth bass (*Micropterus salmoides*), bluegill (*Lepomis macrochirus*) and speckled dace (*Rhinichthys osculus*).

No fish were seen during the site visit on November 29th. However, the stream appears to be able to provide some rearing capacity for juvenile salmonids. Flows are probably extremely limited during the summer. Flow data from Oswego Creek taken just downstream of the dam identifies flows ranging from less than 1 cfs to spikes around 7 cfs. between May and September in 1958.

The creek may have occasional warm water fish species introduced from the lake above the stream. Summer may be limiting juvenile rearing due to low flow and warmth. Cutthroat may also use pools if appropriate sized gravel is nearby for use.

Aquatic Habitat

Stream structure: The stream was composed of riffles, runs, cascades, and several significant pools located throughout the study reach. Some of the pools were more than two feet in depth. The entire lower end of the stream is back-watered by the Willamette River. At the upper end of the creek next to the dam, a large bedrock cascade exists that is not passable to fish except during elevated flows.

Habitat complexity: Very little large woody debris was observed in the channel from the backwater pool connecting the stream to the Willamette upstream to the dam. Substrate was predominantly bedrock with organic detritus (leaves) and silts covering the stream bottom in places, particularly in the pools. Two small gravel patches were identified. In several locations large boulders had rolled into the stream. Minimal cut banks, overhanging vegetation or other cover was observed.

Substrate: A couple of gravel patches were noted. One was below the highway bridge, and covered an area approximately 3' x 3'. This gravel patch was just a couple inches thick. . The other gravel patch noted was approx. 4' x 6' and had gravel from 1 to 3 centimeters in diameter. Silt covered bedrock is the predominant substrate along the creek. There is an abundance of fines and organic detritus in all the pools with up to 1 foot of muck in large pools. In the swiftest portions of the stream, all bed-load had been scoured to bedrock. The sediment regime has been drastically altered by the creation of the Lake Oswego dam. Apparently larger flows have occurred since virtually all the streambed has been scoured to bedrock.

Slope: Average slope of the reach covered by the topographic map from about 420 feet above the road down to the Willamette

River is about 3.8%. This value will vary slightly with a change in river levels. From the river to the pumphouse/blockhouse, the slope is 1.25%. From the blockhouse up to the road crossing, the slope is 4.4%. A steeper grade of 10.5% is located under the bridge. Upstream from the road to a large pool, the grade is 4.5 %. Just below the dam is a significant cascade feature that would be difficult for adult salmonids including steelhead and coho to negotiate except at elevated flows allowing migration up the margins. However, there is no advantage in reaching the dam since passage by the dam is not provided.

Flow: Flow was several cubic feet per second (cfs) during the site visit. Flow was coming over the dam (1-2 cfs), through a pipe bisecting the dam (~1 cfs) and through a 3-foot wooden pipe extending from the dam down to a blockhouse. Additionally, flow would increase with rain via storm outlets off the bridge. On a subsequent visit flow off the road was estimated to be 3 cfs during a rain event.

Threatened and Endangered Species

A search of the Oregon Natural Heritage Program (ORNHP) database was performed to determine if rare, threatened or endangered species have been documented within a 2-mile radius of the Park. The search revealed that listed species of fish, wildlife and plants may be found in the vicinity of the Park. The species and their status are summarized below.

Table 2. Rating Code for Sensitive Species (Federal and/or State Agencies)

Rating Code	Description
LE	**Listed Endangered** Taxa listed by federal and/or state agencies (under the ESA and OESA) as those which are in danger of becoming extinct within the foreseeable future throughout all or a significant portion of their range.
LT	**Listed Threatened** Taxa listed by agencies under the ESA and/or OESA as those likely to become endangered within the foreseeable future.
PE	**Proposed Endangered** Taxa proposed by agencies to be listed as Endangered under the ESA and/or OESA.
PT	**Proposed Threatened** Taxa proposed by agencies to be listed as Threatened under the ESA and/or OESA.
C	**Candidate** Candidate taxa for which the agencies have sufficient information to support a proposal to list under the ESA and/or OESA.
C->	**Former Candidate, to be recognized** as SoC (by USFWS at next Candidate Notice of Review; considered as candidate species until formally recategorized).
SoC	**Species of Concern** All former C2 taxa (a category being eliminated by USFWS) that were previously thought to warrant listing, but needed previously thought to warrant listing, but needed additional information before being proposed as Threatened or Endangered under the ESA. The USFWS no longer intends to publish this list as a Notice of Review.

Sensitive Animal Occurrences

Several species of salmonids occur in the Willamette River, and an American bald eagle nest is located on Lake Oswego just over a mile west of the park. The following table summarizes the ORNHP list.

Table 3. Oregon Natural Heritage List of Threatened or Endangered Animal Species within 2-miles of Park

Common Name	Species Name	Fed	State	Suitable Habitat?
Chinook salmon	*Oncorhynchus tshawytscha*		--	Willamette River
Coho salmon	*Oncorhynchus kisutch*	C	LE	Willamette River
Steelhead trout	*Oncorhynchus mykiss*	LT	SC	Willamette River
Coastal Cutthroat trout	*Oncorhynchus clarki clarki*	PT	--	Willamette River
Oregon chub	*Oregonichthys crameri*	LE	SC	Last seen 1904
Bald Eagle	*Haliaeetus leucocephalus*	LT	LT	Known nest on Lake Oswego
NW Pond Turtle	*Clemmys marmorata*	SOC	SC	No suitable habitat on park property

Sensitive Plant Occurrences

The ORNHP database provided the following list of sensitive plant species documented in the vicinity of George Rogers Park. Several of the species could potentially be found within the park property.

Table 4. ONHP List of Threatened or Endangered Plant Species

Common Name	Species Name	Fed	State	Preferred Habitat	Suitable Habitat?
Plants					
Tall Bugbane	*Cimicifuga elata*	---	C	moist shady mixed woods	Yes*
Howellia	*Howellia aquatilis*	---	LT	shallow ponds	Yes*
White rock larkspur	*Delphinium leucophaeum*	SOC	LE	moist places on basalt cliffs	Yes*
Oregon sullivantia	*Sullivantia oregana*	SOC	C	wet, shaded, rocky areas	Yes*

* Though suitable habitat is present, plant occurrences are unlikely (see following discussion).

- Tall Bugbane has been documented in mixed woods within a few miles of the Park, in a very small patch of less than 10 plants. Suitable habitat is present within the Park, though the prevalence of invasives such as English ivy in much of the understory, as well as past disturbance, severely limits its potential.
- Howellia was last documented in the Lake Oswego area in 1892; the plant is assumed extirpated.
- White Rock Larkspur has been documented on basalt cliffs above the shoreline of Lake Oswego, as well as on Elk Rock along the Willamette River. These locations tend to be relatively open, mostly dry communities except where seepage supports the larkspur. There may be potential habitat on bluffs adjacent to the Willamette River trail and along Oswego Creek, though these may be too shady, dominated by invasive species, or otherwise lack suitable substrate to support the plant.
- Oregon Sullivantia has been documented on the Palisades along Oswego Lake, as well as on Elk Rock. It prefers shaded, perpetually wet, rocky areas, often within the spray zone of a waterfall. There may be potential habitat within the Park, though its habitat is very limited due to extensive ivy infestation and past disturbance.

In each case, it is apparent that potential habitat may be present within the Park, but that actual plant presence is unlikely. This is due primarily to past land uses, which have been ongoing for well over a century, and that have favored colonization by invasive species such as English Ivy. In addition, the very restricted (if not already locally extirpated) populations of these plants provide virtually no potential for recolonization of disturbed areas due to limited seed production and distribution ability. Despite the poor likelihood of encountering any of these species, they could not be entirely eliminated from consideration (with possible exception of *Howellia*) without suitable habitat survey(s) conducted during the appropriate flowering time.

Natural Resource Regulations and Ordinances

George Rogers Parks is bordered to the east by the Willamette River and to the south by Oswego Creek. Both of these waterways are regulated by state and federal laws and are protected by local ordinances. As such, park improvements that impact these resources will need to obtain state and federal permits and local approvals before implementation. A discussion of federal, state, and local permits and regulations is given below.

Greenway Management Overlay District

The Greenway Management Overlay extends 150 feet shoreward from the ordinary low waterline of the Willamette River. All proposed impacts within the Greenway Management Overlay District need to comply with the provisions of LOC Chapter 49 Development Code. This includes ensuring the City of Lake Oswego that significant fish and wildlife habitats are protected; significant natural and scenic areas, viewpoints and vistas will be protected and enhanced; areas of ecological, scientific, historical or archeological significance will be protected, restored, or enhanced to the maximum extent possible; the quality of the air and water in and adjacent to the Willamette River will be maintained or enhanced in the development, change of use, or intensification of use of land within the Greenway Management overlay; areas of annual flooding, water areas, and wetlands will be retained in their natural state to the maximum possible extent to provide for water retention, overflow and other natural functions as well as protect the health, safety and welfare of the public; the natural vegetative fringe shall be maintained or enhanced to assure scenic quality, protection of wildlife, protection from erosion and screening of uses from the river; areas considered for development, change or intensification of use which have erosion potential will be protected from erosion by means compatible with the natural character of the Greenway; recreational needs will be satisfied by public and private means in a manner consistent with the natural limitations of the land; and public safety and protection of public and private property will be provided to the maximum extent practicable, especially from vandalism and trespass. In addition, conflicts with adjacent lands will be minimized.

Non-water related or dependent structures shall be located west of and no closer than 25 feet to the contour elevation line that establishes the Army Corps of Engineers 50-year floodplain line.

Sensitive Lands Overlay District

Oswego Creek is within a Resource Protection (RP) Class I Stream Corridor. In addition, riparian areas to the north and south of the creek are designated as a Resource Conservation (RC) Tree Groves (Figure 6). Both of these resource protection areas are regulated under LOC 48.17. The RP Stream Corridor has a 30-foot setback, plus an additional 10-foot setback for structures, roads, driveways, etc. Any proposed impacts within these resource areas will require an alternatives analysis, discussing why there is no alternative to the park improvements, and potentially a mitigation plan to offset any proposed losses to the resource areas.

Clean Water Act and Removal Fill Law

As mentioned previously, both the Oregon Division of State Lands (DSL) and the US Army Corps of Engineers (COE) regulate wetlands and waters of the state. Both the Willamette River and Oswego Creek would be considered regulated waters. DSL regulates impacts to wetlands and water resources under the Removal-Fill Law (ORS 196.800-196.990) and the COE through Section 404 of the Clean Water Act.

Within George Rogers Park, the DSL and the COE will regulate wetlands that meet the wetland definition as included in the *Corps of Engineers Wetland Delineation Manual Technical Report Y-87-1*, (Environmental Laboratory, 1987). This manual defines wetlands as requiring indicators of hydric soils, a dominance of hydrophytic vegetation, and wetland hydrology.

If there are no adjacent wetlands, as is the case with much of Oswego Creek and the Willamette River, the limit of DSL's and the COE's jurisdiction can be slightly different. DSL Administrative Rules define the limits of the state's jurisdiction on "constantly flowing streams" as "bankfull stage or the line of non-aquatic vegetation, whichever is higher" (OAR 141-085-0015(3)(c)). "Bankfull stage" is further defined as:"…the stage or elevation at which water overflows the natural banks of streams or other waters of this state and begins to inundate the upland. In the absence of physical evidence, the two-year recurrence interval flood elevation may be used to approximate the bankfull stage."

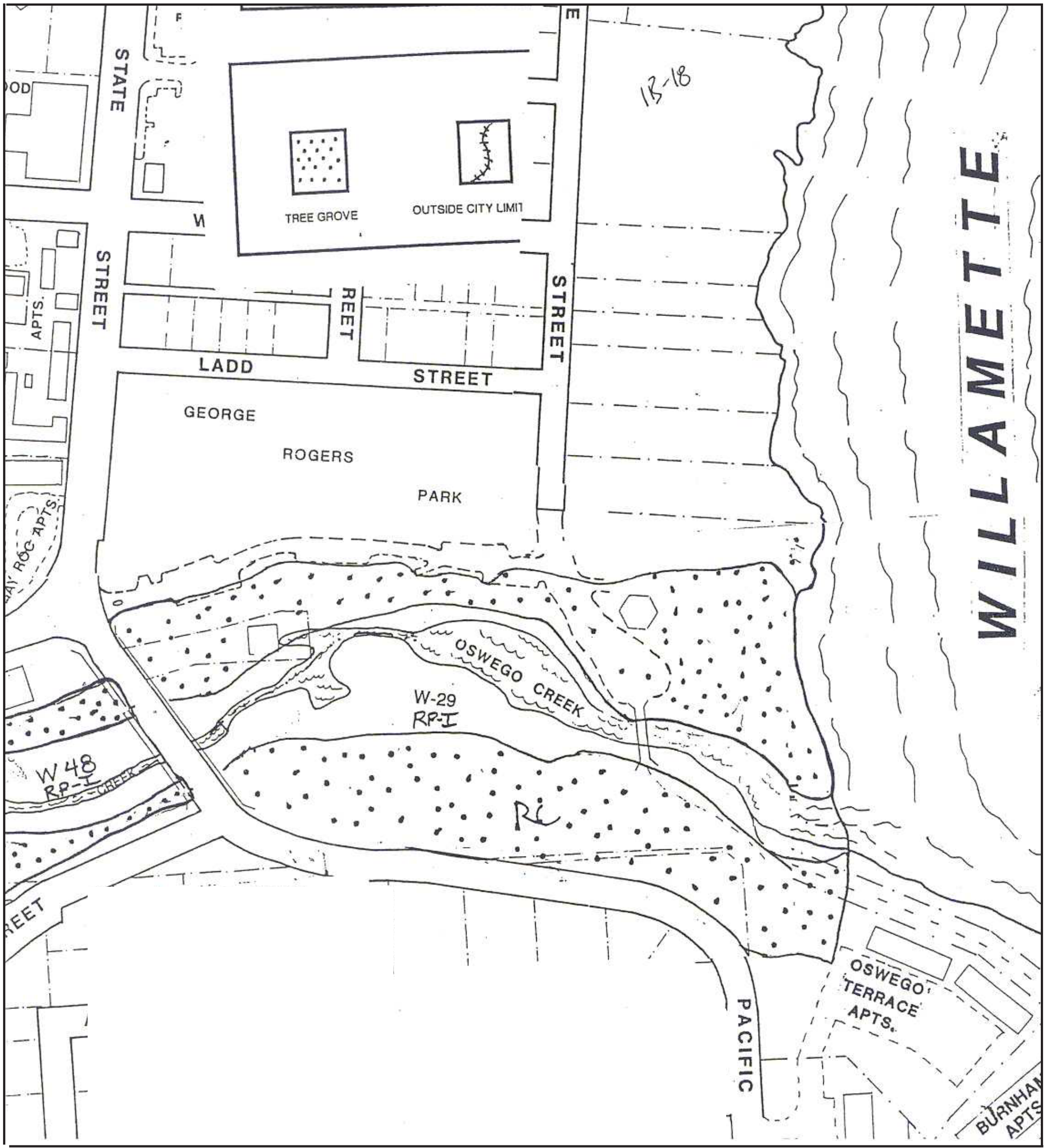


Fig. 11. Natural Resource Inventory Information for George Rogers Park in Lake Oswego, Oregon (City of Lake Oswego 1994/95 Natural Resource Inventory Individual Property Maps).

Federal regulations define the limits of COE jurisdiction on "nontidal waters of the U.S." as the "ordinary high water mark" (33 CFR 328.4(c)), on streams where adjacent wetlands are absent. The ordinary high water mark can be determined by a line on the shore or bank established by fluctuations of water indicated by physical characteristics including: a clear, natural line on the bank, shelving, changes in soil, destruction of terrestrial vegetation, or presence of litter and debris. Typically, on a creek such as Oswego Creek, the ordinary high water mark on the stream bank can be determined by a scour line that lies below the top of bank. Thus, the line of DSL jurisdiction is typically higher than that of the COE. The ordinary High water elevation of the Willamette River at George Rogers Park is estimated at elevation 21.4, National Geodedic Vertical Datum.

Both agencies will require the City of Lake Oswego to obtain permits if park improvement projects impact areas within state and federal regulation. DSL usually does not require permits if less than 50 cubic yards of material is removed or filled in a wetland or a creek. However, this rule does not apply to waterways that have been designated as "essential indigenous anadromous salmonid habitat." Both Oswego Creek and the Willamette River have received this designation. As such, the 50 cubic yard rule does not apply.

If permits are required, the City will have to file a permit application with the DSL and the COE. The *joint permit application* requires information on the purpose of the proposed development, a description of the proposed project, the amount of wetland or waterway to be impacted, the quantity and type of material to be placed in the wetland or waterway, an alternatives analysis for the development of the property, methods to control erosion during construction, a description of the resource proposed for impact, and a compensatory mitigation plan.

Impacts to regulated wetlands and waterways usually requires mitigation. Mitigation is the creation, enhancement or restoration of wetlands. The agencies require that applicants first consider wetland mitigation on-site and in-kind. This means the mitigation site is located on the development site and the impacted wetland is replaced with a similar type or class of wetland. If on-site mitigation is not possible, off-site mitigation may be acceptable if the site is within the same watershed as the impacted wetland.

The agencies have established minimum required ratios for wetland mitigation. These ratios are:

Type of mitigation	Ratio	Explanation
Wetland restoration	1:1	This usually means restoring hydrology to an area that was previously wetland
Wetland creation	1.5:1	Creating a wetland in an area where wetland has never existed
Wetland enhancement	3:1	Enhancing a degraded wetland, usually by excavating or planting desirable species

The agencies may not require the type of mitigation described above if the impacts are to the open water areas of the river or creek. In this case, the agencies may require the City of Lake Oswego to improve the quality of the creek and the river's riparian areas.

In addition to the permits from the DSL and the COE, the City may also have to obtain 401 Water Quality Certification from the Department of Environmental Quality (DEQ). Section 401 of the Federal Clean Water Act, requires that applicants for wetland fill projects comply with state water quality standards. In Oregon, these are administered by DEQ. DEQ has prepared conditions for many of the COE's Nationwide Permits that if satisfied allow the COE project manager to issue the permit without individual DEQ review. However, certain permits have not been pre-conditioned and require DEQ's project manager to review the joint permit application. DEQ will review the application to determine whether suitable safeguards have been instituted to ensure that the water quality of wetlands and waters adjacent to the proposed development will be protected. This includes erosion control, pretreatment of stormwater, spill protection, etc.

Endangered Species Act

Both the Willamette River and Oswego Creek are considered Essential Indigenous Anadromous Salmonid Habitat and provide habitat for several species of protected fish. The portion of the river adjacent to the park is primarily a corridor for fish migrating both upstream to spawn (mature adults) and downstream (smolts). Though many of the fish are migrating through this section of the river, the mainstem river does serve as a rearing area for some salmon including chinook juveniles. The backwater area of Oswego Creek may also provide refugia for fish during periods of high flow. The following species listed in Table 5 may be present in the Willamette River adjacent to the park at some point during their life history.

Table 5. Listed Species and Specific ESU's (Evolutionarily Significant Unit) within the Willamette River

Chinook salmon, *Oncorhynchus tshawytscha*: (Lower Columbia River ESU
(T[1] -3/99[2]), Upper Willamette River ESU (T-3/99))

- Coho salmon, *Oncorhynchus kisutch*, (Lower Columbia River ESU (T - 3/99))
- Steelhead trout: *Oncorhynchus mykiss irideus*, (Lower Columbia River ESU (T- 3/98) Upper Willamette ESU (T-3/99))

[1]T= Listed as Threatened by the National Marine Fisheries Service (NMFS) under the Endangered Species Act (ESA

[2]Month and year of listing in the Federal Register

If park improvements require impacts to the river or the creek and a permit is required from the COE, approval of the project from the National Marine Fisheries Service (NMFS) may be required. The issuing of a permit by the COE is considered to be a federal action. The NMFS reviews the federal action to ensure that it does not jeopardize the continued existence of any threatened or endangered species or species proposed for such designation, or result in the destruction or adverse modification of designated or proposed critical habitat. This is to ensure compliance with Section 7(c) of the 1973 ESA, as amended. Under Section 7, the applicant through consultation prepares a Biological Assessment (BA). The consultation is accomplished, in part, through a BA, which evaluates the potential effects the proposed project may have on plant and animal species that are listed as threatened or endangered under the ESA, and those that are proposed for listing.

Factors considered in the preparation of the Biological Assessment include species' dependence on specific habitat components that would be removed or modified, the abundance and distribution of habitat and habitat components in the project vicinity, distribution and population levels of the species (if known), the degree of impact to habitat, and the potential to mitigate the adverse effect. For fish species, the methods outlined in *Making Endangered Species Act Determinations of Effect for Individual or Grouped Actions at the Watershed Scale* (NMFS 1996) are generally used to analyze the potential for project impacts on water quality and instream and riparian habitat quality. The BA determines the environmental baseline for the watershed, discusses how the proposed action would affect the environmental baseline, and then uses that information to arrive at a determination of effect.

After consultation with the applicant, the NMFS issues a Biological Opinion (BO) describing how the proposed project will not jeopardize the continued existence of any threatened or endangered species or result in the destruction or adverse modification of designated or proposed critical habitat. The BO generally includes conservation measures intended to mitigate for any adverse effects that the project may have. They are also generally intended to ensure that the environmental baseline is improved.

Context | Transportation Analysis

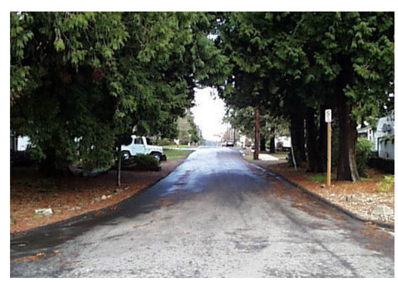
One of the main components to be identified in the master planning process is the transportation system. The transportation system involves all travel characteristics including pedestrian and bicycle access/circulation, transit service, vehicular access/circulation, and parking facilities. This report details the existing transportation infrastructure and operational characteristics of George Rogers Park.

Transportation Facilites

Roadways

There are two primary roadways located within the general vicinity of George Rogers Park. State Street (OR 43) is a major north-south roadway connecting Lake Oswego with Portland to the north and the cities of West Linn and Oregon City to the south (see Figure 11). The other major roadway is McVey Avenue. McVey Avenue serves the southern half of Lake Oswego and northern Clackamas County. Together, these two roadways provide regional access to George Rogers Park. Direct vehicular access to the park is provided by several local roadways located off of State Street. One of the access routes is the Green-McVey Street/State Street intersection. Green Street is a dedicated park access road serving the southern half of the park and the main parking lots. Although the Green Street intersection is intended as the main park access, operational constraints at the State Street/McVey Avenue intersection effectively limit the access opportunities to Green Street. In particular, southbound vehicles on State Street are restricted from making a southbound left-turn at the Green Street park entrance. As a result of the restriction, several local streets to the north of the park (Ladd, Wilbur, Durham and Furnace Streets) serve as park access and circulation roadways from the north.

Green Street Entrance, looking west towards McVey Street.



Durham Road, looking north from Ladd Street.

Ladd Street is a local street forming the northernmost boundary of the park. Ladd Street is significant in that it serves as another vehicular entry point to the park, especially for vehicles traveling southbound on State Street. In addition to Ladd Street, Wilbur Street is another local street parallel to Ladd Street, that provides access to/from the park, although more indirectly via Furnace Street and Durham Street.

For circulation purposes, Furnace Street provides a roadway connection along the east side of the park between Ladd Street and Green Street. This roadway connection is restricted to southbound vehicle movements in order to reduce cut-through traffic on neighborhood streets. As a result of this circulation restriction, all vehicles on Green Street are not permitted to

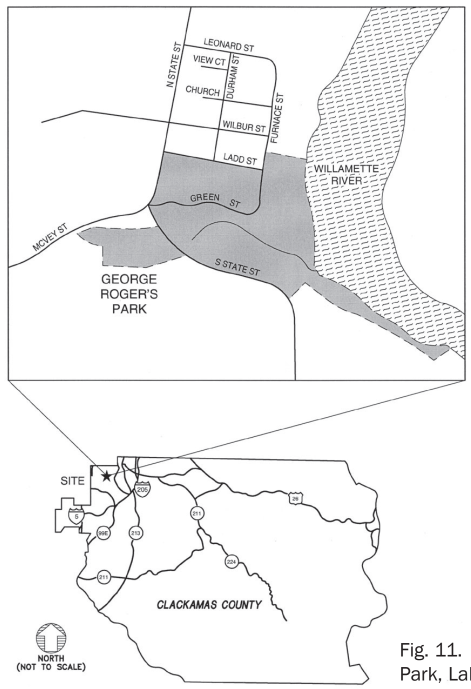


Fig. 11. Vicinity Map, for George Rogers Park, Lake Oswego, Oregon.

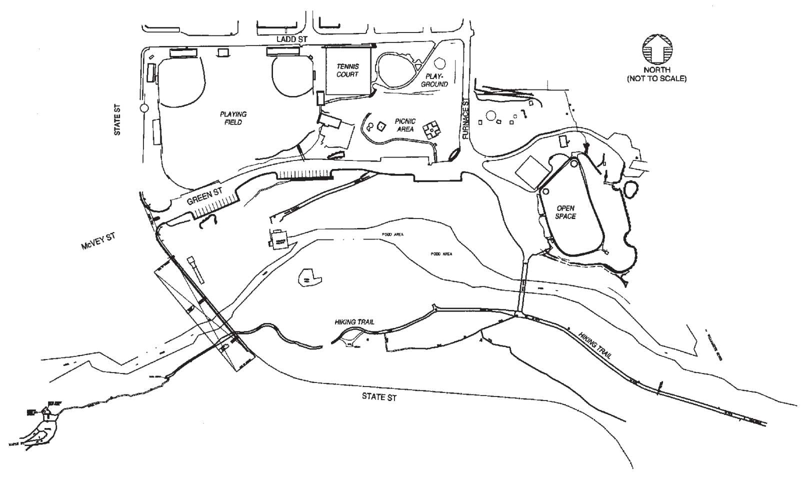


Fig. 12. Site Plan for George Rogers Park, Lake Oswego, Oregon.

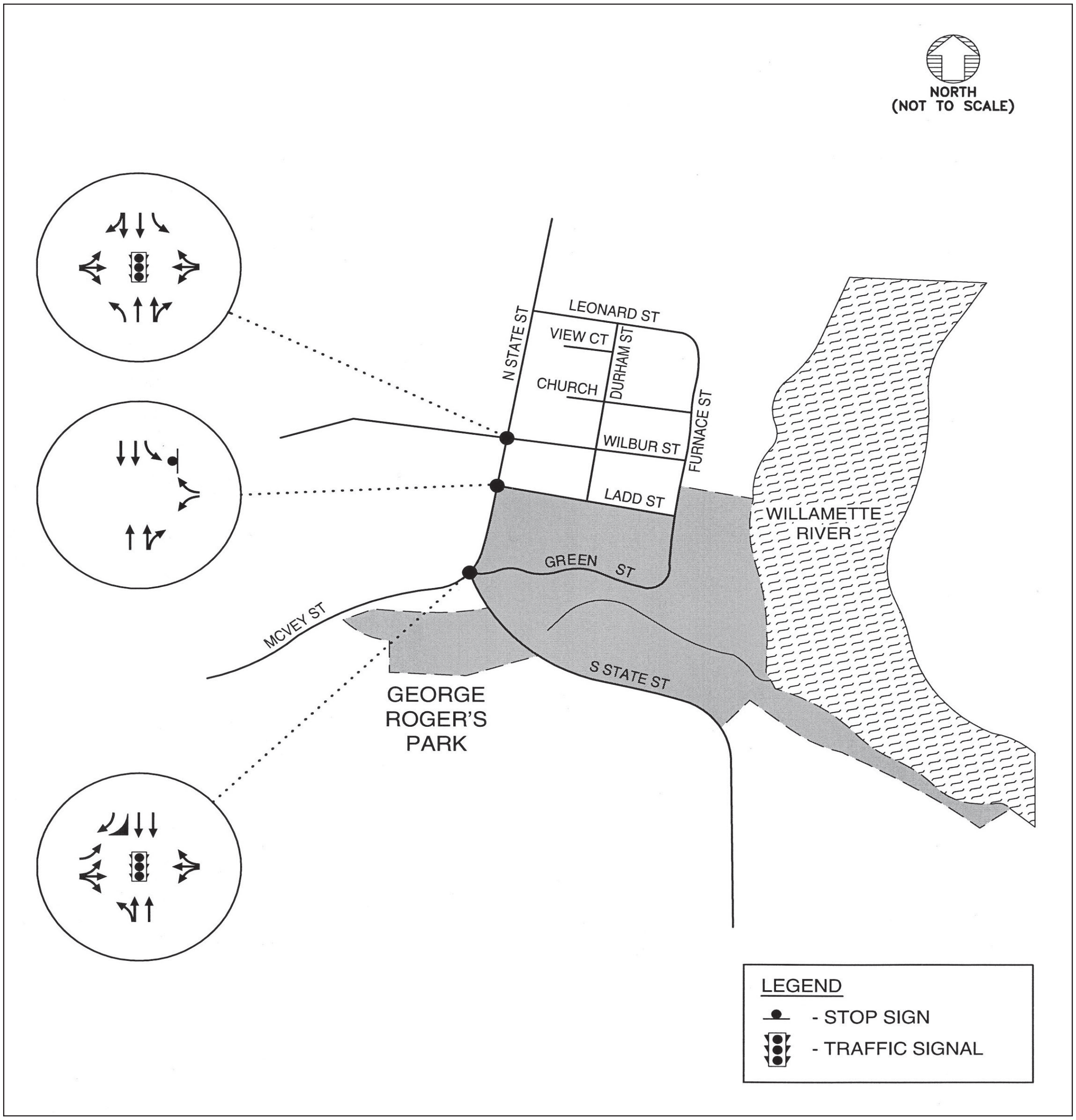


Fig. 13. Existing Lane Configurations and Traffic Control Devices.

access Ladd Street without first exiting the Park onto State Street.

Table 6 provides a summary of the roadway facilities in the site vicinity. Figure 13 illustrates the location of the major intersections formed by these facilities as well as lane configurations and traffic control devices.

Table 6: Existing Transportation Facilities and Roadway Designations

Roadway	Classification	Cross Section	Speed Limit (mph)	Side-walks?	Bicycle Lanes?	On-Street Parking?
State Street	ODOT – Statewide Highway Lake Oswego – Major Arterial	4/5	25/35	Yes	No	No
McVey Avenue	Clackamas County – Major Arterial Lake Oswego – Minor Arterial	2	35	Yes	No	No
Ladd Street	Local Street	2	NP	No	No	Permitted
Wilbur Street	Local Street	2	NP	Partial	No	Permitted
Durham Street	Local Street	2	NP	No	No	Permitted
Green Street	Local - Park Access Road	2	NP	No	No	No
Furnace Street	Local	2	NP	No	No	Permitted

NP: Not Posted; assumed to be 25 mph.

Pedestrian Access and Circulation

The major regional roadways serving George Rogers Park have sidewalks and signalized pedestrian crossings resulting in good pedestrian access opportunities to the park. Although pedestrian opportunities are provided along the major regional access streets, several of the nearby local streets lack sidewalks. These streets include Ladd Street, Furnace Street, Wilbur Street, and Durham Street.

As previously described and illustrated in Figure 1, the park provides several different types of recreational facilities. For the most part, the athletic fields and playground facilities are grouped together in the western portion of the park with the hiking/nature trails and memorial gardens in the eastern portion of the park. The park lacks any type of sidewalks or walking trails that connect the two areas and parking lots. Many regionally significant trails intersect in Lake Oswego. There are currently gaps in the Willamette River Greenway Trail, particularly between George Rogers Park and Roehr

Park, as well as a segment in the Dunthorpe neighborhood between Portland and Lake Oswego. Originally constructed in 1871, the Old River Road Trail originates in George Rogers Park, extends along the Willamette River through the Glenmorrie neighborhood in Lake Oswego, and connects up with the Old River Woods neighborhood in West Linn, providing access for pedestrians and bicyclists to Mary S. Young State Park in West Linn and Tryon Creek State Park in Southwest Portland. Although there is not an existing linkage to the Greenway Trail, the regional Tryon Creek Trail extends along Terwilliger Boulevard. There are also opportunities for further connections along Stafford Road and in the North Stafford area, as well as a River-to-River trail, connecting the Willamette and Tualatin Rivers.

Transit Opportunities

Tri-Met operates the following two bus routes in the vicinity of George Rogers Park:

Route 36: *South Shore*, runs between the Tualatin Park-and-Ride and the Lake Oswego Transit Center through the southern half of Lake Oswego. During peak commuter hours, several transit buses continue on to the downtown Portland transit mall and back. Service is provided on weekdays, with frequencies ranging from every half-hour during peak periods to every hour during off-peak periods.

Route 35: *Macadam*, provides service on weekdays, evening, and weekends along Highway 43 (State Street) between downtown Portland, the Lake Oswego Transit Center, and Oregon City. Service during the weekdays is provided at half-hour intervals until the evening period when it switches to one-hour intervals. Saturday and Sunday service is provided at one-hour intervals.

Parking Facilities

George Rogers Park has several dedicated parking lots and on-street parking areas to serve visitors to the park. Figure 14 illustrates the location of these parking lots and the approximate number of parked cars that each can accommodate. In total, the park has 93 dedicated parking stalls distributed among four separate parking lots. In addition to the dedicated parking stalls, on-street parking is allowed along the southern half of Ladd Street and portions of Furnace Street that together can accommodate another 20-28 vehicles, bringing the total available park parking to 121 spaces. On-street parking along the north side of Ladd Street is restricted to residential use only.

In order to evaluate the utilization of the parking areas, parked vehicle counts were conducted on a mid-week afternoon in October. At the time the counts were conducted, soccer fields, the playground, and hiking trails were in use. Table 7 illustrates the parking lot utilization figures during four separate observations between the hours of 4:00 p.m. and 6:00 p.m. In general, it was observed that park patrons who were visiting the athletic fields, tennis courts, and children's playground parked primarily on Ladd Street. The large parking lot at the southeastern portion of the park was mainly used by park patrons using the hiking/nature trails. It was also observed that the three smaller parking lots along Green Street were used on a limited basis. The parking occupancy data summarized in Table 7 illustrate that George Rogers Park has adequate parking supply to meet the demands of a typical weekday afternoon between the hours of 4:00 p.m. and 6:00 p.m.

Table 7: George Rogers Parking Lot Utilization, Weekday Afternoon

Parking Location	Capacity/Number of Spaces	Cars Parked			
		4:00 PM	5:00 PM	5:30 PM	6:00 PM
P1	14*	1	3	6	6
P2	11*	8	6	5	2
P3	3 *	0	0	0	0
P4	28	6	5	6	13
P5	26	3	2	3	3
P6	15	0	2	2	0
P7	24	0	0	0	1
Total	121	18	18	22	25

* Estimated from field observations

Although not officially designated a parking area, nearby homeowners observed that park users sometimes park on Furnace Street, Wilbur Street, and Durham Street during special events and organized park activities (a listing of some of the larger special events and organized activities is provided in *Appendix B*). Residents also indicate some violation of the residential parking restriction on the north side of Ladd Street. Although the parking conditions are a source of some frustration, residents are generally accepting of the conditions since most problems occur during infrequent and pre-scheduled events. Parking impacts are highest for residents of Ladd Street.

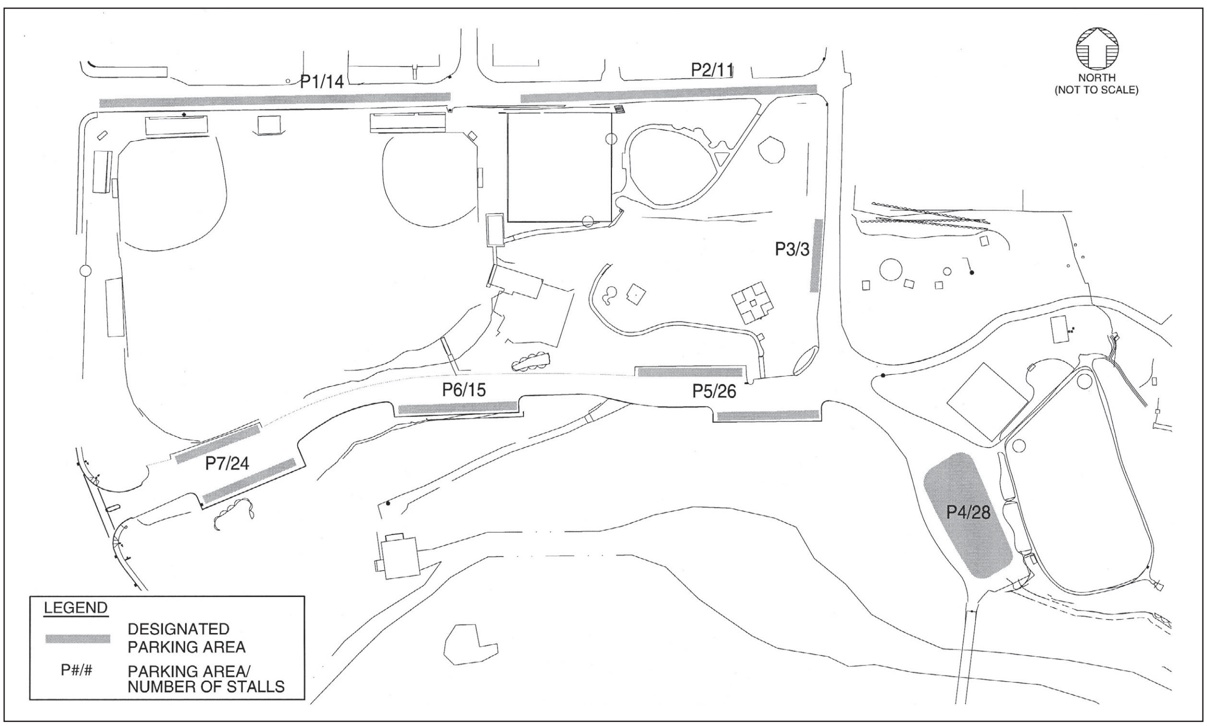


Fig. 14. Parking Locations in George Rogers Park, Lake Oswego, Oregon.

Traffic Volumes and Peak Hour Operations

The State Street intersections with McVey-Green Streets, Wilbur Street, and Ladd Street are the primary vehicular access routes to the George Rogers Park. Manual turning movement counts were obtained at the three study intersections in October 2001. The weekday evening counts were conducted between 4:00 p.m. and 6:00 p.m. and the Saturday mid-day counts were conducted between 10:00 a.m. and 1:00 p.m. Appendix F contains the traffic count data sheets used in this study.

Current Intersection Operations

All operations analyses described in this report were performed in accordance with the procedures stated in the 1997 Highway Capacity Manual. The three study intersections are all located along an ODOT facility (State Street) and as a result fall under the operational jurisdiction of ODOT. For ODOT controlled intersections, the amended *1999 Oregon Highway Plan* (Reference 1) requires a volume-to-capacity ratio derived from a two-hour peak operating condition be used as the intersection operational performance measure. According to Table 7 in the *1999 Oregon Highway Plan*, intersections along State Street are required to operate at or below a maximum volume-to-capacity ratio of 0.99 during a two-hour peak traffic condition[1] .

The weekday p.m. and Saturday mid-day traffic volumes and operational analyses for the study intersections are illustrated in Figures 15 and 16 respectively. Based on the most recent signal timing data obtained from ODOT, the operational performance at the study intersections was calculated. As shown in Figures 16 and 17, all of the study intersections are functioning acceptably according to ODOT standards. These operating conditions closely match what was observed in the field.

It should be noted that the State Street/McVey Avenue intersection has a unique characteristic that affects the overall traffic operation. Specifically, the southbound approach consists of two dedicated through lanes. These two through lanes begin to merge into one through lane just beyond the intersection to the south as State Street bridges over Oswego Creek. This lane

[1] For the purposes of this study, ODOT staff has recommended that the two-hour standard traffic volumes be calculated by averaging the two highest consecutive hours.

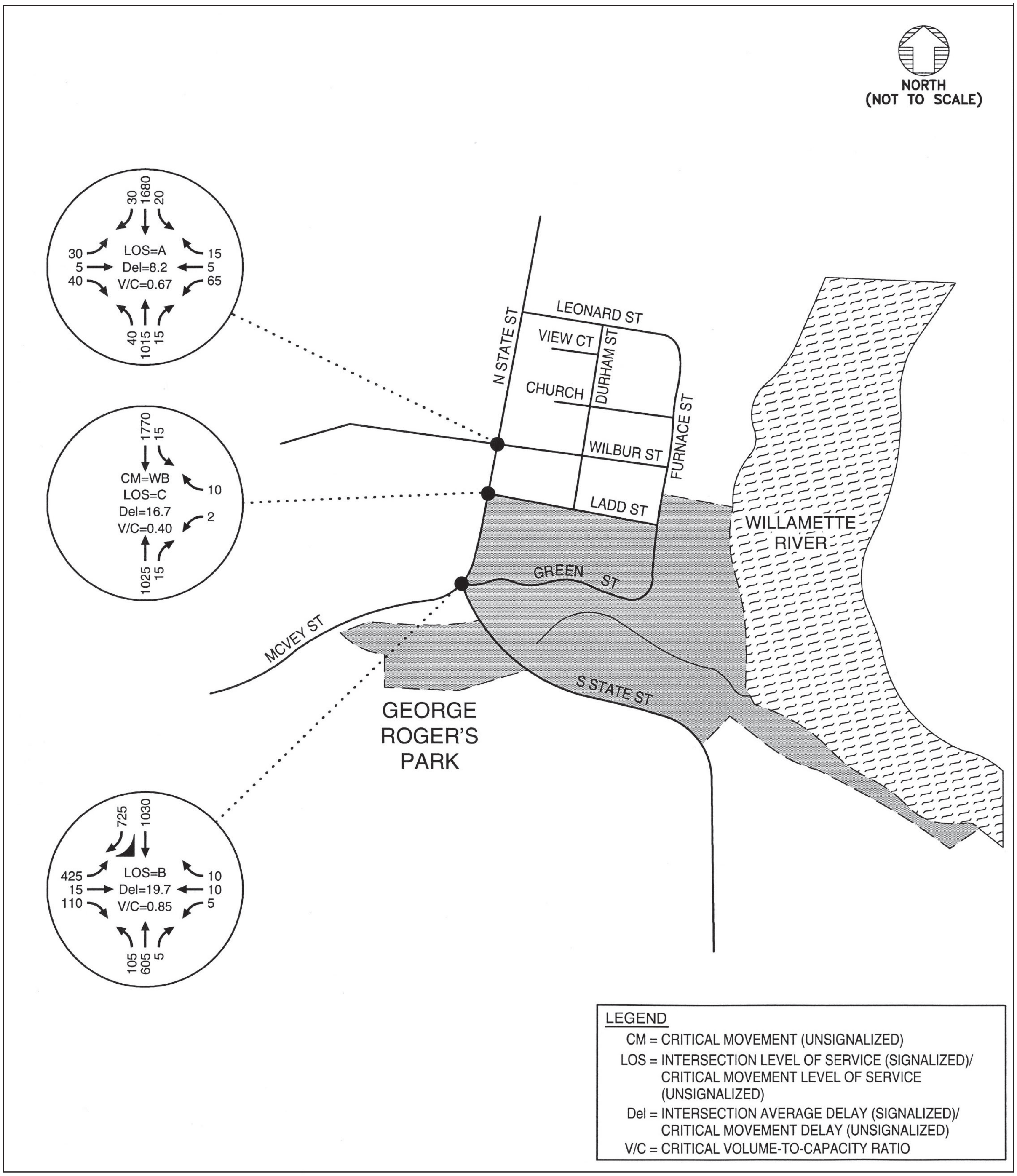


Fig. 15. Existing Traffic Conditions Weekday PM Peak Period, December 2001.

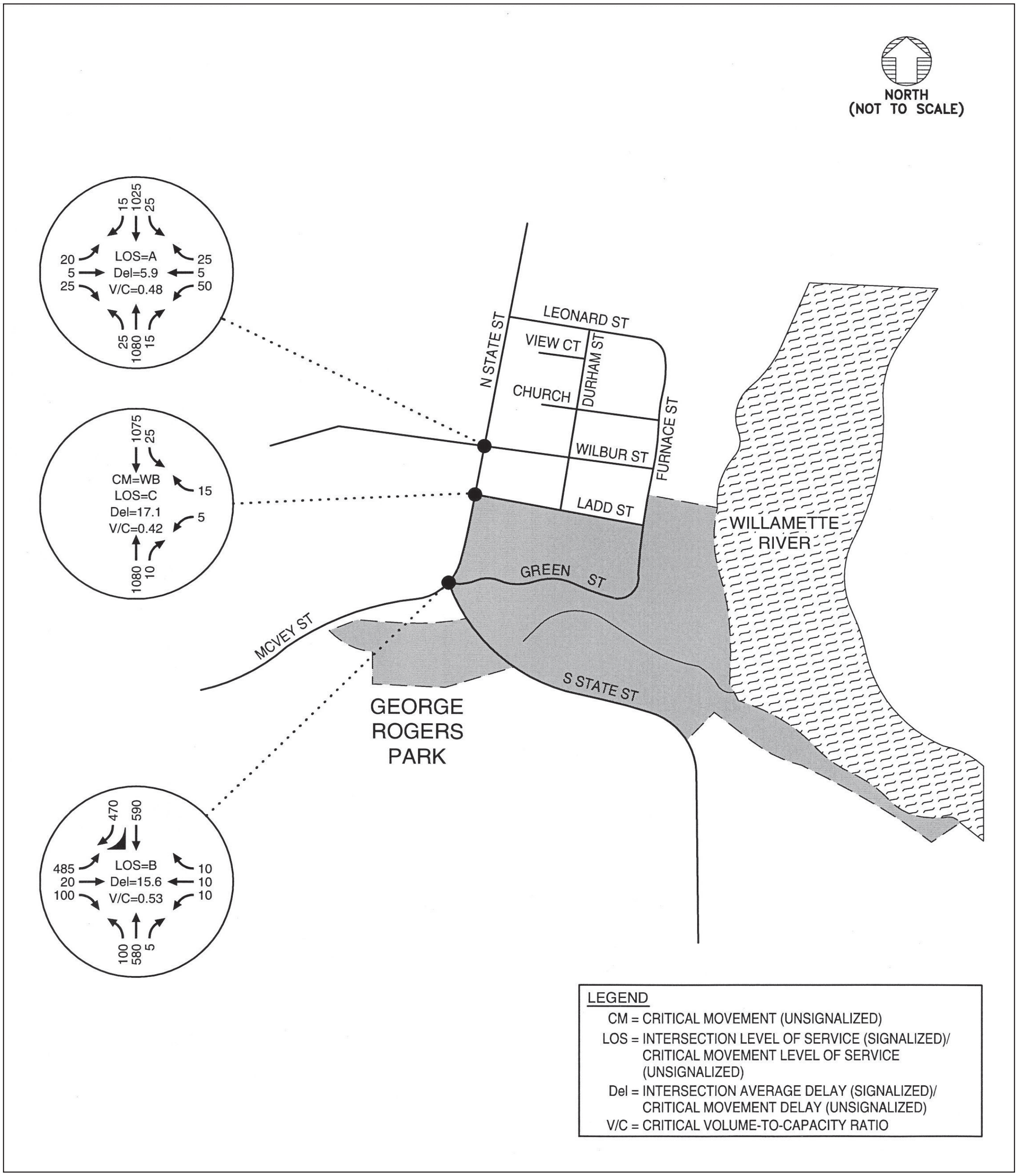


Fig. 17. Existing Traffic Conditions Saturday Mid-day Peak Period, December 2001.

drop adversely impacts the lane utilization of the southbound approach as drivers begin to anticipate the lane drop before traveling through the intersection. As a result, it was observed that the outside through lane has a utilization of approximately twenty percent of the inside through lane. This feature was accounted for when calculating the operations of the intersection.

Traffic Safety

The crash histories of the respective study intersections were reviewed in an effort to identify potential intersection safety issues. Crash records were obtained from ODOT for the five-year period from January 1, 1996 through December 31, 2000. A summary of the crash data is provided in Table 8 that includes the type of crashes over the five-year analysis period at the study intersections. Because motorists may not report some crashes, or because the property damage limit was not exceeded, not all crashes that occur at an intersection will show up in the data.

Table 8: Study Intersection Crash Histories (1996-2000)

Intersection	Number of Crashes	Collision Type				Crash Rate*
		Lane Change/ Turning	Rear-End	Angle	Other	
State Street/ Wilbur Street	15	1	12	0	2	0.27
State Street/ Ladd Street	4	0	2	1	1	0.08
State Street/ McVey Avenue	42	20	14	2	5	0.73

*Detailed crash rate calculations are provided in *Appendix* ***G***.

Crash rates for intersections are often expressed in crashes per million entering vehicles (MEV) for evaluation purposes. The result of the crash rate calculations are also presented in Table 8 and show that the State Street/McVey Avenue intersection experiences the highest number of vehicle crashes which results in a higher vehicle crash rate. Although this crash rate is not considered abnormally high, the intersection has had a high proportion of crashes associated with the northbound left-turn movement. This movement, which currently operates under a protected/permitted phase, has been the subject of some debate in the past.

In 1997, the City of Lake Oswego and ODOT evaluated the potential to reconstruct the intersection due to collisions involving northbound State Street vehicles making a permitted left-turn (green light with no left-turn arrow) onto McVey Avenue. ODOT analyzed several mitigation options for the intersection that included dedicated northbound and southbound left-turn lanes on State Street and widening of the Oswego Creek bridge. However, due to infrastructure costs and the estimated degradation that these improvements would have on the traffic signal operations, it was determined that these improvements were not feasible at the time. As a compromise, ODOT agreed to install a short protected phase (green left-turn arrow) to the northbound left-turn movement on State Street as a means of reducing the potential for future collisions. This protected phase was installed in mid 1998.

Table 9 shows a year-by-year tally of the northbound left-turn crashes that have occurred at this intersection since 1996. The table shows that since 1998 (the year that the protected left-turn phase was installed) the number of northbound left-turn crashes has declined, but that the protected phase has not completely eliminated the vehicle collision type. It may be that the crashes are occurring during the permitted portion of the signal phase. Given that there are only two years of crash data since the installation of the protected left-turn phase, it would be premature to draw conclusions regarding the safety benefits of the 1998 signal modification and the current safety status of the intersection as a whole. It is recommended that ODOT and the City of Lake Oswego continue to monitor this intersection for any developing crash patterns or significant changes in the number of northbound left-turn crashes.

Table 9: Study Intersection Crash Rates

Year	Number of Northbound Left-turn Crashes
1996	1
1997	6
1998*	9
1999	5
2000	3

*Year that the protected left-turn phase was installed.

Summary of Existing Conditions

Pedestrian access to/from the park and surrounding neighborhoods/business districts is adequate. However, pedestrian circulation and connectivity within the park is limited. There are no dedicated connections between the formal park uses in the western portion (soccer fields, children's play area, etc.) and hiking/nature trail connections in the southeastern portion of the park. In addition, pedestrian connections between park uses and the parking areas are limited.

Vehicular access to the park at the State Street/Green Street intersection is limited by the southbound turning movement restriction. As a result of this restriction, vehicles entering the park from the north depend on Ladd Street and Wilbur Street for park access. During typical peak hour conditions, the number of trips accessing the park is relatively low; but during special events, neighborhood cut-through traffic can be significant.

Parking areas serving George Rogers Park can accommodate approximately 121 vehicles, which is ample capacity for typical conditions. However, Ladd Street is used for a significant share of parking, rather than the designated parking lots along Green Street. This is due to the use of Ladd Street as a primary access way to the park, as well as to the convenience of Ladd Street to parking generators, such as the soccer fields and children's play area.

Appendix A | Bibliography

Appendix A | Bibliography

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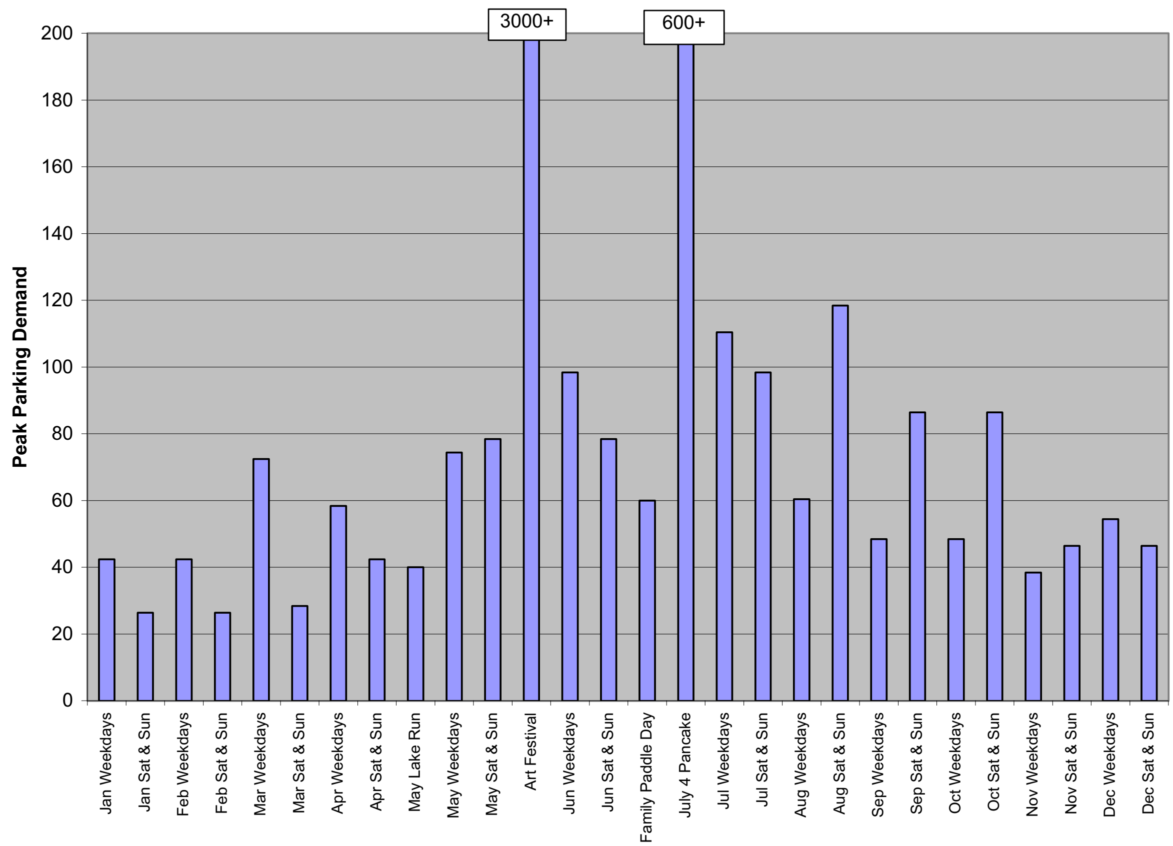
Appendix B | George Rogers Park Special Events

Appendix B | George Rogers Park Special Events

Event	Date	Time Period	Daily Attendance	Total Attendance
Festival of the Arts	Mid June	All day	5,500	15,000 – 20,000
July 4th Pancake Breakfast	July 4th	Morning	1,500	1,500
Adult Softball	Summer Weekdays	Evenings	100-150	5,100
Boy Scout Christmas Tree Sale	Late November-December	Evenings and all day weekends	30 on weekdays/ 150 on weekends	630 weekdays/ 1,500 weekends
Local Schools Field Day/Picnic	May & June	Mid-day	60	300
Reserved Picnic Shelters	May-September	9 a.m. – 9 p.m.	25 weekdays/ 400 weekends	500 weekdays/ 8,000 weekends
Summer Camps	June-August	9 a.m. – 3 p.m.	45	1800
Staff Picnic	August	10 a.m. – 3 p.m.	200	200
Adult Community Center Picnic	July	10 a.m. – 3 p.m.	150	150
Family Paddle Day	July	9 a.m. – 7 p.m.	150	150
Ski Bus Pickup/Dropoff	December-March	6 a.m. – 8 p.m.	40	600
Adult Soccer Leagues	September-November	6 – 10 p.m.	100	10,00
Youth Sports Camps	July	12-3 p.m.	50	50
Punt, Pass & Kick	September	1-3 p.m.	150	150
Lake Run Walk & Parking	May	6 a.m.-3 p.m.	4,000	4,000
High School Rec. Softball	April-May	6-10 p.m.	90	540
Waluga Little League	March-June	3-10 p.m.	160	600
LO Little League	March-June	3-10 p.m.	180	750
LO Soccer Club (youth soccer)	August-November	3-10 p.m.	100 weekdays/ 250 weekends	2,500
LO Little League Fall Ball	September-October	5-10 p.m.	45	360
LO School Dist. Softball	March-June	3-8 p.m.	50	700


3000+
600+
Peak Parking Demand
200
180
160
140
120
100
80
60
40
20
0
Jan Weekdays
Jan Sat & Sun
Feb Weekdays
Feb Sat & Sun
Mar Weekdays
Mar Sat & Sun
Apr Weekdays
Apr Sat & Sun
May Lake Run
May Weekdays
May Sat & Sun
Art Festival
Jun Weekdays
Jun Sat & Sun
Family Paddle Day
July 4 Pancake
Jul Weekdays
Jul Sat & Sun
Aug Weekdays
Aug Sat & Sun
Sep Weekdays
Sep Sat & Sun
Oct Weekdays
Oct Sat & Sun
Nov Weekdays
Nov Sat & Sun
Dec Weekdays
Dec Sat & Sun

Appendix C | Existing Buildings Evaluation

Appendix C | Existing Building Evaluation

A site visit was conducted at George Rogers Park in the City of Lake Oswego to review the six primary building structures within the park. These structures included:

- Concession Building
- Upper Picnic Shelter
- Restroom/Maintenance
- Bandstand
- Lower Picnic Shelter
- Lower Restroom

The intent of the review was to evaluate the functional and programmatic services the buildings provide, gain a better understanding of the character of the structures, assess the general condition of each building and record any deficiencies observed. The building evaluation for each structure is broken down into four categories: 1) General Description / Building Data; 2) Design Consultant Drawings; 3) Observations; and, 4) Maintenance / General Recommendations. It is intended that the general recommendations provided with each building evaluation be used as a starting point to determine a more comprehensive approach to develop a series of cohesive and integrated maintenance and upgrade strategies.

Supplementary information, where provided, used to assist in the development of this report is indicated. No measurements were taken to confirm as-built conditions, however, based upon the walk-through it appears that the information indicated on the drawings is generally correct with regard to the architectural features. The dimensions noted on the drawings provided were assumed to be correct for the purpose of this evaluation. Kurt Minges, the manager for George Rogers Park, was helpful in providing access, background information, usage patterns and an overview of items requiring attention for the various structures. Of particular interest was mention of the fact that vandalism in the park is not prevalent.

Assessment and verification of building compliance with the "American with Disabilities Act" (ADA) and applicable building codes is not included as part of this evaluation, however, the buildings appear to be generally in compliance. Any deficiencies that were observed are noted. Architectural and structural evaluations of the facilities are based on visual review of the buildings and review of the provided building documents. No destructive testing of building components was conducted; hence no responsibility is assumed for evaluation of concealed conditions, defects or components.

Concession Building

General Description/Building Data

Concession Building

The concession building is a free standing structure located on the North side of the playing fields, approximately 300 s.f. in area. The building consists of a slab on grade, concrete masonry walls, a gable roof fabricated with wood truss roof framing members and a standing seam metal roof. The concession area occupies the western portion of the building while the eastern portion of the building is used for storage. Each area is accessed by its own door located on the west and east side of the building respectively. Internally, the two spaces do not communicate with one another.

Design Consultant Drawings

No drawings were provided for the structure.

Observations

Overall, the building appears to be in satisfactory condition. The building form and detailing is unique to the park; it does not have any significant or notable architectural features and does not contribute to the overall aesthetic nature of the park or relate to other park structures. The most significant issue that needs to be addressed is water infiltration along the north wall. The foundation drainage system, if one exists, is not functioning. This has allowed water to penetrate the concrete masonry wall and collect within the building. Water infiltration may have also have occurred under the doors as mud was observed on the floor.

Maintenance/General Recommendations

- The interior and exterior finish coatings are ‘tired’. Updating these would improve the general appearance of the building.
- The building interior is in need of an aggressive cleaning.
- Update the detailing and finish surfaces to be more

consistent with other park structures.

- Dry rot was observed at the base of the door frame trim at both doors.
- Regrade at each of the doors and provide concrete pads to alleviate water infiltration.
- Remediate the water infiltration problem along the North wall.
- Install a gutter along the North side of the building to control water runoff.
- Repair portions of the plywood soffit under the eave at the North side.
- Update access to the building from Ladd Street and provide pedestrian control at the berms.
- Provide a minimum of one ADA compliant service counter. Both service counters are not ADA compliant. The counters are 43" A.F.F. which exceeds the ADA requirement of 36" A.F.F.
- Determine the desirability of providing exterior lighting. None was observed. A natural lighting system could be integrated if the structure is renovated. Addi tionally, the use of new exterior lighting may provide an opportunity to develop a park-wide lighting strategy that would help establish both visual consistency throughout the park and to consolidate lighting maintenance.
- Pipes are not insulated.

Upper Picnic Shelter

General Description/Building Data

The upper picnic shelter is located on theeEast side of the playing fields adjacent to the tennis court and the restroom/ maintenance building. It provides approximately 612 s.f. of covered area. The shelter consists of a slab on grade, heavy timber columns and roof framing members and a gable cedar shake roof. Amenities offered at the shelter include water and electrical service.

Upper Picnic Shelter

Design Consultant Drawings

The ORB Organization Architects, P.C. The drawing is not dated. The picnic shelter is referenced on the Construction Documents for the restroom/maintenance building, which are dated 1981.

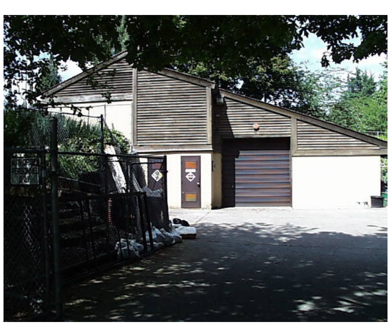
Observations

The character of the building is consistent with a majority of other park structures with the use of the heavy timber structure elements and cedar shake roof. Overall, the shelter appears to be in relatively good condition. Despite the fact that it is located in a prominent position the character of the structure does not have a commanding presence.

Maintenance/General Recommendations

- The underside of the roof deck should be cleaned.
- The building signage should be cleaned.
- Finish surfaces are in need of refinishing.
- Lighting is limited to one ceiling mounted light fixture.
- The roof leaks and the cedar shakes show signs of age.
- The building paper between the skip sheathing and the cedar shakes has deteriorated and should be replaced when the structure is reroofed.
- Consideration should be given to providing either a permanent grill pit or a designated area for grilling around the perimeter of the structure.Finish surfaces are in need of refinishing.

Restroom Maintenance Building - upper level



Restroom Maintenance Building - lower level

Restroom/Maintenance Building

General Description/Building Data

The restroom/maintenance building is a two storey structure located on the Southeast side of the playing fields adjacent to the tennis court and upper picnic shelter. The upper level, which includes men's and women's restroom facilities, a mechanical chase and a storage area, is approximately 639 s.f. The lower level, which includes the maintenance area, two exterior storage rooms and access to the mechanical chase, is approximately 809 s.f. Total area is approximately 1,448 s.f. The shelter is a split level design. Both levels are slab on grade, with concrete masonry walls, a wood framed mezzanine, wood roof framing members and two shed cedar shake roofs.

Design Consultant Drawings

Richard Carothers Associates, dated February 1981.

Observations

As one of the most recently constructed buildings in the park the restroom/maintenance building appears to be in good shape. It is generally consistent with the other structures in the park although the scale of this structure is relatively larger with less surface relief. From a security standpoint the restroom facilities provide ample natural light and no significant hidden corners – it is easy to fully assess the situation upon entering. Both restrooms provide two stalls and one lavatory that appear to be ADA compliant. Natural light is supplemented with a single fluorescent light fixture in each restroom. The restroom relies on natural ventilation. In lieu of doors the restrooms are provided with a gate type door that is locked in the open position while the facility is open for use. The maintenance area, which occupies the lower level, utilizes the adjacent topography and landscaping to reduce the visual impact as well as providing clear access to Old River Road. Both the storage and work areas appear adequate with respect to space allocation.

Maintenance/General Recommendations

- A roof leak was observed above the mechanical chase where the vent stack penetrates the roof.
- The cedar shakes are showing signs of age.
- The facility is provided with porcelain toilets and urinals, which can be prone to vandalism in less secure locations.
- There is no gutter along the roof edge at the entrance to the restrooms. Significant water runoff was observed.
- Restroom signage is not ADA compliant.
- Lighting at the restroom entry is limited to one ceiling mounted light fixture.
- The concrete floor did not appear to be sealed, or, the sealer has worn off.
- Access to the maintenance storage platform is provided via a job-made ladder, similar to a wooden ship's ladder, in lieu of the folding stair noted on the Contract Documents. A second handrail should be installed on the exterior side of this ladder.
- Consideration should be given to installing baby changing stations in the restrooms.

Bandstand

General Description/Building Data

The bandstand is a freestanding structure located in the Memorial Garden and is approximately 200 s.f. in area. The building is open on all four sides and consists of a raised platform with exposed concrete support piers, a wood framed floor, standard wood framing support columns and a wood framed shed roof with asphalt shingles. The platform is accessed via a ramp on the back of the structure.


Bandstand

Design Consultant Drawings

No drawings have been provided for the structure.

Observations

In concept the structure gestures toward the heavy timber construction utilized with other structures in the park although the framing is not technically considered a heavy timber framed structure. There are no building services provided to the structure.

Maintenance/General Recommendations

- Some of the boards on the ramp show signs of decay and should be replaced.
- Finish surfaces are in need of refinishing. The paint color varies from the structures adjacent to the playing fields.
- Limited water damage was observed at the edge of the plywood roof sheathing along the rear of the shed roof. Installing drip flashing or a gutter would help control further decay.
- The roof should be cleaned of moss and other accumulated organic debris.
- An awkward condition exists at the bottom of the ramp where it abuts up to the concrete pier foundation. The landing surface is uneven. Providing a pad at the base of the ramp at the same level as the existing foundation would alleviate this condition.

Lower Picnic Shelter

General Description/Building Data

The lower picnic shelter is located in the Memorial Garden in close proximity to the bandstand. It provides approximately 720 s.f. of covered area. The shelter is open on all sides and consists of a slab on grade, heavy timber columns and roof framing members and a cedar shake roof. The plan is based on a nine-square pattern with the roof form consisting of a series of four shed roofs radiating from a central square opening in the roof. A fixed grilling area is provided in the center of the structure.

Design Consultant Drawings

Robert E. Meyer Engineers, Inc., dated December 1975.

Observations

Interestingly, the building does not provide significant weather protection during rain events. There are no building services provided to the structure. Of specific structural concern is the rotting / infestation observed at the bases of 3 of the 4 wood columns. A structural engineer should evaluate this condition.

Lower Picnic Shelter

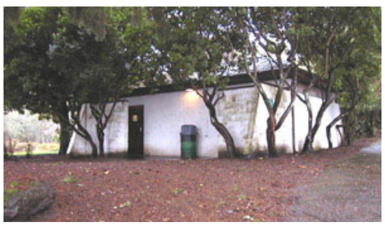
Maintenance/General Recommendations

- The concrete slab is out of plane at two locations.
- There is no direct connection with the slab at the picnic shelter and the adjacent concrete path. Access from the path to the picnic shelter crosses dirt and may be difficult to negotiate for someone with a disability.
- Spacer boards are missing between the concrete slabs. The joint width is approximately 1”, from edge of concrete to edge of concrete. The disparity in alignment between adjacent slabs is exacerbated by the increased joint width.
- Dry rot/infestation was observed in 3 of the 4 column bases.
- The cedar shakes are showing signs of age.
- A hose bib indicated on the Construction Documents was not found on site.
- The split face CMU half height walls indicated on the Construction Documents do not exist on site.

Lower Restroom Building

General Description/Building Data

The lower restroom building is located near the boat ramp, in close proximity to the iron smelter, in the eastern quadrant of the park. It includes men's and women's restroom facilities, as well as a mechanical chase/storage area and is approximately 364 s.f. in area. The building consists of a slab on grade, concrete masonry walls, wood roof framing members and hip cedar shake roof.



Lower Restroom Building

Design Consultant Drawings

Robert E. Meyer Engineers, Inc., dated December 1975.

Observations

The building is discretely located within the landscaping adjacent to the top of the boat ramp. Overall, the building appears to be in reasonable shape but is showing signs of age. Although the materials are relatively consistent with the other structures in the park (i.e. concrete masonry walls, cedar shake roof) the restroom building has its own unique aesthetic. Of all the buildings evaluated, this building was the most affected by vandalism, even though the amount of vandalism was limited. It is assumed that the vandalism is due to its remote location. Additionally, for this same reason, this building seemed to offer little in the way of a sense of security. Whereas upon entering the facility it is easy to fully assess the situation, taking the initiative to use the facility seemed to be the biggest hurdle.

Maintenance/General Recommendations

- Provide a greater sense of security around the perimeter of the facility.
- A sidewalk is illustrated on the original Construction Documents that connects the drive at the boat ramp to the sidewalk leading to the grill pits and iron smelter. The sidewalk has not been installed. There are no hard connections to adjacent walkways.
- Lighting at the restroom entry is limited to one soffit mounted light fixture. A similar fixture is located on the West side of the building above the mechanical room door. Additional area lighting should be considered.
- Interior lighting is provided by two surface mounted

incandescent fixtures. Replacing the fixtures with fluorescent lights would reduce both maintenance and energy costs.

- The gutters have corroded and need to be replaced.
- The cedar shakes are showing signs of age.
- The interior and exterior finish coatings need to be cleaned and generally are 'tired'. Updating these would improve the general appearance.
- The concrete floor did not appear to be sealed, or, the sealer has worn off.
- An opaque coating has been applied to the transom windows. This coating shows signs of vandalism and is not of a very high quality finish. One window is broken and the frames on some of the other windows are out of plane. Replacing the windows with a more vandal resistant, opaque glass and repairing the frames would improve the overall image of these lites and increase natural light.
- The exterior screen walls impede on the required clear dimension at the restroom entrance doors.
- The ventilation grilles on both doors are damaged and should be replaced.
- The door closers do not appear to be ADA compliant.
- Restroom signage is not ADA compliant.
- The toilet partitions are plastic and have been vandalized. Removing the vandalism has created variations in the finished surfaces.
- The stalls are not ADA compliant. Grab bars have been provided.
- The facility is provided with porcelain toilets and urinals which can be prone to vandalism in less secure locations.
- Consideration should be given to installing hand dryers. None are provided.
- The pipes in the mechanical chase are not insulated. There is no heat provided to the chase.

Appendix D | Found Plant Species

Appendix D

Found Plant Species within George Rogers Park, City of Lake Oswego (Based on December 2001 site visit: not comprehensive)

Scientific Name	Common Name	Habitat Type	Native? (N/I)*	USFWS
TREES				
Abies grandis	Grand Fir	A/B	N	FACU-
Acer macrophyllum	Bigleaf Maple	B/C	N	FACU
Alnus rubra	Red Alder	B/C	N	FAC
Arbutus menziesii	Pacific Madrone	B	N	
Betula pendula	European White Birch	E	I	
Fraxinus oregona	Oregon Ash	C	N	FACW
Juniperus sp.	Juniper	E	na	
Liquidambar styraciflua	American Sweetgum	E	I	
Pinus spp.	Pine	E	na	UPL
Populus trichocarpa	California Poplar	C	N	FAC
Prunus avium	Mazzard Cherry	B	I	UPL
Pseudotsuga menziesii	Common Douglasfir	A/B	N	UPL
Robinia pseudoacacia	Black Locust	B/E	I	UPL
Quercus garryana	Oregon White Oak	B/C	N	UPL
Quercus muhlenbergi	Chinkapin Oak	B	I	UPL
Salix babylonica	Babylon Weeping Willow	C	I	
Salix lasiandra	Pacific willow	C	N	FACW+
Salix scouleriana	Scouler Willow	B/C	N	FAC
Taxus brevifolia	Pacific Yew	A/B/C	N	NI
Thuja plicata	Giant Arborvitae	A/B/C	N	FAC
SHRUBS/ VINES				
Acer circinatum	Vine Maple	B/C	N	FAC-
Amelanchier alnifolia	Saskatoon Serviceberry	A/B	N	FACU
Mahonia aquifolium	Oregongrape	A/B/E	N	UPL
Mahonia nervosa	Cascades Mahonia	A/B	N	UPL
Clematis ligusticifolia	Western Virginsbower	B/C	N	FAC-
Cornus stolonifera	Redosier Dogwood	C	N	FACW
Corylus cornuta	Beaked Filbert	B/C	N	FACU
Crataegus douglasi	Douglas Hawthorn		N	FAC
Crataegus monogyna	Singleseed Hawthorn	B/C	I	FACU+

Scientific Name	Common Name	Habitat Type	Native? (N/I)*	USFWS
Cytisus scoparius	Scotch Broom	C	I**	UPL
Hedera helix	English Ivy	A/B/C/E	I**	UPL
Holodiscus discolor	Creambush Rockspirea	A/B	N	UPL
Ilex aquifolium	English Holly	A/B/C/E	I**	UPL
Lonicera involucrata	Bearberry Honeysuckle	B/C	N	FAC+
Oemleria cerasiformis	Indian Plum	A/B/C	N	FACU
Physocarpus capitatus	Pacific Ninebark	C	N	FACW-
Rubus discolor	Himalayan Blackberry	B/C/D/E	I**	FACU
Rubus laciniatus	Cutleaf Blackberry	B/C/D	I**	FACU+
Rubus parviflorus	Western Thimbleberry	A/B	N	FAC-
Rubus ursinus	California Dewberry	A/B/C	N	FACU
Sambucus racemosa	European Red Elderberry	A/B/C	N	FACU
Spiraea douglasi	Douglas Spirea	C	N	FACW
Symphoricarpos albus	Common Snowberry	A/B/C/E	N	FACU
HERBS				
Adiantum pedatum	American Maidenhair	B/C	N	UPL
Agrostis tenuis	Colonial Bentgrass	C/E	I	FAC
Aster sp.	Aster	C	N	
Athyrium filixfemina	Ladyfern	C	N	
Carex deweyana	Shortscale Sedge	B/C	N	FACU
Chrysanthemum leucanthemum	Oxeyedaisy	C/E	I	UPL
Cirsium arvense	Canada Thistle	C/E	I**	FACU+
Cirsium lanceolatum	Bull Thistle	C/E	I**	FACU
Claytonia sibirica	Siberian Springbeauty	A/B/C	N	FAC
Dactylis glomerata	Orchardgrass	C/E	I	FACU
Daucus carota	Wild Carrot	C/E	I	UPL
Disporum hookeri	Hooker Fairybells	A	N	
Elymus glaucus	Blue Wildrye	B/C	N	FACU
Epilobium watsoni	Watson Willowweed	C/D	N	FACW-
Equisetum hyemale	Scouringrush	B	N	FACW
Festuca subulata	Bearded Fescue	A/B	N	FACU+
Galium aparine	Catchweed Bedstraw	C/E	N	FACU
Geranium robertianum	Herbrobert Geranium	B/C/E	I**	UPL
Geranium molle	Dovefoot Geranium	B/E	I	UPL
Geum macrophyllum	Largeleaved Avens	C/D	N	FACW-

Scientific Name	Common Name	Habitat Type	Native? (N/I)*	USFWS
Holcus lanatus	Common Velvetgrass	C/E	I	FAC
Hypericum perforatum	Common St.Johnswort	C/E	I	UPL
Hypochaeris radicata	Spotted Catsear	C/E	I	UPL
Iris pseudacorus	Yellowflag Iris	D	I	OBL
Juncus bufonius	Toad Rush	C/D	I	FACW
Juncus tenuis	Poverty Rush	C/D	N	FACW-
Lactuca muralis	Wall Lettuce	A/B	I	NOL
Lapsana communis	Common Nipplewort	A/B/C/E	I	UPL
Lotus corniculatus	Birdsfoot Deervetch	D	I	FAC
Lunaria annua	Dollarplant	B	I	
Lythrum salicaria	Purple Lythrum	D	I**	
Melissa officinalis	Common Balm	D	I	FACW-
Oenanthe sarmentosa	Pacific Waterdropwort	C/D	N	OBL
Osmorhiza chilensis	Sweet Cicely	B/C	N	
Phacelia heterophylla	Varileaf Phacelia	B	N	
Phalaris arundinacea	Reed Canarygrass	C/D	I**	FACW
Plantago lanceolata	Buckhorn Plantain	B/C/E	I	FAC
Plantago major	Rippleseed Plantain	B/C/E	I	FACU
Polypodium glycyrrhiza	Licoricefern	B/C/E	N	UPL
Polystichum munitum	Western Swordfern	A/B/C/E	N	FACU
Prunella vulgaris	Common Selfheal	B/C/E	I	
Pteridium aquilinum	Western Bracken	B/C/E	N	FACU
Ranunculus repens	Creeping Buttercup	C/D/E	I	FACW
Rumex crispus	Curly Dock	C/D/E	I	FAC+
Rumex obtusifolius	Bitterdock	B/C	I	
Senecio jacobaea	Ragwort Groundsel	D/E	I**	
Solanum dulcamara	Bitter Nightshade	C/D	I	FAC+
Stellaria media	Chickweed	B/C	N	
Tanacetum vulgare	Common Tansy	D/E	I	
Taraxacum officinale	Common Dandelion	D/E	I	FACU
Tellima grandiflora	Alaska Fringecup	A/B/C	N	UPL
Tolmiea menziesii	Menzies Tolmiea	B/C	N	FAC
Trifolium repens	White Clover	E	I	FAC
Urtica dioica	Bigsting Nettle	C/E	N	FAC
Vancouveria hexandra	(ncm – no common name)	A/B/C	N	UPL
Verbascum thapsus	Flannel Mullein	D/E	I	

N/I*= Native, or Introduced (from another region or country)
** = noxious weed (usually not native); may warrant control measures

Habitat Unit	Community
A	Upland Coniferous Forest
B	Upland Mixed Coniferous-Deciduous Forest
C	Riparian Deciduous Forest (PFO in part)
D	Riparian Wetland (PSS, PEM) ---includes areas below OHW
E	Managed Park Landscapes, Upland

Wetland Indicator Codes	
OBL	Obligate Wetland
FACW	Facultative Wetland
FAC	Facultative
FACU	Facultative Upland
UPL	Upland
NI	Not Indicator

Appendix E | Wildlife Species & Christmas Bird Count

Appendix E | Wildlife Species likely to be or observed within George Rogers Park, City of Lake Oswego

Scientific Name	Common Name
MAMMALS	
Castor canadensis	Beaver
Eptesicus fuscus	Big Brown Bat
Odocoileus hemionis columbianus	Black-tailed Deer
Canis latrans	Coyote
Tamiasciurus douglasii	Douglas Squirrel*
Sciurus niger	Fox Squirrel* **
Urocyon cinereoagenteus	Grey Fox
Myosotis lucifugus	Little Brown Bat
Mustela vison	Mink
Glaucomys sabrinus	Northern Flying Squirrel
Rattus rattus	Norway Rat
Myocastor coypu	Nutria**
Didelphis virginiana	Opossum**
Procyon lotor	Raccoon*
Lutra canadensis	River Otter
Vulpes fulva	Red Fox
Mephitis mephitis	Striped Skunk
Eutamias townsendii	Townsend's Chipmunk
Sciurus griseus	Western Gray Squirrel
BIRDS	
Turdus migratorius	American Robin*
Corvus brachyrhynchos	American Crow*
Carduelis tristis	American Goldfinch*
Columba fasciata	Band-tailed Pigeon
Tyto alba	Barn Owl
Hirundo rustica	Barn Swallow
Ceryle alcyon	Belted Kingfisher*
Thryomanes bewickii	Bewick's Wren*
Parus atricapillus	Black-capped Chickadee*
Pheucitus melanocephalus	Black-headed Grosbeak*
Certhia americana	Brown Creeper*
Molothrus ater	Brown-headed Cowbird
Psaliparus minimus	Bushtit*
Branta canadensis	Canada Goose*
Callipepla californica	California Quail
Bombycilla cedrorum	Cedar Waxwing
Geothylpis trichas	Common Yellowthroat
Mergus merganser	Common Merganser*
Accipiter cooperii	Cooper's Hawk
Junco hyemalis	Dark-eyed Junco*
Anser domesticus	Domestic Goose*
Picoides pubescens	Downy Woodpecker
Phalacrocorax auritus	Double Crested Cormorant*
Sturnus vulgaris	European Starling**
Coccothraustes vespertinus	Evening Grosbeak

Scientific Name	Common Name
Passerella iliaca	Fox Sparrow*
Regulus satrapa	Golden-crowned Kinglet*
Zonotrichia atricapilla	Golden-crowned Sparrow
Butroides virescens	Green Heron
Ardea herodias	Great Blue Heron*
Bubo virginianus	Great-horned Owl
Picoides villosus	Hairy Woodpecker
Catharus guttatus	Hermit Thrush*
Carpodacus mexicanus	House Finch
Passer domesticus	House Sparrow**
Troglodytes aedon	House Wren
Charadrius vociferus	Killdeer
Carduelis psaltria	Lesser Goldfinch
Anas platyrhychos	Mallard*
Zenaida macroura	Mourning Dove
Colaptes auratus	Northern Flicker*
Circus cyaneus	Norther Harrier
Dryocopus pileatus	Pileated Woodpecker*
Carduelis pinus	Pine Siskin*
Contopus borealis	Olive-sided Flycatcher
Vermivora celata	Orange-crowned Warbler
Sitta canadensis	Red-breasted Nuthatch*
Buteo jamaicensis	Red tailed Hawk
Phasianus colchicus	Ring-necked Pheasant
Regulus calendula	Ruby crowned Kinglet*
Selasphorus rufus	Rufous Hummingbird
Aphelocoma insularis	Scrub Jay*
Accipiter striatus	Sharp-shinned Hawk
Melospiza melodia	Song Sparrow*
Pipilo erythrophthalmus	Spotted Towhee*
Cyanocitta stelleri	Steller's Jay*
Tachycineta thalassina	Violet Green Swallow
Sturnella neglecta	Western Meadowlark
Otus kennicottii	Western Screech Owl
Piranga ludoviciana	Western Tanager
Contopus sordidulus	Western Wood Pewee
Sitta carolinensis	White-breasted Nuthatch
Zonotricha leucophrys	White crowned Sparrow
Troglodytes troglodytes	Winter Wren*
Aix sponsa	Wood Duck
Sphyrapicus varius	Yellow-bellied Sapsucker
Dendroica coronata	Yellow-rumped Warbler

Scientific Name	Common Name
AMPHIBIANS	
Rana aurora aurora	Red-legged Frog
Pseudacris regilla	Pacific Tree Frog
Ambystoma gracile	Northwestern Salamander
Ambystoma macrodactylum	Long-toed Salamander
Ensatina eschscholtzii	Ensatina
Taricha granulosa	Rough-skinned Newt
REPTILES	
Eglaria coerulea	Northern Alligator Lizard
Thamnophis ordinoides	Northwestern Garter Snake
Thamnophis sirtalis	Common Garter Snake

*Species directly observed by sight, call, or sign.
**Exotic species

Portland Christmas 2000 Bird Count - Lake Oswego*

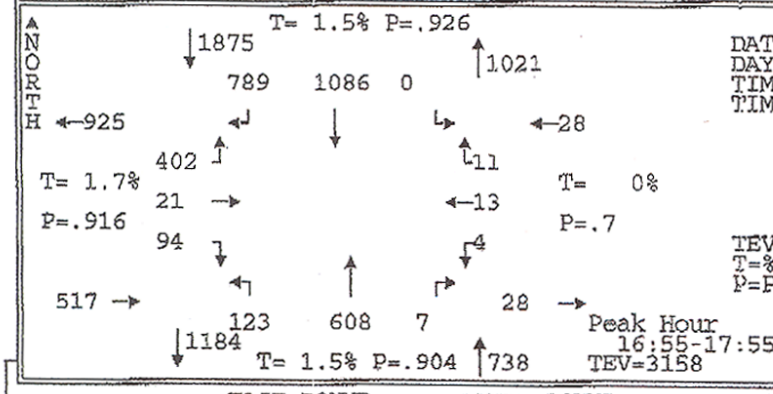
Scientific Name	Common Name
Podilymbus podiceps	Pied-billed Grebe
Podiceps grisegena	Red-necked Grebe
Aechmophorus occidentalis	Western Grebe
Phalacrocorax auritus	Double-crested Cormorant
Ardea herodias	Great Blue Heron
Casmerodius albus	Great Egret
Butorides striatus	Green Heron
Branata canadensis	Canada Goose
Aix sponsa	Wood Duck
Anas crecca	Green-winged Teal
Anas platyrhynchos	Mallard
Anas clypeata	Northern Shoveler
Anas strepera	Gadwall
Anas penelope	Eurasian Wigeon
Anas americana	American Wigeon
Aytha valisineria	Canvasback
Bucephala albeola	Bufflehead
Lophodytes cucullatus	Hooded Merganser
Haliaeetus leucocephalus	Bald Eagle
Accipiter striatus	Sharp-shinned Hawk
Accipiter cooperii	Cooper's Hawk
Buteo jamaicensis	Red-tailed Hawk
Fulica americana	American Coot
Gallinago gallinago	Common Snipe

Larus delawarensis	Ring-billed Gull
Larus argentatus	Herring Gull
Larus glaucescens	Glaucous-winged Gull
Larus hyperboreus	Glaucous Gull
Columba livia	Rock Dove
Columba fasciata	Band-tailed Pigeon
Zenaida macroura	Mourning Dove
Calypte anna	Anna's Hummingbird
Ceryle alcyon	Belted Kingfisher
Sphyrapicus ruber	Red-breasted Sapsucker
Picoides pubescens	Downy Woodpecker
Colaptes auratus	Northern Flicker
Dryocopus pileatus	Pileated Woodpecker
Cyanocitta stelleri	Steller's Jay
Aphelocoma coerulescens	Western Scrub-Jay
Corvus brachythynchos	American Crow
Parus atricapillus	Black-capped Chickadee
Parus rufescens	Chestnut-backed Chickadee
Psaltriparus minimus	Bushtit
Sitta canadensis	Red-breasted Nuthatch
Sitta carolinensis	White-breasted Nuthatch
Certhia americana	Brown Creeper
Thryomanes bewickii	Bewick's Wren
Troglodytes troglodytes	Winter Wren
Regulus satrapa	Golden-crowned Kinglet
Regulus calendula	Ruby-crowned Kinglet
Catharus guttatus	Hermit Thrush
Turdus migratorius	American Robin
Ixoreus naevius	Varied Thrush
Bombycilla cedrorum	Cedar Waxwing
Sturnus vulgaris	European Starling
Verio huttoni	Hutton's Vireo
Dendroica coronata	Yellow-rumped Warbler "Audubon's"
Dendroica townsendi	Townsend's Warbler
Pipilo erythrophthalmus	Spotted Towhee
Passerella iliaca	Fox Sparrow
Melospiza melodia	Song Sparrow
Melospiza lincolnii	Lincoln's Sparrow
Zonotrichia albicollis	White-throated Sparrow
Zonotrichia atricapilla	Golden-crowned Sparrow
Junco hyemalis	Dark-eyed Junco
agelaius phoeniceus	Red-winged Blackbird
Carpodacus purpureus	Purple Finch
Carpodacus mexicanus	House Finch
Carduelis pinus	Pine Siskin
Carduelis tristis	American Goldfinch
Passer domesticus	House Sparrow

* This list was generated from the Portland Christmas Bird Count Summary 2000.

Appendix F | Traffic Counts

INTERSECTION TURN MOVEMENT COUNT SUMMARY REPORT
STATE STREET AT MCVEY AVENUE



DATE OF COUNT: 10/25/01
DAY OF WEEK: Thu
TIME STARTED: 16:00
TIME ENDED: 18:00

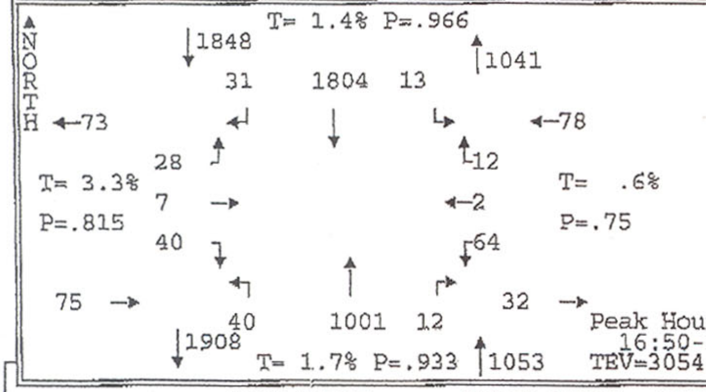
TEV=TOTAL ENTRY VOLUME
T=%TRUCKS BY APPROACH
P=PHF BY APPROACH

DLDY

Traffic Smithy
(503) 641-6333

TIME PERIOD FROM - TO	EAST BOUND			SOUTH BOUND			NORTH BOUND			WEST BOUND			ALL
	↴	→	↑	↵	↓	↳	↰	↑	↱	↓	←	↑	
16:00-16:05	11	3	45	57	73	0	10	40	0	0	2	2	243
16:05-16:10	5	3	31	68	75	0	11	49	1	0	1	0	244
16:10-16:15	13	2	43	39	85	0	6	37	0	0	0	0	225
16:15-16:20	12	0	29	57	79	0	7	66	1	1	0	2	254
16:20-16:25	9	1	49	55	97	0	7	59	0	1	1	0	279
16:25-16:30	7	0	30	52	66	0	11	52	0	0	1	2	221
16:30-16:35	15	0	41	44	71	0	6	37	0	1	1	1	217
16:35-16:40	6	0	30	71	86	0	8	49	1	0	0	0	251
16:40-16:45	10	1	44	56	83	0	4	57	1	0	0	1	257
16:45-16:50	10	0	33	49	94	0	5	57	0	0	0	1	249
16:50-16:55	10	0	38	51	84	0	5	51	1	0	0	0	240
16:55-17:00	11	2	35	63	87	0	7	42	1	0	1	1	250
17:00-17:05	3	3	25	56	87	0	11	44	1	0	3	3	236
17:05-17:10	5	1	38	57	93	0	8	53	0	1	1	0	257
17:10-17:15	7	1	42	65	75	0	14	61	1	0	0	0	266
17:15-17:20	10	0	30	69	111	0	9	55	1	0	0	2	287
17:20-17:25	11	4	31	64	96	0	15	47	1	0	2	1	272
17:25-17:30	11	5	28	61	72	0	10	53	0	1	1	1	243
17:30-17:35	9	1	38	67	102	0	4	42	0	1	2	0	266
17:35-17:40	4	1	20	70	92	0	14	58	2	0	1	1	263
17:40-17:45	9	0	40	71	104	0	15	56	0	1	0	1	297
17:45-17:50	8	2	48	69	88	0	8	43	0	0	1	0	267
17:50-17:55	6	1	27	77	79	0	8	54	0	0	1	1	254
17:55-18:00	10	2	34	60	81	0	9	48	0	0	2	0	246
Total Survey	212	33	849	1448	2060	0	212	1210	12	7	21	20	6084
PHF	.73	.52	.87	.91	.91	0	.81	.9	.58	.5	.65	.69	.954
% Trucks	.9	6.1	1.8	.9	1.9	0	.9	1.7	0	0	0	0	1.5
Stopped Buses	0	0	0	0	0	0	0	0	0	0	0	0	
Peds	0	5	0	0	0	0	0	7	0	0	1	0	
Hourly Totals													
16:00-17:00	119	12	448	662	980	0	87	596	6	3	7	10	2930
16:15-17:15	105	9	434	676	1002	0	93	628	7	4	8	11	2977
16:30-17:30	109	17	415	706	1039	0	102	606	8	3	9	11	3025
16:45-17:45	100	18	398	743	1097	0	117	619	8	4	11	11	3126
17:00-18:00	93	21	401	786	1080	0	125	614	6	4	14	10	3154

INTERSECTION TURN MOVEMENT COUNT SUMMARY REPORT
STATE STREET AT WILBUR STREET/MIDDLECREST ROAD



DATE OF COUNT: 10/25/01
DAY OF WEEK: Thu
TIME STARTED: 16:00
TIME ENDED: 18:00

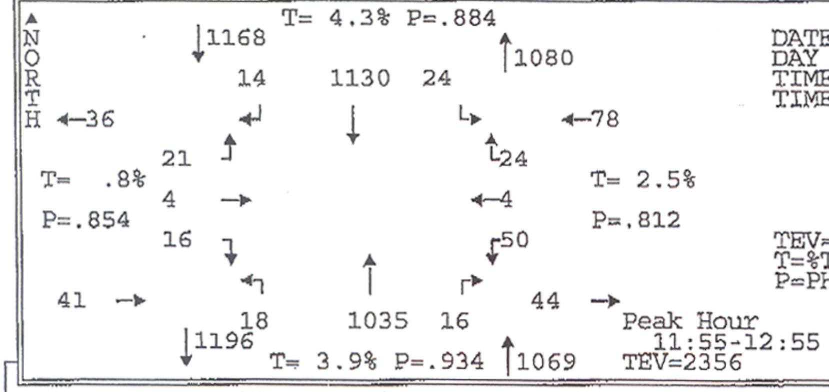
TEV=TOTAL ENTRY VOLUME
T=%TRUCKS BY APPROACH
P=PHF BY APPROACH

DJUK

Traffic Smithy
(503) 641-6333

TIME PERIOD FROM - TO	EAST BOUND ↴	→	⤴	SOUTH BOUND ↲	↓	↳	NORTH BOUND ↰	↑	↱	WEST BOUND ⤵	←	↥	ALL
16:00-16:05	4	0	0	3	124	3	4	80	0	8	1	3	230
16:05-16:10	4	1	3	2	131	3	2	81	4	4	0	0	235
16:10-16:15	4	0	5	1	118	2	1	75	2	4	0	3	215
16:15-16:20	1	0	3	0	133	1	0	100	0	6	0	2	246
16:20-16:25	0	0	6	1	145	1	2	102	1	4	0	2	264
16:25-16:30	0	0	4	6	104	0	3	83	2	0	1	4	207
16:30-16:35	11	0	6	3	116	1	6	79	0	6	0	1	229
16:35-16:40	2	0	3	3	146	3	5	78	0	7	1	1	249
16:40-16:45	2	0	2	2	135	1	2	99	0	4	0	0	247
16:45-16:50	4	0	0	0	144	2	2	95	0	7	0	4	258
16:50-16:55	1	0	2	5	144	1	4	88	0	5	0	1	251
16:55-17:00	2	1	2	5	153	3	2	73	0	0	0	1	242
17:00-17:05	3	1	4	3	144	1	6	66	1	1	0	2	232
17:05-17:10	2	1	5	0	142	0	2	83	2	3	0	1	241
17:10-17:15	1	1	4	3	131	1	3	98	1	8	0	3	254
17:15-17:20	2	0	1	2	177	0	4	85	2	6	0	1	280
17:20-17:25	1	1	1	1	154	0	0	87	2	5	0	0	252
17:25-17:30	4	1	2	2	141	1	5	82	1	7	0	1	247
17:30-17:35	8	0	1	1	156	1	3	78	2	8	1	1	260
17:35-17:40	0	0	1	5	162	2	3	85	1	8	0	0	267
17:40-17:45	8	0	2	1	143	1	4	87	0	5	0	1	252
17:45-17:50	8	1	3	3	157	2	4	89	0	8	1	0	276
17:50-17:55	4	1	2	2	134	3	5	79	0	6	0	0	236
17:55-18:00	5	0	1	0	119	1	6	75	2	9	0	2	220
Total Survey	81	9	63	54	3353	34	78	2027	23	129	5	34	5890
PHF	.63	.58	.54	.6	.96	.65	.83	.93	.6	.7	.5	.5	.960
% Trucks	2.5	0	4.8	0	1.4	2.9	0	1.8	0	0	0	2.9	1.5
Stopped Buses	0	0	0	0	0	0	0	0	0	0	0	0	
Peds	0	18	0	0	12	0	0	13	0	0	18	0	
Hourly Totals													
16:00-17:00	35	2	36	31	1593	21	33	1033	9	55	3	22	2873
16:15-17:15	29	4	41	31	1637	15	37	1044	7	51	2	22	2920
16:30-17:30	35	6	32	29	1727	14	41	1013	9	59	1	16	2982
16:45-17:45	36	6	25	28	1791	13	38	1007	12	63	1	16	3036
17:00-18:00	46	7	27	23	1760	13	45	994	14	74	2	12	3017

INTERSECTION TURN MOVEMENT COUNT SUMMARY REPORT
S. STATE STREET (HIGHWAY 43) AT WILBUR STREET



DATE OF COUNT: 11/03/01
DAY OF WEEK: Sat
TIME STARTED: 10:00
TIME ENDED: 13:00

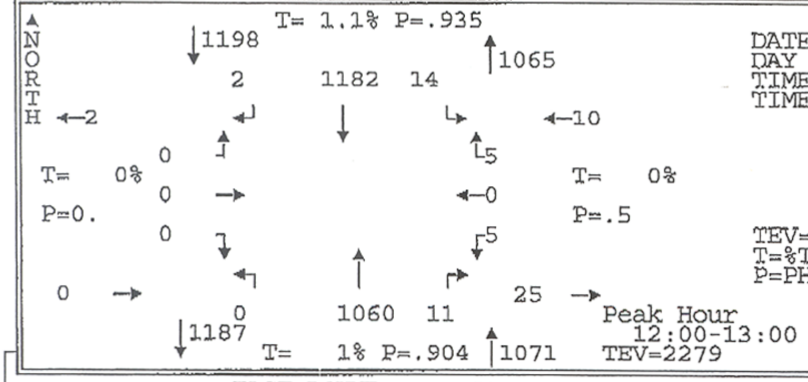
TEV=TOTAL ENTRY VOLUME
T=%TRUCKS BY APPROACH
P=PHF BY APPROACH

PADM

Traffic Smithy
(503) 641-6333

TIME PERIOD FROM - TO	EAST BOUND ↴	EAST BOUND →	EAST BOUND ↰	SOUTH BOUND ↲	SOUTH BOUND ↓	SOUTH BOUND ↳	NORTH BOUND ↰	NORTH BOUND ↑	NORTH BOUND ↱	WEST BOUND ↓	WEST BOUND ←	WEST BOUND ↑	ALL
10:00-10:05	1	0	0	2	44	1	4	77	0	3	0	2	134
10:05-10:10	1	0	0	3	53	1	4	73	1	0	0	2	138
10:10-10:15	4	0	2	2	68	0	2	97	2	2	0	1	180
10:15-10:20	1	0	3	1	66	3	3	78	0	2	1	0	158
10:20-10:25	3	1	1	1	63	0	0	73	0	1	0	0	143
10:25-10:30	1	0	0	0	58	0	0	75	0	4	0	0	138
10:30-10:35	3	1	0	1	53	0	1	69	2	1	1	1	133
10:35-10:40	0	0	2	6	72	2	1	89	2	6	1	3	184
10:40-10:45	1	0	1	0	56	2	1	73	1	3	0	1	139
10:45-10:50	0	0	0	0	78	1	0	73	1	5	0	1	159
10:50-10:55	3	0	0	2	62	0	0	83	5	5	0	1	161
10:55-11:00	2	0	1	1	61	1	7	79	5	0	0	1	158
11:00-11:05	3	1	1	2	61	0	3	99	2	4	0	2	178
11:05-11:10	3	0	2	1	78	2	4	59	1	3	0	1	154
11:10-11:15	0	0	0	0	73	1	0	102	0	1	1	3	181
11:15-11:20	6	0	1	2	70	1	3	113	4	4	1	3	208
11:20-11:25	2	0	0	1	78	1	2	118	1	6	0	7	216
11:25-11:30	2	0	1	0	93	0	0	80	1	3	0	3	183
11:30-11:35	3	0	0	1	77	3	3	82	0	2	0	1	172
11:35-11:40	0	0	1	1	92	3	1	93	1	2	2	3	199
11:40-11:45	7	1	4	1	76	3	1	91	1	3	0	3	191
11:45-11:50	7	0	3	0	79	3	2	85	1	4	0	0	184
11:50-11:55	0	3	0	1	68	1	4	94	2	8	0	2	183
11:55-12:00	0	0	3	1	83	1	1	112	2	4	1	2	210
12:00-12:05	0	1	3	2	70	3	2	72	0	3	0	1	157
12:05-12:10	2	1	1	1	87	4	4	75	1	6	1	2	185
12:10-12:15	1	0	3	2	131	3	1	86	3	1	0	2	233
12:15-12:20	2	0	0	5	94	3	0	71	1	5	1	0	182
12:20-12:25	4	1	1	0	89	1	2	96	0	4	0	0	198
12:25-12:30	1	0	2	2	98	1	2	88	0	4	0	2	200
12:30-12:35	1	1	1	0	88	4	0	83	2	4	1	0	185
12:35-12:40	0	0	1	0	113	1	3	76	0	5	0	5	204
12:40-12:45	2	0	4	0	108	1	2	103	3	1	0	2	226
12:45-12:50	3	0	1	0	85	0	1	89	2	6	0	4	191
12:50-12:55	0	0	1	1	84	2	0	84	2	7	0	4	185
12:55-13:00	2	0	1	1	73	3	3	101	1	3	0	0	188
Total Survey	71	11	45	44	2782	56	67	3091	50	125	11	65	6418
PHF	.57	.5	.75	.44	.9	.6	.64	.94	.57	.89	.5	.55	.948
% Trucks	1.4	0	0	2.3	4.3	5.4	6	3.9	4	2.4	0	3.1	4
Stopped Buses	0	0	0	0	0	0	0	0	0	0	0	0	
Peds	0	18	0	0	22	0	0	21	0	0	16	0	
Hourly Totals													
10:00-11:00	20	2	10	19	734	11	23	939	19	32	3	13	1825
10:15-11:15	20	3	11	15	781	12	20	952	19	35	4	14	1886
10:30-11:30	25	2	9	16	835	11	22	1037	25	41	4	27	2054
10:45-11:45	31	2	11	12	899	16	24	1072	22	38	4	29	2160
11:00-12:00	33	5	16	11	928	19	24	1128	16	44	5	30	2259
11:15-12:15	30	6	20	13	1004	26	24	1101	17	46	5	29	2321
11:30-12:30	27	7	21	17	1044	29	23	1045	12	46	5	18	2294
11:45-12:45	20	7	22	14	1108	26	23	1041	15	49	4	18	2347
12:00-13:00	18	4	19	14	1120	26	20	1024	15	49	3	22	2334

INTERSECTION TURN MOVEMENT COUNT SUMMARY REPORT
S. STATE STREET (HIGHWAY 43) AT LADD STREET



DATE OF COUNT: 11/03/01
DAY OF WEEK: Sat
TIME STARTED: 10:00
TIME ENDED: 13:00

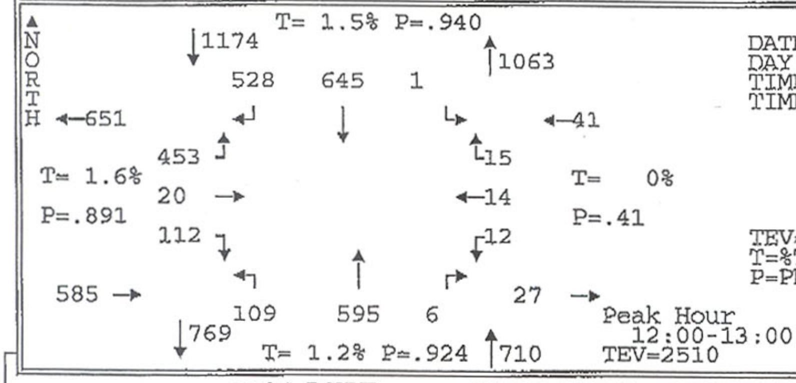
TEV=TOTAL ENTRY VOLUME
T=%TRUCKS BY APPROACH
P=PHF BY APPROACH

DJUP

Traffic Smithy
(503) 641-6333

TIME PERIOD FROM - TO	EAST BOUND			SOUTH BOUND			NORTH BOUND			WEST BOUND			ALL
	↴	→	↱	↲	↓	↳	↰	↑	↱	↓	←	↑	
10:00-10:05	0	0	0	0	43	1	0	99	1	0	0	0	144
10:05-10:10	0	0	0	0	75	3	0	73	1	1	0	0	153
10:10-10:15	0	0	0	0	63	4	0	91	2	0	0	0	160
10:15-10:20	0	0	0	0	66	1	0	74	1	0	0	0	142
10:20-10:25	0	0	0	0	61	0	0	67	0	0	0	0	128
10:25-10:30	0	0	0	0	58	1	0	78	0	0	0	0	137
10:30-10:35	0	0	0	0	77	0	0	88	0	0	0	0	165
10:35-10:40	0	0	0	0	65	1	0	77	0	0	0	0	143
10:40-10:45	0	0	0	0	74	1	0	82	0	1	0	0	158
10:45-10:50	0	0	0	0	66	0	0	77	0	0	0	0	143
10:50-10:55	0	0	0	0	62	3	0	94	0	0	0	1	160
10:55-11:00	0	0	0	0	76	1	0	101	0	0	0	0	178
11:00-11:05	0	0	0	0	68	3	0	71	2	1	0	0	145
11:05-11:10	0	0	0	0	75	3	0	86	0	0	0	6	170
11:10-11:15	0	0	0	0	81	1	0	113	1	1	0	4	201
11:15-11:20	0	0	0	0	82	3	0	114	0	1	0	3	203
11:20-11:25	0	0	0	0	85	3	0	83	1	0	0	1	173
11:25-11:30	0	0	0	0	78	4	0	91	0	1	0	2	176
11:30-11:35	0	0	0	0	94	5	0	86	3	0	0	3	191
11:35-11:40	0	0	0	0	80	3	0	97	0	1	0	0	181
11:40-11:45	0	0	0	0	85	1	0	82	0	0	0	1	169
11:45-11:50	0	0	0	0	74	0	0	102	1	0	0	1	178
11:50-11:55	0	0	0	0	84	1	0	102	0	0	0	1	188
11:55-12:00	0	0	0	0	77	2	0	76	0	0	0	0	155
12:00-12:05	0	0	0	1	105	0	0	81	1	0	0	0	188
12:05-12:10	0	0	0	0	114	0	0	81	0	0	0	0	195
12:10-12:15	0	0	0	0	100	0	0	96	2	0	0	0	198
12:15-12:20	0	0	0	0	97	0	0	78	3	0	0	0	178
12:20-12:25	0	0	0	0	101	0	0	92	0	1	0	1	195
12:25-12:30	0	0	0	0	94	1	0	83	0	0	0	0	178
12:30-12:35	0	0	0	0	117	0	0	80	0	0	0	0	197
12:35-12:40	0	0	0	1	98	4	0	101	3	0	0	3	210
12:40-12:45	0	0	0	0	87	2	0	95	1	0	0	0	185
12:45-12:50	0	0	0	0	86	1	0	96	0	1	0	0	184
12:50-12:55	0	0	0	0	85	1	0	92	1	1	0	1	181
12:55-13:00	0	0	0	0	98	5	0	85	0	2	0	0	190
Total Survey	0	0	0	2	2931	59	0	3164	24	12	0	28	6220
PHF	0	0	0	.5	.93	.5	0	.91	.55	.31	0	.42	.962
% Trucks	0	0	0	0	1.2	0	0	1	0	0	0	0	1
Stopped Buses	0	0	0	0	0	0	0	0	0	0	0	0	
Peds	0	1	0	0	1	0	0	12	0	0	2	0	
Hourly Totals													
10:00-11:00	0	0	0	0	786	16	0	1001	5	2	0	1	1811
10:15-11:15	0	0	0	0	829	15	0	1008	4	3	0	11	1870
10:30-11:30	0	0	0	0	889	23	0	1077	4	5	0	17	2015
10:45-11:45	0	0	0	0	932	30	0	1095	7	5	0	21	2090
11:00-12:00	0	0	0	0	963	29	0	1103	8	5	0	22	2130
11:15-12:15	0	0	0	1	1058	22	0	1091	8	3	0	12	2195
11:30-12:30	0	0	0	1	1105	13	0	1056	10	2	0	7	2194
11:45-12:45	0	0	0	2	1148	10	0	1067	11	1	0	6	2245
12:00-13:00	0	0	0	2	1182	14	0	1060	11	5	0	5	2279

INTERSECTION TURN MOVEMENT COUNT SUMMARY REPORT
S. STATE STREET (HIGHWAY 43) AT MCVEY AVENUE



DATE OF COUNT: 11/03/01
DAY OF WEEK: Sat
TIME STARTED: 10:00
TIME ENDED: 13:00

TEV=TOTAL ENTRY VOLUME
T=%TRUCKS BY APPROACH
P=PHF BY APPROACH

DLEF

Traffic Smithy
(503) 641-6333

TIME PERIOD FROM - TO	EAST BOUND ↴ (right)	EAST BOUND →	EAST BOUND ↰ (left)	SOUTH BOUND ↲ (right)	SOUTH BOUND ↓	SOUTH BOUND ↳ (left)	NORTH BOUND ↰ (right)	NORTH BOUND ↑	NORTH BOUND ↱ (left)	WEST BOUND ↓ (right)	WEST BOUND ←	WEST BOUND ↑ (left)	ALL
10:00-10:05	8	1	47	20	25	0	11	52	0	1	1	1	167
10:05-10:10	4	0	39	41	34	1	6	36	1	1	1	1	165
10:10-10:15	5	0	45	32	27	0	4	42	1	0	2	2	160
10:15-10:20	5	0	28	33	32	0	3	45	1	1	0	0	148
10:20-10:25	6	1	26	25	36	0	9	39	0	1	0	0	143
10:25-10:30	3	0	33	24	35	0	3	47	0	0	0	0	145
10:30-10:35	4	1	45	27	48	0	9	37	1	0	0	1	173
10:35-10:40	5	1	38	30	33	0	8	44	0	0	0	1	160
10:40-10:45	10	0	35	35	36	0	7	38	1	1	0	3	166
10:45-10:50	9	0	33	30	38	0	9	42	2	0	2	1	166
10:50-10:55	16	2	54	35	28	0	4	44	1	0	5	1	190
10:55-11:00	7	5	51	37	41	0	6	36	2	1	2	1	189
11:00-11:05	5	8	44	33	32	0	4	28	2	0	1	2	159
11:05-11:10	9	2	46	32	35	0	5	39	3	0	1	8	180
11:10-11:15	11	6	46	23	50	0	10	54	1	0	4	5	210
11:15-11:20	8	0	42	40	52	0	7	65	0	1	1	3	219
11:20-11:25	8	0	32	25	59	0	9	53	0	0	0	0	186
11:25-11:30	8	1	43	46	35	0	5	46	0	1	0	0	185
11:30-11:35	3	0	42	55	37	0	9	44	0	1	0	2	193
11:35-11:40	8	1	48	42	38	0	7	45	0	0	0	0	189
11:40-11:45	8	0	39	35	50	0	9	44	0	1	0	1	187
11:45-11:50	5	1	50	34	41	0	8	51	0	0	1	0	191
11:50-11:55	10	1	43	25	59	0	7	50	0	1	0	2	198
11:55-12:00	8	0	42	27	50	0	12	40	0	1	1	0	181
12:00-12:05	7	0	36	43	62	0	6	49	0	0	1	1	205
12:05-12:10	4	1	20	53	57	0	8	56	0	0	2	1	202
12:10-12:15	9	1	45	37	60	0	8	49	0	0	0	0	209
12:15-12:20	15	0	30	44	54	0	5	51	0	1	0	1	201
12:20-12:25	12	1	42	43	62	0	11	49	1	0	0	0	221
12:25-12:30	10	3	47	44	46	0	5	37	0	0	0	0	192
12:30-12:35	8	1	28	56	61	0	9	46	1	0	0	3	213
12:35-12:40	6	4	52	44	51	1	11	51	1	0	1	2	224
12:40-12:45	9	0	37	39	39	0	11	52	1	4	4	4	200
12:45-12:50	7	3	46	39	55	0	9	50	0	3	2	3	217
12:50-12:55	13	4	33	36	53	0	15	50	2	2	3	0	211
12:55-13:00	12	2	37	50	45	0	11	55	0	2	1	0	215
Total Survey	285	51	1444	1314	1596	2	280	1656	22	24	36	50	6760
PHF	.76	.56	.84	.92	.9	.25	.78	.95	.5	.33	.39	.42	.975
% Trucks	2.8	0	1.4	1.4	1.5	0	2.5	1	0	0	0	0	1.4
Stopped Buses	0	0	0	0	0	0	0	0	0	0	0	0	
Peds	0	10	0	0	2	0	0	9	0	0	0	0	
Hourly Totals													
10:00-11:00	82	11	474	369	413	1	79	502	10	6	13	12	1972
10:15-11:15	90	26	479	364	444	0	77	493	14	4	15	23	2029
10:30-11:30	100	26	509	393	487	0	83	526	13	4	16	26	2183
10:45-11:45	100	25	520	433	495	0	84	540	11	5	16	24	2253
11:00-12:00	91	20	517	417	538	0	92	559	6	6	9	23	2278
11:15-12:15	86	6	482	462	600	0	95	592	0	6	6	10	2345
11:30-12:30	99	9	484	482	616	0	95	565	1	5	5	8	2369
11:45-12:45	103	13	472	489	642	1	101	581	4	7	10	14	2437
12:00-13:00	112	20	453	528	645	1	109	595	6	12	14	15	2510

HCM Signalized Intersection Capacity Analysis
3: McVey Avenue & State Street

12/17/2001

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
	↗	→	↘	↙	←	↖	↖	↑	↗	↘	↓	↙
Lane Configurations	↰	✥			✥			↰↑			↑↑	↱
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1800	1900	1900	1800	1900
Total Lost time (s)	4.0	4.0			4.0			4.0			4.0	4.0
Lane Util. Factor	0.95	0.95			1.00			0.95			0.95	1.00
Frpb, ped/bikes	1.00	0.99			1.00			1.00			1.00	1.00
Flpb, ped/bikes	1.00	1.00			1.00			1.00			1.00	1.00
Frt	1.00	0.95			0.96			1.00			1.00	0.85
Flt Protected	0.95	0.97			0.98			0.99			1.00	1.00
Satd. Flow (prot)	1715	1627			1761			3261			3288	1509
Flt Permitted	0.95	0.97			0.98			0.79			1.00	1.00
Satd. Flow (perm)	1715	1627			1761			2579			3288	1509
Volume (vph)	485	20	100	10	10	10	100	580	5	0	590	470
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	485	20	100	10	10	10	100	580	5	0	590	470
Lane Group Flow (vph)	314	291	0	0	30	0	0	685	0	0	590	470
Confl. Peds. (#/hr)			2	3					4			
Heavy Vehicles (%)	0%	0%	5%	4%	0%	0%	4%	4%	0%	0%	4%	7%
Turn Type	Split			Split			pm+pt					Free
Protected Phases	8	8		7	7		1	6			2	
Permitted Phases							6					Free
Actuated Green, G (s)	17.2	17.2			3.0			42.8			42.8	75.0
Effective Green, g (s)	17.2	17.2			3.0			42.8			42.8	75.0
Actuated g/C Ratio	0.23	0.23			0.04			0.57			0.57	1.00
Clearance Time (s)	4.0	4.0			4.0			4.0			4.0	
Vehicle Extension (s)	3.0	3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)	393	373			70			1472			1876	1509
v/s Ratio Prot	c0.18	0.18			0.02						0.18	
v/s Ratio Perm								c0.27				0.31
v/c Ratio	0.80	0.78			0.43			0.47			0.31	0.31
Uniform Delay, d1	27.3	27.1			35.2			9.4			8.4	0.0
Progression Factor	1.00	1.00			1.00			1.00			1.23	1.00
Incremental Delay, d2	10.8	10.1			4.2			0.2			0.4	0.5
Delay (s)	38.1	37.3			39.3			9.6			10.8	0.5
Level of Service	D	D			D			A			B	A
Approach Delay (s)		37.7			39.3			9.6			6.2	
Approach LOS		D			D			A			A	

Intersection Summary			
HCM Average Control Delay	15.6	HCM Level of Service	B
HCM Volume to Capacity ratio	0.53		
Actuated Cycle Length (s)	75.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	71.1%	ICU Level of Service	C
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
6: Wilbur/Middlecrest Street & State Street

12/17/2001

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		✣			✣		↰	↑↱		↰	↑↱	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1800	1900	1900	1800	1900
Total Lost time (s)		4.0			4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor		1.00			1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes		0.98			0.99		1.00	1.00		1.00	1.00	
Flpb, ped/bikes		0.99			0.99		1.00	1.00		1.00	1.00	
Frt		0.93			0.98		1.00	1.00		1.00	1.00	
Flt Protected		0.98			0.96		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1694			1759		1805	3377		1671	3376	
Flt Permitted		0.87			0.72		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1508			1309		1805	3377		1671	3376	
Volume (vph)	30	5	40	65	5	15	40	1015	15	20	1680	30
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	30	5	40	65	5	15	40	1015	15	20	1680	30
Lane Group Flow (vph)	0	75	0	0	85	0	40	1030	0	20	1710	0
Confl. Peds. (#/hr)	9		9	9		9	6		6	6		6
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	1%	0%	8%	1%	0%
Parking (#/hr)						0						
Turn Type	Perm			Perm			Prot			Prot		
Protected Phases		8			4		1	6		5	2	
Permitted Phases	8			4								
Actuated Green, G (s)		9.1			9.1		5.3	75.9		3.0	73.6	
Effective Green, g (s)		9.1			9.1		5.3	75.9		3.0	73.6	
Actuated g/C Ratio		0.09			0.09		0.05	0.76		0.03	0.74	
Clearance Time (s)		4.0			4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)		3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		137			119		96	2563		50	2485	
v/s Ratio Prot							c0.02	0.30		0.01	c0.51	
v/s Ratio Perm		0.05			c0.06							
v/c Ratio		0.55			0.71		0.42	0.40		0.40	0.69	
Uniform Delay, d1		43.5			44.2		45.9	4.2		47.6	7.1	
Progression Factor		1.00			1.00		1.30	0.56		1.33	0.66	
Incremental Delay, d2		4.4			18.3		0.3	0.0		2.7	0.8	
Delay (s)		47.9			62.5		59.8	2.4		65.8	5.5	
Level of Service		D			E		E	A		E	A	
Approach Delay (s)		47.9			62.5			4.5			6.2	
Approach LOS		D			E			A			A	

Intersection Summary			
HCM Average Control Delay	8.2	HCM Level of Service	A
HCM Volume to Capacity ratio	0.67		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	68.8%	ICU Level of Service	B

c Critical Lane Group

Baseline

Synchro 5 Report
Page 1

KITTELPORT-ST51

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Volume (veh/h)	2	10	1025	15	15	1770
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (veh/h)	2	10	1025	15	15	1770
Pedestrians	10					
Lane Width (ft)	12.0					
Walking Speed (ft/s)	4.0					
Percent Blockage	1					
Right turn flare (veh)						
Median type	None					
Median storage veh)						
vC, conflicting volume	1958	530			1050	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	96	98			98	
cM capacity (veh/h)	55	495			665	

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	12	683	357	15	885	885
Volume Left	2	0	0	15	0	0
Volume Right	10	0	15	0	0	0
cSH	213	1700	1700	665	1700	1700
Volume to Capacity	0.06	0.40	0.21	0.02	0.52	0.52
Queue Length (ft)	4	0	0	2	0	0
Control Delay (s)	22.9	0.0	0.0	10.5	0.0	0.0
Lane LOS	C			B		
Approach Delay (s)	22.9	0.0		0.1		
Approach LOS	C					

Intersection Summary			
Average Delay	0.2		
Intersection Capacity Utilization	61.6%	ICU Level of Service	B

HCM Signalized Intersection Capacity Analysis
3: McVey Avenue & State Street

12/17/2001

	↗	→	↘	↙	←	↖	↖	↑	↗	↘	↓	↙
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	✥			✥			↰↑			↑↑	↱
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1800	1900	1900	1800	1900
Total Lost time (s)	4.0	4.0			4.0			4.0			4.0	4.0
Lane Util. Factor	0.95	0.95			1.00			*0.63			*0.63	1.00
Frpb, ped/bikes	1.00	0.99			1.00			1.00			1.00	1.00
Flpb, ped/bikes	1.00	1.00			1.00			1.00			1.00	1.00
Frt	1.00	0.94			0.95			1.00			1.00	0.85
Flt Protected	0.95	0.97			0.99			0.99			1.00	1.00
Satd. Flow (prot)	1649	1589			1780			2230			2246	1599
Flt Permitted	0.95	0.97			0.99			0.55			1.00	1.00
Satd. Flow (perm)	1649	1589			1780			1236			2246	1599
Volume (vph)	425	15	110	5	10	10	105	605	5	0	1030	725
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	425	15	110	5	10	10	105	605	5	0	1030	725
Lane Group Flow (vph)	279	271	0	0	25	0	0	715	0	0	1030	725
Confl. Peds. (#/hr)			5	6					7			
Heavy Vehicles (%)	4%	0%	2%	0%	0%	0%	0%	1%	0%	0%	1%	1%
Turn Type	Split			Split			Prot					Free
Protected Phases	8	8		7	7		1	6			2	
Permitted Phases												Free
Actuated Green, G (s)	21.2	21.2			3.1			62.2			62.2	100.0
Effective Green, g (s)	21.2	21.2			3.1			63.7			63.7	100.0
Actuated g/C Ratio	0.21	0.21			0.03			0.64			0.64	1.00
Clearance Time (s)	4.0	4.0			4.0			5.5			5.5	
Vehicle Extension (s)	3.0	3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)	350	337			55			787			1431	1599
v/s Ratio Prot	0.17	c0.17			0.01						0.46	
v/s Ratio Perm								c0.58				0.45
v/c Ratio	0.80	0.80			0.45			0.91			0.72	0.45
Uniform Delay, d1	37.4	37.4			47.6			15.6			12.2	0.0
Progression Factor	1.00	1.00			1.00			1.00			0.56	1.00
Incremental Delay, d2	11.9	13.0			5.9			14.2			2.4	0.7
Delay (s)	49.3	50.4			53.5			29.8			9.3	0.7
Level of Service	D	D			D			C			A	A
Approach Delay (s)		49.8			53.5			29.8			5.7	
Approach LOS		D			D			C			A	

Intersection Summary			
HCM Average Control Delay	19.7	HCM Level of Service	B
HCM Volume to Capacity ratio	0.85		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	83.4%	ICU Level of Service	D
c Critical Lane Group			

Baseline

Synchro 5 Report
Page 1

KITTELPORT-ST51

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		✥			✥		↰	↑↑↱		↰	↑↑↱	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1800	1900	1900	1800	1900
Total Lost time (s)		4.0			4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor		1.00			1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes		0.99			1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00			1.00		1.00	1.00		1.00	1.00	
Frt		0.93			0.96		1.00	1.00		1.00	1.00	
Flt Protected		0.98			0.97		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1680			1711		1736	3282		1805	3279	
Flt Permitted		0.89			0.85		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1523			1504		1736	3282		1805	3279	
Volume (vph)	20	5	25	50	5	25	25	1080	15	25	1025	15
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	20	5	25	50	5	25	25	1080	15	25	1025	15
Lane Group Flow (vph)	0	50	0	0	80	0	25	1095	0	25	1040	0
Confl. Peds. (#/hr)	2		3	2		3			1			1
Heavy Vehicles (%)	0%	0%	5%	4%	0%	0%	4%	4%	0%	0%	4%	7%
Turn Type	Perm			Perm			Prot			Prot		
Protected Phases		8			4		1	6		5	2	
Permitted Phases	8			4								
Actuated Green, G (s)		7.3			7.3		1.6	52.6		3.1	54.1	
Effective Green, g (s)		7.3			7.3		1.6	52.6		3.1	54.1	
Actuated g/C Ratio		0.10			0.10		0.02	0.70		0.04	0.72	
Clearance Time (s)		4.0			4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)		3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		148			146		37	2302		75	2365	
v/s Ratio Prot							c0.01	c0.33		0.01	0.32	
v/s Ratio Perm		0.03			c0.05							
v/c Ratio		0.34			0.55		0.68	0.48		0.33	0.44	
Uniform Delay, d1		31.6			32.3		36.4	5.0		34.9	4.3	
Progression Factor		1.00			1.00		1.05	0.69		1.42	0.27	
Incremental Delay, d2		1.4			4.2		35.1	0.6		1.8	0.4	
Delay (s)		33.0			36.4		73.2	4.1		51.3	1.5	
Level of Service		C			D		E	A		D	A	
Approach Delay (s)		33.0			36.4			5.6			2.7	
Approach LOS		C			D			A			A	

Intersection Summary			
HCM Average Control Delay	5.9	HCM Level of Service	A
HCM Volume to Capacity ratio	0.48		
Actuated Cycle Length (s)	75.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	50.2%	ICU Level of Service	A
c Critical Lane Group			

HCM Unsignalized Intersection Capacity Analysis
23: Ladd Street & State Street

12/17/2001

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Volume (veh/h)	5	15	1080	10	25	1075
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (veh/h)	5	15	1080	10	25	1075
Pedestrians	10					10
Lane Width (ft)	12.0					12.0
Walking Speed (ft/s)	4.0					4.0
Percent Blockage	1					1
Right turn flare (veh)						
Median type	None					
Median storage veh)						
vC, conflicting volume	1682	565			1100	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	94	97			96	
cM capacity (veh/h)	83	465			637	

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	20	720	370	25	538	538
Volume Left	5	0	0	25	0	0
Volume Right	15	0	10	0	0	0
cSH	216	1700	1700	637	1700	1700
Volume to Capacity	0.09	0.42	0.22	0.04	0.32	0.32
Queue Length (ft)	8	0	0	3	0	0
Control Delay (s)	23.3	0.0	0.0	10.9	0.0	0.0
Lane LOS	C			B		
Approach Delay (s)	23.3	0.0		0.2		
Approach LOS	C					

Intersection Summary			
Average Delay	0.3		
Intersection Capacity Utilization	44.7%	ICU Level of Service	A

Appendix G | Crash Data Summary

ACCIDENT ANALYSIS

Project Name:	George Rogers Park Master Plan
Project Number:	4888
Analyst:	jxh
Date:	12/17/2001
Filename:	H:\projfile\4888\tiacalcs\[Accident.xls]Analysis

KITTELSON & ASSOCIATES, INC.
610 SW Alder, Suite 700
Portland, Oregon 97205
(503) 228-5230
Fax: (503) 273-8169

ARTERIAL ANALYSIS

Street Name:
From: Mile Post
To: Mile Post

Average Daily Traffic =
Length of Segment (miles) =
Number of Accidents =
Time Period (years) =

Accident Rate = | | 1,000,000 — *Accidents / mvm*

INTERSECTION ANALYSIS

Intersection	Vehicles Entering Intersection	Number of Accidents	Time Period	Accident Rate
State Street/Wilbur Street	30,150	15	5	15 × 1,000,000 / (30,150 × 365 × 5) = 0.27 *Accidents / mev*
State Street/Ladd Street	29,150	4	5	4 × 1,000,000 / (29,150 × 365 × 5) = 0.08 *Accidents / mev*
State Street/McVey Avenue	31,550	42	5	42 × 1,000,000 / (31,550 × 365 × 5) = 0.73 *Accidents / mev*
				1,000,000 — *Accidents / mev*

Each intersection block also shows "Mile Post" (blank).