



Opportunity Mapping

Technical Addendum

July 2019

Funding for this document provided in part by member jurisdictions, grants from U.S. Department of Transportation, Federal Transit Administration, Federal Highway Administration and Washington State Department of Transportation. PSRC fully complies with Title VI of the Civil Rights Act of 1964 and related statutes and regulations in all programs and activities. For more information, or to obtain a Title VI Complaint Form, see <https://www.psrc.org/title-vi> or call 206-587-4819. Sign language, and communication material in alternative formats, can be arranged given sufficient notice by calling 206-464-7090, TTY Relay 711.

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Introduction	3
Background	4
Rationale for Update	5
Updates to Indicators in the Opportunity Index.....	7
Education	7
Economic Health	9
Housing and Neighborhood Quality.....	11
Mobility and Transportation	14
Health and Environment	16
Future Implementation.....	18
Map Description	18

Introduction

This addendum to the *Equity, Opportunity, and Sustainability in the Central Puget Sound Region* report¹, prepared in support of the Growing Transit Communities Strategy², documents a 2018 update to the Puget Sound Regional Council's Opportunity Mapping. Created in 2012 of a desire to better understand access to opportunities within the four-county region, PSRC's Opportunity Mapping presents a geographic analysis of where opportunity-rich and opportunity-poor neighborhoods exist. The updated index was recently used to assess the impact on access to opportunity for each alternative in the Regional Growth Strategy, a key component of VISION 2050 for guiding planning policies and actions across the region over the next three decades.

Opportunity Mapping provides a resource to PSRC, local member jurisdictions, and other interested parties by using a regional geography of opportunity to inform local decision-making processes. Scaled to United States Census tracts, this index uses a variety of data as indicators to assess regional measures of educational attainment, economic health, neighborhood and housing quality, mobility and transportation, and public and environmental health. As measures of current conditions, these metrics are likely to evolve as the underlying data changes due to shifts in demographics over time, as well as change in the conditions themselves. For this reason, it is necessary to update Opportunity Mapping at regular intervals to reflect levels of opportunity as they exist on the ground.

Additionally, this index and PSRC's own analysis of geographic displacement risk share a nexus with overall regional experiences of racial and social inequity. Neither Opportunity Mapping nor Displacement Risk Mapping can predict where displacement will occur, the magnitude of its occurrence, or how areas of opportunity will change in the future. However, by illuminating the relative severity of conditions and outcomes that influence levels of opportunity in the region, PSRC and its member jurisdictions will have an informed ability to craft policies and actions that target investments, projects, or programs to particular areas. These could include affordable housing, transportation, and other services to advance positive outcomes and mitigate historical racial and social disparities in access to opportunity.

¹ PSRC, *Equity, Opportunity, and Sustainability in the Central Puget Sound Region*, <https://www.psrc.org/sites/default/files/equoppsusreport2.pdf>

² <https://www.psrc.org/growing-transit-communities>

Background

Originally conceived as a geographical assessment tool within the Growing Transit Communities program, Puget Sound Regional Council created Opportunity Mapping for the region in partnership with the Kirwan Institute for the Study of Race and Ethnicity at the Ohio State University in 2011-2012. PSRC intended for this tool to directly assist with the implementation and monitoring of plans within the Growing Transit Communities program, especially with regards to regional housing policies and decisions on equitable distributions of resources. This is in alignment with the program requirements of the Sustainable Communities Initiative administered by the U.S. Department of Housing and Urban Development (HUD), from which PSRC received funding.

Since 2012, PSRC has applied Opportunity Mapping to a variety of other projects internally. These include use as a performance outcome criterion for project prioritization within the Regional Transportation Plan, project selection via the Transportation Improvement Program, and as an overlay for other regional analyses.

Several organizations and companies external to PSRC have also used Opportunity Mapping. Private consulting firms have used data from the Opportunity Index for market analysis and subarea planning projects within the region. King County Housing Authority has also used the index to form assessments of where tenant-based housing vouchers have been used in King County in order to adjust the calculation of voucher pricing, as well as for decision-making on property acquisitions based on opportunity scores. More generally, the Washington State Housing Trust Fund has included levels of opportunity as part of its review of Low-Income Housing Tax Credit applications.

Rationale for Update

During the scoping process for VISION 2050, an update to the VISION 2040 regional growth strategy, PSRC received numerous comments and recommendations to develop strategies addressing regional issues around equity and social justice. PSRC decided to include Opportunity Mapping as part of the performance evaluation process of developing alternative Regional Growth Strategies for the Draft Supplemental Environmental Impact Statement (DSEIS) within the VISION 2050 plan update. Since the adoption of VISION 2040 in 2008 and the creation of Opportunity Mapping in 2012, the demographics of the central Puget Sound region have changed, with significant regional shifts in racial populations and concentrations of poverty. In addition to these demographic changes, the underlying data for indicators of education, economic health, housing and neighborhood quality, mobility and transportation, and health and the environment may have also evolved. In order to more accurately map geographical access to opportunity, PSRC decided to update the data used in the Opportunity Index, allowing PSRC to judge potential equity outcomes based on projected growth patterns from the DSEIS Regional Growth Strategy alternatives, using more current neighborhood conditions across the region.

With preparing the DSEIS to the VISION 2050 plan as the impetus, PSRC made the decision to maintain the overall structure of the original Opportunity Index from 2012 and obtained the most recent data available for the existing indicator metrics, retaining the original data sources where applicable. This decision to utilize the same metrics within the update was considered appropriate for three reasons: 1) the approach represented a continuation of PSRC's prior investment in creating the index and did not propose to "reinvent the wheel;" 2) it was assumed that the original design of the index from 2012, and its underlying metrics, would still be applicable in 2018; and 3) this update approach permitted a relatively quick turnaround, allowing PSRC to use Opportunity Mapping as part of the development of the DSEIS for VISION 2050. This decision also allowed PSRC to preserve the index's continued use within the Growing Transit Communities strategy, the Regional Transportation Plan, and the Transportation Improvement Program.

It must be stressed, however, that there are some caveats to this update approach. As the original project was supported by grant funding from HUD, there were not additional funds available to purchase updated datasets from previously used proprietary sources. Some indicators from the original index were removed from the update due to local neighborhood conditions behind those metrics being no longer applicable in 2018.

The following section will describe updates made to the indicators used in the Opportunity Index, whether they be new data from the same source, new data sources, or both. Categories of indicators include metrics on Education, Economic Health, Housing and Neighborhood Quality, Mobility and Transportation, and Health and Environment. Some datasets were maintained from original sources due to reasons outlined above. Although the indicator metrics and the design of the index was largely carried over, PSRC did not perform a comparison analysis of the original index from 2012 and the update performed in 2018. PSRC considers such a direct comparison to not be feasible, as the design of the tool creates relative rather than absolute metrics within the overall index. Significantly, there are major changes in the geographical extent of each index that also preclude such a comparison; PSRC decided in 2012 to analyze levels of access to opportunity specifically within urban areas inside the regional Urban Growth Area boundaries, but in 2018 decided to expand the index to every census tract within the central Puget Sound region, including rural and natural resource areas.

Updates to Indicators in the Opportunity Index

Education

Indicator	2012 Index			2018 Update		
	Description	Source	Dates	Description	Source	Dates
Reading Test Scores	School proficiency on 4 th grade Reading in <i>Measurements of Student Progress</i> (MSP) testing	Washington State Report Card, Office of Superintendent of Public Instruction (OSPI)	2010-2011	School proficiency on 4 th grade English Language Arts (ELA) in <i>Smarter Balanced Assessments</i> (SBA) testing	Washington State Report Card, Office of Superintendent of Public Instruction (OSPI)	2016-2017
Math Test Scores	School proficiency on 4 th grade Math in <i>Measurements of Student Progress</i> (MSP) testing			School proficiency on 4 th grade Math in <i>Smarter Balanced Assessments</i> (SBA) testing		
Student Poverty	Percent of primary school students receiving free or reduced price meals			Percent of primary school students receiving free or reduced price meals		
Teacher Qualifications	Percent of primary school teachers who obtained a master's degree or higher			Percent of primary school teachers who obtained a master's degree or higher		
Graduation Rates	Percent of high school students who graduate on time (adjusted 5-year cohort)			Percent of high school students who graduate on time (adjusted 5-year cohort)		

For indicator metrics in the Education category, the original data source of the Office of the Superintendent of Public Instruction's *Washington State Report Card* was kept, and the data updated to years 2016-2017, the most recently available dataset in 2018. The primary difference was that Washington State transitioned to using national Common Core standards for math and English language arts instruction and joined the Smarter Balanced Assessment Consortium in 2015. The state replaced its previous *Measures of Student Progress* testing program with the new computer-based *Smarter Balanced Assessments* program. This new testing program uses a different range for student test scoring than the older program, but is placed into a similar four-level scale as before.

Education

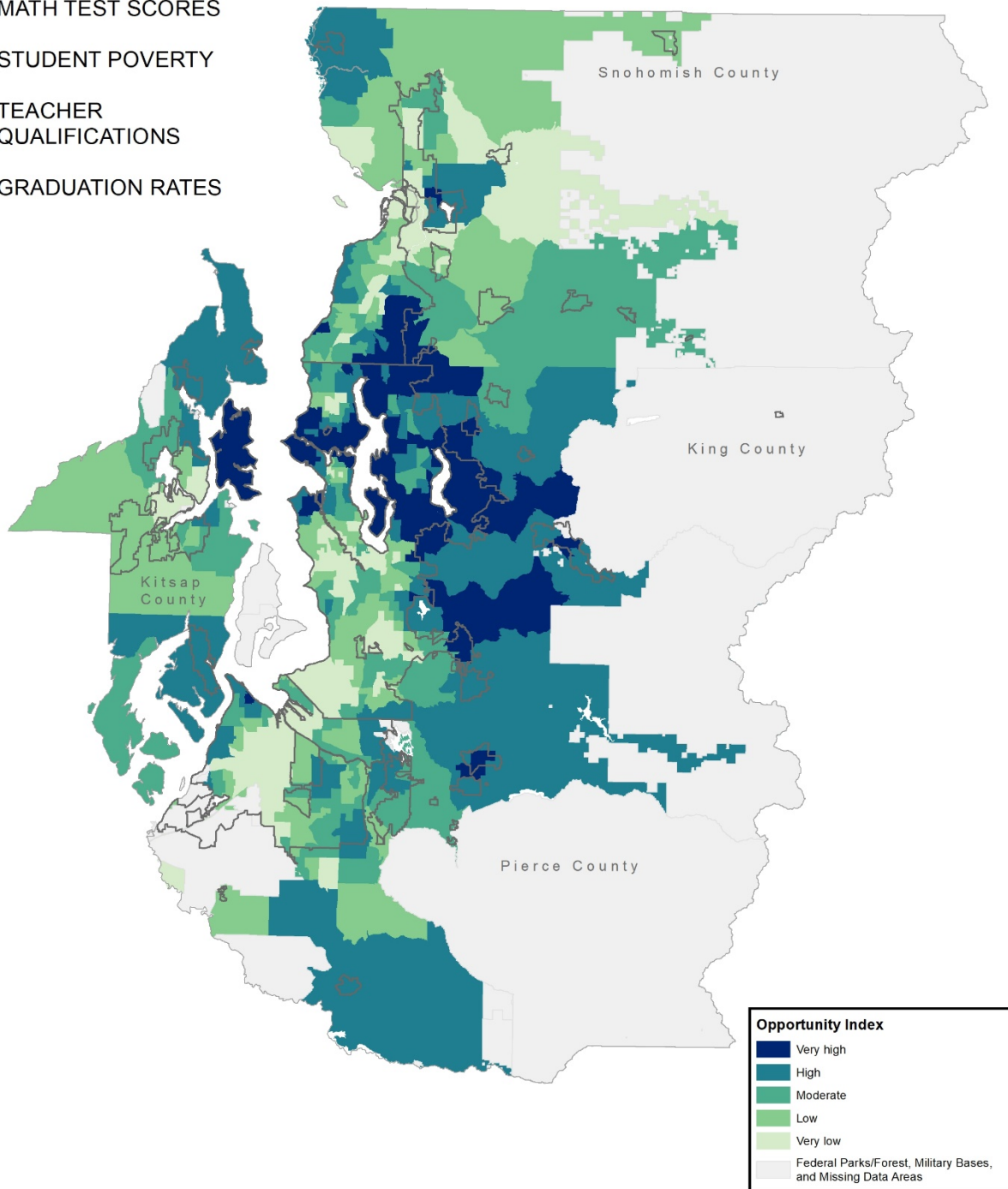
READING TEST SCORES

MATH TEST SCORES

STUDENT POVERTY

TEACHER
QUALIFICATIONS

GRADUATION RATES



Economic Health

Indicator	2012 Index			2018 Update		
	Description	Source	Dates	Description	Source	Dates
Access to Living Wage Jobs	Percent of all jobs that provide <i>living wages</i> (\$21.87/hr) within 15min travel time by auto & 30min by transit	Living wage (1 adult, 1 child): <i>Searching for Work That Pays</i> , Alliance for a Just Society. Jobs: <i>Covered Employment Estimates</i> , PSRC	2010 2008-2009	Percent of all jobs that provide <i>living wages</i> (\$27.87/hr) within 15min travel time by auto & 30min by transit	Living wage (1 adult, 1 child): <i>Living Wage Calculator</i> , MIT. Jobs: <i>Covered Employment Estimates</i> , PSRC	2017 2015-2016
Job Growth	Percent change in number of jobs between 2000 & 2010	<i>Covered Employment Estimates</i> , PSRC	2000-2010	Percent change in number of jobs between 2007 & 2017	<i>Covered Employment Estimates</i> , PSRC	2007-2017
Unemployment Rates	Percent of residents who reported being unemployed	<i>5-yr Estimates American Community Survey (ACS)</i> , US Census Bureau	2006-2010	Percent of residents who reported being unemployed	<i>5-yr Estimates American Community Survey (ACS)</i> , US Census Bureau	2012-2016

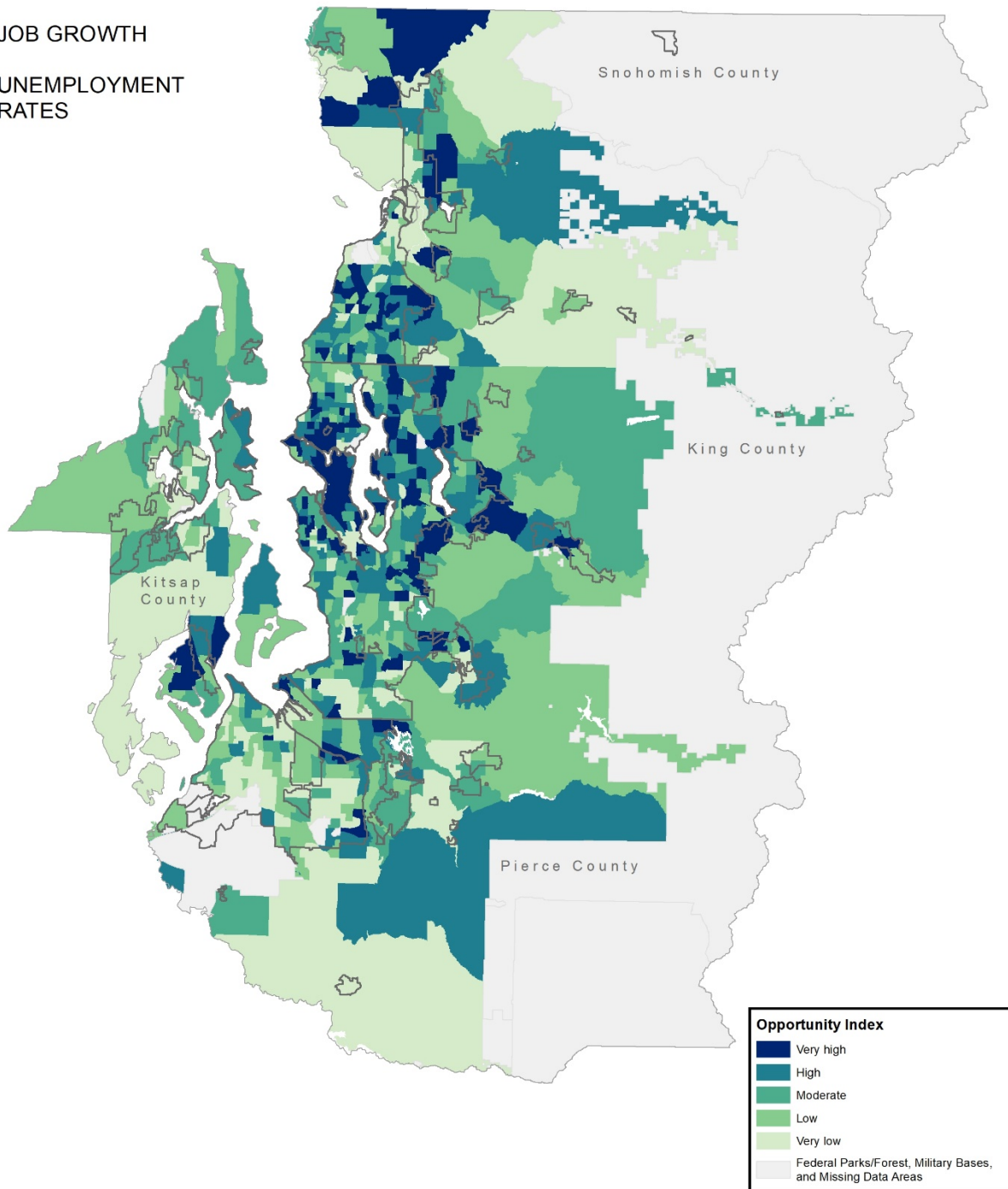
For indicator metrics in the Economic Health category, the living wage calculated for a household of one adult and one child within the Seattle-Bellevue-Tacoma Metropolitan Statistical Area was adjusted to an estimate derived from the Massachusetts Institute of Technology's Living Wage Calculator, using the value of the dollar in 2017. The source used for the original living wage calculation in 2012 no longer exists. The travel times by automobile and by transit were calculated using PSRC's internal regional travel model. PSRC uses data from Washington State Employment Security Department's Quarterly Census of Earnings and Wages (QCEW) to derive estimates of covered employment counts in the central Puget Sound region. These data reported in the QCEW lag by one year from the first quarter of the prior calendar year (March 2017). Data representing local unemployment rates were updated to the 2012-2016 5-Year Estimates produced by the U.S. Census Bureau in the American Community Survey (ACS). These estimates, released in December 2017, also lag by one year and represent the most recently available data at the time of update in 2018.

Economic Health

ACCESS TO LIVING
WAGE JOBS

JOB GROWTH

UNEMPLOYMENT
RATES



Housing and Neighborhood Quality

Indicator	2012 Index			2018 Update		
	Description	Source	Dates	Description	Source	Dates
Housing Vacancy Rates	Percent of all housing units that are vacant	<i>Decennial Census</i> , US Census Bureau	2010	Percent of all housing units that are vacant	<i>5-yr Estimates American Community Survey (ACS)</i> , US Census Bureau	2012-2016
Foreclosure Rates	Estimated foreclosure rates	<i>Neighborhood Stabilization Program (NSP)</i> , U.S. Department of Housing & Urban Dev. (HUD)	2008	Was not included – this was a one-time dataset & this phenomenon is largely no longer applicable		
High Cost Loan Rates	Percent of high cost loan (homes financed by subprime mortgage related plan)	<i>Neighborhood Stabilization Program (NSP)</i> , U.S. Department of Housing & Urban Dev. (HUD)	2004-2006	Was not included – this was a one-time dataset & this phenomenon is largely no longer applicable		
Housing Stock Condition	Percent of all households in poor condition (lack complete plumbing facilities) ³	<i>5-yr Estimates American Community Survey (ACS)</i> , US Census Bureau	2006-2010	Percent of all households in poor condition (lack complete plumbing facilities)	<i>5-yr Estimates American Community Survey (ACS)</i> , US Census Bureau	2012-2016
Crime Index	Estimated index based on all personal & property crimes relative to total population	<i>PCensus Dbx</i> , Tetrad Computer Applications, Inc.	2010	Was included but not updated – this was a one-time data purchase & there is no known available substitute; it is assumed that relative spatial distribution of crime has not changed dramatically		

While the original Opportunity Mapping from 2012 used five indicators in this category, PSRC removed two during the update in 2018. Rates of foreclosure and high cost housing loans from subprime mortgage plans, taken from HUD’s Neighborhood Stabilization Program, were deemed to be uniquely tied chronologically to the years immediately following the national “Great Recession.” HUD created the program in response to the housing-based financial crisis from the recession, and the data collection from the program was a one-time exercise. HUD released its last round of funding in 2010 and Washington State is in the process of closing out its program. As a result, these data represent a phenomenon that PSRC largely considered to be no longer applicable to the region in 2018.

³ Physical housing characteristics for occupied housing units, American Community Survey

The source for data representing rates of vacant housing units was changed from the 2010 Decennial Census to the 2012-2016 ACS 5-year Estimates – the most recently available data at the time. It should be noted, however, that data from the American Community Survey are collected from representative populations, rather than the total population, and therefore contain margins of error not present in the Decennial Census. Data for the housing stock condition indicator were updated to the 2012-2016 ACS 5-Year Estimates, which is only present in the American Community Survey.

The indicator representing an index of crime was carried over to the updated Opportunity Index but not updated with a new dataset. PSRC purchased these data from Tetrad Computer Applications, Inc. when creating the original index, and at the time of update there was no known publicly available substitute for the data. The United States as a whole has seen an overall decrease in the per capita crime rate since 2010⁴, and PSRC made the assumption that there was no significant change in the relative spatial distribution of crime rates that would warrant seeking out a new data source for the 2018 update.

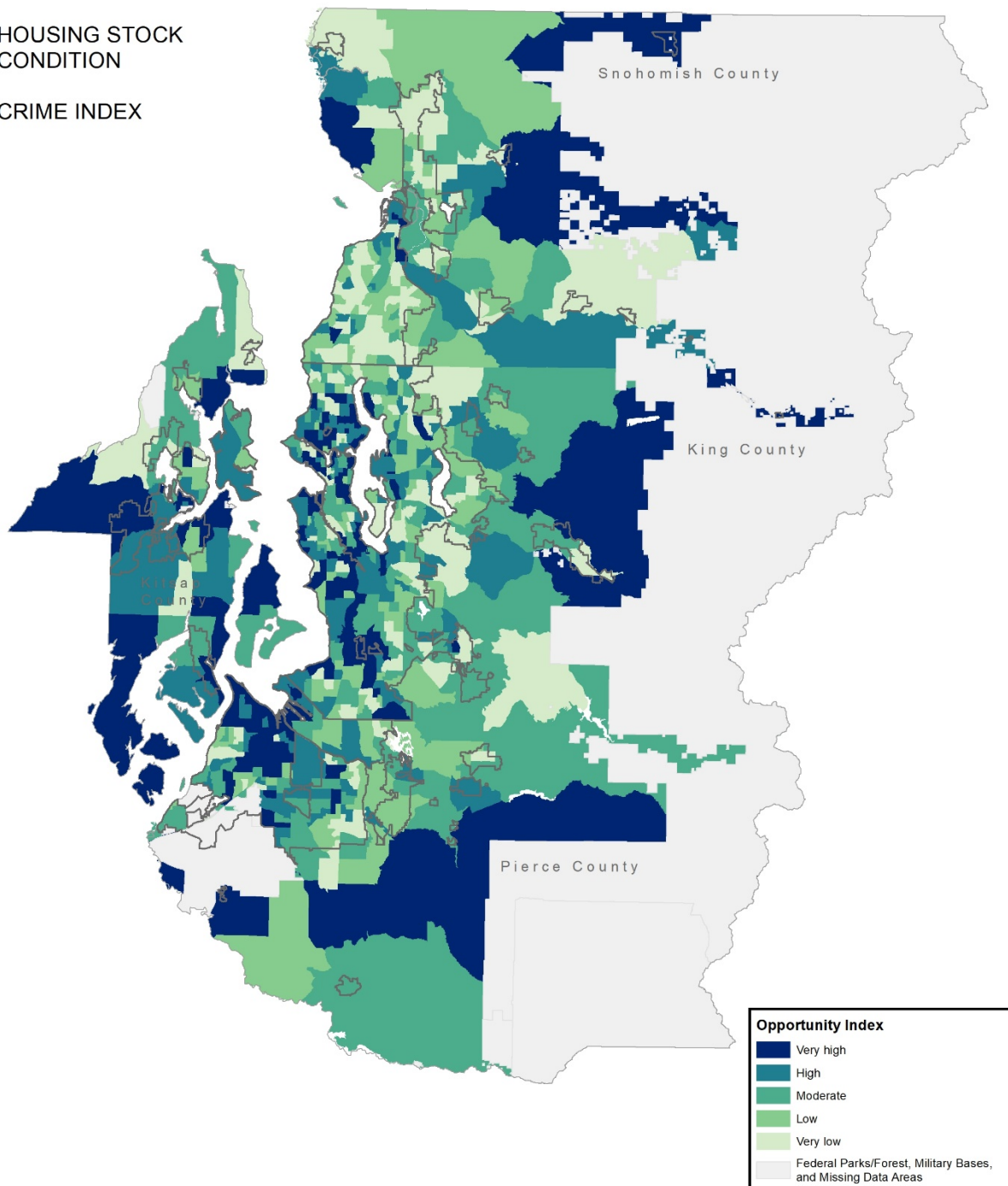
⁴ U.S. Federal Bureau of Investigation, *Crime in the U.S. 2017*, Table 1.
<https://ucr.fbi.gov/crime-in-the-u.s/2017/crime-in-the-u.s.-2017/topic-pages/tables/table-1>

Housing and Neighborhood Quality

HOUSING VACANCY
RATE

HOUSING STOCK
CONDITION

CRIME INDEX



Mobility and Transportation

Indicator	2012 Version			2018 Update		
	Description	Source	Dates	Description	Source	Dates
Drive Commute Cost	Cost of average commute to work at \$0.50/mile	PSRC	2008	Cost of average commute to work at \$0.53/mile	PSRC	2014
Access to Transit	Percent of area within ¼-mile of express bus stops	PSRC	2010	Percent of area within ¼-mile of high-capacity transit stops/stations	PSRC	2017
Transit Fare Cost	Cost of average transit fare	PSRC	2008	Cost of average transit fare	PSRC	2014
Walkability	Percent of all commuters who walk to work	<i>5-yr Estimates American Community Survey (ACS)</i> , US Census Bureau	2006-2010	Percent of all commuters who walk to work	<i>5-yr Estimates American Community Survey (ACS)</i> , US Census Bureau	2012-2016

Updated data from PSRC were used for the cost of commutes to work by single-occupancy automobile, representing an increase in the cost per mile driven. Data for the average cost of transit fare was updated using internal regional data from PSRC. Data for regional access to transit was updated to include high-capacity transit stops or stations, such streetcars or Sound Transit’s Link Light Rail. These transit options did not exist or were not included in the original metric, and the language of the updated indicator also reflects updated language used in the draft VISION 2050 plan. PSRC updated data representing the percent of commuters walking to work to the 2012-2016 ACS 5-Year Estimates.

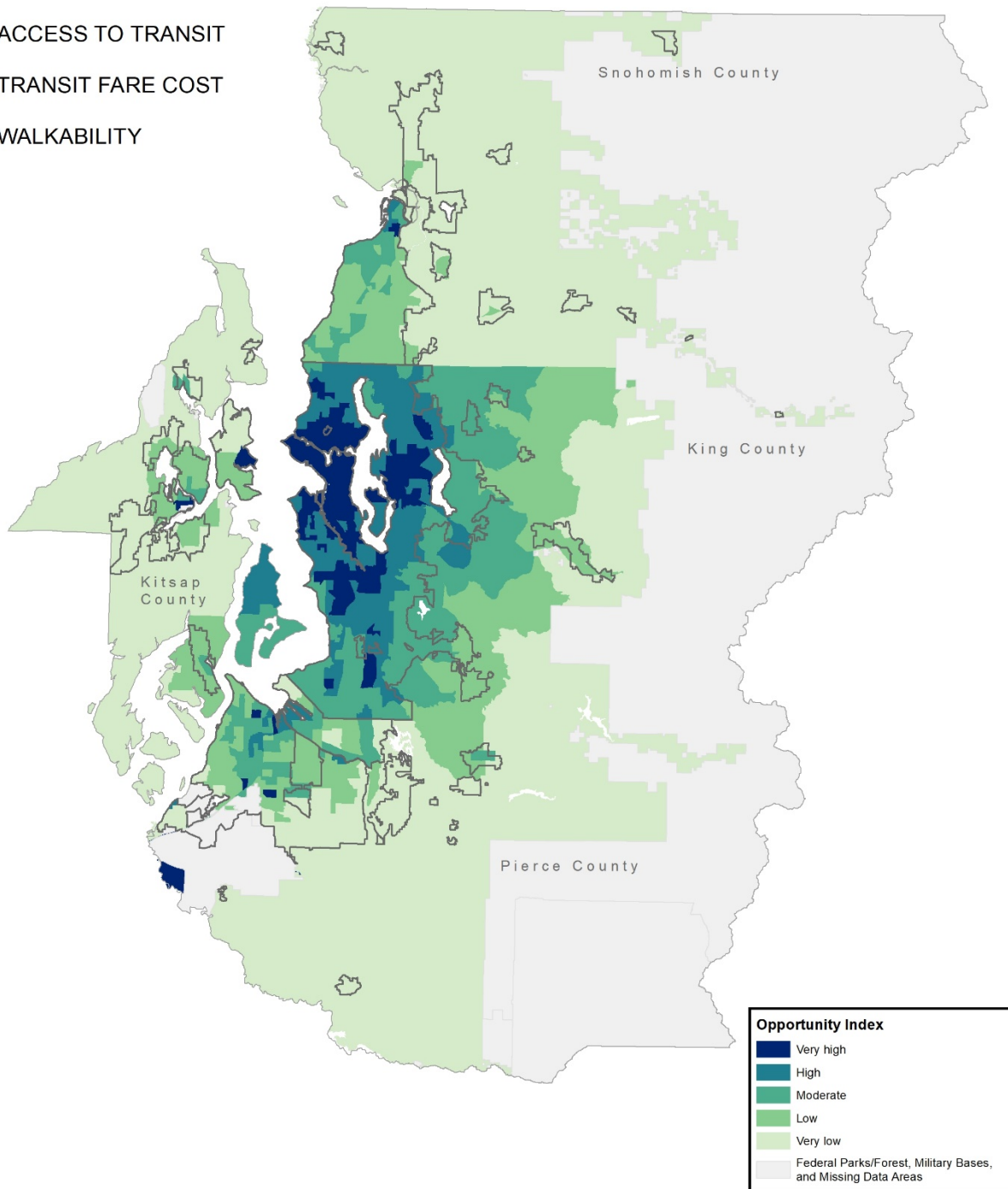
Mobility and Transportation

DRIVE COMMUTE
COST

ACCESS TO TRANSIT

TRANSIT FARE COST

WALKABILITY



Health and Environment

Indicator	2012 Version			2018 Update		
	Description	Source	Dates	Description	Source	Dates
Proximity to Park/Open Space	Distance to nearest park or open space	PSRC	2006	Distance to nearest park or open space	PSRC	2017
Proximity to Toxic Site Release	Pounds/square foot of toxic release from toxic waste sites within 2 miles	Environmental Protection Agency (EPA)	2010	Pounds/square foot of toxic release from toxic waste sites within 2 miles	Environmental Protection Agency (EPA)	2016
Access to Healthy Food	Percent of area within a food desert	<i>Identifying Food Deserts Access to Healthy Food in the Puget Sound Region</i> , PSRC & University of Washington	2011	Will be included but not updated – this was a one-time project & there is no known available substitute; it is assumed that relative access to healthy food has not changed dramatically		

Data for regional proximity to parks and open space areas was calculated by PSRC using the most recently available data in 2018. PSRC calculated release of toxic waste from toxic waste sites using the most recent data from the U.S. Environmental Protection Agency. Data from the original index representing regional access to healthy food sources was carried over to the 2018 index but not updated. These data came from a report (*Identifying Food Deserts: Access to Healthy Food in the Puget Sound Region*⁵) produced in 2011 by PSRC and the University of Washington's Department of Urban Design and Planning, and PSRC was not aware of any available substitute for the data at the time. It was also assumed that relative access to healthy food sources in the region had not changed dramatically between 2012 and 2018.

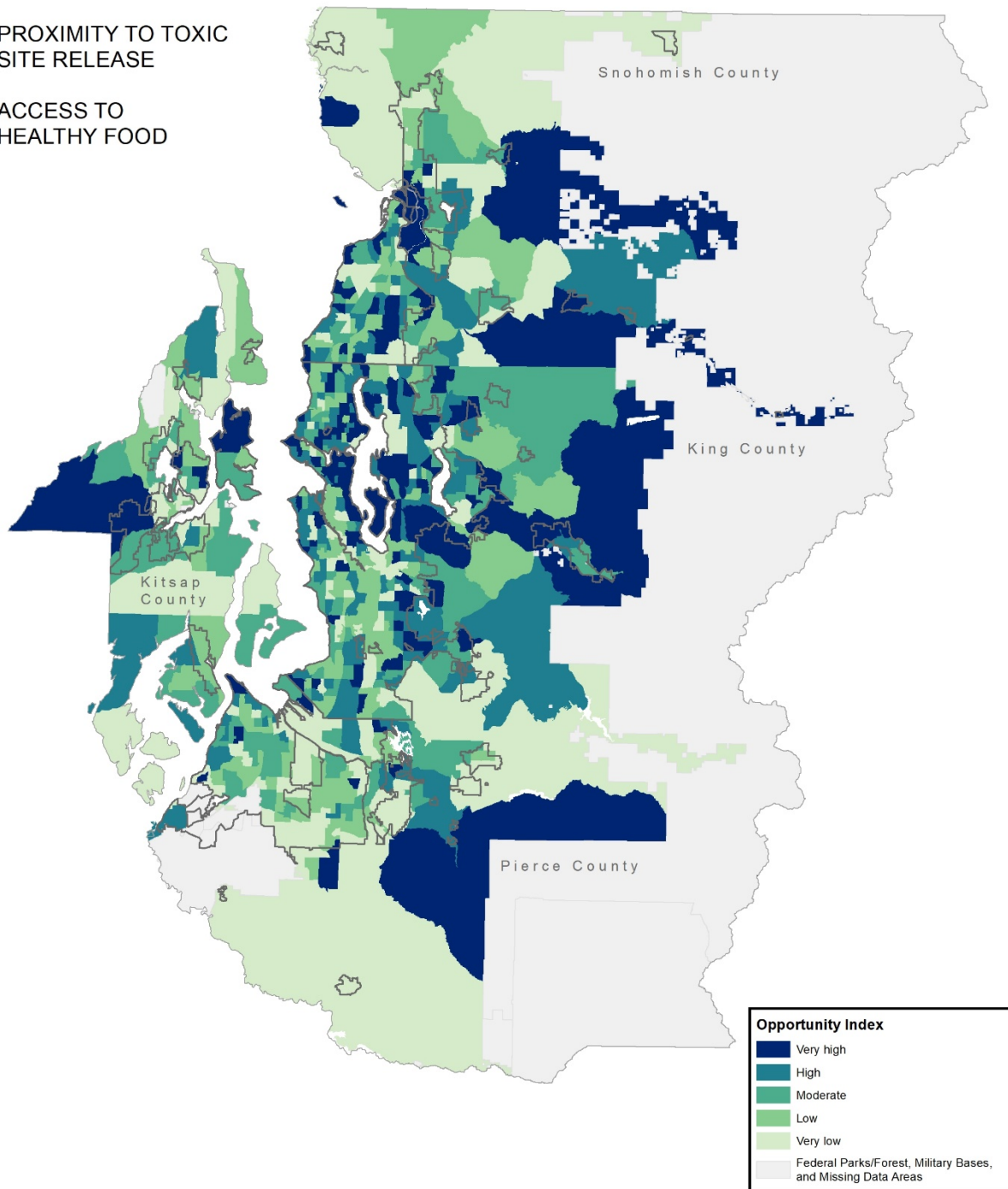
⁵ https://courses.washington.edu/studio67/psrcfood/Food_studio_docs/Vol05_Food_Deserts.pdf

Health and Environment

PROXIMITY TO PARK/
OPEN SPACE

PROXIMITY TO TOXIC
SITE RELEASE

ACCESS TO
HEALTHY FOOD



Future Implementation

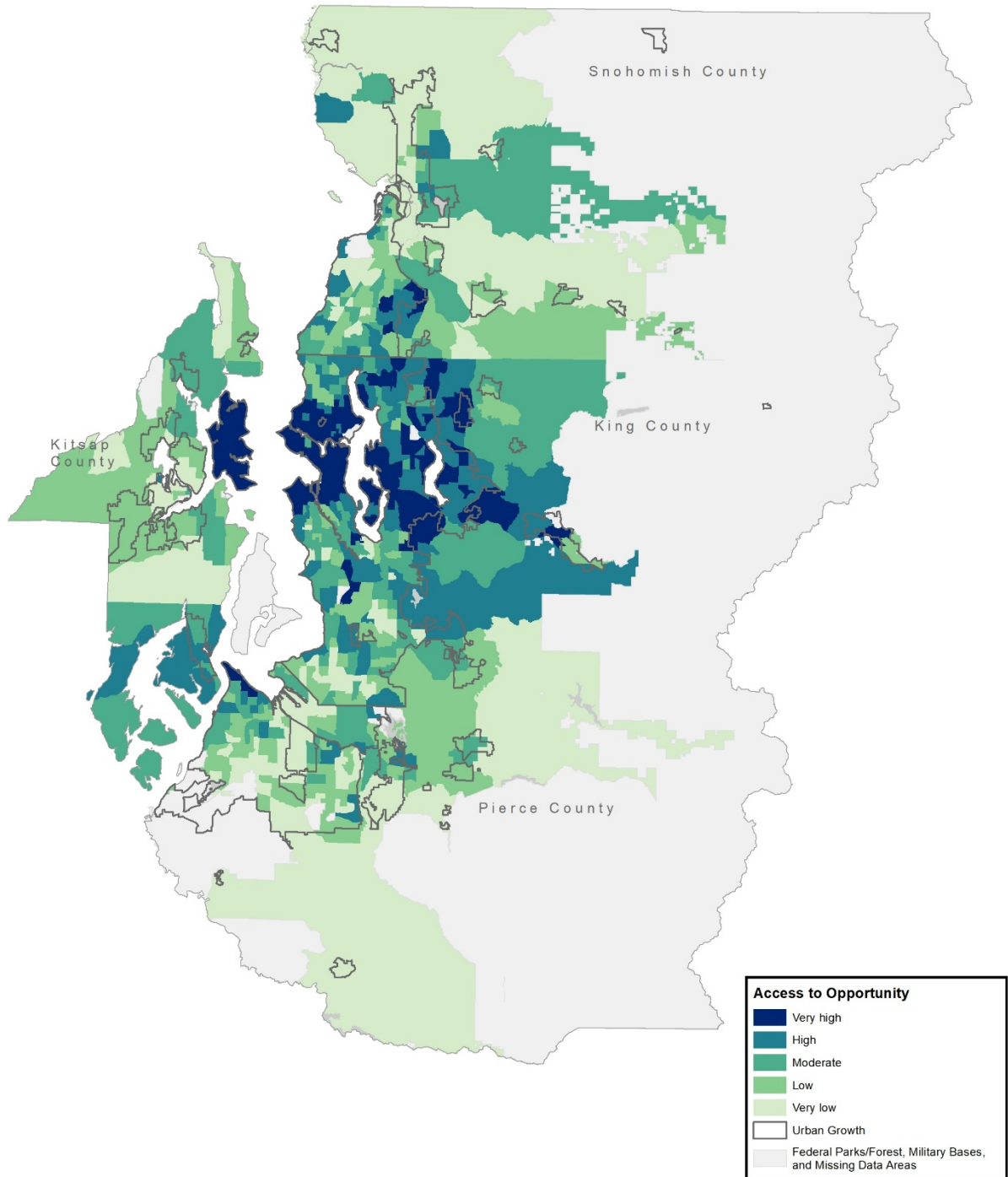
Since completing the update in 2018, PSRC has used Opportunity Mapping to evaluate growth alternatives in the VISION 2050 DSEIS and anticipates its continued use in developing the preferred Regional Growth Strategy alternative as part of the draft VISION 2050 plan, especially in tandem with Displacement Risk Mapping where issues concerning equity are significant. PSRC also intends to continue using the index for its original development purpose of helping to implement strategies within the Growing Transit Communities program. PSRC also sees great potential for Opportunity Mapping to inform decision-making and regional planning processes in the future.

To date, PSRC has and continues to receive requests from local member jurisdictions and organizations for information about PSRC's Opportunity Mapping and opportunity mapping in general. Recognizing that measures of opportunity differ across regions, PSRC envisions that as it works to further update and modify its opportunity mapping approach it can provide technical assistance to other organizations and help advance knowledge and best practices supporting the work of mapping access to opportunity.

Map Description

A map of the composite regional opportunity index is found on the following page. Census tracts in dark blue represent areas with higher access to opportunity ("very high" in the legend) and tracts in the lightest green represent areas with lower access to opportunity ("very low" in the legend). Relative to the four counties in the region, King County has the largest percent of area with greater access to opportunity (80% moderate to very high), with the central core of Seattle, cities on the east side of Lake Washington, and Mercer Island being notable examples. Areas in South King County, Pierce County including South Tacoma, and Snohomish County show relatively less access to opportunity in the region.

Opportunity Index



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