



CITY OF KIRKLAND
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MEMORANDUM

To: Kurt Triplett, City Manager

From: Rachel Konrady, Surface Water Planner
Kelli Jones, Surface Water Program Supervisor
John Burkhalter, Development & Environmental Engineering Manager
Julie Underwood, Public Works Director

Date: February 18, 2021

Subject: SURFACE WATER UTILITY AND MASTER PLANNING PROCESS OVERVIEW

RECOMMENDATION:

It is recommended that the City Council receive an overview about the Surface Water Utility program and the upcoming Surface Water Master Plan update.

BACKGROUND:

Surface Water Utility History

The Surface Water Utility was formed in 1998 with these primary goals:



Reduce Flooding



Improve Habitat



Improve Water Quality



Maintain Infrastructure



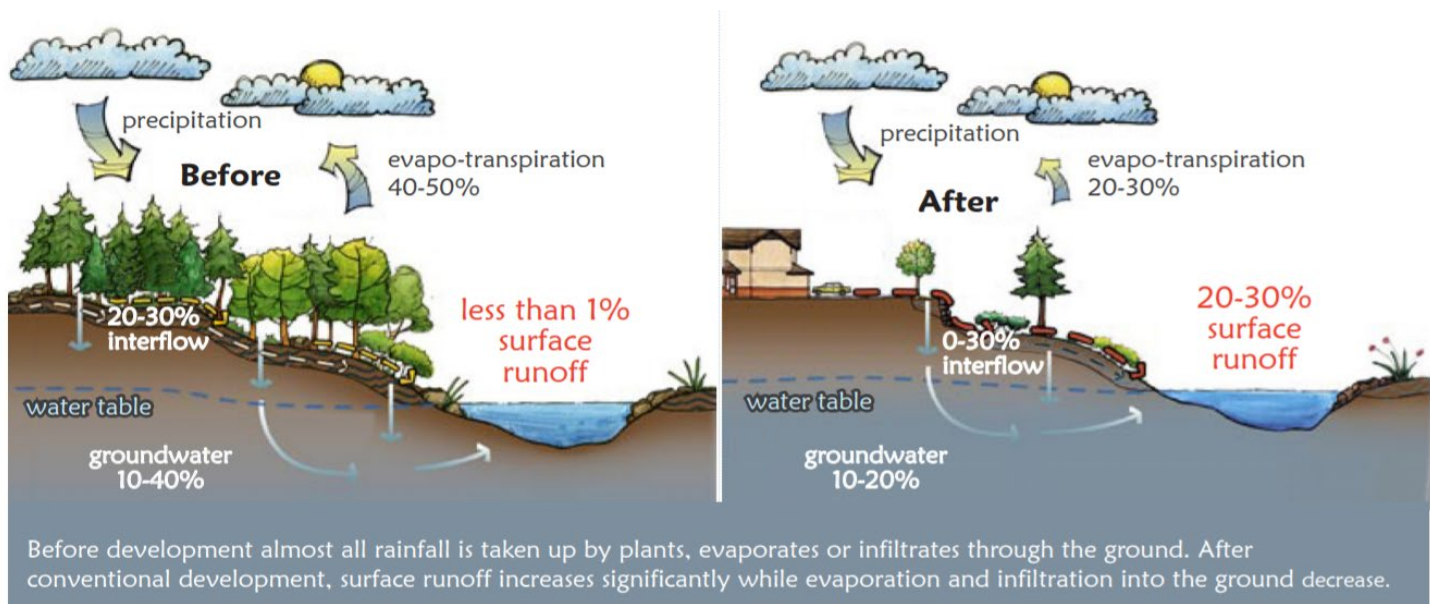
Educate and Engage the Public

In order to make progress on these goals, Kirkland has deployed a variety of programs and services, summarized in the section below.

Defining Stormwater and Surface Water Management

When using the term “stormwater,” we are referencing the system of catch basins, vaults or tanks, and pipes that collect and move rainwater from upland areas down to the nearest wetland, stream, or lake—the *constructed system*. “Surface water” is a more comprehensive term that includes natural features such as streams, lakes, and wetlands in addition to the constructed stormwater system.

The City cares about and has an interest in stormwater management because development has significantly altered how water flows through the environment. It flows more rapidly and at higher quantities, while also carrying pollutants it picks up along the way. The goal is for the stormwater system eventually to mimic the way that water moves through a forest, as depicted in the illustration below.



Solving Existing Problems and Preventing New Ones

In about the 1990s, research began to show the impacts that uncontrolled stormwater from land development was having on streams and water quality. Shortly thereafter, state and federal regulations were put in place to require development to mitigate for stormwater impacts. Most of Kirkland was developed before these regulations existed. New developments in Kirkland meet strict stormwater control requirements, but historic development typically does not have appropriate infrastructure to slow or clean stormwater. The Utility is striving to solve old problems caused by former development practices while preventing new problems. Maps that depict when development occurred in Kirkland since 1900 are attached; all developments before approximately the year 2000 were built before modern stormwater regulations (see Attachments A – E, Year Parcels Developed with respective range of years). Some facilities were built prior to that time, but those were focused on flood control and are not protective of stream habitat or water quality.

The construction of a large stormwater vault at Fire Station 24 is an example of how new construction is required to address stormwater impacts. This vault together with a water quality system downstream will slow and clean stormwater before it is discharged to Juanita Creek.

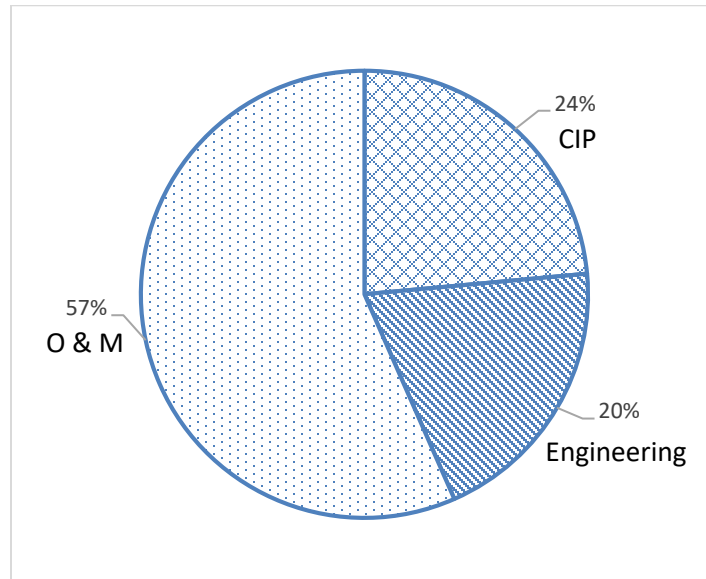


71 ft x 112 ft Stormwater Vault

SURFACE WATER BUDGET AND RATES OVERVIEW:

The Surface Water Utility funds programs and projects in three primary areas: 1) maintenance and operations, 2) engineering, and 3) capital improvement projects. City staff that are supported by the Utility includes 38.25 FTEs distributed among the maintenance division, the engineering division, and a variety of other positions including but not limited to grounds maintenance staff, streets maintenance staff, and an urban forester position that provides services related to surface water.

The total Surface Water Utility budget for 2021-2022 is \$25,493,957. The pie chart below shows the funding as divided between the maintenance and operations division, engineering division, and capital improvements for the current biennium.



The City Council establishes the Surface Water Utility rates during the budget process. This serves as the main source of revenue for the Utility. In 2021, single-family residential lots will pay a flat rate fee of \$237.88 per year and commercial/multifamily properties will pay a fee that is based on the amount of impervious surface on their property. Typically, rate increases are proposed in response to inflation, but also in response to priorities and programs as proposed in the *Surface Water Master Plan*.

SURFACE WATER UTILTIY PROGRAMS:

The *Surface Water Master Plan* guides the priorities, program implementation, and budget requests for the Utility during the time horizon of the plan. Surface water programs are implemented to meet both the applicable regulatory standards and the environmental goals of the City. The paragraphs below spotlight some programs or projects for each of the divisions of the Utility.

Maintenance and Operations

The maintenance division inspects, cleans, maintains, and repairs the public stormwater system. Also, the staff in this division are the first responders to reported spills and flooding calls. From information collected in the [2014 Surface Water Master Plan](#), the public stormwater system in Kirkland is comprised of 257 miles of pipe, 38 miles of ditch, 554 underground facilities, and 55 stormwater ponds. There are 20 FTE positions that support the work of this division.

Program Spotlights:



Inspection Program:

The Stormwater Maintenance Crews inspect more than 15,000 catch basins every 2 years, 662 facilities every year, and checks 172 spots where debris tends to build up before and after storms in the rainy season. These efforts prevent localized flooding and protect water quality.



Spill Response:

Kirkland maintains a 24-hour spill reporting hotline. The Maintenance Crew responds to calls and cleans up the road and stormwater system to prevent pollutants from entering local wetlands, streams and lakes. In 2019, the crew, with investigation and enforcement support from the Engineering Division, responded to 268 reported spills.

Engineering Division

The engineering division provides planning, permit administration, inspection of private systems, spills response and investigation, and engineering and technical support to private development application reviews, certain maintenance activities, and capital improvement that include a surface water element. This division also leads public education and outreach efforts for the utility. There are 12 FTE positions in this division.

Program Spotlights:

Yard Smart:

This popular voluntary stewardship program provides site visits to homeowners or property managers to discuss rainwater management practices they can implement on their property. This results in removing stormwater from our constructed systems and introducing it back into the ground. Follow-up technical assistance reports are provided along with rebates to owners that construct projects. Between 2019 - 2020, staff conducted 143 site visits and residents installed 44 projects on 35 properties. Projects included rain gardens, cisterns, native landscaping, and tree planting.



Development Review:

Development review staff collaborate to make sure that proposed projects meet stormwater design standards, and that stormwater is integrated with other infrastructure requirements. In 2019, 670 projects were reviewed to make sure that facilities intended to slow down and remove pollutants from stormwater were designed properly, and that measures would be taken to prevent soil erosion during construction. Construction inspectors performed 6,206 inspections for public works infrastructure that same year. This review and inspection process ensure that new development projects mitigate stormwater impacts, which prevents new surface water problems.



Capital Improvement Projects—Surface Water

The CIP group oversees the capital investments that are designed and constructed to maintain infrastructure, improve habitat, improve water quality, and reduce flooding. It also manages grant awards in support of these projects.

Program Spotlights:



132nd Square Park:

The construction of a large stormwater retrofit facility and the concurrent renovation of park facilities at 132nd Square Park is an example of the collaborative potential of stormwater projects. The Engineering Division was successful in achieving a multi-million-dollar grant to slow down, clean, and infiltrate 50 acres of stormwater. This grant helped catalyze a larger construction project that will achieve amenity improvements for the park as a whole.



Advance Mitigation Site:

This unique cross-departmental project supported the restoration of approximately 5 acres of wetland and stream buffer habitat in Juanita Bay Park, near the outlet of Forbes Creek. The advanced restoration of this area will reduce the cost of mitigation for public transportation and parks projects by site by serving as a location where credits can be 'purchased' for construction impacts throughout the City in coming years.

In addition to the programs and projects summarized above, the following are other projects and programs managed or provided by the Surface Water Utility:

- Retrofit Planning and Construction (Totem Lake, North Rose Hill, Cedar Creek)—adding stormwater control to existing developed areas;
- Aging and Failing Infrastructure—repairing and replacing public infrastructure;
- Drainage Complaint Response;
- Streamside and Wetlands Habitat Restoration in support of water quality and fish habitat;
- Fish Passage Barrier Removal and Culvert Enhancement;
- Flood Reduction to protect property and public safety;
- Beaver Complaint Response and Management Support;
- Water Quality Monitoring to evaluate progress on meeting water quality standards;
- Green Kirkland Partnership—the Utility provides support for forest restoration activities in public parks, especially for areas near streams and wetlands; and
- Many more!

SURFACE WATER METRICS:

In the big picture, surface water management efforts should be evaluated by the degree to which flooding that impacts the safety and property of the community is reduced or eliminated, and the degree to which environmental metrics improve. Changes in environmental metrics such as water quality parameters, physical stream habitat, and Benthic Index of Biotic Integrity (“bug”) scores are incremental, and they are the result of cumulative action by all members of the community. It has taken about 100 years to reach the current degraded state of our streams. Restoring degraded streams and lakes is a costly and long-term proposition—it may take another 100 years. That is why the Utility emphasizes preventing new problems together with solving existing problems. Although stormwater control for new development may seem expensive, restoring degraded streams is far more costly and the outcome is less certain.

Currently, the Utility is gathering annual metrics for 2020. Annual metrics from 2019 are summarized below:

- Inspected 7,498 catch basins
- Cleaned 1,719 catch basins
- Inspected 662 stormwater facilities
- Cleaned 139 stormwater facilities
- Completed 1,168 pipe video inspections, for a total of 116,027 feet of pipe
- Maintained good compliance with the NPDES Permit
- Provided 110 educational workshops, primarily through a consultant to teach school age children about the effects of stormwater
- Inspected 307 private stormwater systems
- Reached over 340,000 people region-wide with Pet Waste education
- Provided 5-6 additional construction site tree inspections per week (starting 2020)

SURFACE WATER AND STORMWATER REGULATIONS IN WASHINGTON STATE:

Surface Water programs and projects are guided both by state and federal regulations, and also by community priorities. Below is a summary of the major regulations under which Kirkland operates:

National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit: Phase II

The primary form of stormwater regulation is through the National Pollutant Discharge Elimination System Permit (NPDES) for Municipal Separate Storm Sewer Systems. Kirkland has been identified as a Phase II

municipal stormwater permittee and therefore must establish a stormwater program that complies with conditions in the Western Washington Phase II Municipal Stormwater Permit. The NPDES Permit allows municipalities to discharge stormwater from systems it owns and operates into receiving waters such as rivers, lakes, streams, and groundwater provided that they implement programs to reduce pollutants in stormwater to the “maximum extent practicable.”

Washington State Water Quality Standards

Water quality standards are established by the Department of Ecology and codified in State law. The water quality standards set the foundation to keep water clean and healthy and are used to assess the health of Washington’s surface water and set pollution limits. The standards have a three-part approach and cover (1) Designated uses, such as fishing, swimming, drinking water supply, and aquatic life (2) Numeric and narrative water quality criteria (3) Policies to protect waters from future pollution.

Federal Endangered Species Act—Listing of Chinook Salmon as Threatened

The Endangered Species Act (ESA) of 1973 is a federal legislation for both domestic and international conservation. The act aims to provide a framework to conserve and protect endangered and threatened species and their habitats. The Endangered Species Act is administered primarily by the U.S. Fish and Wildlife Service (FWS) of the Department of the Interior. Chinook Salmon are federally Listed as Threatened.

Washington Department of Fish and Wildlife—Hydraulic Project Approval Process

Washington State law ([RCW 77.55](#)) requires people planning construction or maintenance projects in or near state waters to get a Hydraulic Project Approval (HPA) from the Washington Department of Fish and Wildlife (WDFW). This includes most marine and fresh waters. An HPA ensures that construction is done in a manner that protects fish and their aquatic habitats.

SURFACE WATER MASTER PLAN UPDATE:

The surface and stormwater programs have operated under a Master Plan since 1994. The plan has been updated in 2005, 2014, and revised in 2015. With the *2014 Surface Water Master Plan* nearing the end of its planning horizon, the City needs to begin planning for the next 7-10 years. This next master plan update will maintain the same goals that were the foundation of the utility: reduce flooding, improve habitat, improve water quality, maintain infrastructure, and educate and engage the public.

Priorities that are driving this plan update are:

- Meeting new NPDES permit requirements and preparing for anticipated ones;
- Creating a new prioritized list of CIP projects that balances the overlapping goals of the Utility;
- Identifying and prioritizing new programmatic actions list (e.g., proactive approach to replacing aging and failing infrastructure, changing storm events and capacity issues, etc.); and
- Integrating with other City plans (e.g., *Sustainability Master Plan*, the *Station Area 85th Plan*, the *Transportation Master Plan*, etc.).

The City was able to secure external funding to support the master plan update and will be kicking off the update at the end of March/beginning of April of this year. The goal is to complete the plan and have Council adopt the plan by the end of 2022 to start 2023 with a new plan to guide the Utility’s work for the next 7-10 years.

Attachment A: Year Parcel Developed: 1900 - 1936

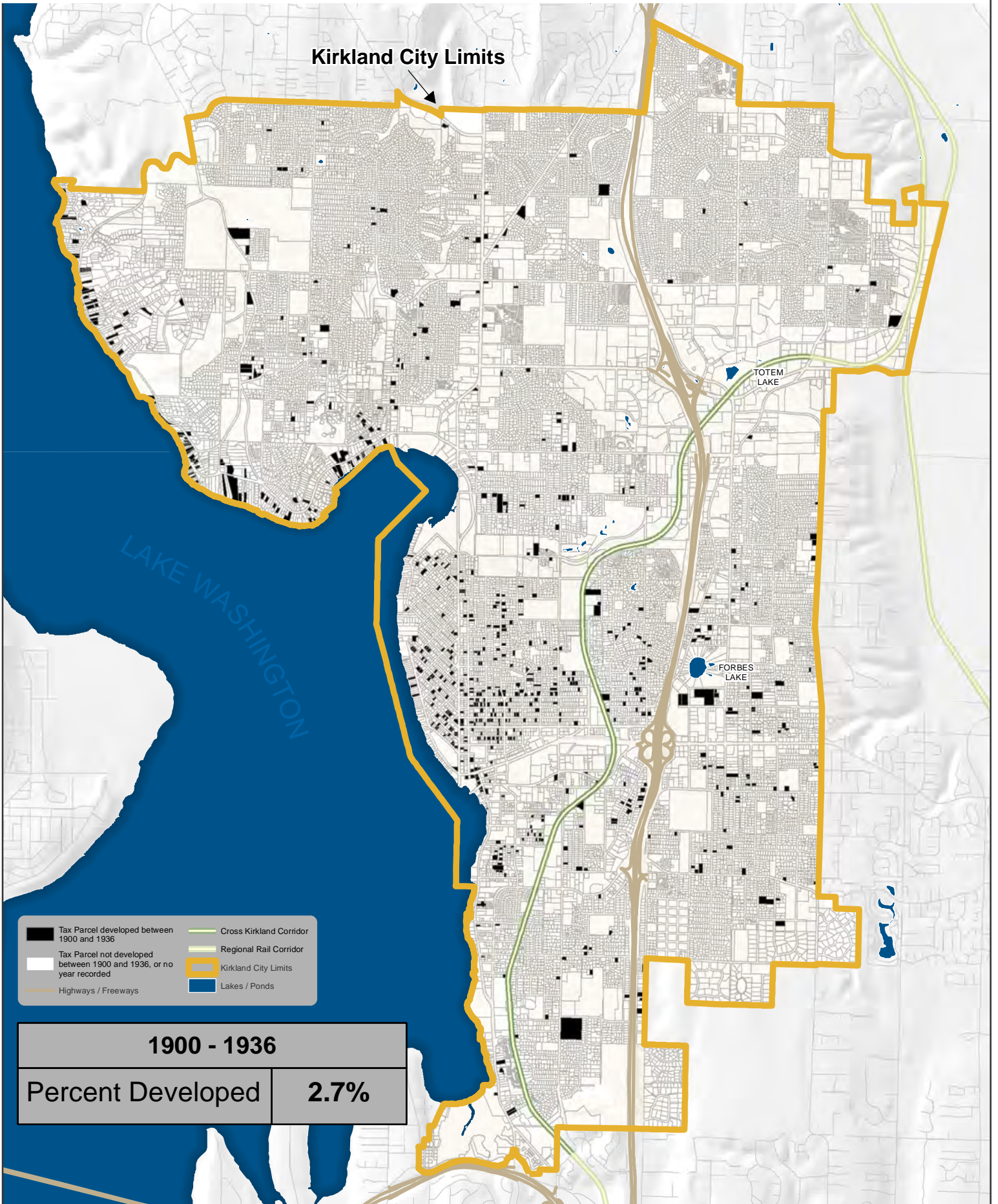
Attachment B: Year Parcel Developed: 1937 - 1959

Attachment C: Year Parcel Developed: 1960 - 1979

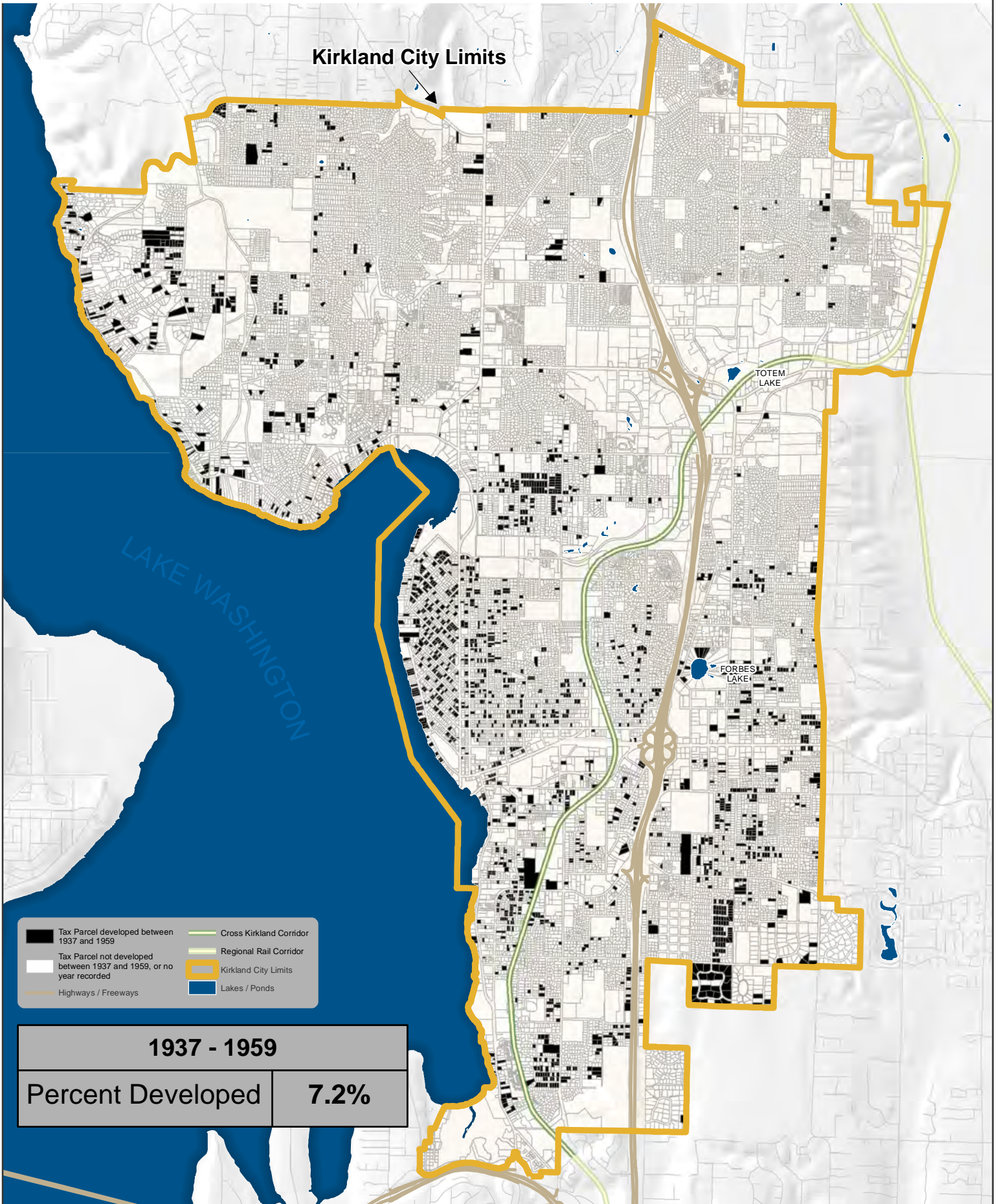
Attachment D: Year Parcel Developed: 1980 - 1999

Attachment E: Year Parcel Developed: 2000 and Later

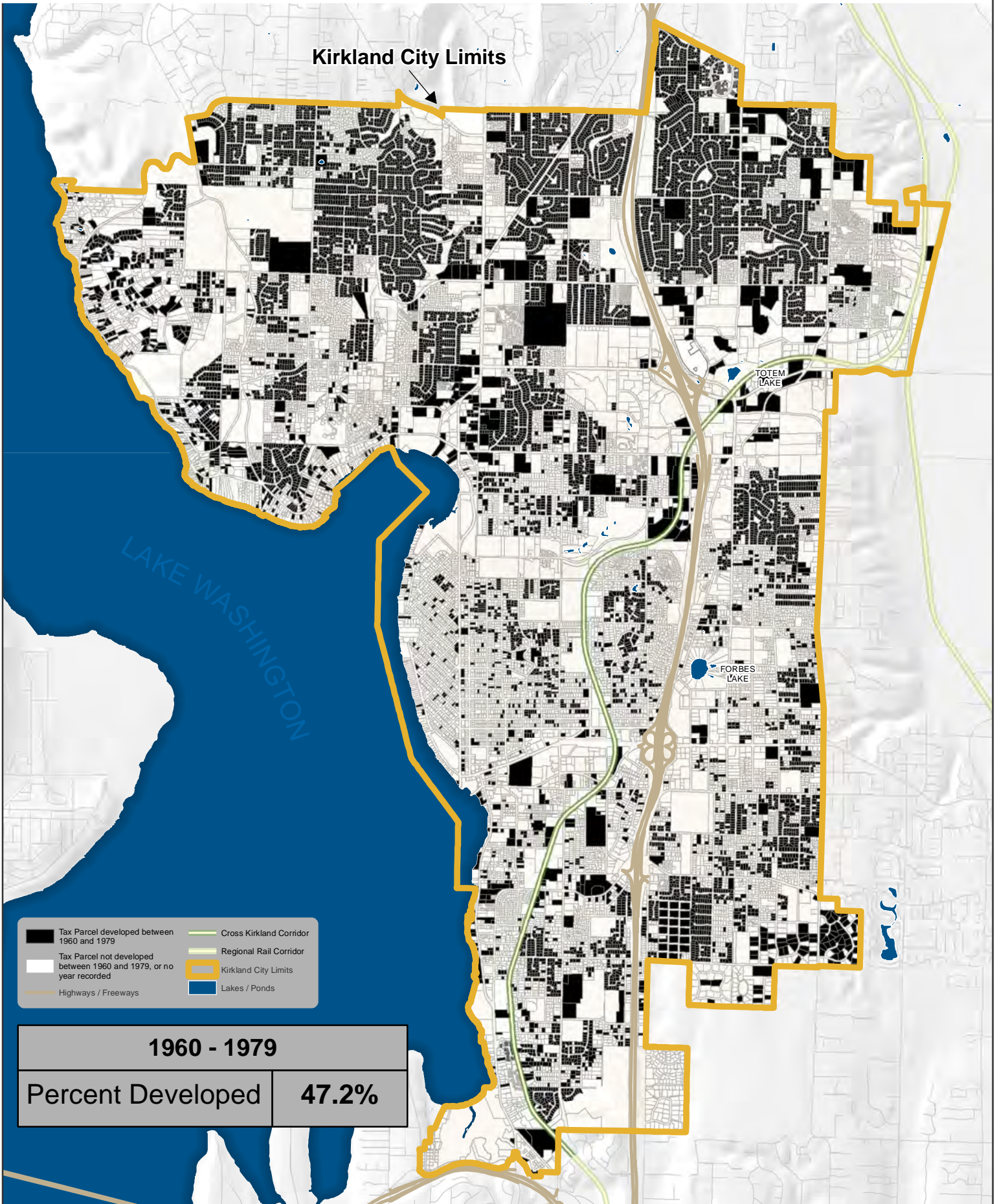
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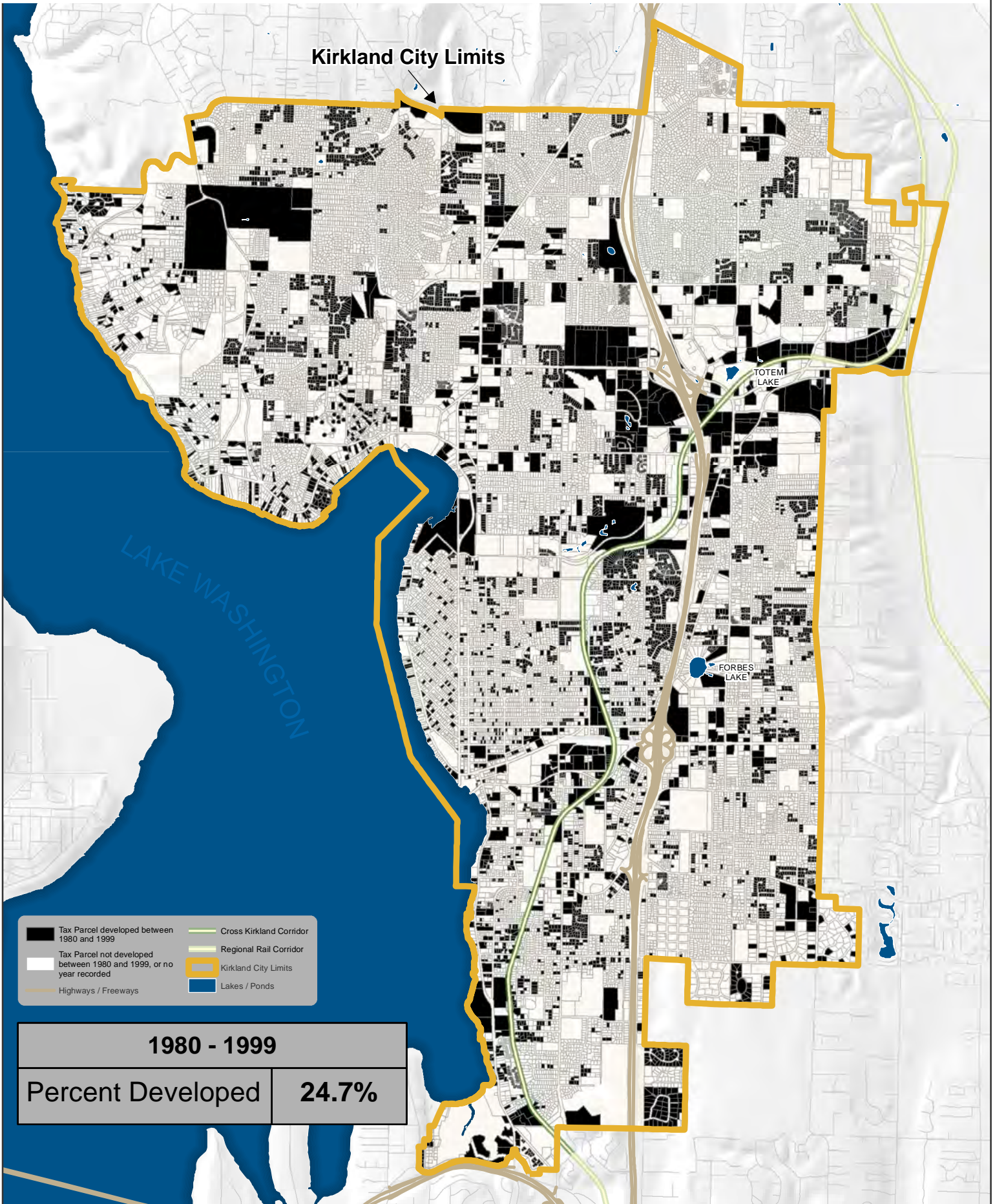
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