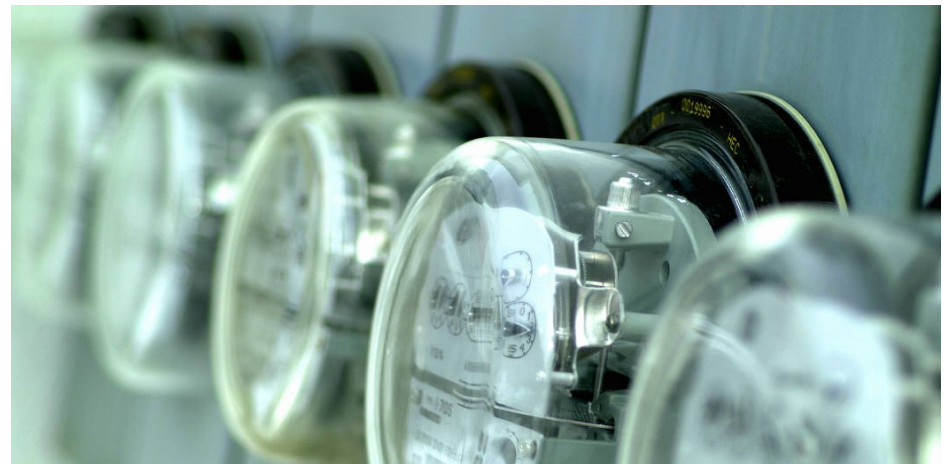




LAKE OSWEGO NORTH END DOWNTOWN REVITALIZATION



STAKEHOLDERS

LORA
Stakeholders Advisory Group
Friends of the Lake Oswego Library
Lake Oswego Chamber of Commerce
Lake Oswego Downtown Business
District Association
Lakewood Center for the Arts

STUDY TEAM

Leland Consulting Group
Myhre Group Architects
DKS Associates
KPFF Consulting Engineers Inc.
GEL Oregon Inc.
Rick Williams Consulting
Lake Oswego Library
LORA

KPFF INC.

UTILITY INFRASTRUCTURE MEMORANDUM



LELAND CONSULTING GROUP

M E M O R A N D U M

DATE: September 21, 2010 (updated September 29, 2010)
TO: Dave Leland, Leland Consulting Group
CC: Jane Blackstone, City of Lake Oswego
FROM: Andrew Haliburton
RE: Lake Oswego North Anchor Feasibility Study **PROJECT NO.:** 310046

PURPOSE

To review existing public and franchised utilities for the proposed North Anchor redevelopment area by gathering information from available records, performing feasibility-level existing conditions assessment, capacity impacts and to comment on opportunities and constraints concerning utility infrastructure needed to support potential redevelopment.

STUDY AREA

This utility study is centered on the south half of Block 30, Lake Oswego – bounded by C Avenue and B Avenue, and by First Street and State Street.

This review also covers the adjacent area of direct influence, loosely bounded by C Avenue and A Avenue, to the north and south respectively; and by State Street and Second Avenue, to the east and west. To the extent that gravity-flow utilities (wastewater and stormwater) can convey flows across the study area from upstream areas of the contributing basin, the whole catchment is considered.

DOWNTOWN GRID

City block frontage is 400' along the long axis (north-south) and 260' along the short axis (east-west). The short side (120'+20'+120') is broken by a 20'-wide mid-block service alley which is dedicated public right-of-way. The mid-block alleys are named after the street lying to the west, so the alley lying between State Street and First Street is *1st Alley* ("first" is written out for streets and abbreviated for alleys to help differentiate between them).

The alleys are the primary utility corridor for the following utilities: sanitary sewer, stormwater, gas, overhead power and telecom. The alleys also serve as primary commercial delivery entrance and garbage/recycling services.

Streets in the downtown grid typically have a 60-foot right-of-way width. First Street has an 80-foot right-of-way width.

OPPORTUNITIES & CONSTRAINTS – DOWNTOWN UTILITIES

A significant influence on the redevelopment potential of downtown blocks is the existing twenty-foot-wide mid-block service alleys. If the programming needs of a new development project require more than 120 feet along the short side (for example Lake View Village), then vacation of the mid-block alley may become necessary. Experience shows that this can be achieved through a combination of utility relocations and otherwise accommodating the service and access functions of the alley.

OPPORTUNITIES

- 1st Alley provides access and circulation for businesses and garbage/recycling services.
- Multiple options exist for relocating gravity lines in 1st Alley around a North Anchor footprint.
- First Street has an 80-foot-wide right-of-way.
- First Street accommodates fewer existing utilities than 1st Alley.
- First Street could be described as not fully utilized, as a potential utility corridor, although significant street improvements were recently completed and would be impacted by running additional utilities in this right-of-way.
- Opening a corridor between State Street and First Street, as an extension of the existing open lot used for parking, offers significant potential for utilities.
- It would be possible to vacate 1st Alley through the north half of Block 49 (Study Area 4) for development, providing utilities could be relocated either into the corridor identified above, or into State Street. However, it would not be possible to extend this vacation into the southern half of this block (Study Area 6) due to critical utilities serving the Lake View Village development.

CONSTRAINTS

- 1st Alley is an important utility corridor for sewer, storm, gas, overhead power and telecom.
- C Avenue does not connect to State Street due to grade difference and private development.
- The open lot fronting State Street, between A and B Avenues, is a vital utility corridor.
- The missing link of C Avenue between State Street and 1st Alley necessitates the utilization of 1st Alley for local access and circulation both north of, and south of, C Avenue.
- The gravity flow utilities are the most challenging to relocate. Two issues of primary concern are the property service connection point (location and depth), as well as the depth of the main line to which the lateral is connected.
- New structure can be built over existing utilities, but this requires large side and overhead clearances to be designed for maintenance/repair work, as well as access easements and agreements recorded against respective property. This is a significant encumbrance to development of a large footprint. An example of this can be seen at 3rd Alley on the north side of B Avenue.
- The preferred solution is to re-route utilities around the development and to vacate the existing right-of-way so new development is unencumbered.

SUMMARY OF EXISTING INFRASTRUCTURE

WASTEWATER

An 8" sanitary sewer line runs along 2nd Alley on western boundary of development area. An 8" sanitary line runs along First Street into development area from the north and turns to run along B Avenue. This 8" sanitary line runs along B Avenue from First Street to 1st Alley. An 8" sanitary line runs into development area along 1st Alley between C Avenue and A Avenue. From this 8" line in 1st Alley, a 12" line runs eastward, crosses State Street between A Avenue and B Avenue, and heads north to Tryon Creek Wastewater Treatment Plant.

Most of these lines date from around 1936. They are clay pipes in fair condition with moderate to steep slopes. Initial calculations indicate that capacity is not a limiting factor. It has been demonstrated that a cost-effective approach to extending the working life of these pipes and reduce I&I (infiltration and inflow) is in-place lining with PVC.

Multiple options exist to relocate existing 8" sanitary sewer lines in 1st Alley around a North Anchor development footprint:

- Option A: A new 8" sanitary sewer line along the north boundary of the North Anchor development can redirect the sanitary sewer in 1st Alley to the existing sanitary line flowing north on State Street. The location of the pipe in relation to the property line would depend on if the land owner of Tax Lots 540/544, to the north, would be amenable to having the line (and easement) placed on their property. If an agreement cannot be made with the owner of that property (or if the existing building on that property limits the feasibility of that location), the sewer line could be placed under an overhanging portion of the new development. The estimated construction cost for this improvement option is approximately \$80,000, excluding design fees, other associated utility relocations, permits and property acquisition/easement costs. This option does have the potential to impact the North Anchor development by reducing the footprint of the first story.
- Option B: A new 8" sanitary sewer line flowing north in 1st Alley can redirect the existing southerly sanitary flows towards an existing sanitary line flowing north on State Street. The open Tax Lot 600 on State Street (opposite C Avenue) could be utilized for this new sewer line, if an agreement can be made with the owner of that tax lot. This option does not constrain the first story footprint of the North Anchor project as Option A has the potential to do. The estimated construction cost for this improvement option is approximately \$90,000, excluding design fees, other associated utility relocations, permits and property acquisition/easement costs.
- Option C: A new 8" sewer line could be routed around the North Anchor by running west to First Street, south on First Street to connect and combine with the existing sewer crossing B Avenue diagonally from First Street to 1st Alley (Estimate approx. \$160,000).

STORMWATER

The surface slope of the downtown is generally down from NW to SE. A 10" storm drain runs through 2nd Alley to a manhole on B Avenue. In 1st Alley, between B Avenue and C Avenue, a footing drain and roof drain run parallel into a catch basin, which connects to a manhole on B Avenue. A 12" storm drain carries storm water from catch basin in 1st Alley between B Avenue and C Avenue to a manhole on B Avenue. A 12" storm drain runs along B Avenue between 2nd Alley and 1st Alley; then becomes 18" storm drain between 1st Alley and State Street. Several catch basins exist on State Street near B Avenue and carry water to 18" storm drain running along State Street.

The B Avenue Storm Drain Improvement Project is an unfunded project on the City's CIP list. If the North Anchor project occurs before the storm drain is rebuilt, the development project should include an appropriate proportion of the storm drain improvements. It should be assumed that all inlets and catchbasins in the public right-of-way will need to be relocated as part of public improvements associated with the downtown revitalization area.

Records show that the existing storm lines in First Street and B Avenue pre-date 1969, but their condition is unknown. The entire downtown revitalization area has been developed and represents nearly 100 percent impervious surfaces, generating runoff that is untreated and unrestrained. For the purposes of this study, any new development will have a positive impact on capacity of the existing stormwater system through the use of contemporary stormwater management BMPs (best management practices) for low-impact development.

Anticipated storm drainage service for the North Anchor development is similar to the scope of sanitary sewer relocation work described above. Some economy can be achieved by installing the storm lines concurrent with the sanitary sewer lines.

- Option A: A new 8" storm sewer line along the north boundary of the North Anchor development can redirect the drainage flowing south on 1st Alley to the storm main flowing south on State Street. The location of the pipe in relation to the property line would depend on if the land owner of Tax Lots 540/544, to the north, would be amenable to having the line (and easement) placed on their property. If an agreement cannot be made with the owner of that property (or if the existing building on that property limits the feasibility of that location), the storm line could be placed under an overhanging portion of the new development. The estimated construction cost for this improvement option is approximately \$20,000 (assuming economy of construction with sewer improvements), excluding design fees, other associated utility relocations, permits and property acquisition/easement costs. This option does have the potential to impact the North Anchor development by reducing the footprint of the first story.

- Option B: A new 8" storm sewer line flowing north in 1st Alley can redirect the existing southerly drainage flows towards an existing storm line flowing north on State Street. The open Tax Lot 600 on State Street (opposite C Avenue) could be utilized for this new storm line, if an agreement can be made with the owner of that tax lot. This option does not constrain the first story footprint of the North Anchor project as Option A has the potential to do. The estimated construction cost for this improvement option is approximately \$48,000 (assuming economy of construction with sewer improvements), excluding design fees, other associated utility relocations, permits and property acquisition/easement costs.
- Option C: A new 8" storm line could be routed around the North Anchor by running west to First Street, then south on First Street to connect with other storm lines lying at an appropriate depth (deeper than typical storm lines; Estimate approx. \$40,000).

WATER

A 6" water main runs along First Street through project area. This line was recently replaced between A Avenue and B Avenue with the recent First Street improvements. A 6" main runs on State Street along the frontage of Block 49, between A Avenue and B Avenue. A 12" main also runs along the east side of State Street. An 8" main runs along B Avenue through development area.

Records show water mains are ductile iron and their condition is understood to be satisfactory and would need to be verified. It should be assumed that the City will want to replace the 6" main in First Street north of B Avenue if and when public improvements are made on this street.

- The anticipated development does not impact the existing water distribution system; however the fire marshal may require fire flow demands from the project to be modeled. This model would assess the existing system's performance during the event of a fire, and may indicate that pipe upgrades in the vicinity of the project are necessary to sustain required pipe pressures.
- The estimated cost of water main replacement in First Street is \$45,000.
- Three fire hydrants (two on State Street and one on First Street) and one private FDC (Fire Department Connection) lie within the project area and would be impacted by new construction. The estimated relocation cost for these three hydrants and one FDC is \$22,000.
- One additional fire hydrant may be required along First Street between B Avenue and C Avenue. The estimated cost for this hydrant and its service line is \$28,000.
- Additionally, up to three new FDCs can be anticipated for the new development. The estimated construction cost for 3 FDCs with backflow check valves is \$15,000. However, this cost doesn't include typical primary fire protection connection comprising Fire Department Double Detector Check assembly and vaults. If these items are not budgeted for elsewhere, this cost estimate should be increased to \$75,000.

FRANCHISED UTILITY NETWORKS

- 360 Networks has underground facilities in a fiber optics duct bank running down State Street, at about 9 feet west of the center of road. Bank includes 12 x 1.25" HDPE ducts contained in 4 x 4" PVC. No conflicts are anticipated.
- Level 3 has underground fiber optic cables running down State Street at about 9 feet west of center of road. Cables are contained in a 1.5" HDPE duct which is contained in 4 - 4" PVC. No conflicts are anticipated.
- Comcast has aerial facilities running along east side of State Street, west side of 1st Alley, south side B Avenue, and south side of C Avenue. Relocation underground of aerial facilities is proposed along 1st Alley between A Ave and C Ave, along B Ave between State Street and 2nd Street, and along 2nd Alley between A Ave and C Ave. Comcast also has underground facilities scattered throughout the project area, most of which reside in 2nd Alley and 3rd Alley, between B Avenue and C Avenue.
- PGE has transmission circuits along east side of State Street, south side of A Ave, and south side of B Ave. Transmission lines also in 1st Alley and 2nd Alley, between B Ave and C Ave.
- Qwest has underground facilities located along B Ave from State Street to 2nd Alley, along 2nd Alley between B Ave and C Ave, along First Street between B Ave and C Ave, and along 1st Alley between B Ave and A Ave.
- The cost to underground utilities in a developed urban setting is high. Smaller franchise utilities can cost about \$225 per foot to underground. Larger utilities, such as PGE with high voltage and transmission line requirements, can cost about \$450 per foot to underground. Some economy of scale can be achieved by installing both the smaller and larger utilities below ground concurrently; however this requires a detailed level of design before determining accurate costs. For the purposes of this feasibility study, the construction costs for undergrounding of existing aerial utility lines could range from \$800,000 to \$1,400,000, excluding design fees, permits and any property acquisition/easement costs.
- NW Natural has major gas lines running in 1st and 2nd Alley between A Ave and C Ave. Relocation of a 4" section of gas line running through project area between B Ave and C Ave in 1st Alley is proposed. To maintain adequate gas pressures in the lines, a 4" gas main will likely need to be extended through 1st Street, between B Ave and C Ave. The estimated construction cost for this improvement option is approximately \$55,000, excluding design fees, other associated utility relocations and permits.
- Portland and Western Railroad has railroad tracks parallel and just to the east of State Street. No conflicts are anticipated. This study assumes that existing utility crossings of the railroad tracks will be utilized.

COST ESTIMATE INFORMATION

The cost estimates provided in this study are very preliminary and intended for feasibility-level discussion purposes. Cost estimates with a higher level of confidence would necessarily require a more detailed definition of project area and assessment of existing infrastructure. Since the library portion of the project is a public facility, utilities located within the right of way may be required to relocate their facilities at their own expense. This would be a topic to elevate in discussions with the City of Lake Oswego.