

TRANSPORTATION: Baseline

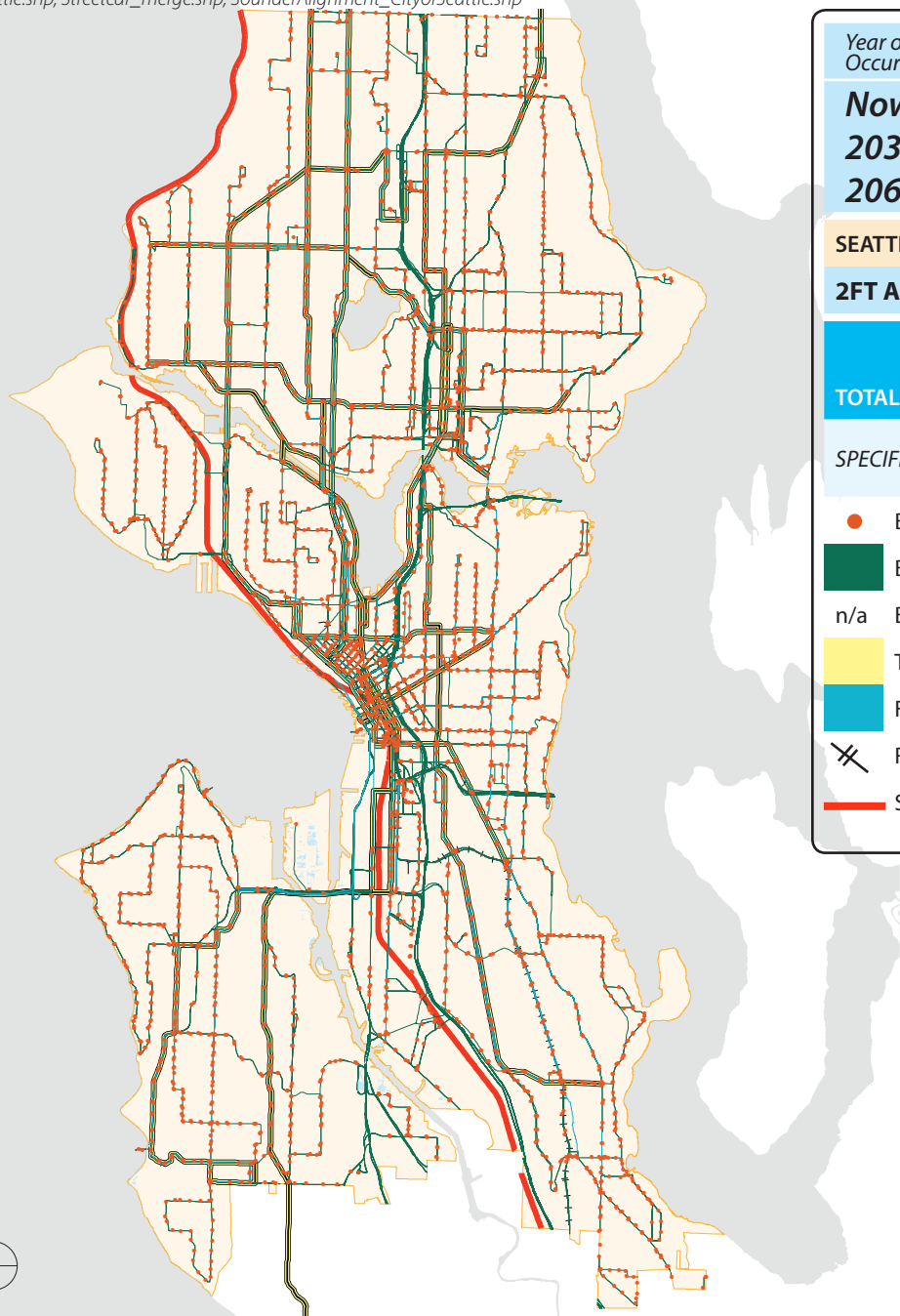


Transportation & Freight Impacts		BASELINE
Transit, CIP, Streets, Trucks & Rail		A Total Area (acres)
SEATTLE LAND AREA		53,238
TOTAL - TRANSPORTATION: TRANSIT		<i>(n/a; see specific data below)</i>
SPECIFIC TRANSIT TYPE		E Specific Transit (# or Linear FT)
● Bus Stops (count)		3,529 stops
■ Bus Routes		171 routes
n/a Bus Route Segment (LF)		14,880,852 Linear Feet
■ TMP Priority Corridor		633,598 Linear Feet
■ Frequent Transit Corridor (LF)		613,321 Linear Feet
✕ Rail: Light/Street Car/Mono (LF)		94,119 Linear Feet
— Sounder Train (LF)		94,748 Linear Feet
TOTAL - TRANSPORTATION: CIP & STREETS		<i>(n/a; see specific data below)</i>
— CIP: Pedestrian		124,367 Linear Feet
— CIP: Transit		792,439 Linear Feet
— CIP: Freight		18,715 Linear Feet
— CIP: ITS		236,098 Linear Feet
✕ Streets: Arterials		3,349,351 Linear Feet
TOTAL - FREIGHT: TRUCKS & RAIL		<i>(n/a; see specific data below)</i>
— Major Truck Routes		941,226 Linear Feet
✕ Freight Rail		185,972 Linear Feet

TRANSPORTATION IMPACTS: Transit

2FT
ABOVE MHHW

GIS data: Metro_RailLines_Seattle.shp, TransitMasterPlanPC, MetroRoutes_Seattle.shp, FrequentTransit.shp, BusStops_Seattle.shp, Streetcar_merge.shp, SounderAlignment_CityofSeattle.shp



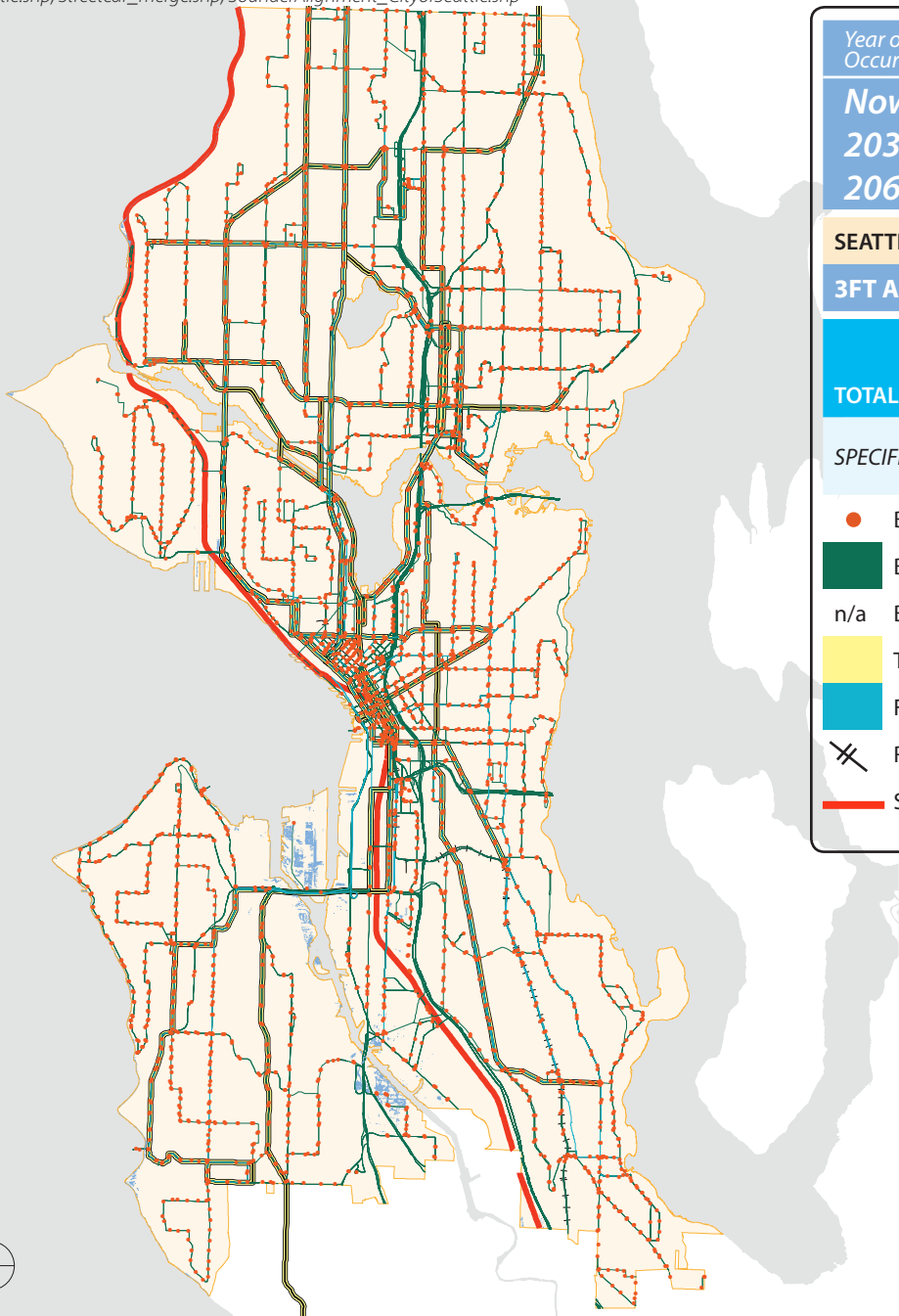
Year of Occurrence: FREQUENCY	BASELINE		IMPACTED	
Now: ANNUALLY	A Total Area (acres)	53,238	B Total Area Impacted	B/A = % of Total Baseline Seattle Land Area
2035: MONTHLY				
2060: DAILY				
SEATTLE LAND AREA				
2FT ABOVE MHHW (11' NAVD88)			120 acres	0.2%
TOTAL - TRANSPORTATION: TRANSIT	n/a, see specific data below			
SPECIFIC TRANSIT TYPE	E Specific Transit (# or Linear FT)	F Specific Transit Impacted	F/E = % of Specific Baseline Transit	
● Bus Stops (count)	3,529 stops	2 stops	0.06%	
■ Bus Routes	171 routes	14 routes	8.2%	
n/a Bus Route Segment (LF)	14,880,852 Linear Feet	2,556 LF	0.02%	
■ TMP Priority Corridor	633,598 Linear Feet	74 LF	0.01%	
■ Frequent Transit Corridor (LF)	613,321 Linear Feet	75 LF	0.01%	
✕ Rail: Light/Street Car/Mono (LF)	94,119 Linear Feet	n/a	n/a	
— Sounder Train (LF)	94,748 Linear Feet	25 LF	0.03%	



TRANSPORTATION IMPACTS: Transit

3FT
ABOVE MHHW

GIS data: Metro_RailLines_Seattle.shp, TransitMasterPlanPC, MetroRoutes_Seattle.shp, FrequentTransit.shp, BusStops_Seattle.shp, Streetcar_merge.shp, SounderAlignment_CityofSeattle.shp



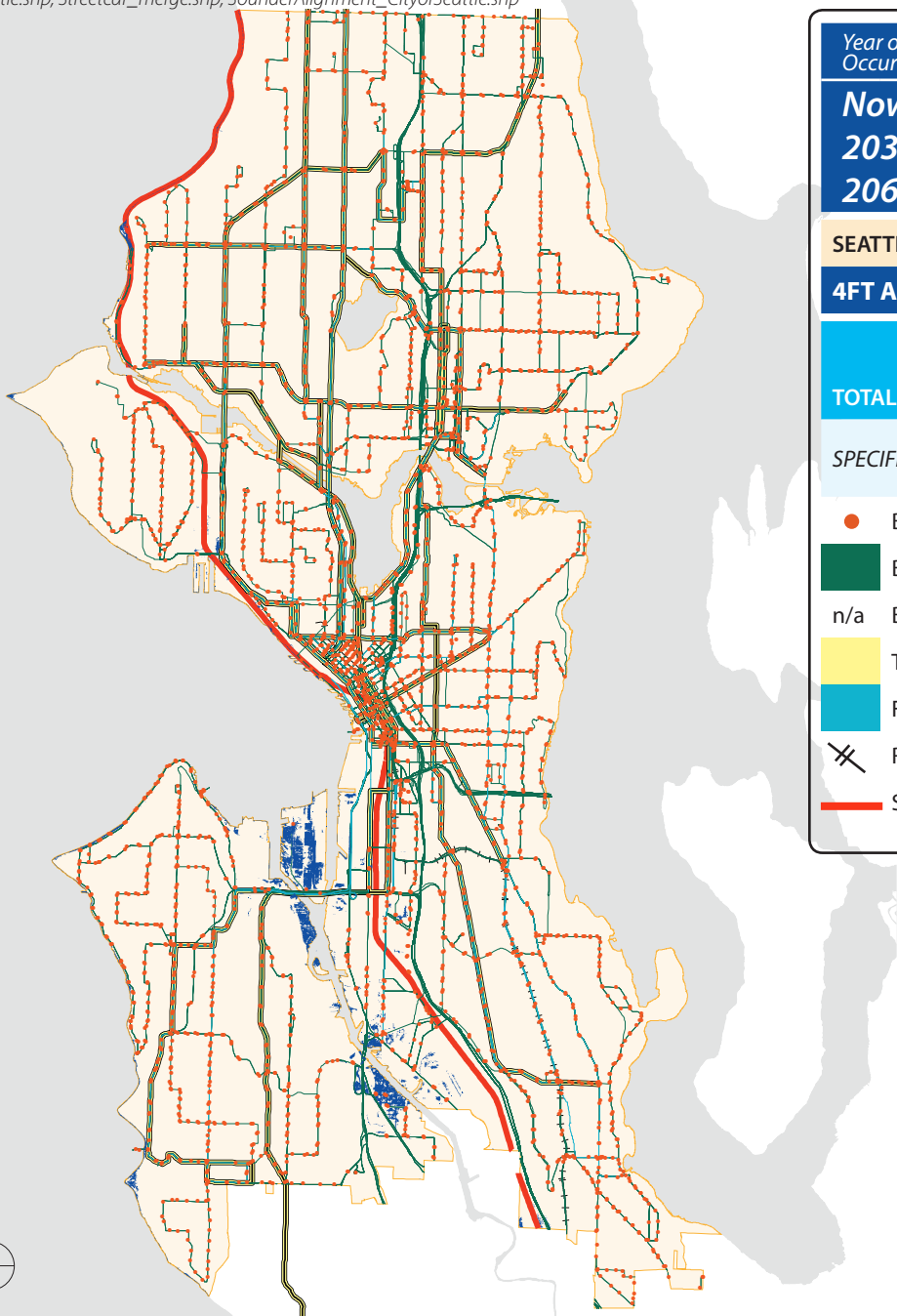
Year of Occurrence: FREQUENCY	BASELINE		IMPACTED	
Now: 100 YEAR 2035: ANNUALLY 2060: MONTHLY	A	B		B/A =
	Total Area (acres)	Total Area Impacted	% of Total Baseline Seattle Land Area	
SEATTLE LAND AREA	53,238			
3FT ABOVE MHHW (12' NAVD88)		259 acres	0.5%	
TOTAL - TRANSPORTATION: TRANSIT	n/a, see specific data below			
SPECIFIC TRANSIT TYPE	E	F	F/E =	
	Specific Transit (# or Linear FT)	Specific Transit Impacted	% of Specific Baseline Transit	
● Bus Stops (count)	3,529 stops	5 stops	0.14%	
■ Bus Routes	171 routes	14 routes	8.2%	
n/a Bus Route Segment (LF)	14,880,852 Linear Feet	5,988 LF	0.04%	
■ TMP Priority Corridor	633,598 Linear Feet	133 LF	0.02%	
■ Frequent Transit Corridor (LF)	613,321 Linear Feet	143 LF	0.02%	
✕ Rail: Light/Street Car/Mono (LF)	94,119 Linear Feet	n/a	n/a	
— Sounder Train (LF)	94,748 Linear Feet	38 LF	0.04%	



TRANSPORTATION IMPACTS: Transit

4FT
ABOVE MHHW

GIS data: Metro_RailLines_Seattle.shp, TransitMasterPlanPC, MetroRoutes_Seattle.shp, FrequentTransit.shp, BusStops_Seattle.shp, Streetcar_merge.shp, SounderAlignment_CityofSeattle.shp



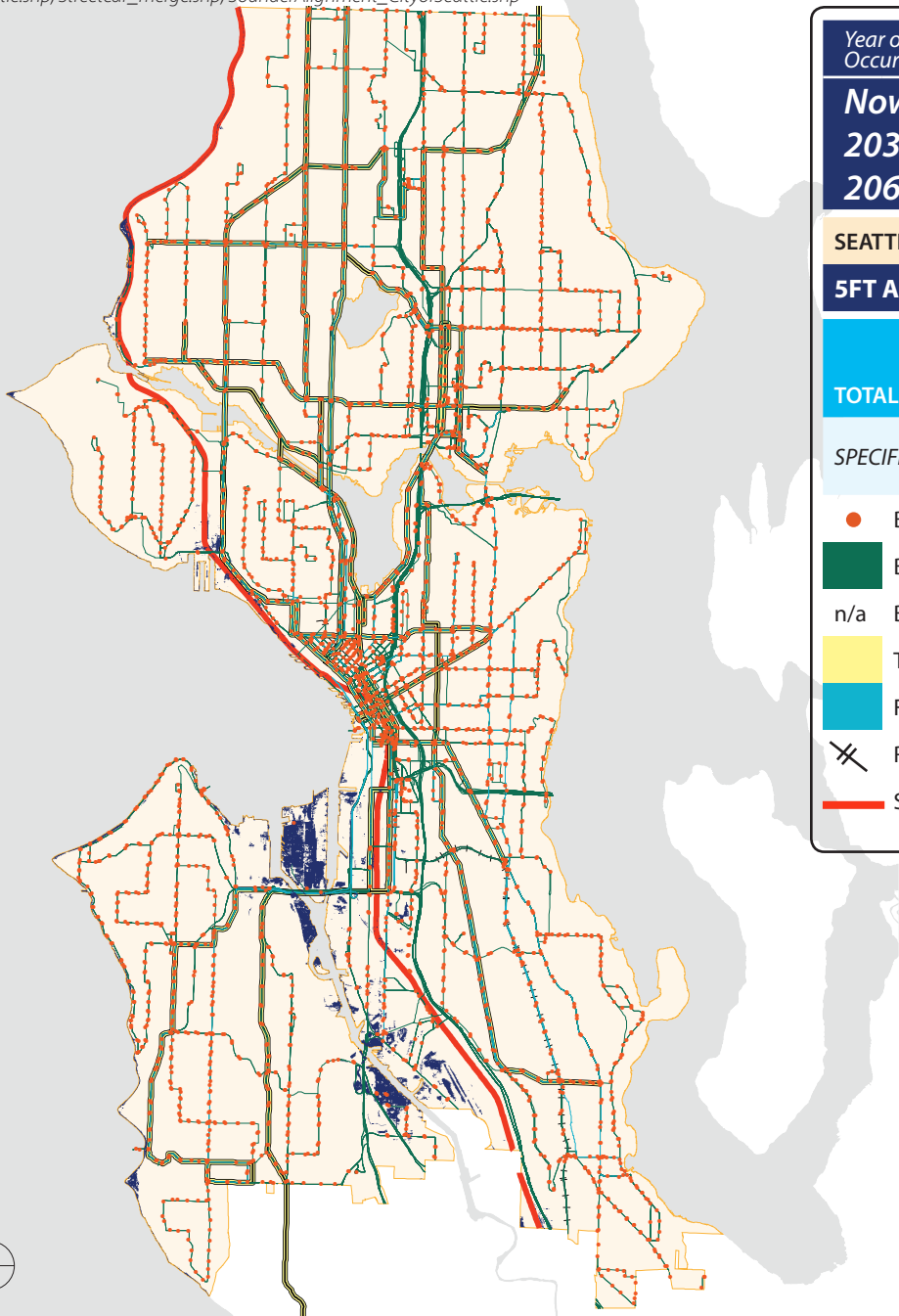
Year of Occurrence: FREQUENCY	BASELINE		IMPACTED	
Now: N/A	A Total Area (acres)	SEATTLE LAND AREA	B Total Area Impacted	B/A = % of Total Baseline Seattle Land Area
2035: 100 YEAR				
2060: ANNUALLY				
		53,238		
		4FT ABOVE MHHW (13' NAVD88)	478 acres	1.0%
TOTAL - TRANSPORTATION: TRANSIT		n/a, see specific data below		
SPECIFIC TRANSIT TYPE	E Specific Transit (# or Linear FT)	F Specific Transit Impacted	F/E = % of Specific Baseline Transit	
● Bus Stops (count)	3,529 stops	7 stops	0.2%	
■ Bus Routes	171 routes	17 routes	10%	
n/a Bus Route Segment (LF)	14,880,852 Linear Feet	10,989 LF	0.07%	
■ TMP Priority Corridor	633,598 Linear Feet	696 LF	0.11%	
■ Frequent Transit Corridor (LF)	613,321 Linear Feet	400 LF	0.07%	
✕ Rail: Light/Street Car/Mono (LF)	94,119 Linear Feet	n/a	n/a	
— Sounder Train (LF)	94,748 Linear Feet	175 LF	0.18%	



TRANSPORTATION IMPACTS: Transit

5FT
ABOVE MHHW

GIS data: Metro_RailLines_Seattle.shp, TransitMasterPlanPC, MetroRoutes_Seattle.shp, FrequentTransit.shp, BusStops_Seattle.shp, Streetcar_merge.shp, SounderAlignment_CityofSeattle.shp



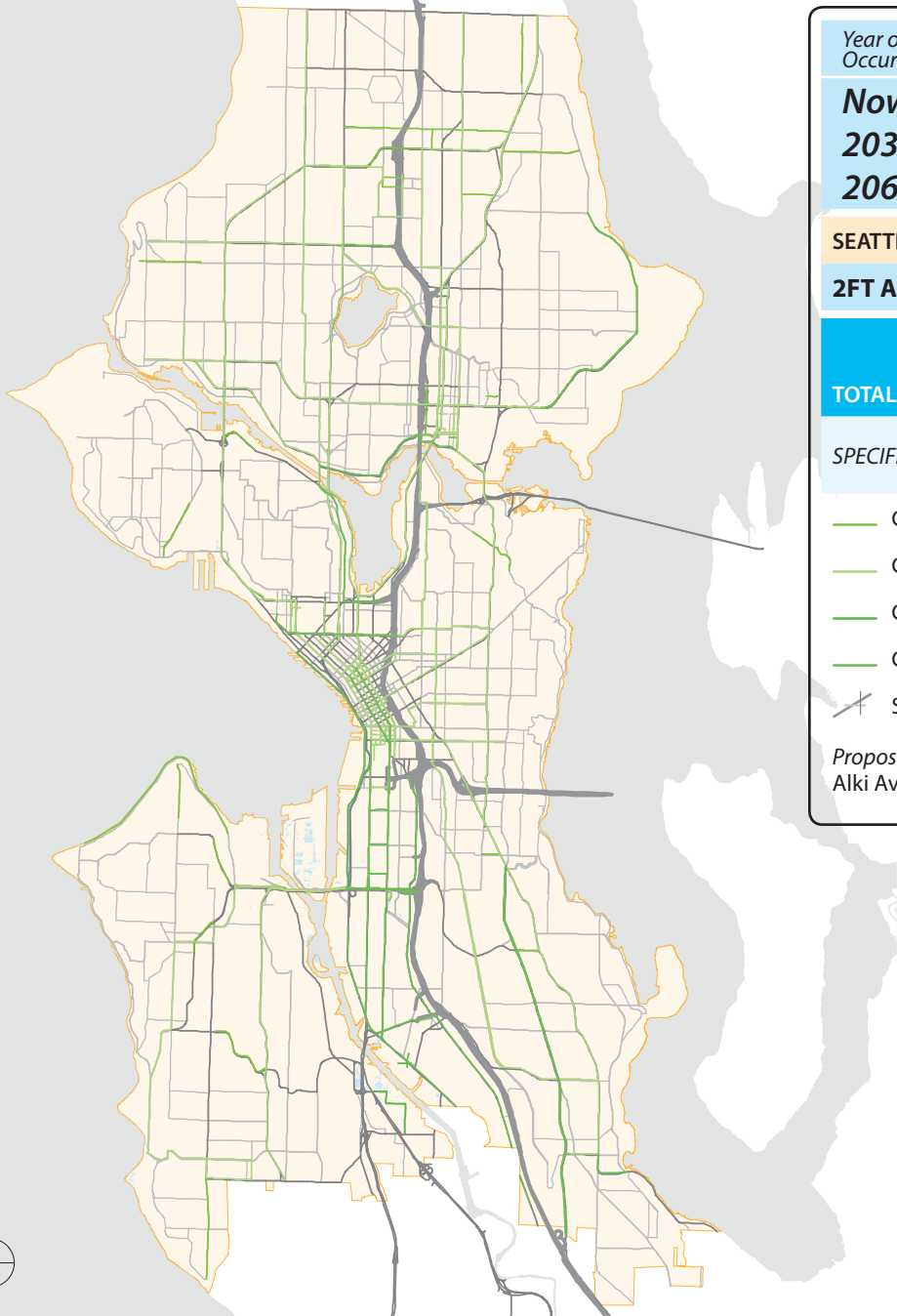
Year of Occurrence: FREQUENCY	BASELINE		IMPACTED	
Now: N/A	A Total Area (acres)	SEATTLE LAND AREA	B Total Area Impacted	B/A = % of Total Baseline Seattle Land Area
2035: N/A				
2060: 100 YEAR				
	53,238			
		5FT ABOVE MHHW (14' NAVD88)	771 acres	1.5%
TOTAL - TRANSPORTATION: TRANSIT		n/a, see specific data below		
SPECIFIC TRANSIT TYPE	E Specific Transit (# or Linear FT)	F Specific Transit Impacted	F/E = % of Specific Baseline Transit	
● Bus Stops (count)	3,529 stops	9 stops	0.26%	
■ Bus Routes	171 routes	35 routes	20.5%	
n/a Bus Route Segment (LF)	14,880,852 Linear Feet	26,440 LF	0.18%	
■ TMP Priority Corridor	633,598 Linear Feet	1,344 LF	0.21%	
■ Frequent Transit Corridor (LF)	613,321 Linear Feet	1,257 LF	0.20%	
✕ Rail: Light/Street Car/Mono (LF)	94,119 Linear Feet	n/a	n/a	
■ Sounder Train (LF)	94,748 Linear Feet	279 LF	0.29%	



TRANSPORTATION IMPACTS: CIP & Streets

2FT
ABOVE MHHW

GIS data: CIP_PropProj.shp, Street Network_Seattle.shp



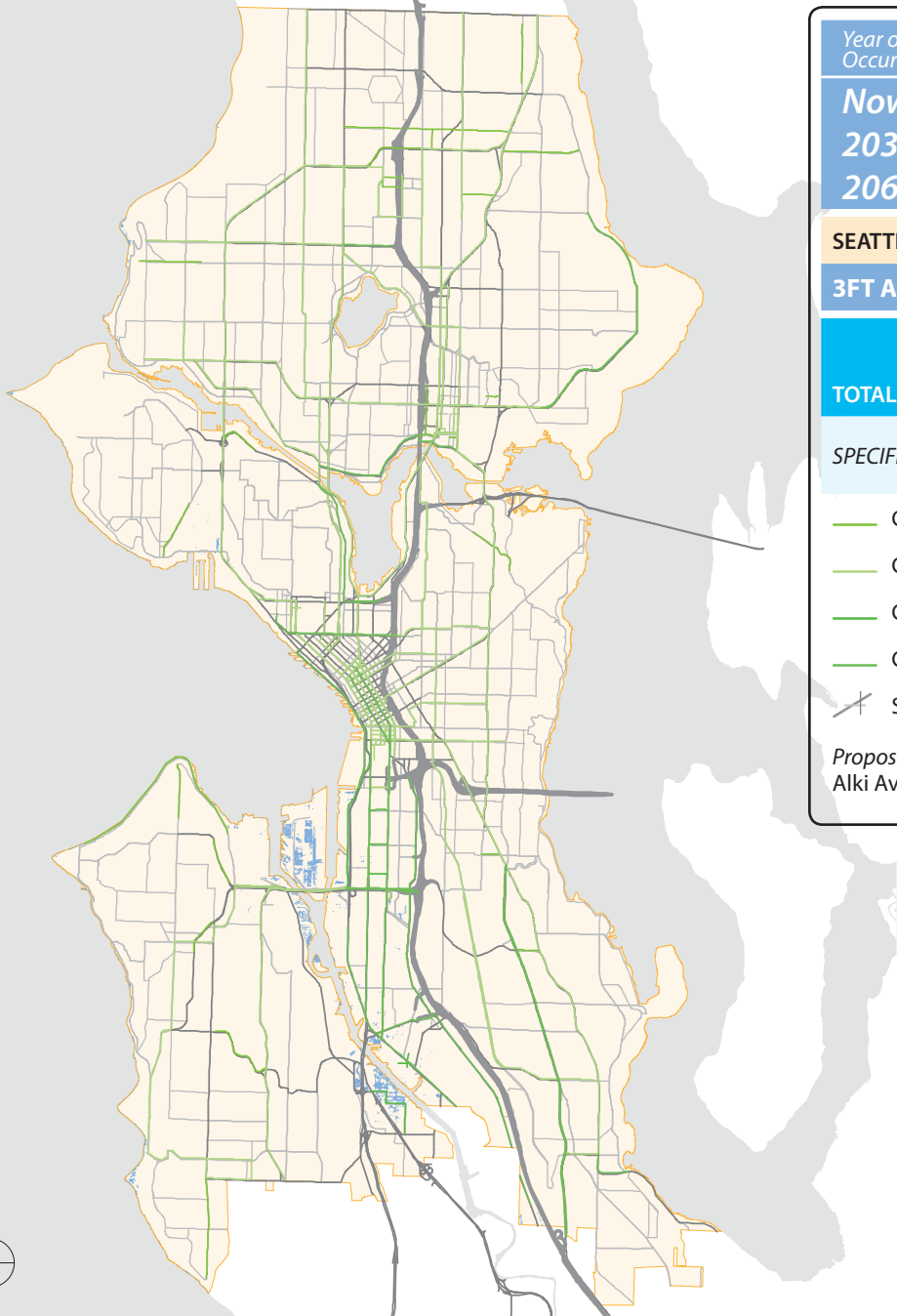
Year of Occurrence: FREQUENCY	BASELINE		IMPACTED	
Now: ANNUALLY	A Total Area (acres)	53,238	B Total Area Impacted	B/A = % of Total Baseline Seattle Land Area
2035: MONTHLY				
2060: DAILY				
SEATTLE LAND AREA				
2FT ABOVE MHHW (11' NAVD88)			120 acres	0.2%
TOTAL - TRANSPORTATION: CIP & STREETS	n/a, see specific data below			
SPECIFIC CIP & STREETS	E Baseline Length (Linear FT)	F Impacted Length	F/E = % of Baseline Length	
— CIP: Pedestrian	124,367 Linear Feet	1,139	0.92%	
— CIP: Transit	792,439 Linear Feet	n/a	n/a	
— CIP: Freight	18,715 Linear Feet	369	1.97%	
— CIP: ITS	236,098 Linear Feet	n/a	n/a	
✂ Streets: Arterials	3,349,351 Linear Feet	549	0.02%	
<i>Proposed Capital Improvement Projects (CIP) in Impacted Areas:</i> Alki Ave SW PMP Corridor, Duwamish Local Freight Access Improvements				



TRANSPORTATION IMPACTS: CIP & Streets

3FT
ABOVE MHHW

GIS data: CIP_PropProj.shp, Street Network_Seattle.shp



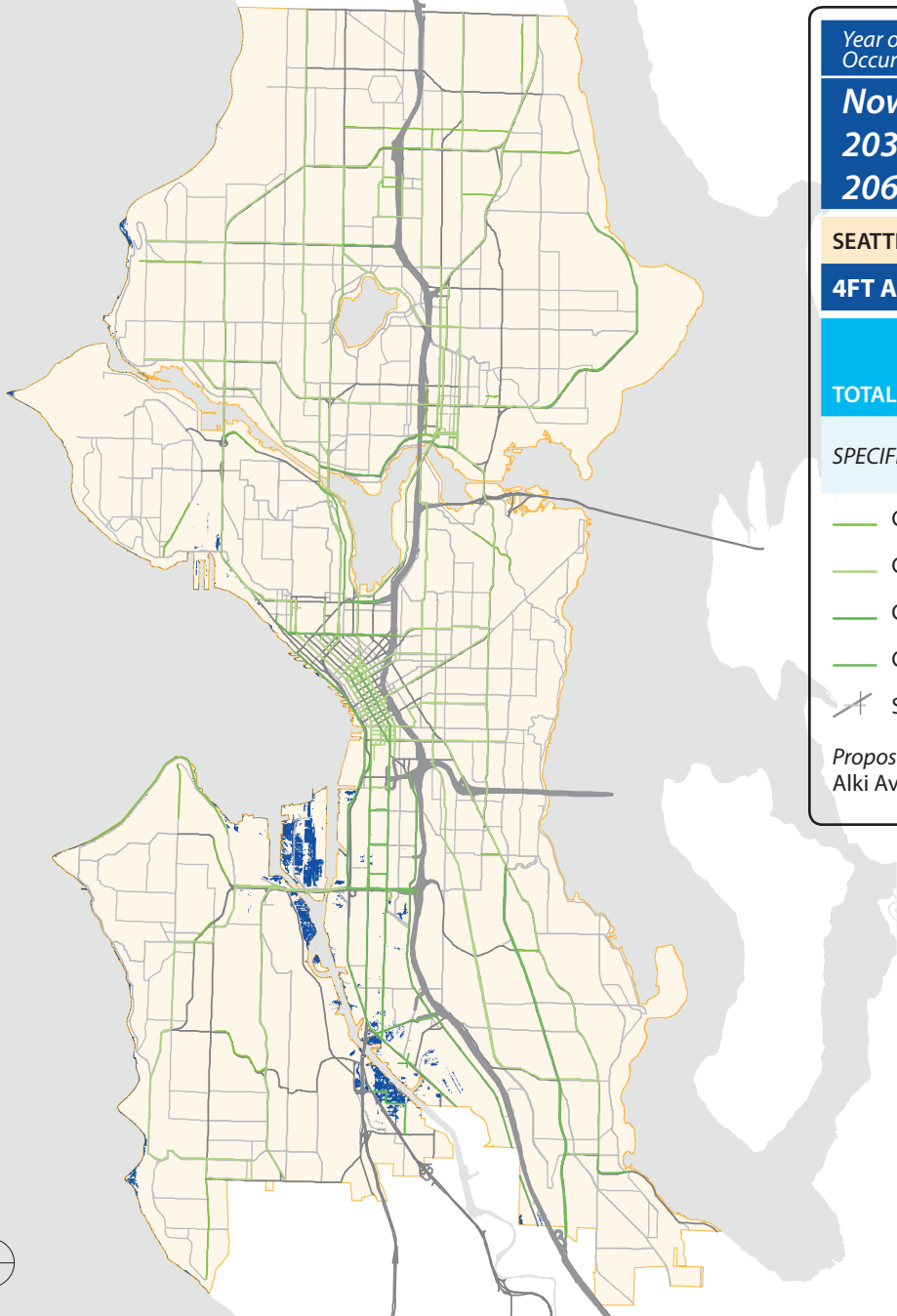
Year of Occurrence: FREQUENCY	BASELINE		IMPACTED	
Now: 100 YEAR 2035: ANNUALLY 2060: MONTHLY	A Total Area (acres)		B Total Area Impacted	B/A = % of Total Baseline Seattle Land Area
SEATTLE LAND AREA	53,238			
3FT ABOVE MHHW (12' NAVD88)			259 acres	0.5%
TOTAL - TRANSPORTATION: CIP & STREETS n/a, see specific data below				
SPECIFIC CIP & STREETS	E Baseline Length (Linear FT)	F Impacted Length	F/E = % of Baseline Length	
— CIP: Pedestrian	124,367 Linear Feet	1,793	1.4%	
— CIP: Transit	792,439 Linear Feet	n/a	n/a	
— CIP: Freight	18,715 Linear Feet	1,430	7.6%	
— CIP: ITS	236,098 Linear Feet	n/a	n/a	
⚡ Streets: Arterials	3,349,351 Linear Feet	2,463	0.1%	
Proposed Capital Improvement Projects (CIP) in Impacted Areas: Alki Ave SW PMP Corridor, Duwamish Local Freight Access Improvements				



TRANSPORTATION IMPACTS: CIP & Streets

4FT
ABOVE MHHW

GIS data: CIP_PropProj.shp, Street_Network_Seattle.shp



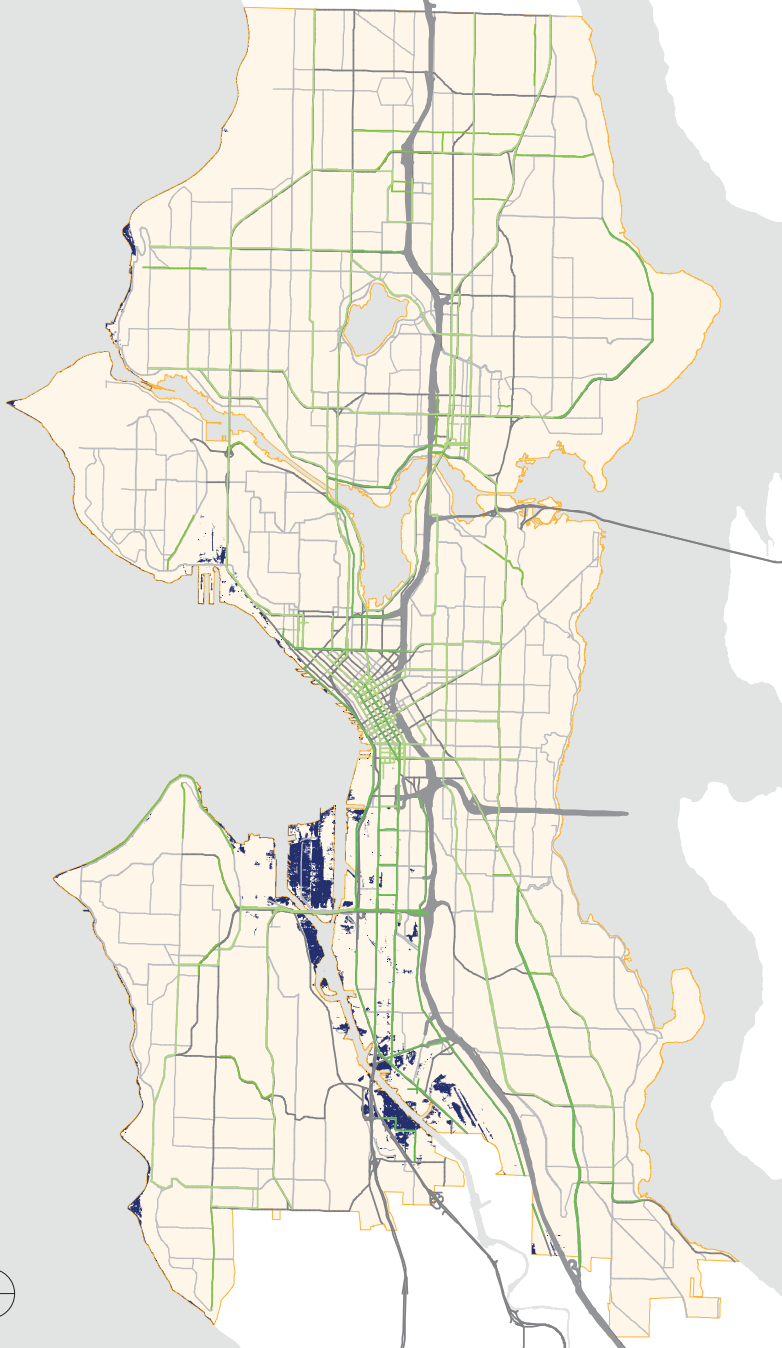
Year of Occurrence: FREQUENCY	BASELINE		IMPACTED	
Now: N/A	A Total Area (acres)	53,238	B Total Area Impacted	B/A = % of Total Baseline Seattle Land Area
2035: 100 YEAR				
2060: ANNUALLY				
SEATTLE LAND AREA				
4FT ABOVE MHHW (13' NAVD88)			478 acres	1.0%
TOTAL - TRANSPORTATION: CIP & STREETS				
	n/a, see specific data below			
SPECIFIC CIP & STREETS	E Baseline Length (Linear FT)		F Impacted Length	F/E = % of Baseline Length
— CIP: Pedestrian	124,367 Linear Feet		3,154	2.5%
— CIP: Transit	792,439 Linear Feet		436	0.1%
— CIP: Freight	18,715 Linear Feet		1,552	8.3%
— CIP: ITS	236,098 Linear Feet		n/a	n/a
✂ Streets: Arterials	3,349,351 Linear Feet		5,312	0.16%
Proposed Capital Improvement Projects (CIP) in Impacted Areas: Alki Ave SW PMP Corridor, Duwamish Local Freight Access Improvements				



TRANSPORTATION IMPACTS: CIP & Streets

5FT
ABOVE MHHW

GIS data: CIP_PropProj.shp, Street Network_Seattle.shp



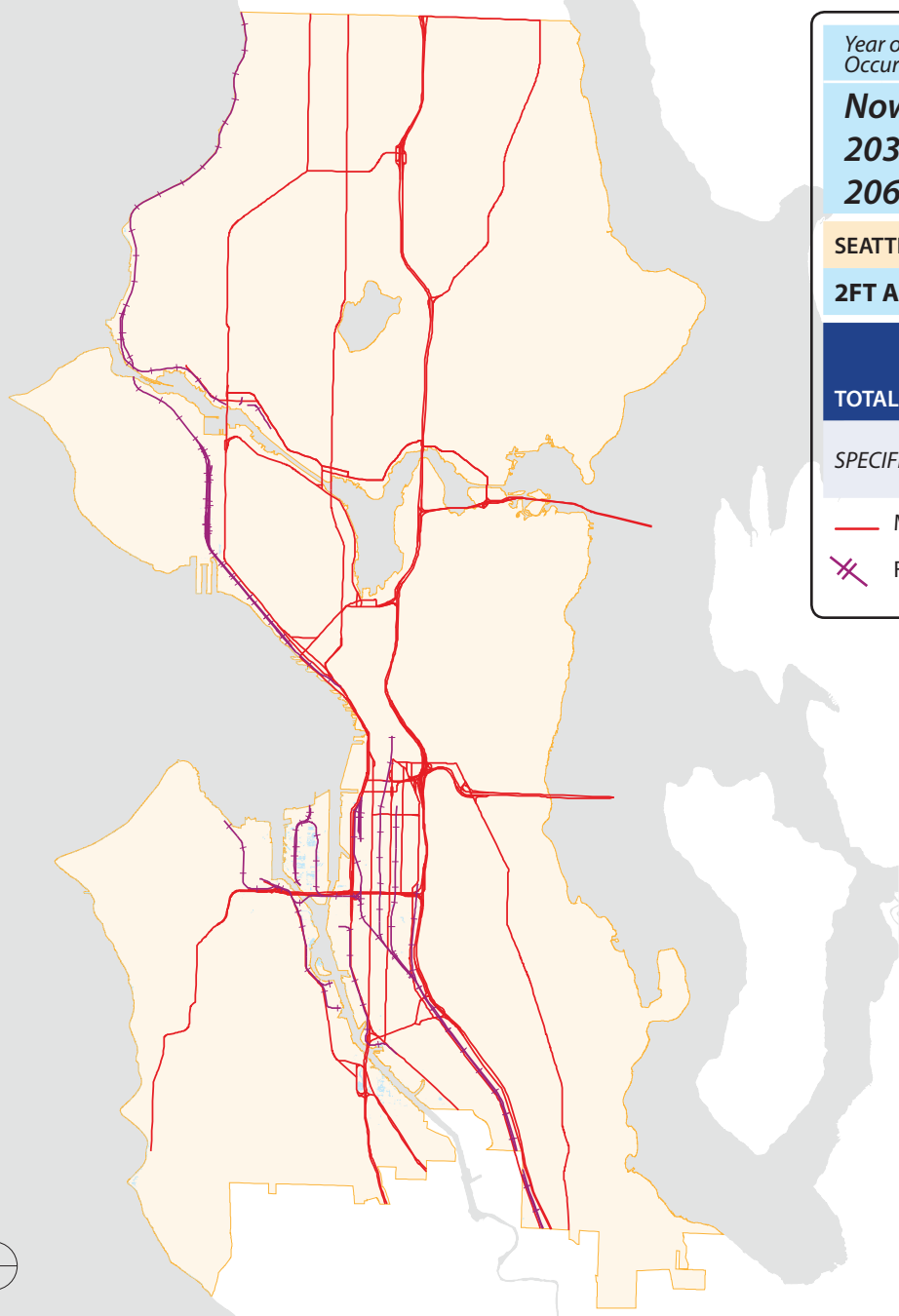
Year of Occurrence: FREQUENCY	BASELINE		IMPACTED	
Now: N/A	A Total Area (acres)	B Total Area Impacted	B/A = % of Total Baseline Seattle Land Area	
2035: N/A				
2060: 100 YEAR				
SEATTLE LAND AREA	53,238			
5FT ABOVE MHHW (14' NAVD88)		771 acres	1.5%	
TOTAL - TRANSPORTATION: CIP & STREETS	n/a, see specific data below			
SPECIFIC CIP & STREETS	E Baseline Length (Linear FT)	F Impacted Length	F/E = % of Baseline Length	
— CIP: Pedestrian	124,367 Linear Feet	4,207	3.4%	
— CIP: Transit	792,439 Linear Feet	540	0.1%	
— CIP: Freight	18,715 Linear Feet	1,593	8.5%	
— CIP: ITS	236,098 Linear Feet	122	0.1%	
✂ Streets: Arterials	3,349,351 Linear Feet	10,410	0.3%	
Proposed Capital Improvement Projects (CIP) in Impacted Areas: Alki Ave SW PMP Corridor, Duwamish Local Freight Access Improvements				



FREIGHT IMPACTS: Trucks & Rail

2FT
ABOVE MHHW

GIS data: MajTruckStreets.shp, Metro_RailLines_Seattle.shp



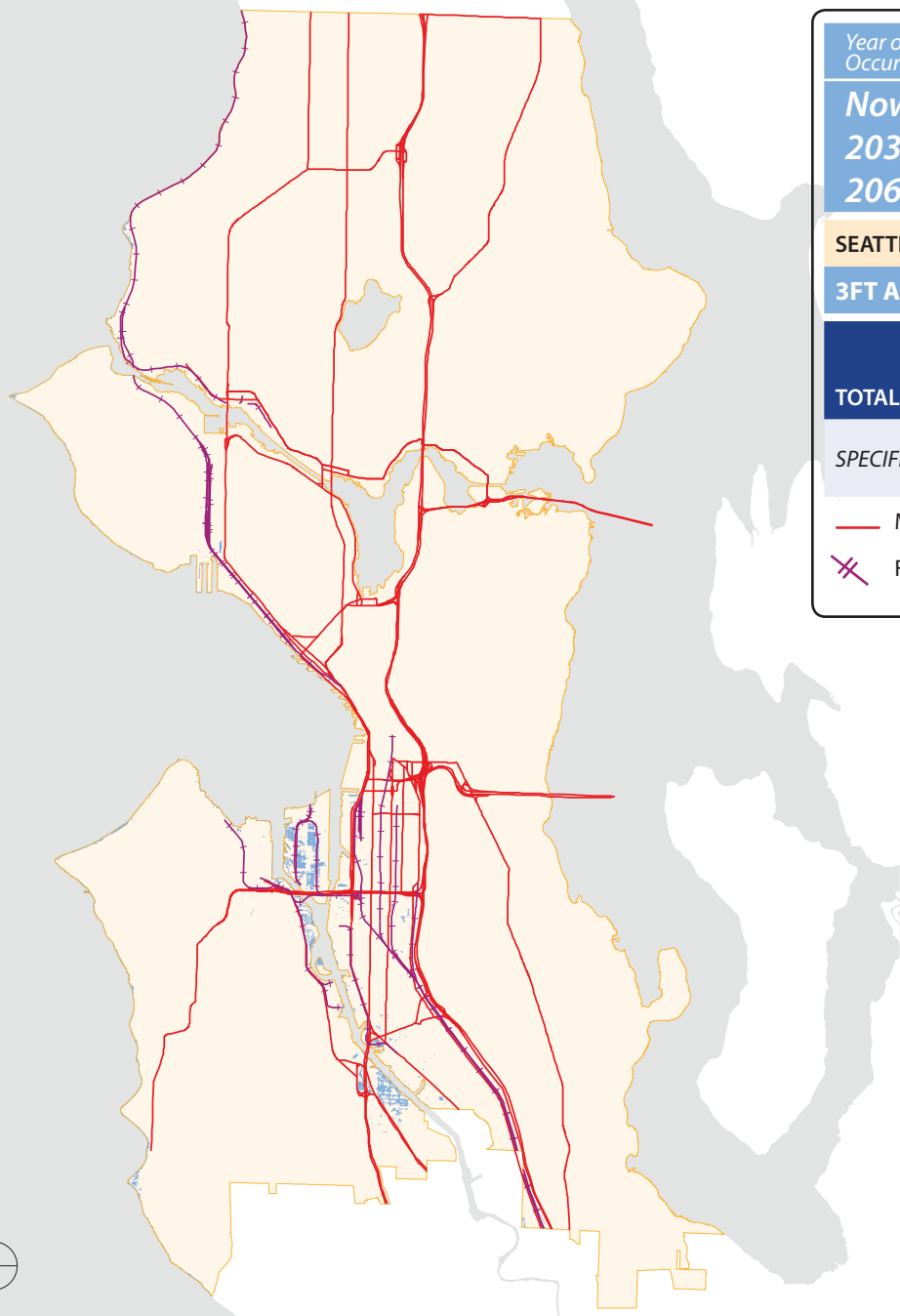
Year of Occurrence: FREQUENCY	BASELINE		IMPACTED	
Now: ANNUALLY	A Total Area (acres)	53,238	B Total Area Impacted	B/A = % of Total Baseline Seattle Land Area
2035: MONTHLY				
2060: DAILY				
SEATTLE LAND AREA				
2FT ABOVE MHHW (11' NAVD88)			120 acres	0.2%
TOTAL - FREIGHT: TRUCKS & RAIL	n/a, see specific data below			
SPECIFIC FREIGHT TYPE	E Baseline Length (Linear FT)		F Impacted Length	F/E = % of Baseline Length
— Major Truck Routes	941,226 Linear Feet		108 LF	0.01%
✕ Freight Rail	185,972 Linear Feet		341 LF	0.18%



FREIGHT IMPACTS: Trucks & Rail

3FT
ABOVE MHHW

GIS data: MajTruckStreets.shp, Metro_RailLines_Seattle.shp



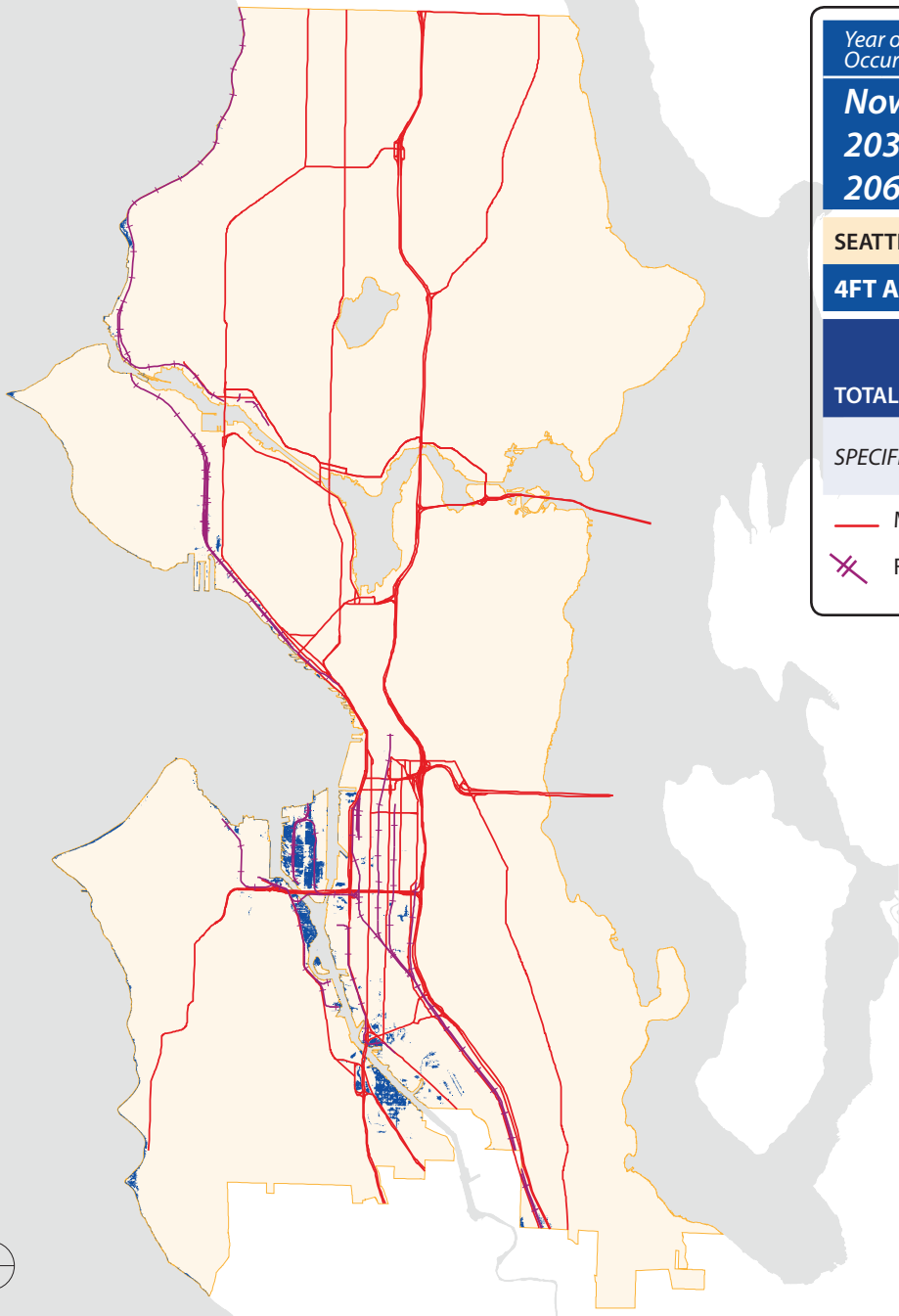
Year of Occurrence: FREQUENCY	BASELINE		IMPACTED	
Now: 100 YEAR 2035: ANNUALLY 2060: MONTHLY	A Total Area (acres)		B Total Area Impacted	B/A = % of Total Baseline Seattle Land Area
SEATTLE LAND AREA	53,238			
3FT ABOVE MHHW (12' NAVD88)			259 acres	0.5%
TOTAL - FREIGHT: TRUCKS & RAIL		n/a, see specific data below		
SPECIFIC FREIGHT TYPE	E Baseline Length (Linear FT)		F Impacted Length	F/E = % of Baseline Length
— Major Truck Routes	941,226 Linear Feet		204 LF	0.02%
✕ Freight Rail	185,972 Linear Feet		4,196 LF	2.3%



FREIGHT IMPACTS: Trucks & Rail

4FT
ABOVE MHHW

GIS data: MajTruckStreets.shp, Metro_RailLines_Seattle.shp



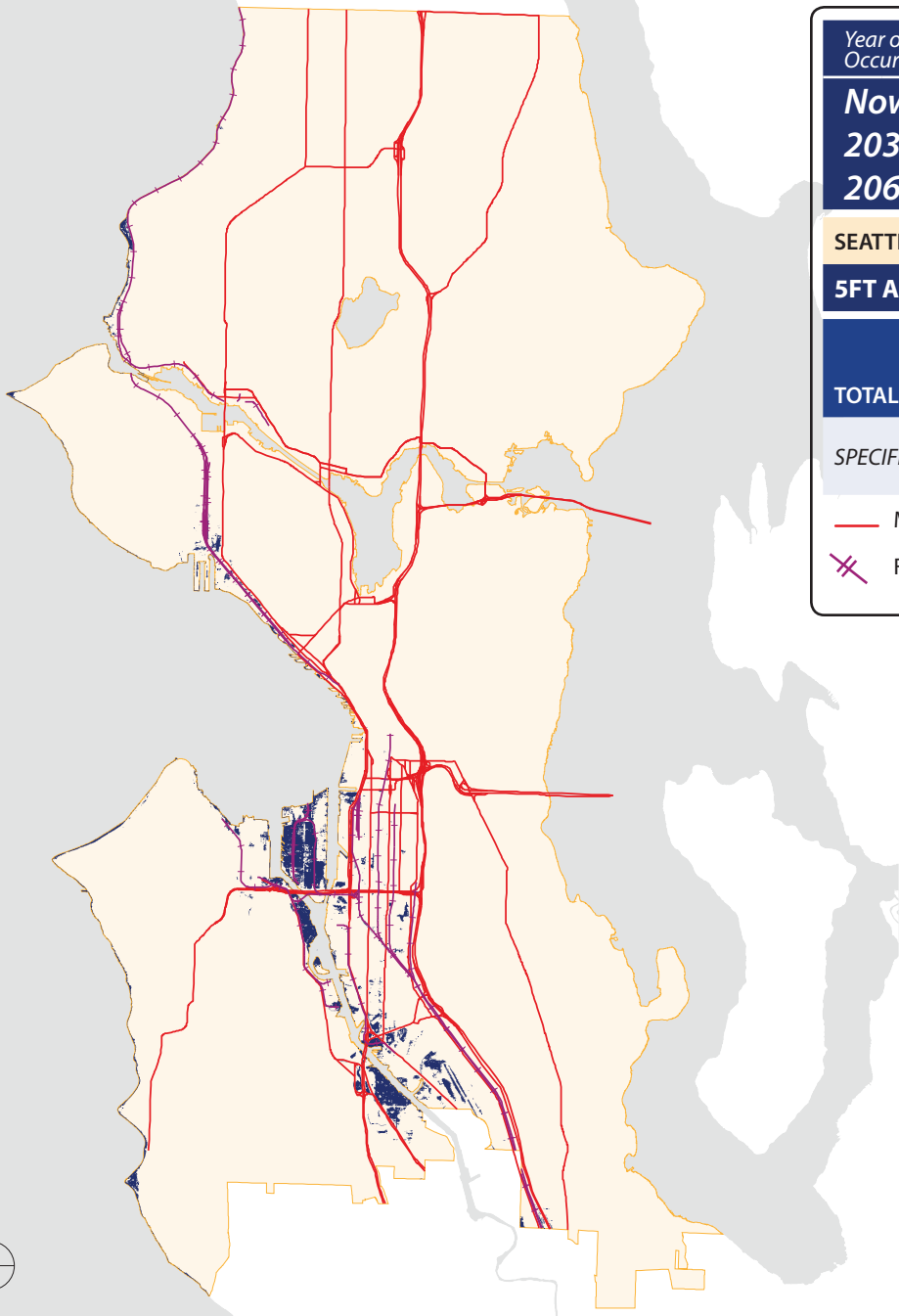
Year of Occurrence: FREQUENCY	BASELINE		IMPACTED	
Now: N/A	A Total Area (acres)	53,238	B Total Area Impacted	B/A = % of Total Baseline Seattle Land Area
2035: 100 YEAR				
2060: ANNUALLY				
SEATTLE LAND AREA	53,238			
4FT ABOVE MHHW (13' NAVD88)			478 acres	1.0%
TOTAL - FREIGHT: TRUCKS & RAIL				
n/a, see specific data below				
SPECIFIC FREIGHT TYPE	E Baseline Length (Linear FT)	F Impacted Length	F/E = % of Baseline Length	
— Major Truck Routes	941,226 Linear Feet	766 LF	0.09%	
✕ Freight Rail	185,972 Linear Feet	10,380 LF	5.58%	



FREIGHT IMPACTS: Trucks & Rail

5FT
ABOVE MHHW

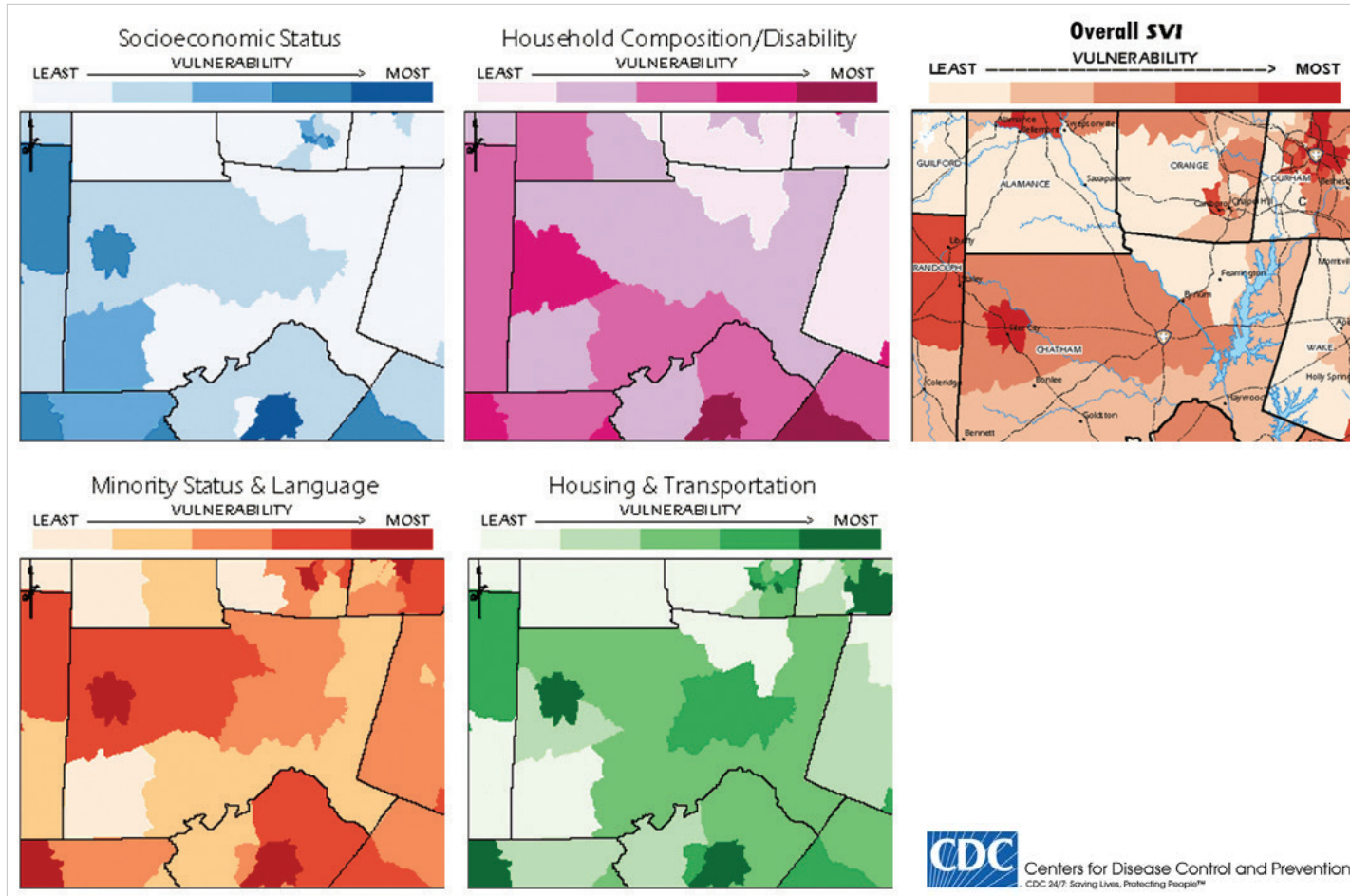
GIS data: MajTruckStreets.shp, Metro_RailLines_Seattle.shp



Year of Occurrence: FREQUENCY	BASELINE		IMPACTED	
Now: N/A	A Total Area (acres)	53,238	B Total Area Impacted	B/A = % of Total Baseline Seattle Land Area
2035: N/A				
2060: 100 YEAR				
SEATTLE LAND AREA				
5FT ABOVE MHHW (14' NAVD88)			771 acres	1.5%
TOTAL - FREIGHT: TRUCKS & RAIL		n/a, see specific data below		
SPECIFIC FREIGHT TYPE	E Baseline Length (Linear FT)	F Impacted Length	F/E = % of Baseline Length	
— Major Truck Routes	941,226 Linear Feet	2,539 LF	0.3%	
✕ Freight Rail	185,972 Linear Feet	17,864 LF	9.6%	



IMPACTS TO FRONTLINE COMMUNITIES



For more information: www.varpguide.com

FRONTLINE COMMUNITIES: Background

SOCIAL VULNERABILITY INDEX (SVI) FOR DISASTER MANAGEMENT:

(From Supplemental Documentation)

Data was developed by CDC's National Center for Environmental Health, Coordinating Office for Terrorism Preparedness and Emergency Response (COTPER), and the Agency for Toxic Substances and Disease Registry's Geospatial Research, Analysis, and Services Program (GRASP) to help public health officials and emergency response planners identify and map the communities that will most likely need support before, during and after a hazardous event.

The SVI indicates relative vulnerability of each census tract according to four social factors 1) Socioeconomic Status, 2) Household composition and disability, 3) Minority status and language, and 4) Housing and transportation. Each census tract is ranked for each social variable and by an overall ranking according to its level of vulnerability in comparison to the average across Emergency Management (EM) region 5¹ (Seattle).

Data² include (by Social Variable):

1) Socioeconomic Status:

- a. Percentile w/in each EM Region for the proportion of persons below poverty estimate
- b. Percentile w/in each EM Region for the proportion of civilian (age 16+) unemployed estimate,
- c. Percentile w/in each EM Region for the per capita income estimate,
- d. Percentile w/in each EM Region for the proportion of persons with no high school diploma (age 25+) estimate.

2) Household Composition/Disability:

- a. Percentile w/in each EM Region for the proportion of persons aged 65 and older
- b. Percentile w/in each EM Region for the proportion of persons aged 17 and younger
- c. Percentile w/in each EM Region for the persons with disability 5+yrs
- d. Percentile w/in each EM Region for the proportion of single parent households with children under 18.

3) Minority Status & Language:

- a. Percentile w/in each EM Region for the proportion minority (all persons except white, non-Hispanic)
- b. Percentile w/in each EM Region for the proportion of persons (age 5+) who speak English "less than well" estimate.

4) Housing & Transportation:

- a. Percentile w/in each EM Region for the proportion of housing in structures with 10 or more units estimate
- b. Percentile w/in each EM Region for the proportion of mobile homes estimate
- c. Percentile w/in each EM Region for the proportion of households with more people than rooms estimate
- d. Percentile w/in each EM Region for the proportion of households with no vehicle available estimate
- e. Percentile w/in each EM Region for the proportion persons in institutionalized group quarters

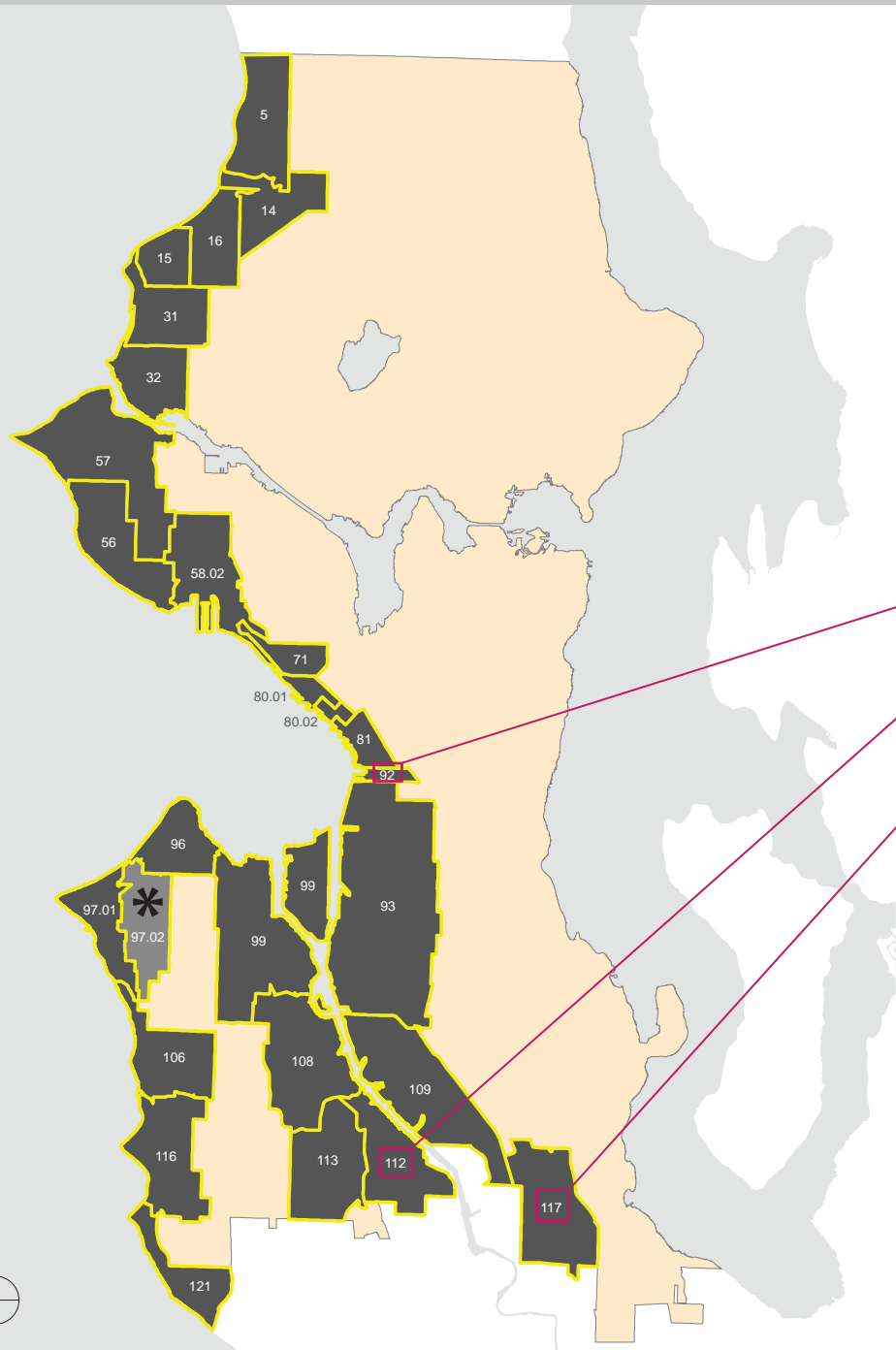
5) Overall Ranking

- a. Overall percentile ranking w/in each EM Region

¹ EM region 5 kingcounty.gov/~media/safety/prepare/documents/EMProfessionals_Plans/RDP/RDP_MAPZONE.ashx

² Sample error was low (<12%) and the data considered reasonably reliable.

FRONTLINE COMMUNITIES: Impacts



The Social Vulnerability Index (SVI) includes 135 tracts in the City of Seattle.

Water levels 2FT–4FT (above MHHW) affect 26 census tracts including: 5, 14, 15, 16, 31, 32, 56, 57, 58.02, 71, 80.01, 80.02, 81, 92, 93, 96, 97.01, 99, 106, 108, 109, 112, 113, 116, 117, 121.

The water level 5FT above MHHW affects these same 26 census tracts with the addition of census tract 97.02 (total of 27 tracts).

Census Tract #92

Census Tract #112

Census Tract #117

- # Highest Overall Social Vulnerability Ranking (see pg 56)
- Impacted Census Tracts
- * Census Tract #97.02 affected only at water levels 5FT above MHHW



FRONTLINE COMMUNITIES: Summary Status

IMPACTED CENSUS TRACT	VULNERABILITY RANKING BY SOCIAL VARIABLE				Overall Ranking
	Socioeconomic Status	Household Composition/ Disability	Minority Status & Language	Housing and Transportation	
5	2	4	2	1	2
14	3	3	3	3	3
15	1	3	1	1	1
16	2	5	1	1	2
31	2	3	1	3	2
32	3	2	1	2	2
56	1	4	1	1	1
57	2	4	3	2	2
58.02	2	2	3	3	2
71	3	1	2	5	2
80.01	2	1	2	5	2
80.02	3	1	3	5	3
81	4	2	3	5	4
92	5	2	5	5	5
93	4	3	5	4	4
96	2	3	1	3	3
97.01	1	3	1	1	1
97.02	2	4	1	2	2
99	4	2	4	2	3
106	3	3	2	2	3
108	4	4	4	3	4
109	4	2	4	3	4
112	5	5	5	4	5
113	4	4	4	2	4
116	2	4	1	1	1
117	5	5	5	4	5
121	1	4	2	1	1

The following summaries of impacts encompass all 27 impacted census tracts. The table at left shows a summary of all impacted tracts, the social variables and their vulnerability rankings. The tables on the following pages break down the data by each social variable, to show the impacted tracts and specific vulnerability levels.

Highest Overall Social Vulnerability Ranking

VULNERABILITY INDEX

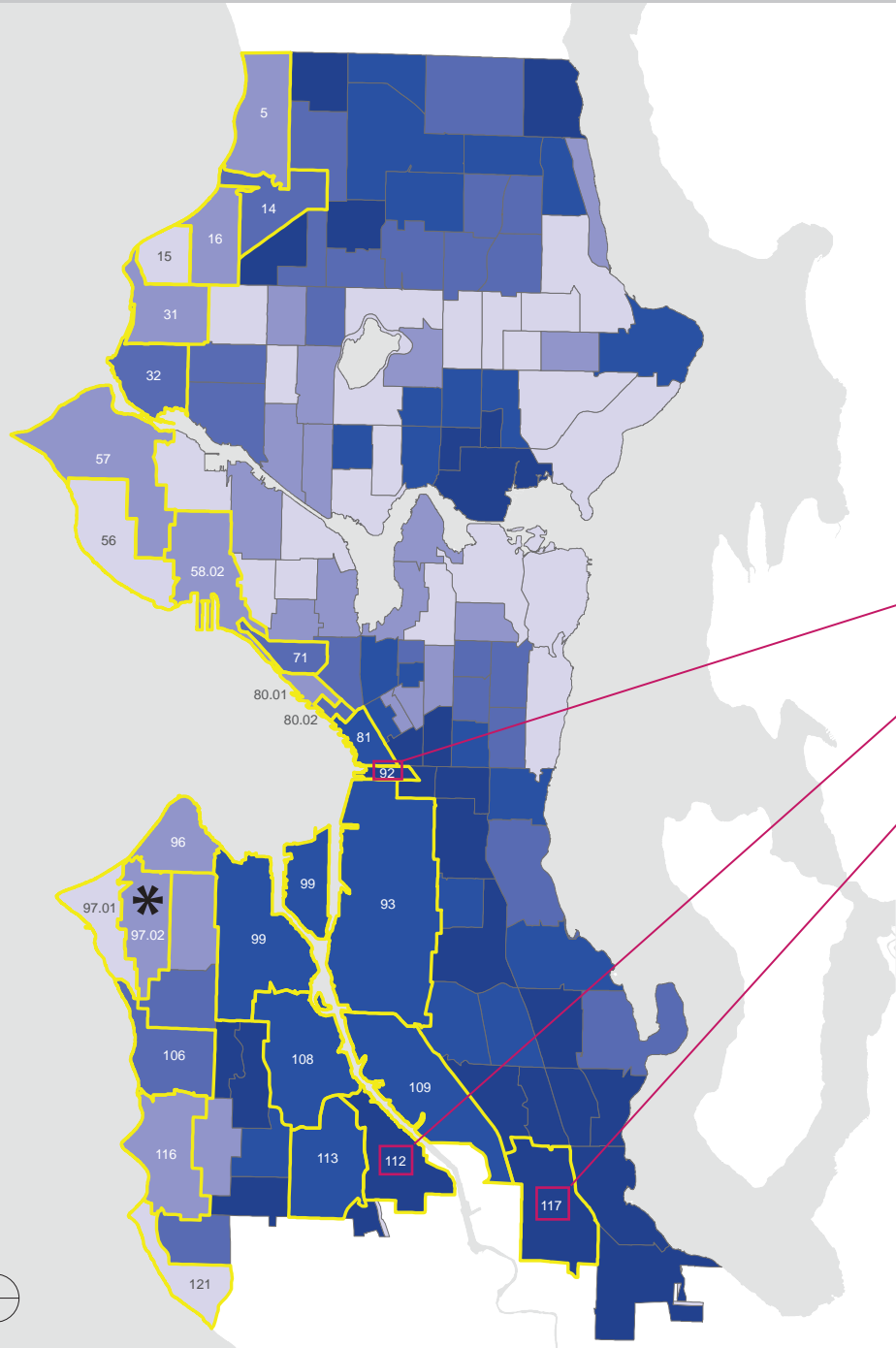


* Affected only at water levels 5 FT above MHHW. All other tracts shown in this table are affected by water levels at 2FT, 3FT, and 4FT above MHHW.

FRONTLINE COMMUNITIES: Socioeconomic Status

SOCIOECONOMIC STATUS SUMMARY

VULNERABILITY RANKING			IMPACTED CENSUS TRACT	
Index	Category	Levels	Total # Impacted	Tract Names
Least	1	0-18%	4	15,56,97.01,121
	2	19%-39%	9	5,16,31,57,58.02,80.01,96,97.02*,116
	3	40%-59%	5	14,32,71,80.02,106
	4	60%-79%	6	81,93,99,108,109,113
Most	5	80%-100%	3	92,112,117



Census Tract #92

Census Tract #112

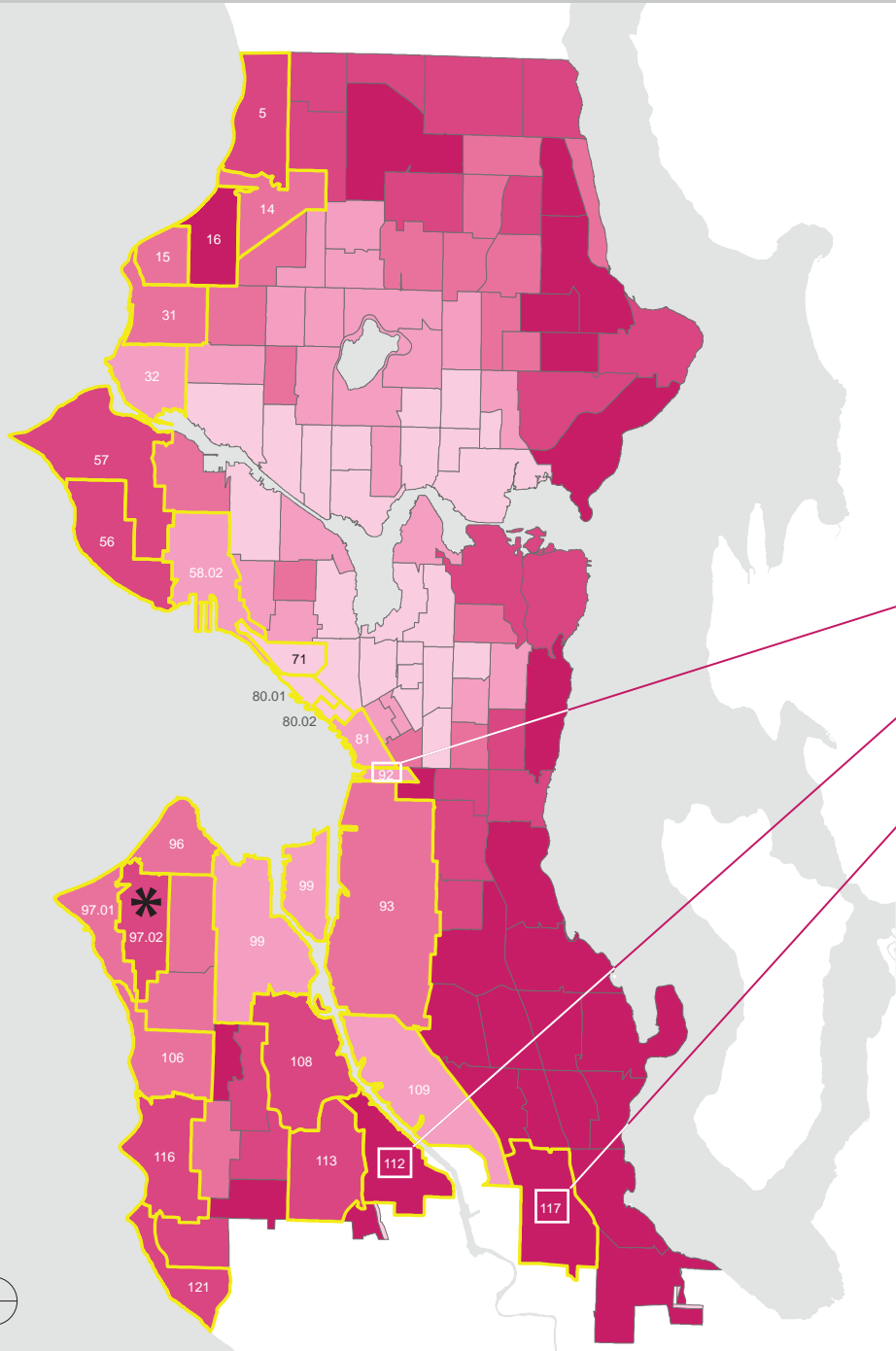
Census Tract #117

- # Highest Overall Social Vulnerability Ranking (see pg 56)
- Impacted Census Tracts
- * Census Tract #97.02 affected only by water levels 5FT above MHHW

FRONTLINE COMMUNITIES: Households/Disability

HOUSEHOLD COMPOSITION/DISABILITY SUMMARY

VULNERABILITY RANKING			IMPACTED CENSUS TRACT	
Index	Category	Levels	Total # Impacted	Tract Names
Least ↓	1	0-18%	3	71,80.01,80.02
	2	19%-39%	6	32,58.02,81,92,99,109
	3	40%-59%	7	14,15,31,93,96,97.01,106
↓	4	60%-79%	8	5,56,57,97.02*, 108,113,116,121
	Most 5	80%-100%	3	16,112,117



Census Tract #92

Census Tract #112

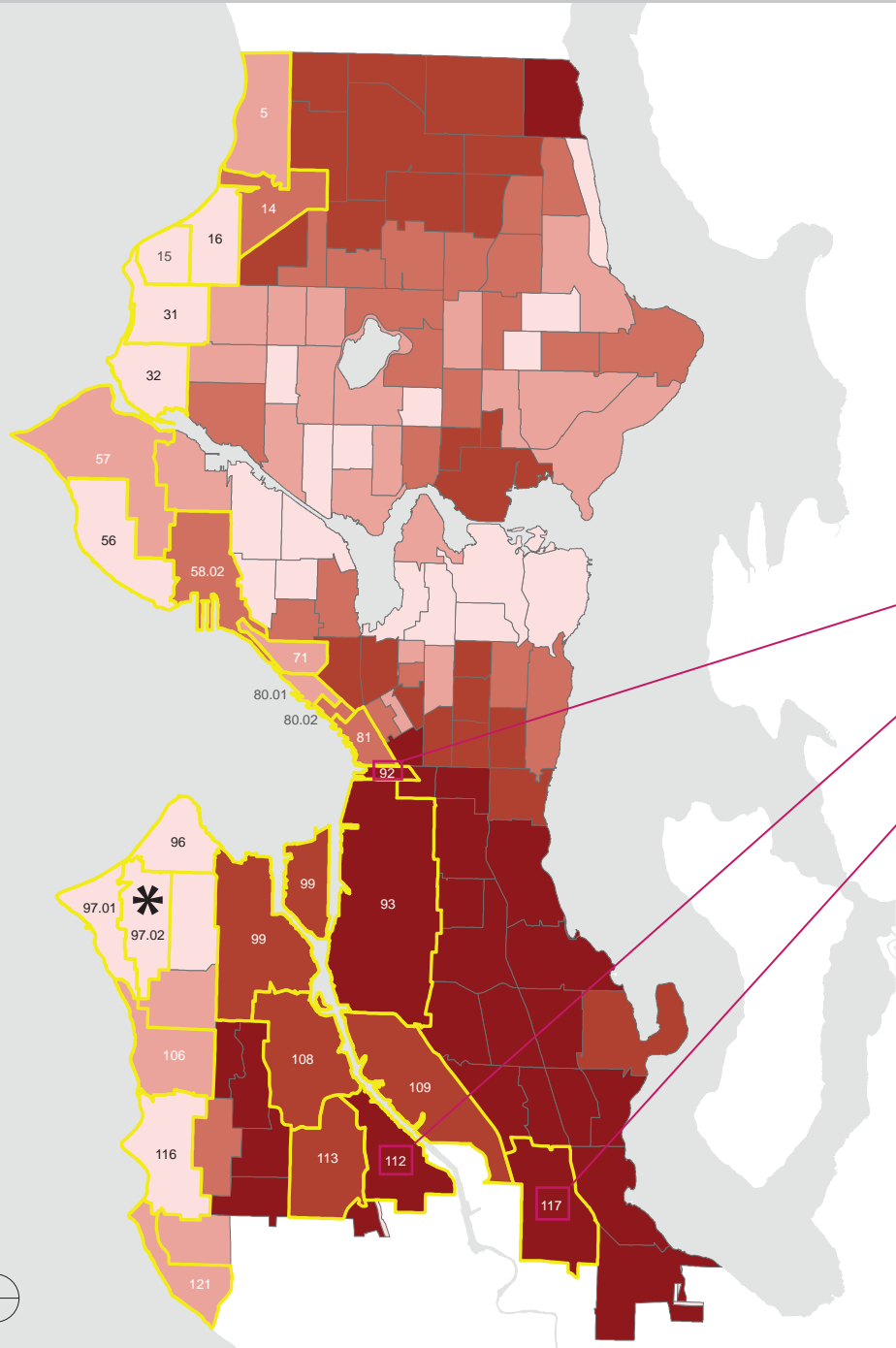
Census Tract #117

- # Highest Overall Social Vulnerability Ranking (see pg 56)
- Impacted Census Tracts
- * Census Tract #97.02 affected only by water levels 5FT above MHHW

FRONTLINE COMMUNITIES: Minority Status & Language

MINORITY STATUS & LANGUAGE SUMMARY

VULNERABILITY RANKING			IMPACTED CENSUS TRACT		
Index	Category	Levels	Total # Impacted	Tract Names	
↓	Least	1	0-18%	9	15,16,31,32,56,96,97.01,97.02*,116
		2	19%-39%	5	5,71,80.01,106,121
		3	40%-59%	5	14,57,58.02,80.02,81
		4	60%-79%	4	99,108,109,113
	Most	5	80%-100%	4	92,93,112,117



Census Tract #92

Census Tract #112

Census Tract #117

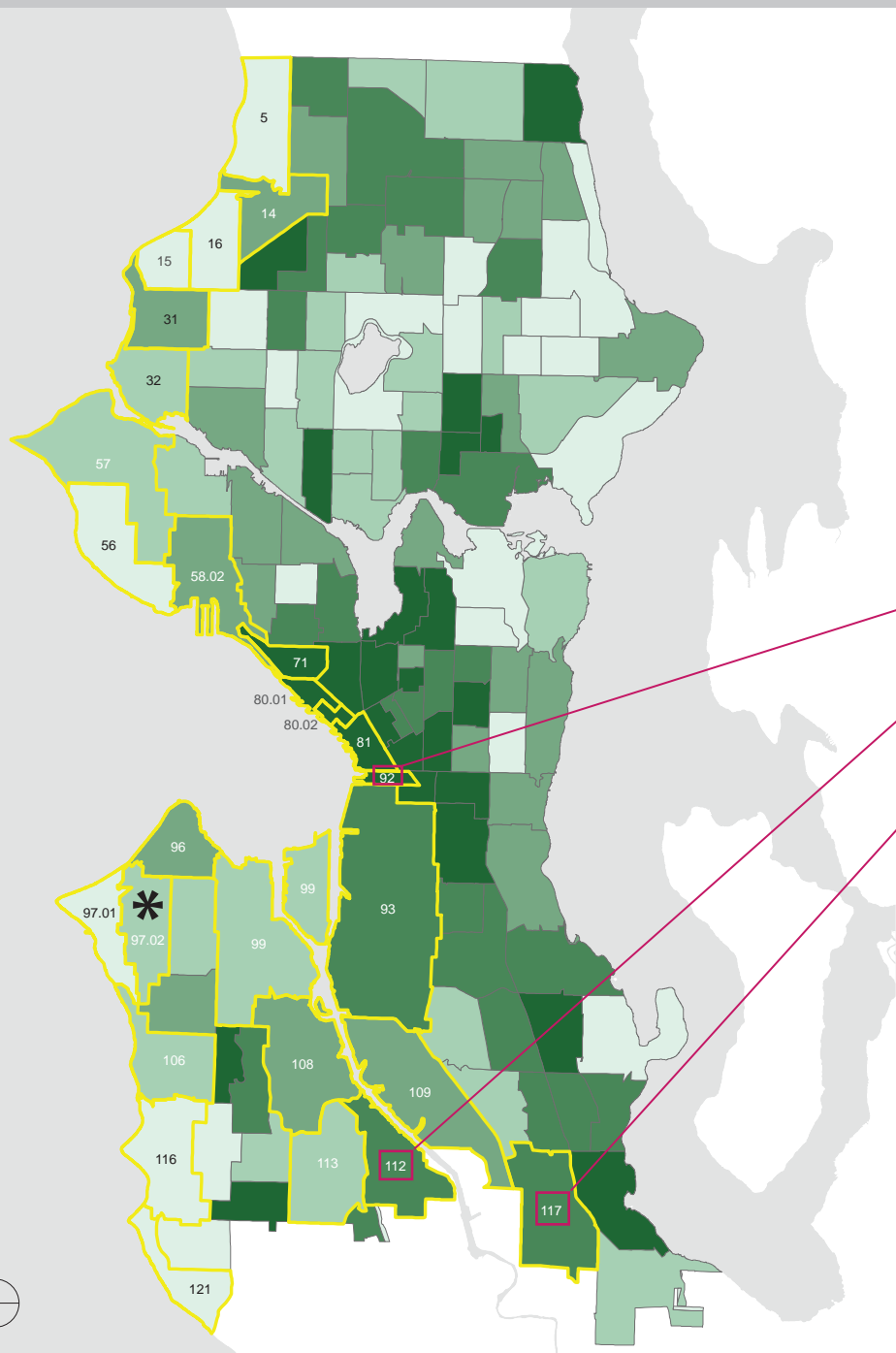
- # Highest Overall Social Vulnerability Ranking (see pg 56)
- Impacted Census Tracts
- * Census Tract #97.02 affected only by water levels 5FT above MHHW



FRONTLINE COMMUNITIES: Housing & Transport

HOUSING & TRANSPORTATION SUMMARY

VULNERABILITY RANKING			IMPACTED CENSUS TRACT	
Index	Category	Levels	Total # Impacted	Tract Names
Least ↓	1	0-18%	7	5,15,16,56,97.01,116,121
	2	19%-39%	6	32,57,97.02*,99,106,113
	3	40%-59%	6	14,31,58.02,96,108,109
↓	4	60%-79%	3	93,112,117
	Most 5	80%-100%	5	71,80.01,80.02,81,92



Census Tract #92

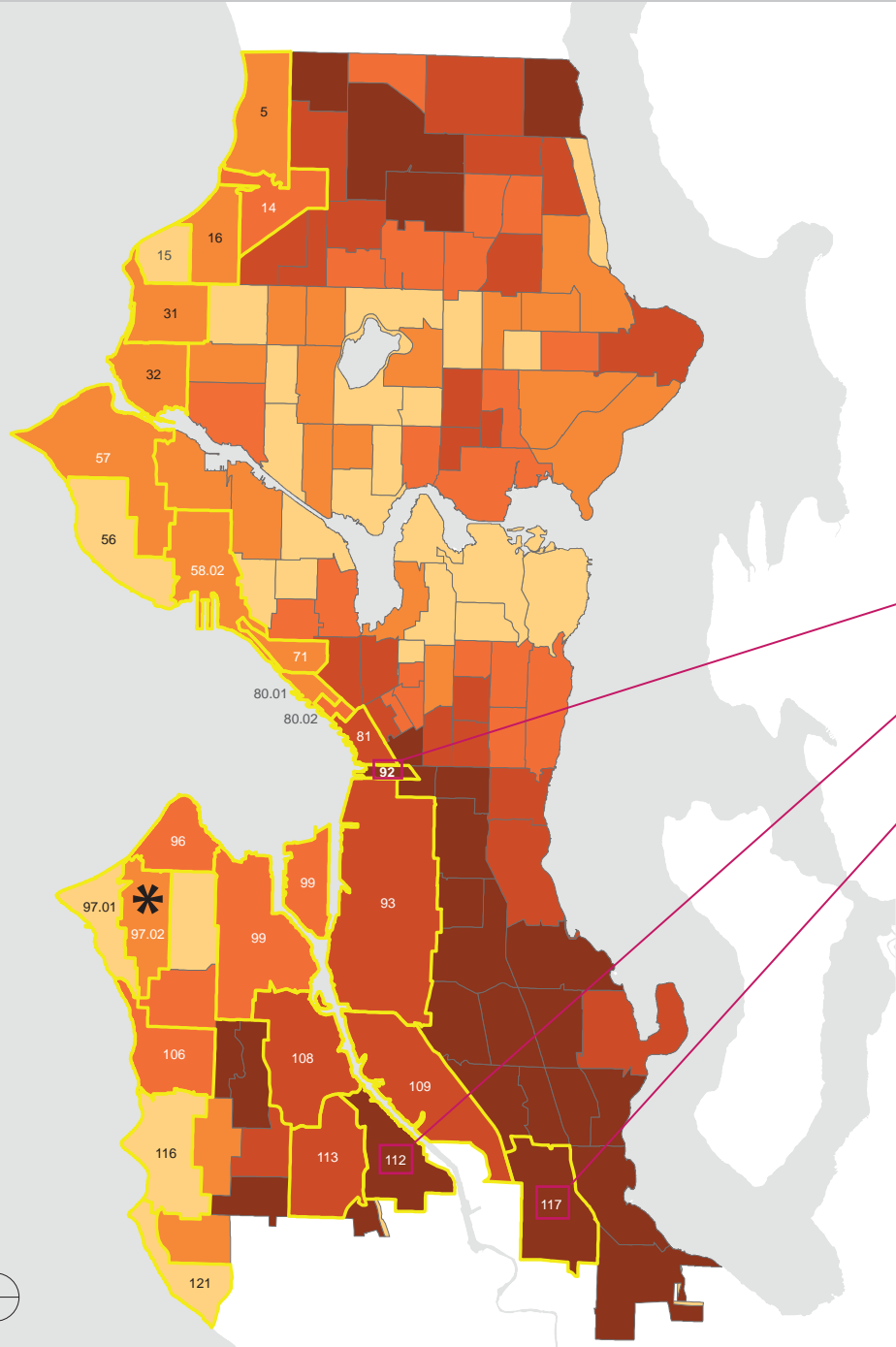
Census Tract #112

Census Tract #117

- # Highest Overall Social Vulnerability Ranking (see pg 56)
- Impacted Census Tracts
- * Census Tract #97.02 affected only by water levels 5FT above MHHW



FRONTLINE COMMUNITIES: Overall Ranking



OVERALL RANKING SUMMARY

VULNERABILITY RANKING			IMPACTED CENSUS TRACT	
Index	Category	Levels	Total # Impacted	Tract Names
Least	1	0-18%	5	15,56,97.01,116,121
	2	19%-39%	9	5,16,31,32,57,58.02,71,80.01,97.02*
	3	40%-59%	5	14,80.02,96,99,106
	4	60%-79%	5	81,93,108,109,113
Most	5	80%-100%	3	92,112,117

Census Tract #92

Census Tract #112

Census Tract #117

- # Highest Overall Social Vulnerability Ranking (see pg 56)
- Impacted Census Tracts
- * Census Tract #97.02 affected only by water levels 5FT above MHHW

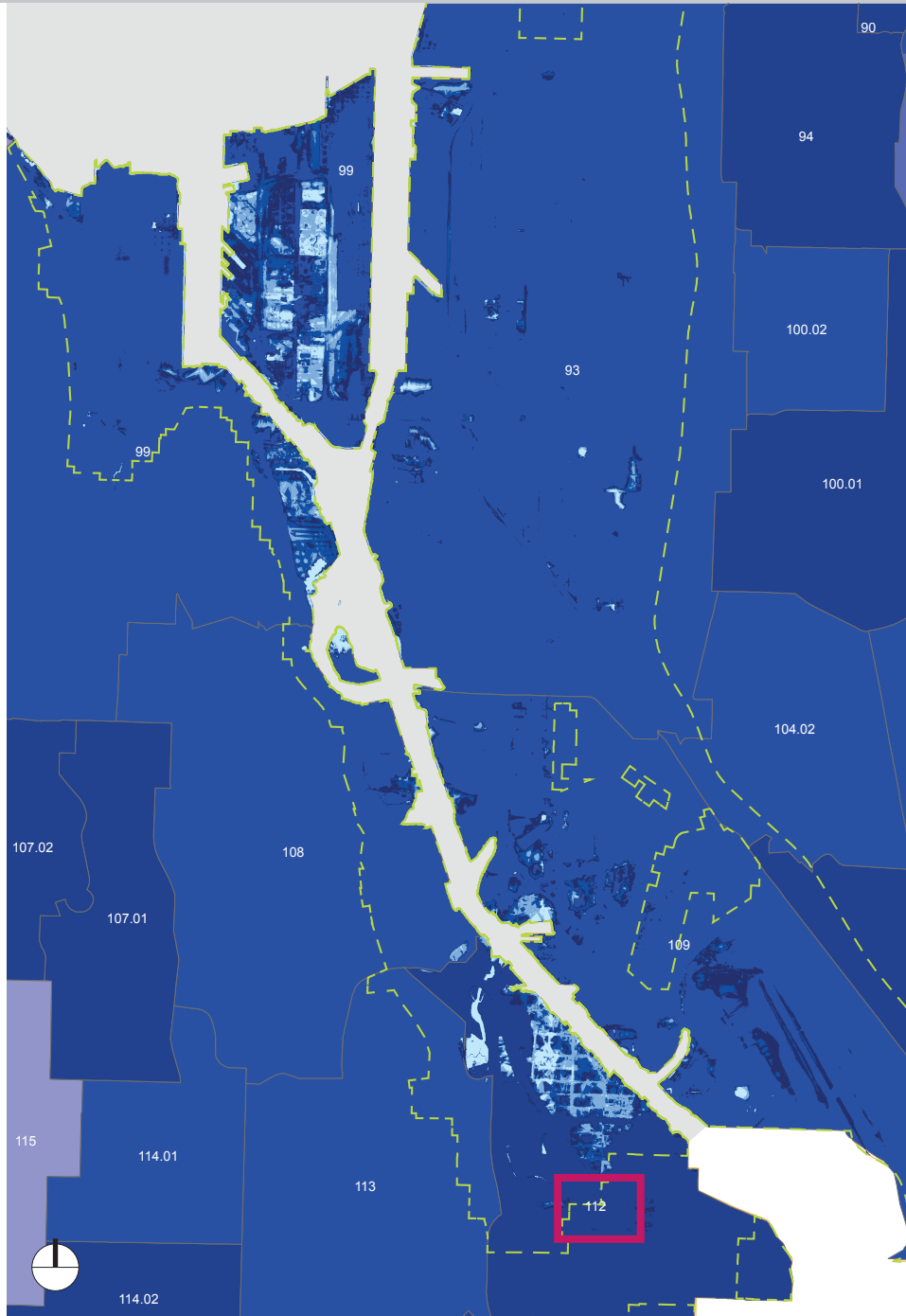


FRONTLINE COMMUNITIES IMPACTS: Duwamish

The following pages graphically illustrate impacts to Frontline Communities on the enlarged map of the Duwamish by Social Variable & Census Tract.

The enlarged maps show all four water levels (2FT–5FT above MHHW) simultaneously.



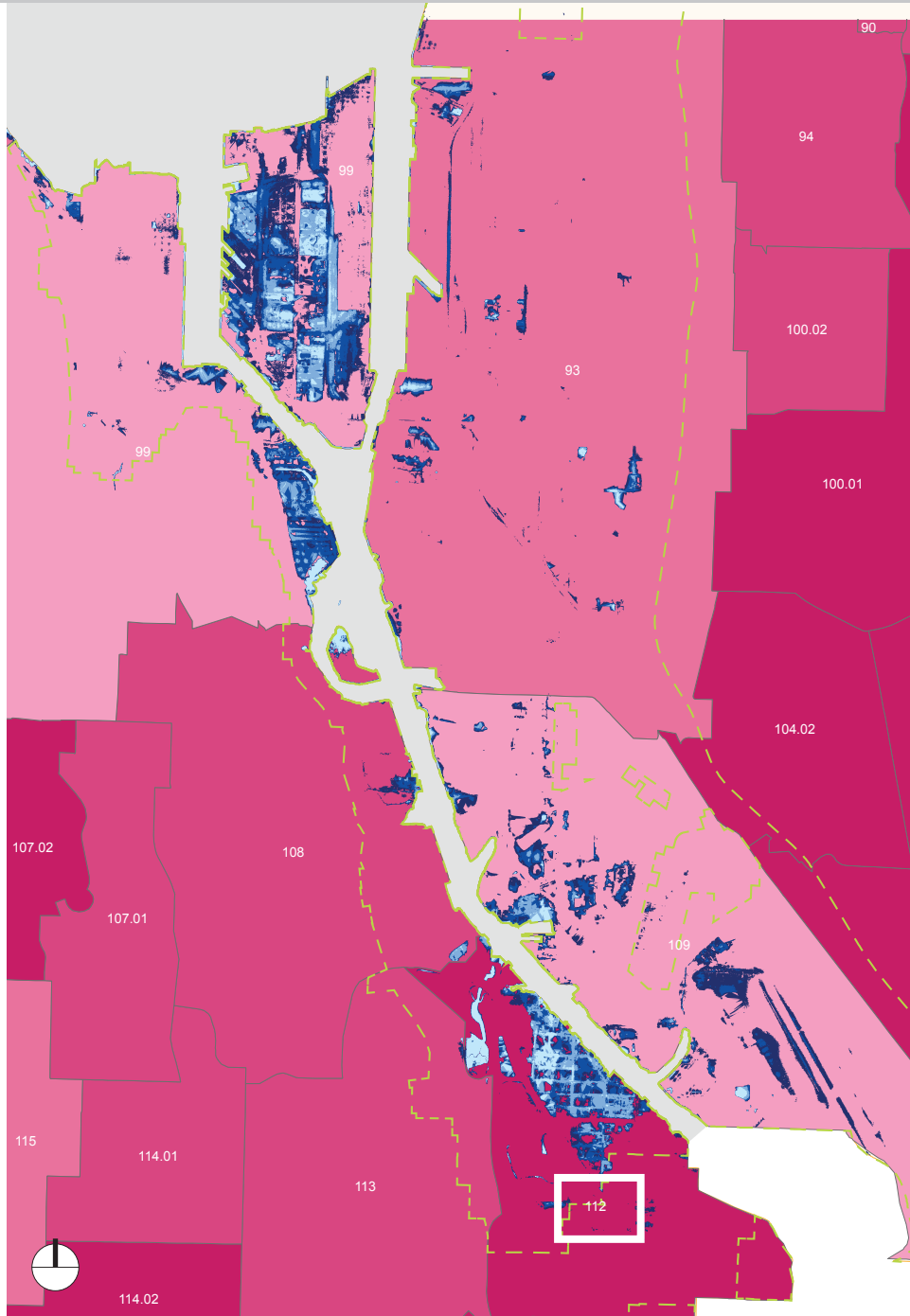


SOCIOECONOMIC STATUS SUMMARY

VULNERABILITY RANKING			IMPACTED CENSUS TRACT	
Index	Category	Levels	Total # Impacted	Tract Names
Least	1	0-18%	4	15,56,97.01,121
	2	19%-39%	9	5,16,31,57,58.02,80.01,96,97.02*,116
	3	40%-59%	5	14,32,71,80.02,106
	4	60%-79%	6	81,93,99,108,109,113
Most	5	80%-100%	3	92,112,117

The enlarged map of the Duwamish River area illustrates flood risk to census tracts 93, 99, 108, 109, 112, and 113. These tracts have a 60–100% vulnerability ranking for socioeconomic status in Seattle.

- Greater Duwamish Planning Area
- # Highest Overall Social Vulnerability Ranking (see pg 56)
- Impacted Area: 2FT above MHHW
- Impacted Area: 3FT above MHHW
- Impacted Area: 4FT above MHHW
- Impacted Area: 5FT above MHHW

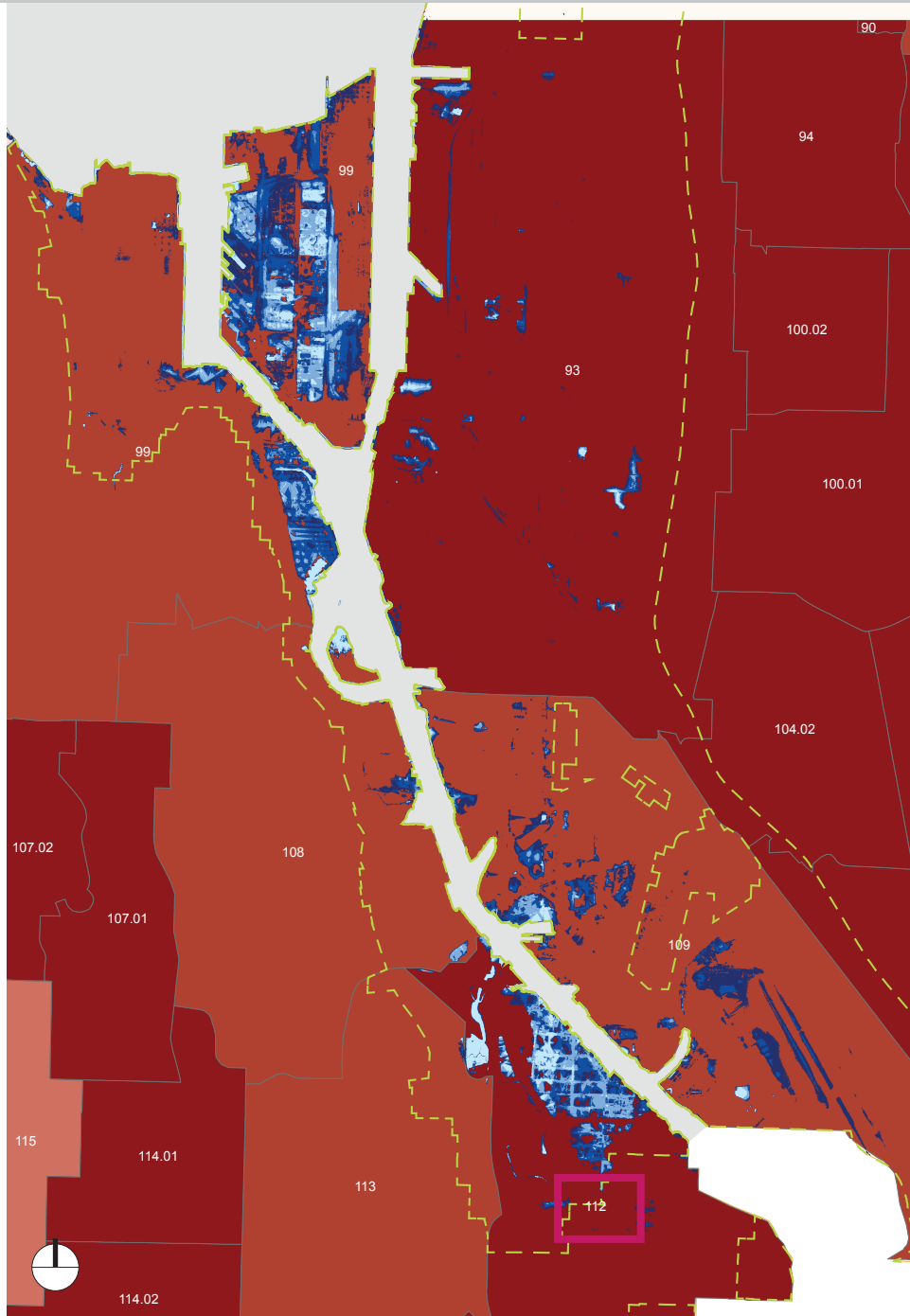


HOUSEHOLD COMPOSITION/DISABILITY SUMMARY

VULNERABILITY RANKING			IMPACTED CENSUS TRACT	
Index	Category	Levels	Total # Impacted	Tract Names
Least	1	0-18%	3	71,80.01,80.02
	2	19%-39%	6	32,58.02,81,92,99,109
	3	40%-59%	7	14,15,31,93,96,97.01,106
	4	60%-79%	8	5,56,57,97.02*, 108,113,116,121
Most	5	80%-100%	3	16, 112 , 117

The enlarged map of the Duwamish River area illustrates flood risk to census tracts 93, 99, 108, 109, 112, and 113. These tracts have a 19–100% vulnerability ranking for household composition and disability in Seattle.

- Greater Duwamish Planning Area
- Highest Overall Social Vulnerability Ranking (see pg 56)
- Impacted Area: 2FT above MHHW
- Impacted Area: 3FT above MHHW
- Impacted Area: 4FT above MHHW
- Impacted Area: 5FT above MHHW



MINORITY STATUS & LANGUAGE SUMMARY

VULNERABILITY RANKING			IMPACTED CENSUS TRACT	
Index	Category	Levels	Total # Impacted	Tract Names
Least	1	0-18%	9	15,16,31,32,56,96,97.01,97.02*,116
↓	2	19%-39%	5	5,71,80.01,106,121
	3	40%-59%	5	14,57,58.02,80.02,81
	4	60%-79%	4	99,108,109,113
Most	5	80%-100%	4	92,93,112,117

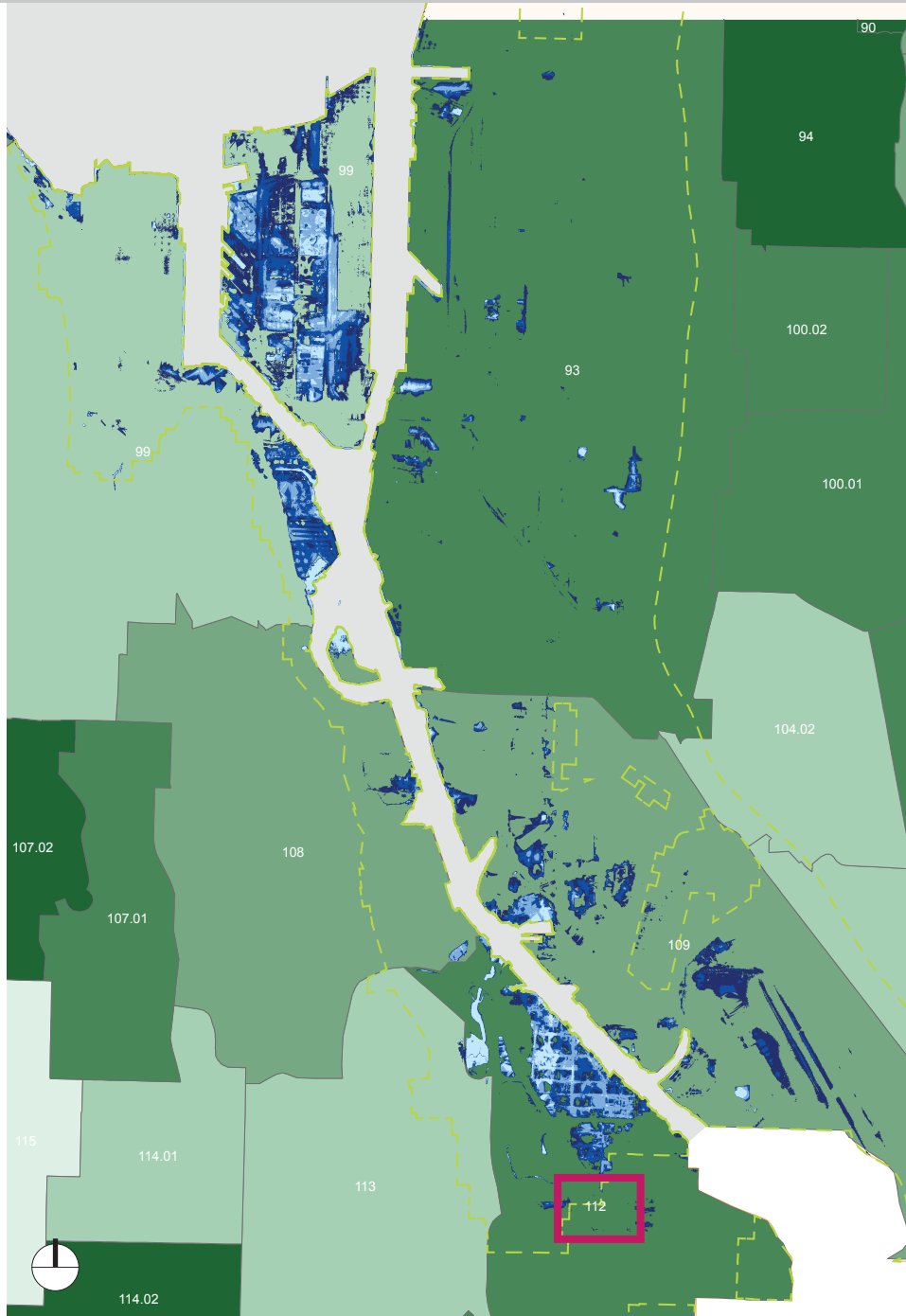
The enlarged map of the Duwamish River area illustrates flood risk to census tracts 93, 99, 108, 109, 112, and 113. These tracts have a 60–100% vulnerability ranking for minority status and language in Seattle.

- Greater Duwamish Planning Area
- # Highest Overall Social Vulnerability Ranking (see pg 56)
- Impacted Area: 2FT above MHHW
- Impacted Area: 3FT above MHHW
- Impacted Area: 4FT above MHHW
- Impacted Area: 5FT above MHHW

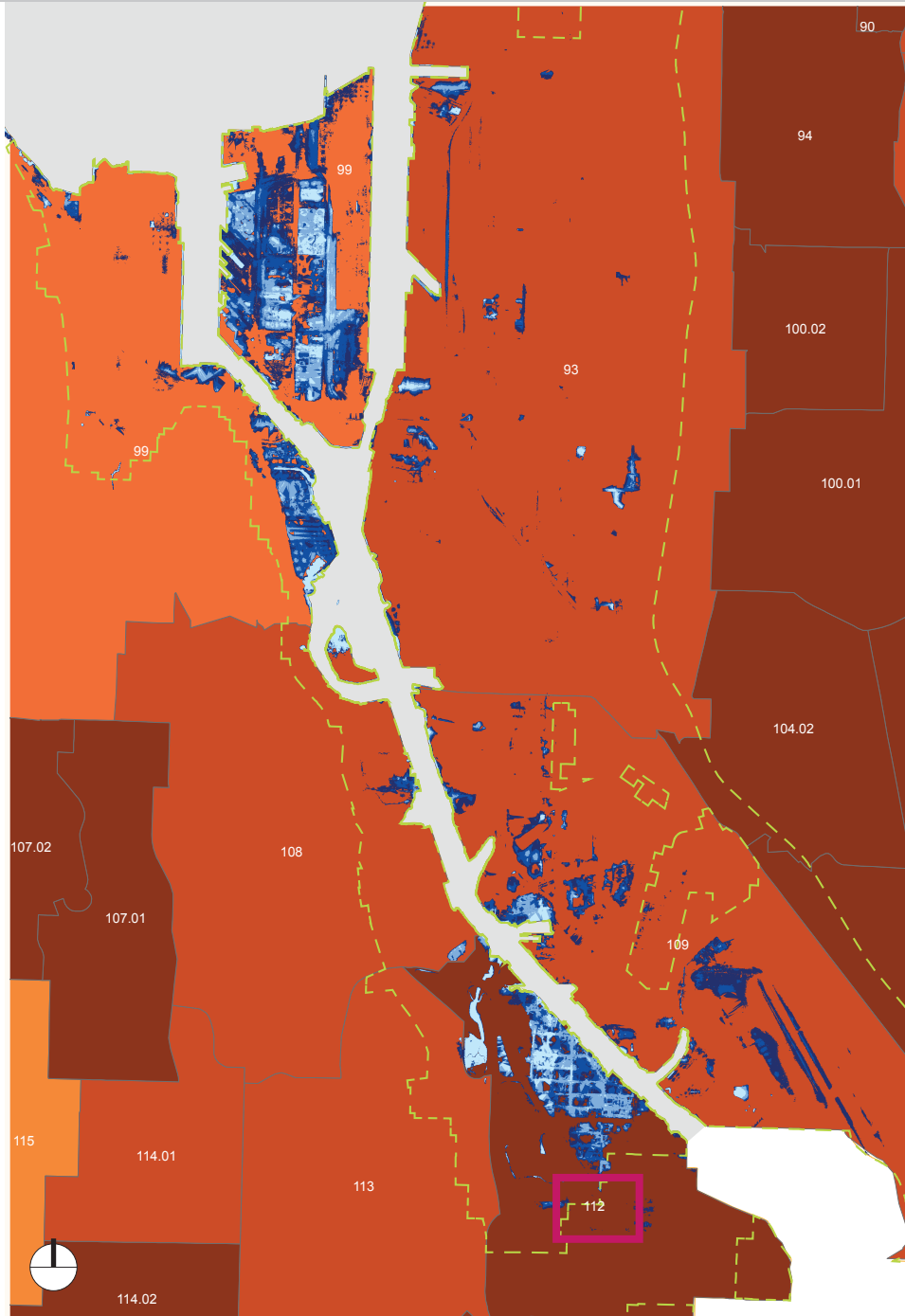
HOUSING & TRANSPORTATION SUMMARY

VULNERABILITY RANKING			IMPACTED CENSUS TRACT	
Index	Category	Levels	Total # Impacted	Tract Names
Least ↓ Most	1	0-18%	7	5,15,16,56,97.01,116,121
	2	19%-39%	6	32,57,97.02*,99,106,113
	3	40%-59%	6	14,31,58.02,96,108,109
	4	60%-79%	3	93,112,117
	5	80%-100%	5	71,80.01,80.02,81,92

The enlarged map of the Duwamish River area illustrates flood risk to census tracts 93, 99, 108, 109, 112, and 113. These tracts have a 19–100% vulnerability ranking for housing and transportation in Seattle.



- Greater Duwamish Planning Area
- # Highest Overall Social Vulnerability Ranking (see pg 56)
- Impacted Area: 2FT above MHHW
- Impacted Area: 3FT above MHHW
- Impacted Area: 4FT above MHHW
- Impacted Area: 5FT above MHHW



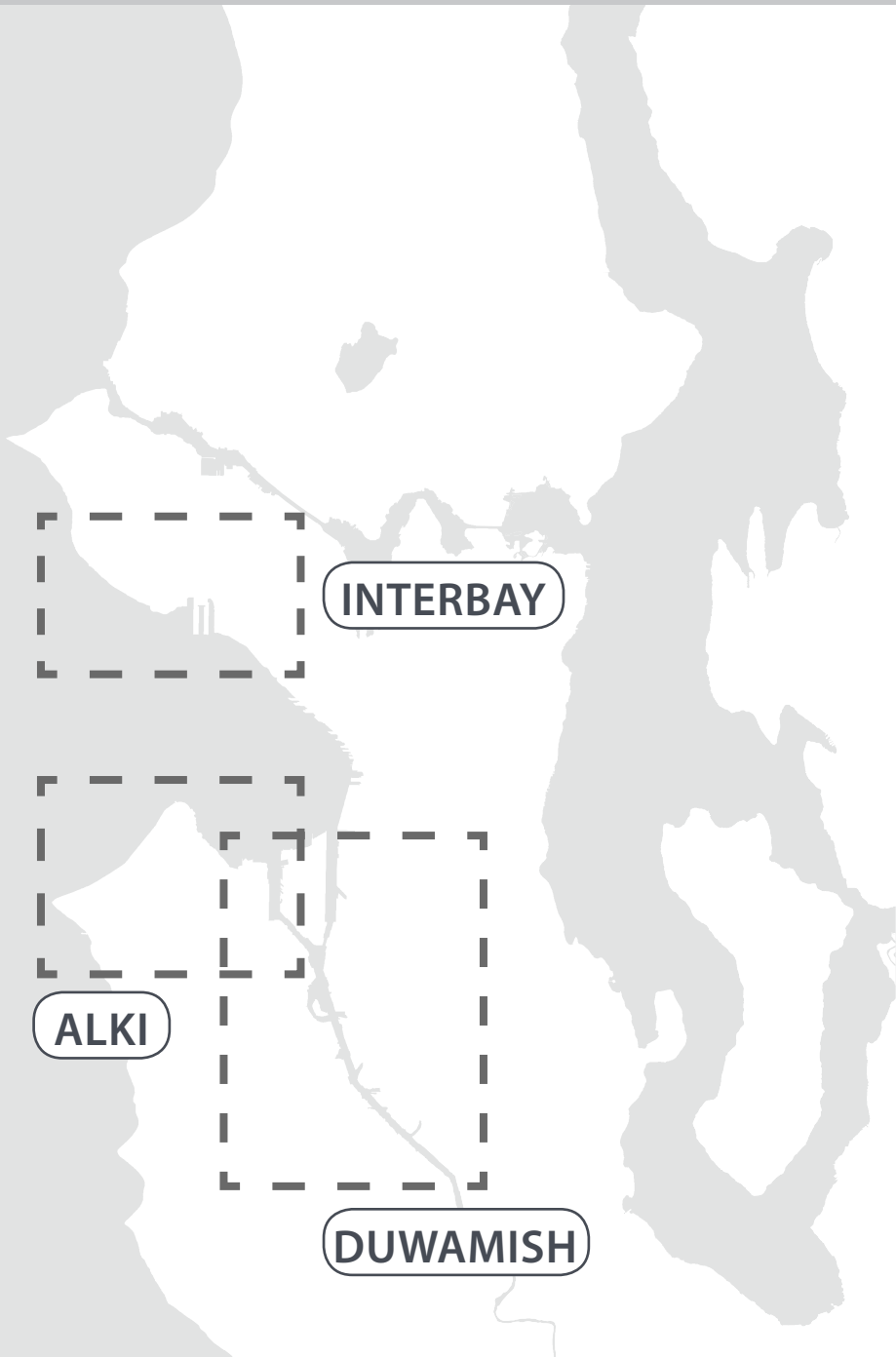
OVERALL RANKING SUMMARY

VULNERABILITY RANKING			IMPACTED CENSUS TRACT	
Index	Category	Levels	Total # Impacted	Tract Names
Least	1	0-18%	5	15,56,97.01,116,121
	2	19%-39%	9	5,16,31,32,57,58.02,71,80.01,97.02*
	3	40%-59%	5	14,80.02,96,99,106
	4	60%-79%	5	81,93,108,109,113
Most	5	80%-100%	3	92,112,117

The enlarged map of the Duwamish River area illustrates flood risk to census tracts 93, 99, 108, 109, 112, and 113. These tracts have a 40–100% overall vulnerability ranking in Seattle.

- Greater Duwamish Planning Area
- # Highest Overall Social Vulnerability Ranking (see pg 56)
- Impacted Area: 2FT above MHHW
- Impacted Area: 3FT above MHHW
- Impacted Area: 4FT above MHHW
- Impacted Area: 5FT above MHHW

FOCUS AREAS IMPACTS



The following pages zoom in on the Citywide maps (shown on pages 9–12), to illustrate impacts in the three most impacted areas of the city. Focus areas include:

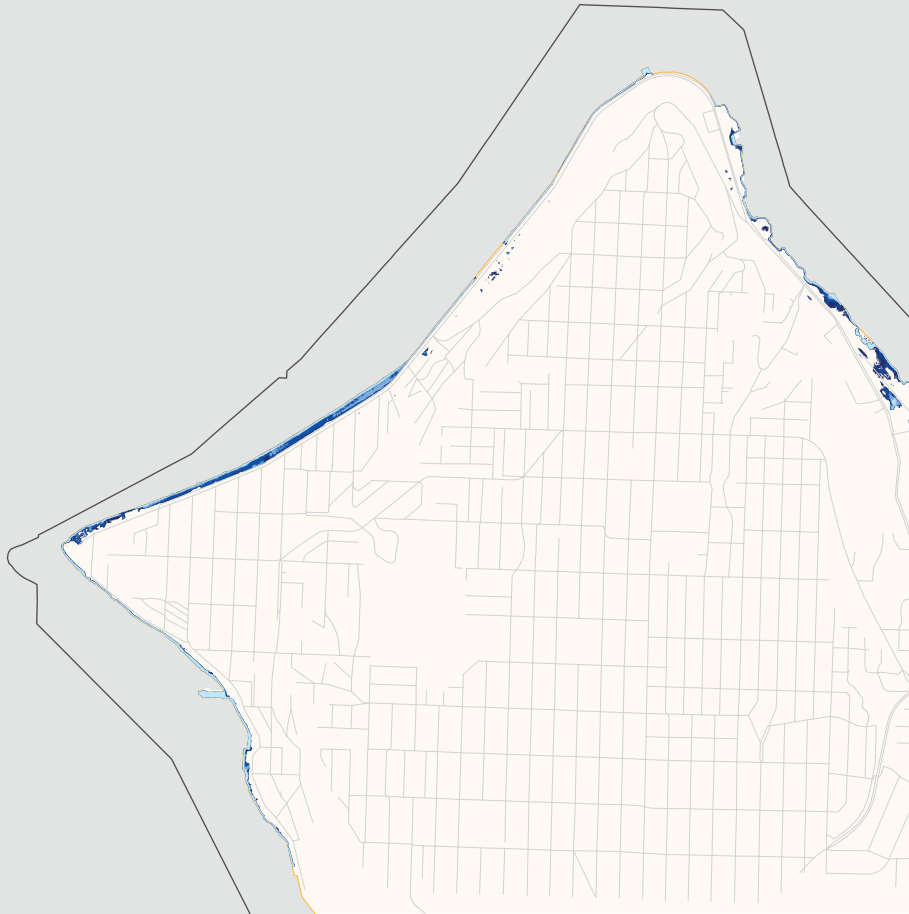
- ALKI
- INTERBAY
- DUWAMISH

Each map shows all four water levels (2FT through 5FT above MHHW) at once to show total projected impacts.

Note: Unlike the Citywide maps, these maps are not at the same scale to one another; they are scaled to fit on the page as appropriate.

This enlarged view of the Alki region highlights total impacts for water levels: 2, 3, 4, and 5 feet above MHHW. Darker blue areas indicate higher sea level rise as described in the key below.

Citywide impacts are summarized in the preceding sections.



- Seattle Land Area
- Seattle City Limits (Political Boundary)
- Water Body & Streams
- Streets
- Impacted Area: 2FT above MHHW
- Impacted Area: 3FT above MHHW
- Impacted Area: 4FT above MHHW
- Impacted Area: 5FT above MHHW



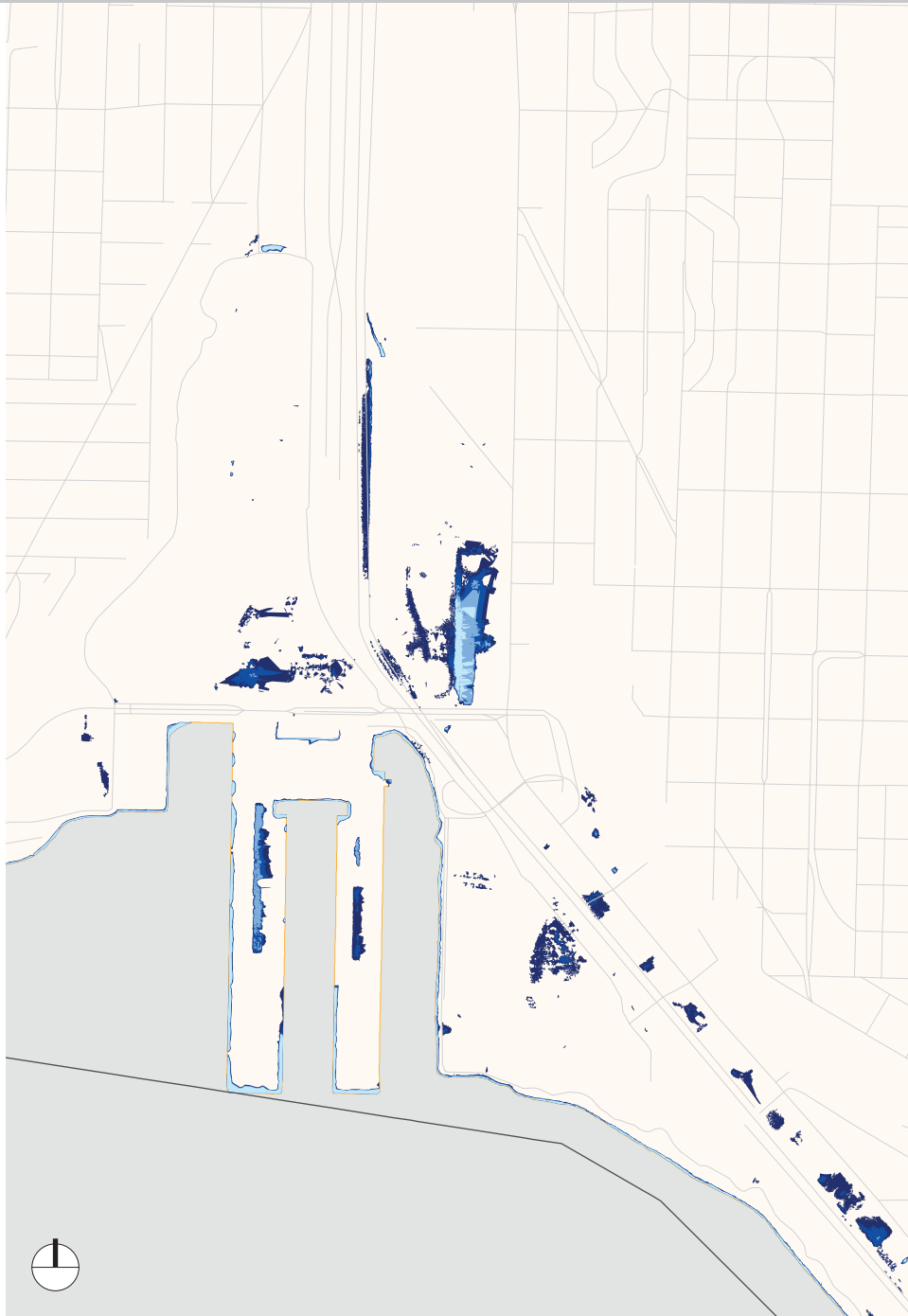
FOCUS AREA IMPACTS: Interbay

2-5FT

ABOVE MHHW

This enlarged view of the Interbay region highlights total impacts for water levels: 2, 3, 4, and 5 feet above MHHW. Darker blue areas indicate higher sea level rise as described in the key below.

Citywide impacts are summarized in the preceding sections.

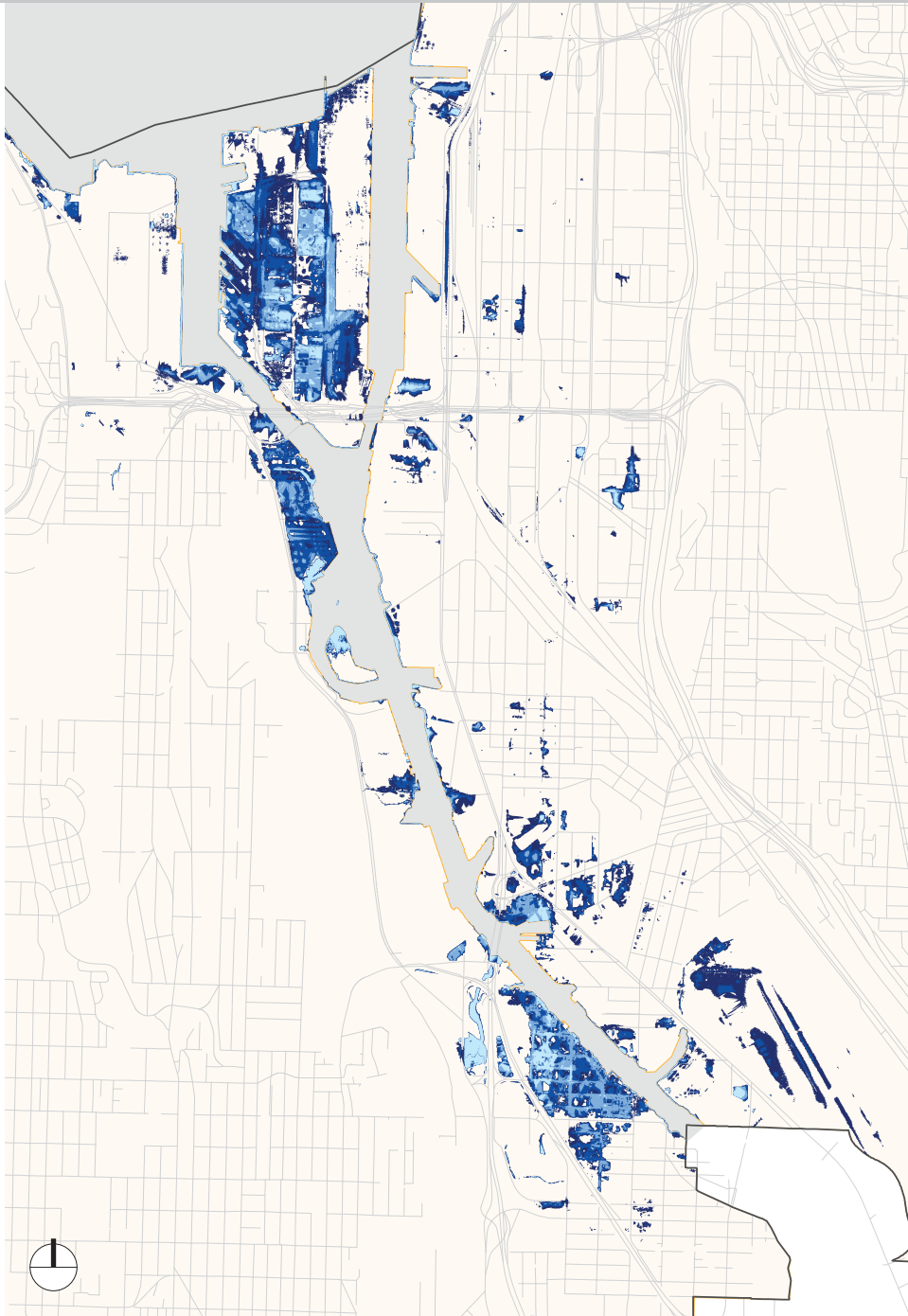


- Seattle Land Area
- Seattle City Limits (Political Boundary)
- Water Body & Streams
- Streets
- Impacted Area: 2FT above MHHW
- Impacted Area: 3FT above MHHW
- Impacted Area: 4FT above MHHW
- Impacted Area: 5FT above MHHW

FOCUS AREA IMPACTS: Duwamish

2-5FT

ABOVE MHHW



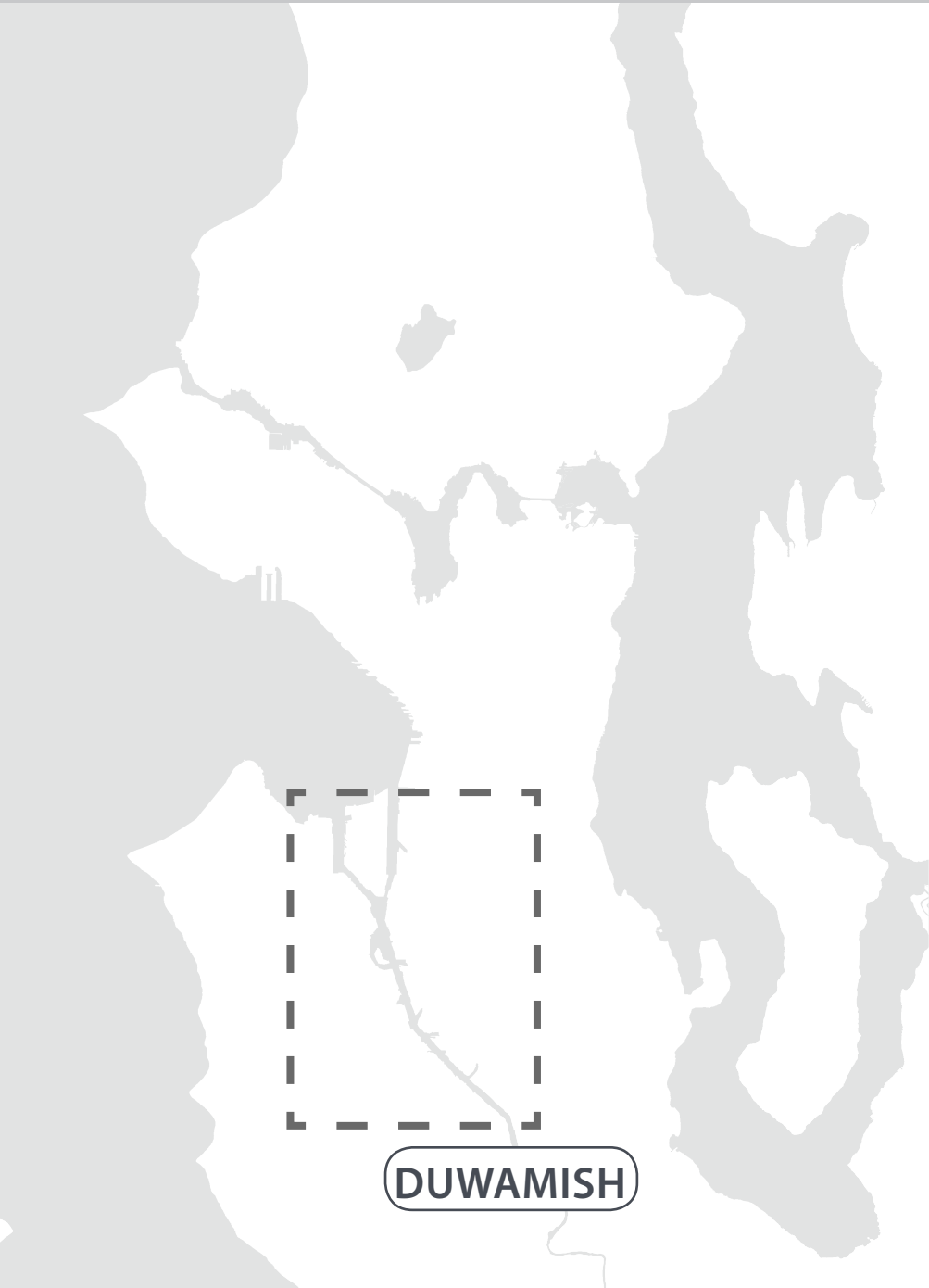
This enlarged view of the Duwamish highlights total impacts for water levels: 2, 3, 4, and 5 feet above MHHW. Darker blue areas indicate higher sea level rise as described in the key below.

Citywide impacts are summarized in the preceding sections.

- Seattle Land Area
- Seattle City Limits (Political Boundary)
- Water Body & Streams
- Streets
- Impacted Area: 2FT above MHHW
- Impacted Area: 3FT above MHHW
- Impacted Area: 4FT above MHHW
- Impacted Area: 5FT above MHHW

APPENDIX

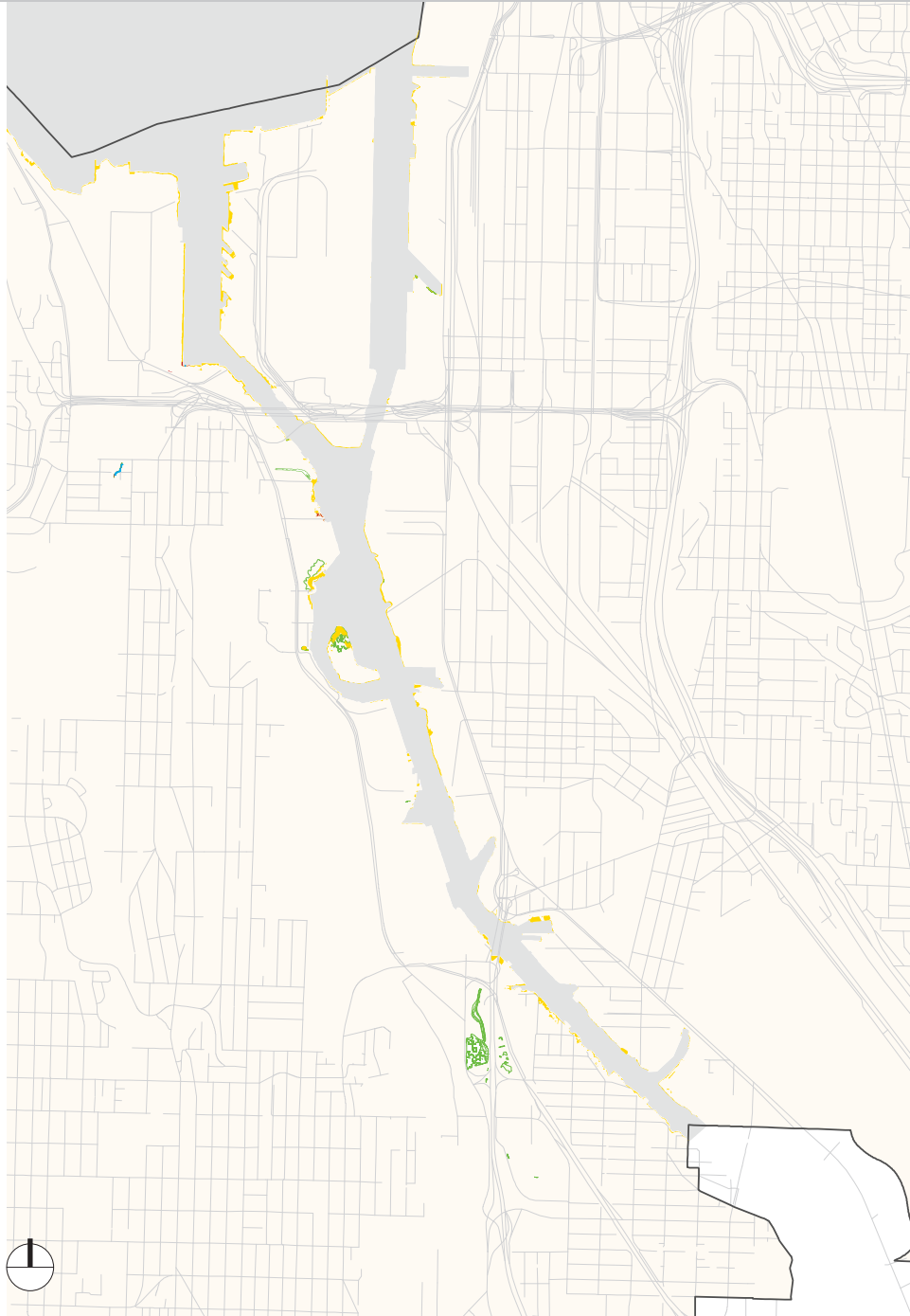
IMPACTS TO DUWAMISH



The following pages graphically illustrate impacts on the enlarged map of the Duwamish by study area category for water levels 2 feet above MHHW. The 2ft level is highlighted because it greatly impacts the Duwamish now at an annual frequency and in the 2060 scenario at a daily frequency.

A summary of baseline and impacted areas are not included in the scope of this mapping inventory, but can be easily accessed in the GIS files and are recommended for future evaluation.

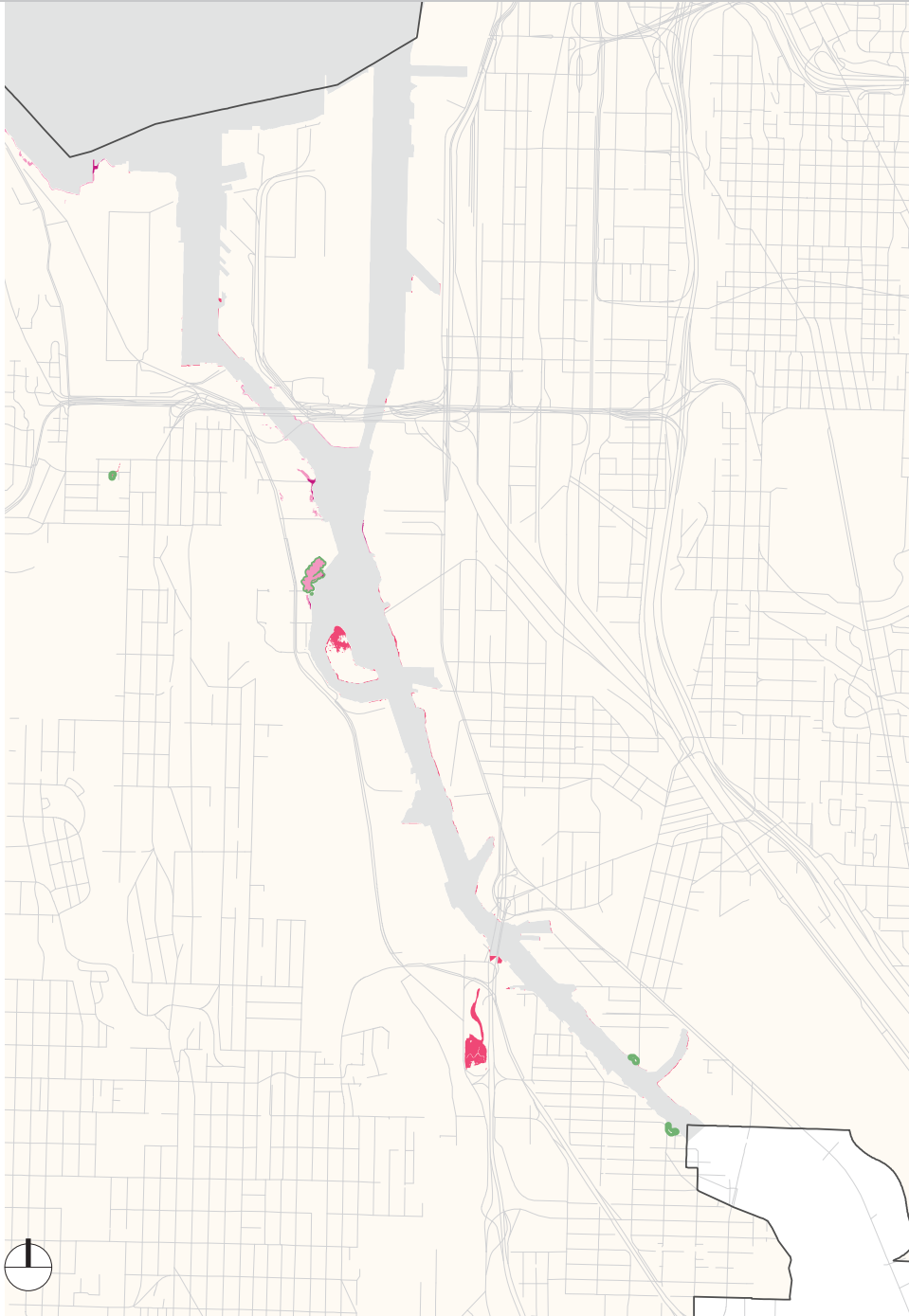
DUWAMISH: Aquatic Critical Areas Impacts



Year of Occurrence: FREQUENCY Now: ANNUALLY 2035: MONTHLY 2060: DAILY		<h1>2FT</h1> <p>ABOVE MHW</p>
KEY	GIS SHAPEFILE	
 Seattle Land Area	City_of_Seattle	
 Seattle City Limits (Political Boundary)	SeattleLimits	
 Water Body & Streams	n/a (negative of City_of_Seattle)	
 Streets	StreetNetworkDatabase	
CRITICAL AREAS		
Aquatic Critical Areas		
 Riparian Corridors	SLR11_RiparianSeattleLimits	
 Wetlands	SLR11_WetlandsSeattleLimits	
 Shoreline Buffer	SLR11_ShorelineHabitatSeattleLim	
 Streams	SLR11_StreamsLandOnly	



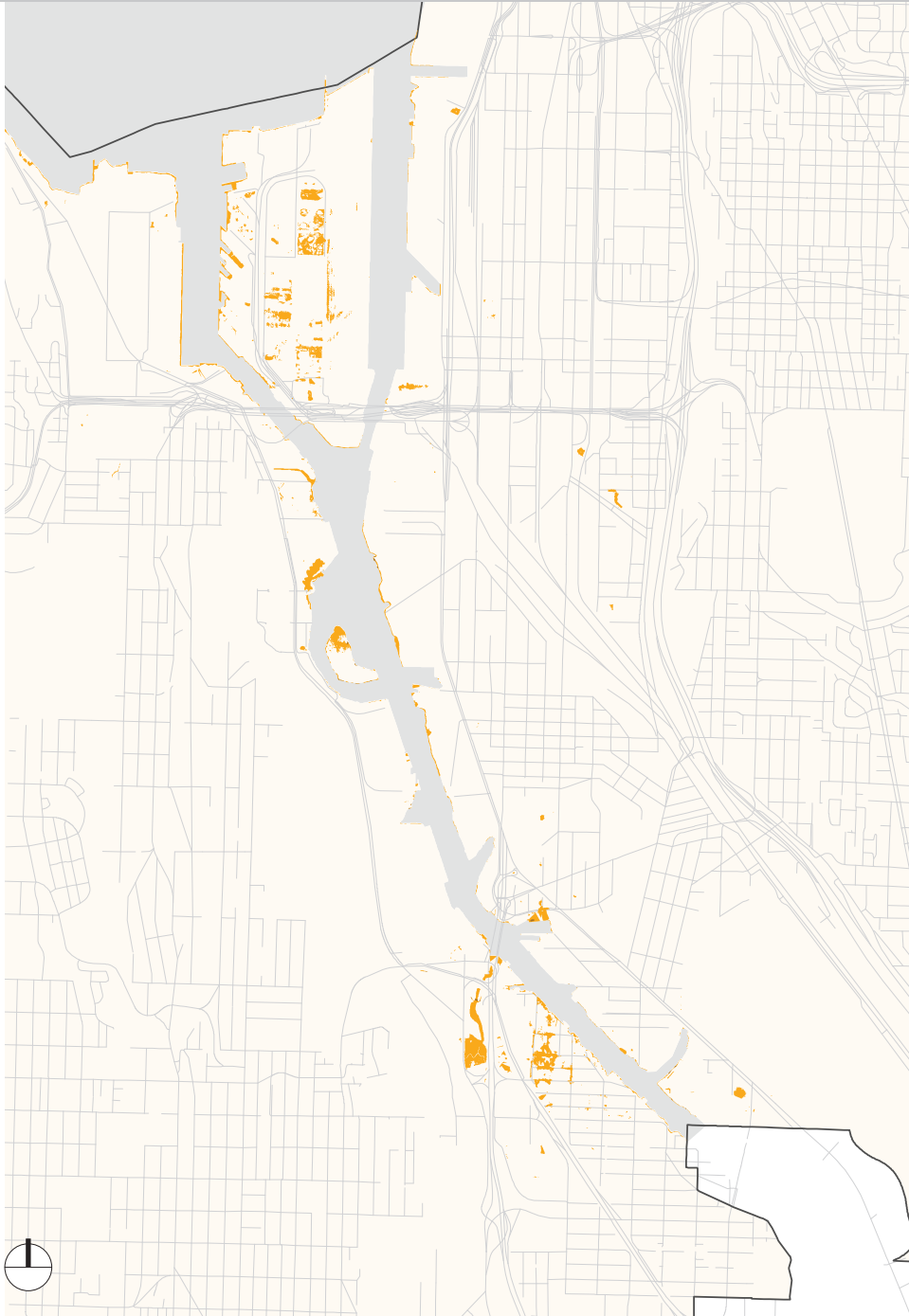
DUWAMISH: Habitat & Parks Impacts



Year of Occurrence: FREQUENCY Now: ANNUALLY 2035: MONTHLY 2060: DAILY		<h1>2FT</h1> <p>ABOVE MHHW</p>
KEY	GIS SHAPEFILE	
Seattle Land Area	City_of_Seattle	
Seattle City Limits (Political Boundary)	SeattleLimits	
Water Body & Streams	n/a (negative of City_of_Seattle)	
Streets	StreetNetworkDatabase	
CRITICAL AREAS		
<i>Habitat & Parks</i>		
PHS-Biodiversity Area/Corr, Eagle		
Eagle Mngmt Area		
PHS-Biodiversity Area/Corr		
Parks	SLR11_Parks_SeattleLimits	



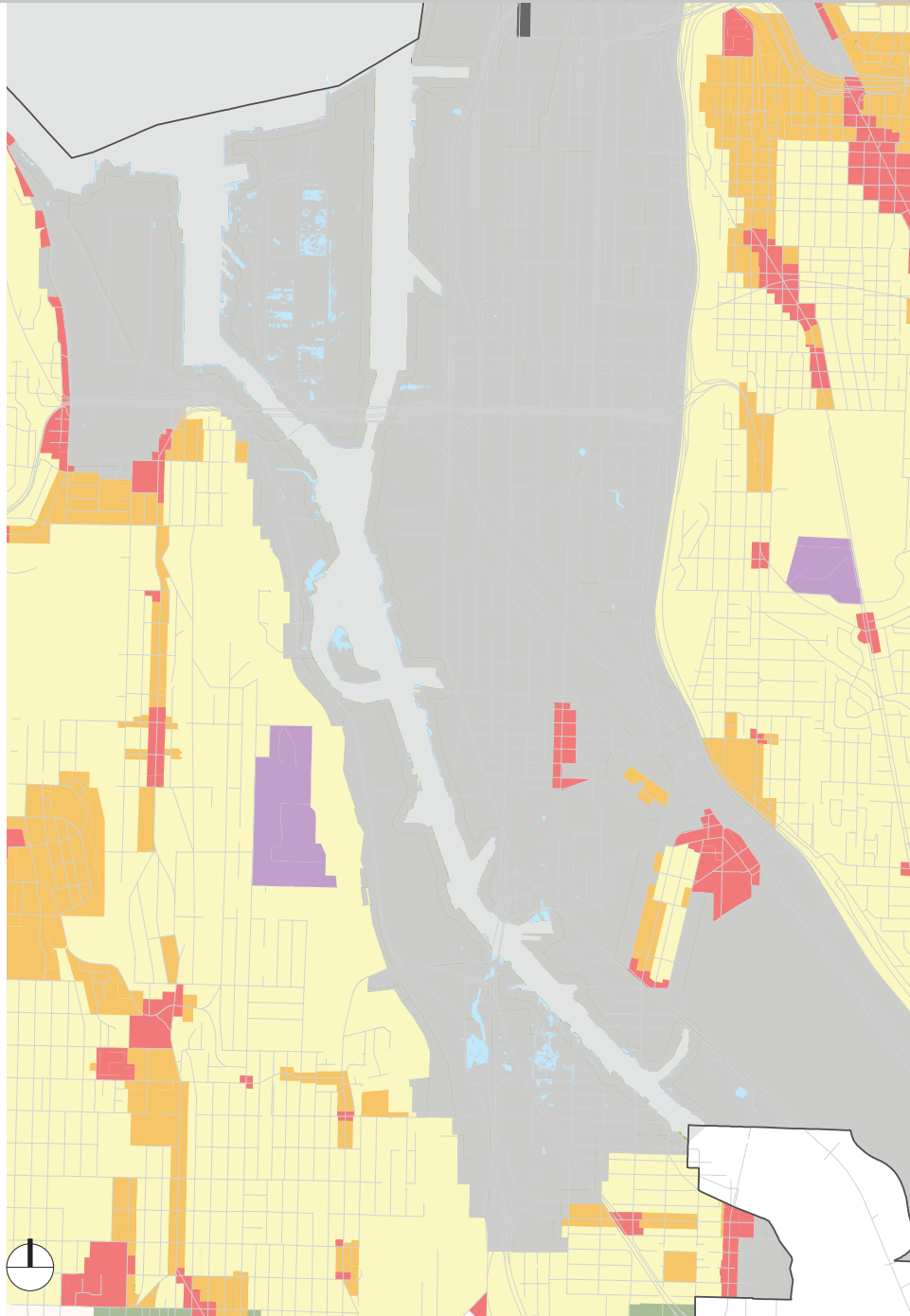
DUWAMISH: Soils Impacts



Year of Occurrence: FREQUENCY Now: ANNUALLY 2035: MONTHLY 2060: DAILY		<h1>2FT</h1> <p>ABOVE MHW</p>
KEY		GIS SHAPEFILE
	Seattle Land Area	City_of_Seattle
	Seattle City Limits (Political Boundary)	SeattleLimits
	Water Body & Streams	n/a (negative of City_of_Seattle)
	Streets	StreetNetworkDatabase
CRITICAL AREAS		
Soils		
	Peat Settlement Prone Areas	SLR11_LiquefactionArea
	Liquefaction Prone Areas	
	Geologic Hazard Areas ¹	
<i>1. Geologic Hazard Areas include known slide areas, potential slide areas, and steep slope erosion areas</i>		



DUWAMISH: Zoned Use Impacts



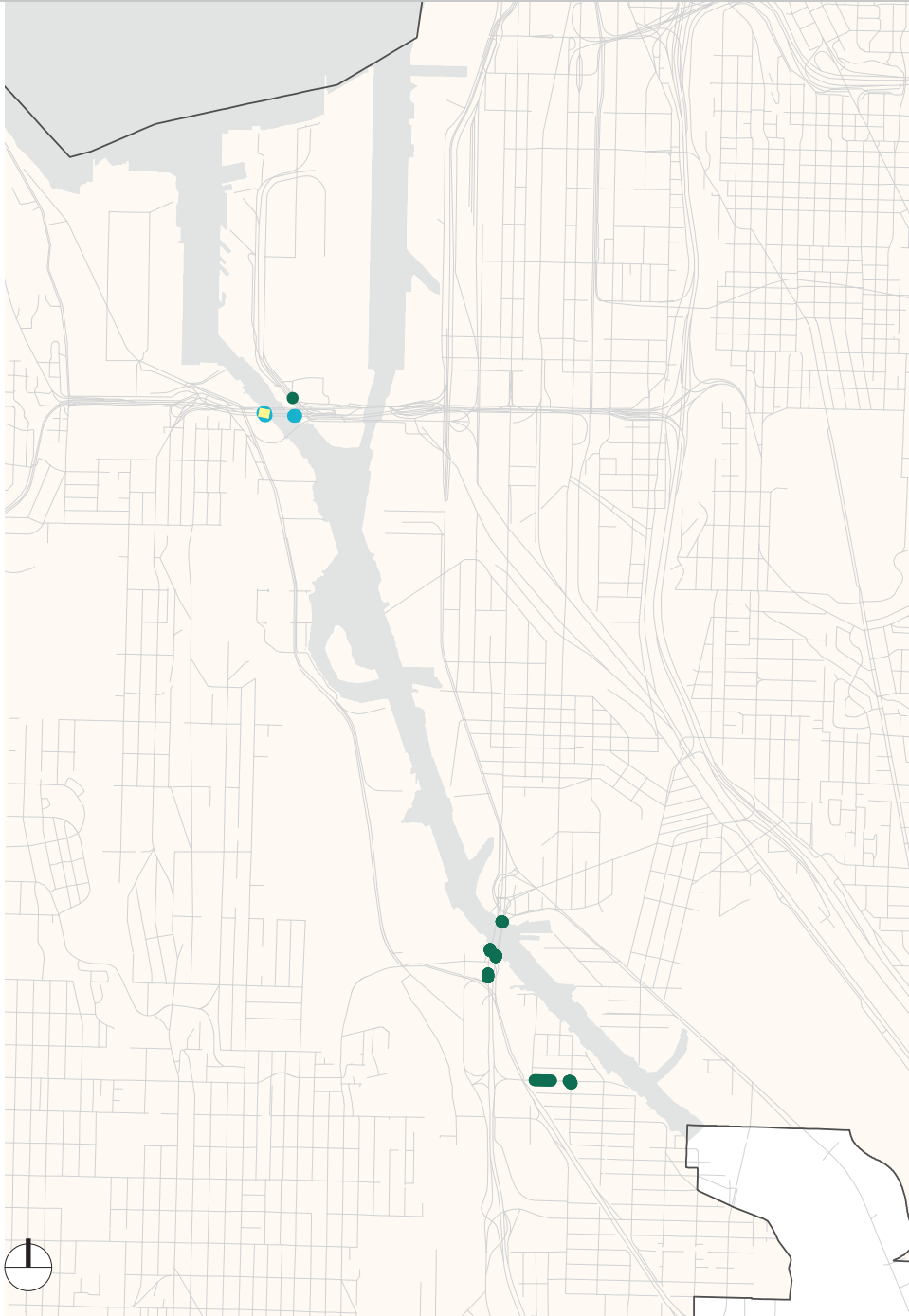
Year of Occurrence: FREQUENCY Now: ANNUALLY 2035: MONTHLY 2060: DAILY		<h1>2FT</h1> <p>ABOVE MHHW</p>
KEY	GIS SHAPEFILE	
Seattle Land Area	City_of_Seattle	
Seattle City Limits (Political Boundary)	SeattleLimits	
Water Body & Streams	n/a (negative of City_of_Seattle)	
Streets	StreetNetworkDatabase	
Inundated Area: 2FT of Sea Level Rise	SLR_11	
LAND USE		
Zoned Use		
Single Family	Zoning_Land	
Multi-Family	Zoning_Land	
Neighborhood/Res. Commercial	Zoning_Land	
Downtown	Zoning_Land	
Industrial Areas	Zoning_Land	
Master Planned Community	Zoning_Land	
Major Institutions	Zoning_Land	

DUWAMISH: Planning Areas Impacts



Year of Occurrence: FREQUENCY Now: ANNUALLY 2035: MONTHLY 2060: DAILY		<h1>2FT</h1> ABOVE MHHW
KEY	GIS SHAPEFILE	
Seattle Land Area	City_of_Seattle	
Seattle City Limits (Political Boundary)	SeattleLimits	
Water Body & Streams	n/a (negative of City_of_Seattle)	
Streets	StreetNetworkDatabase	
Inundated Area: 2FT of Sea Level Rise	SLR_11	
LAND USE		
Planning Areas		
GREATER DUWAMISH	UrbanVillages_Land	
PIONEER SQUARE	UrbanVillages_Land	
SOUTH PARK	UrbanVillages_Land	
Other Planning Areas (Unimpacted)	UrbanVillages_Land	
<i>Planning Areas include urban centers, villages, manufacturing and industrial centers</i>		

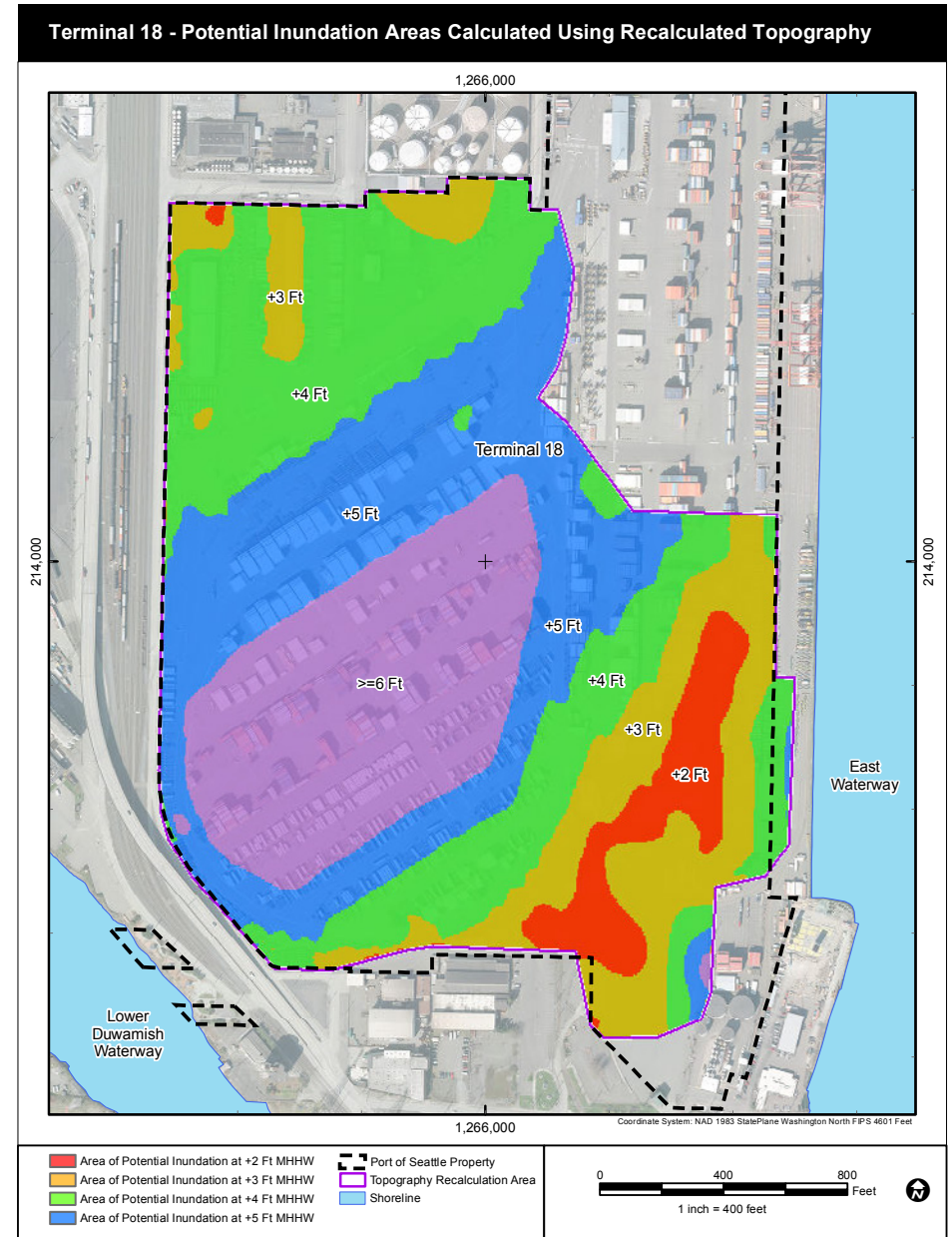
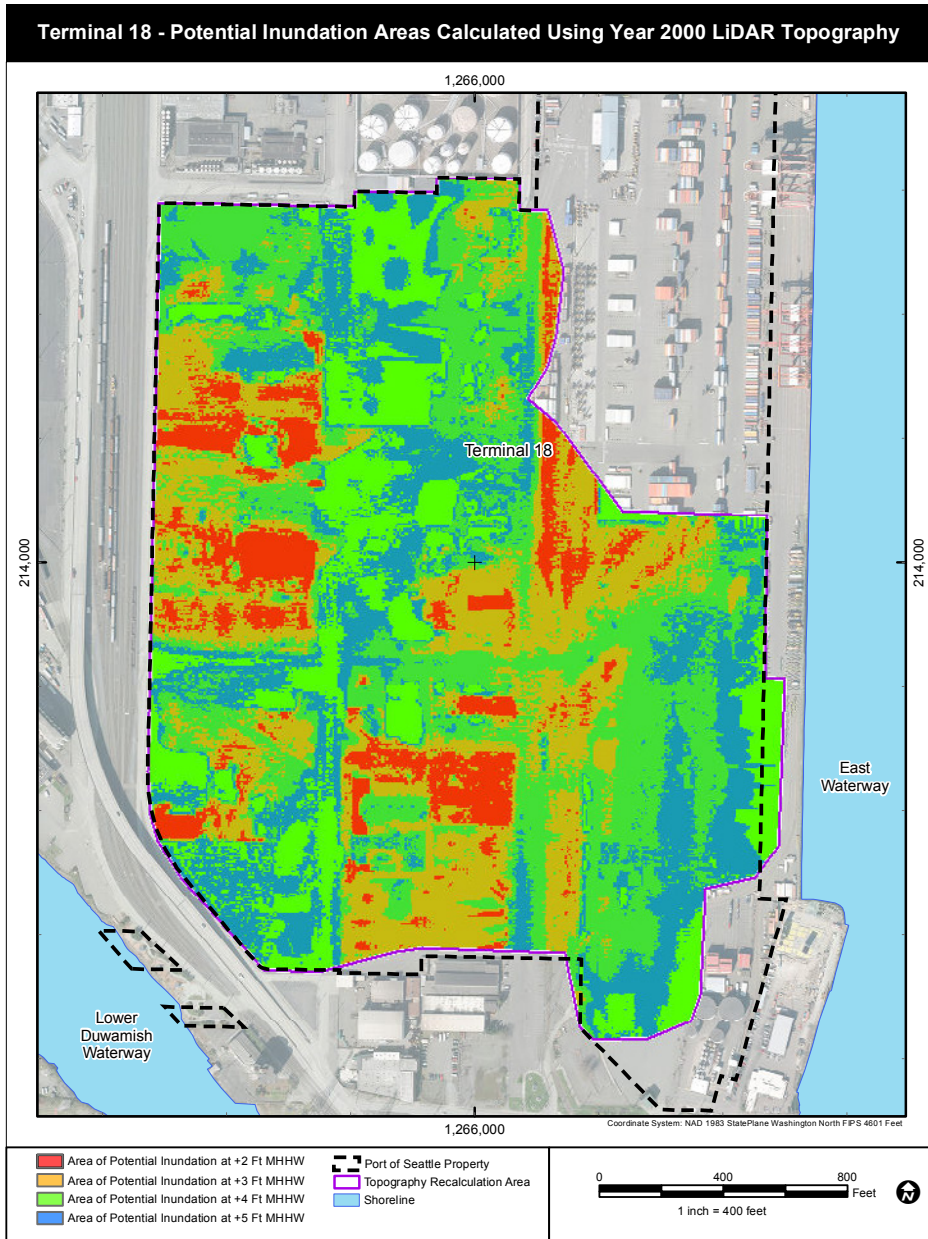
DUWAMISH: Transit Impacts



Year of Occurrence: FREQUENCY Now: ANNUALLY 2035: MONTHLY 2060: DAILY		<h1>2FT</h1> <p>ABOVE MHW</p>
KEY	GIS SHAPEFILE	
 Seattle Land Area	<i>City_of_Seattle</i>	
 Seattle City Limits (Political Boundary)	<i>SeattleLimits</i>	
 Water Body & Streams	<i>n/a (negative of City_of_Seattle)</i>	
 Streets	<i>StreetNetworkDatabase</i>	
TRANSPORTATION		
Transit		
 Bus Stops	<i>SLR11_Bus Stops</i>	
 Bus Routes	<i>SLR11_Bus Routes</i>	
 TMP Priority Corridor	<i>SLR11_TMPPC</i>	
 Frequent Transit Corridor (LF)	<i>SLR11_Freq Transit</i>	



PORT OF SEATTLE TERMINAL-18: Adjusted Inundation



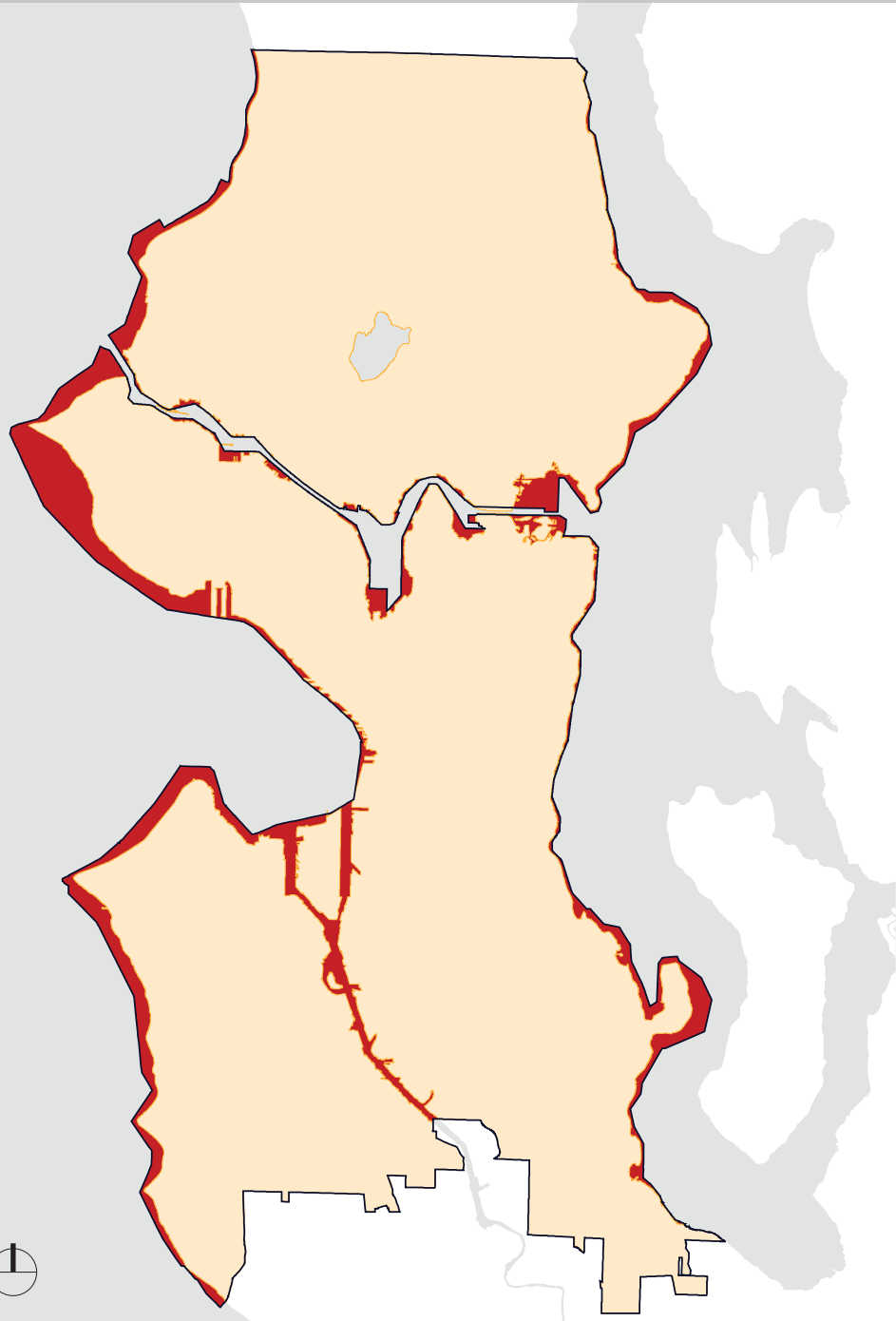
See page 1 Assessment as Screening Tool | Case Study: Port of Seattle

METHODOLOGY

The following pages detail the mapping inventory methodology.



METHODOLOGY: Project Boundary



PROJECT BOUNDARY & EXCLUDED AREA CLIP






An important part of the overall methodology has been to identify the correct project boundary from which to measure affected areas and set a consistent baseline. The "City_of_Seattle" GIS data layer was selected as the project boundary, with the assumption that its edges represent the current day *shoreline* and approximately correlate to the City's official vertical datum of NAVD88. All analyzed data were clipped to this boundary prior to overlaying sea level rise inundation areas.

This was important to do, since some City GIS data layers extend across the shoreline into Puget Sound and other water bodies, with many extending to the political boundary of the "City Limits" (and a few even beyond that line). To prevent calculating sea level rise impacts to those areas that are already in the water, or submerged, they were removed from each study category area's total area from the start.¹

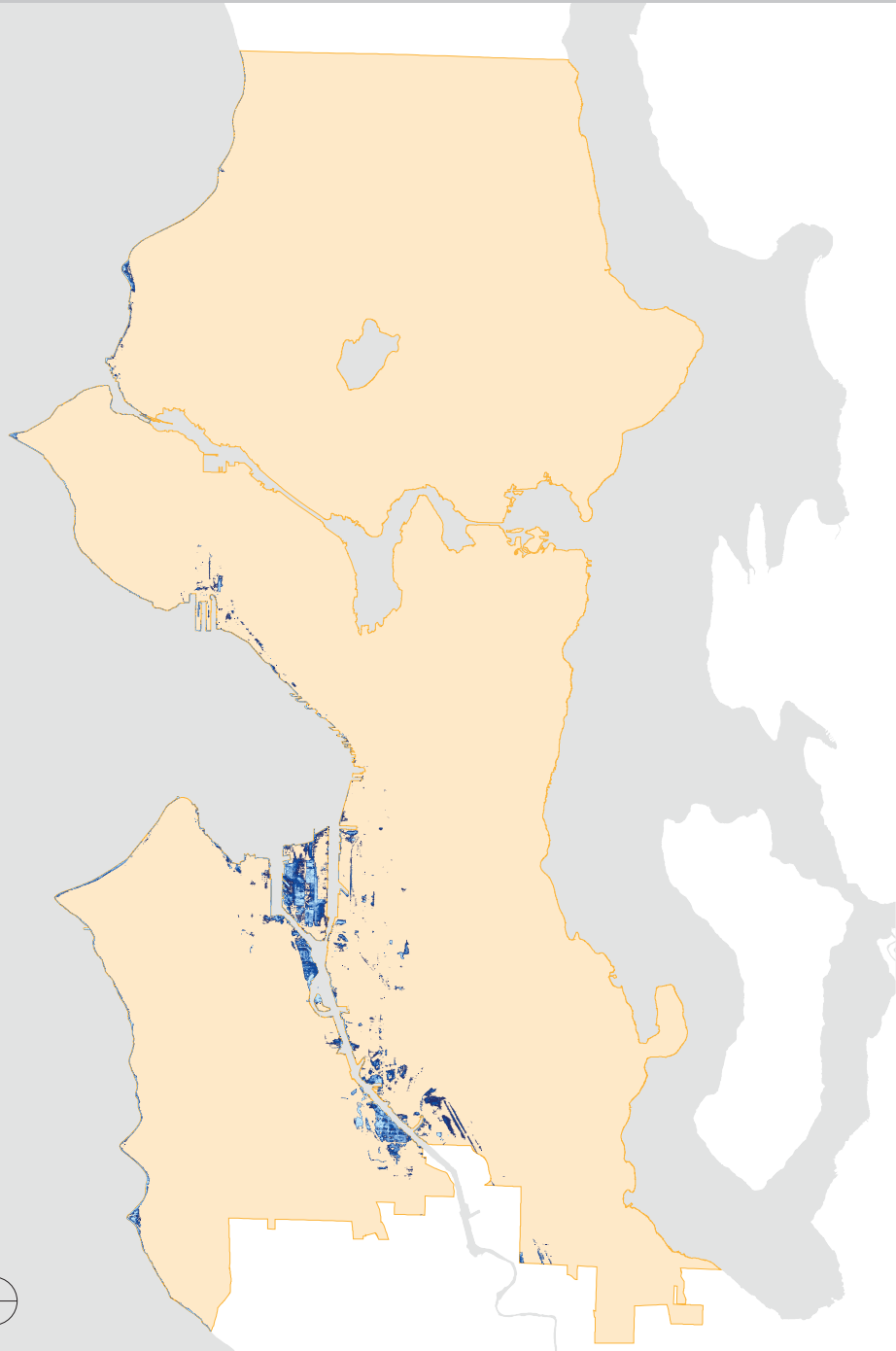
For example, before clipping to the set project boundary, the total acres found for urban center villages in the "DPD_uvmfg_polygon" GIS layer is 16,574 acres; afterwards it is 15,307 acres, which is the baseline area for this land use category.² While this "submerged" versus "shoreline" issue is not readily visible on a citywide map (shown on the left of this page), GIS has the capacity to zoom in on target areas to easily identify the issue.

¹ For record keeping, these excluded areas were tracked and accounted for under a separate "Submerged" category of the City_of_Seattle.shp layer.

² See land use and other categories in the Table of Contents pg iii.

KEY	GIS Shapefile
 Seattle Land Area	City_of_Seattle
 Seattle City Limits (Political Boundary)	SeattleLimits
 Other Land outside City	OtherLand
 Water Body & Streams	n/a
 Excluded Area (aka "Submerged")	n/a (Area b/w Land & Limits)

METHODOLOGY: Quantifying Impact Areas










QUANTIFYING IMPACT BY AREA

Sea Level Rise projections were provided by Seattle Public Utilities (GIS shapefiles SLR_11, SLR_12, SLR_13, SLR_14).

To determine the impacts of sea level rise on Seattle Land Use, the areas of projected inundation are overlaid over the City's land area, which produces a quantifiable area-of-impact to known critical areas and land use areas such as wetlands, shoreline habitat, multifamily zones, planning areas and arterials.

Uncertainties present in GIS data, software, and climate projections should be considered when evaluating the accuracy of the results. The City and its consultants assume no liability in the use of this information.

KEY	GIS Shapefile
 Seattle Land Area	<i>City_of_Seattle</i>
 Other Land outside City	<i>OtherLand</i>
 Water Body & Streams	<i>n/a</i>
 Impacted Area: 2FT ABOVE MHHW (11FT NAVD88)	<i>SLR_11</i>
 Impacted Area: 3FT ABOVE MHHW (12FT NAVD88)	<i>SLR_12</i>
 Impacted Area: 4FT ABOVE MHHW (13FT NAVD88)	<i>SLR_13</i>
 Impacted Area: 5FT ABOVE MHHW (14FT NAVD88)	<i>SLR_14</i>