



Air Pollution Dispersion Modeling

Analyzing Bellevue's
Freeways & Neighborhoods

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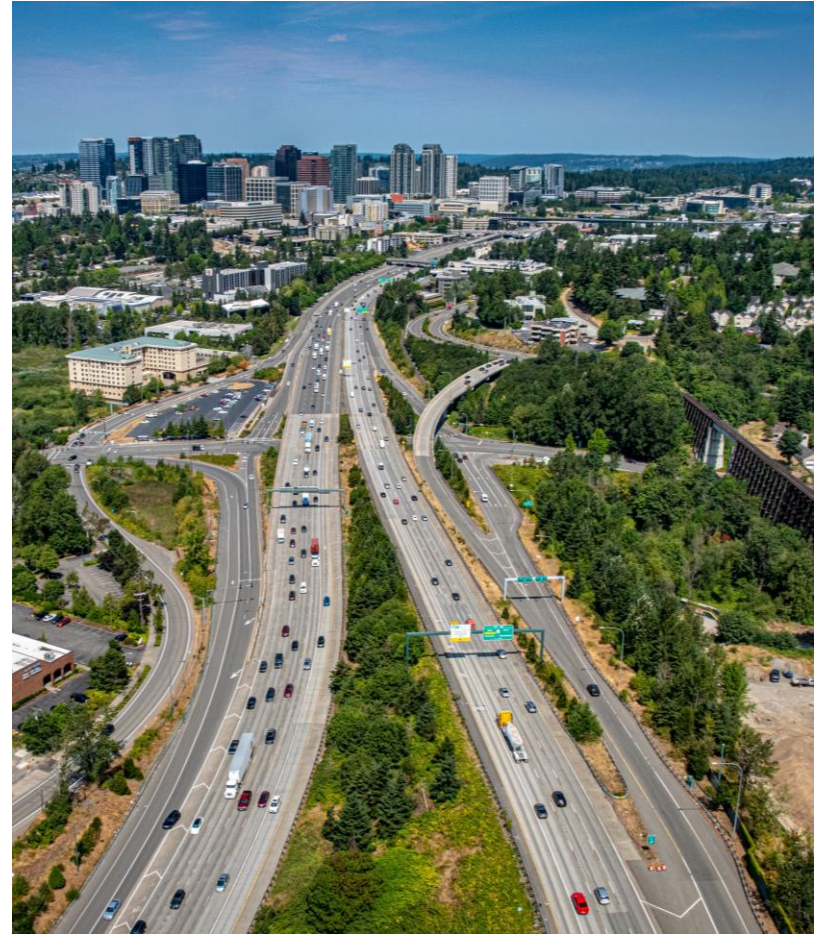
May 7, 2026



Overview

Agenda

1. Study purpose & scope
2. Planning context
3. Key findings
4. Mitigation strategies research
5. What jurisdictions have done

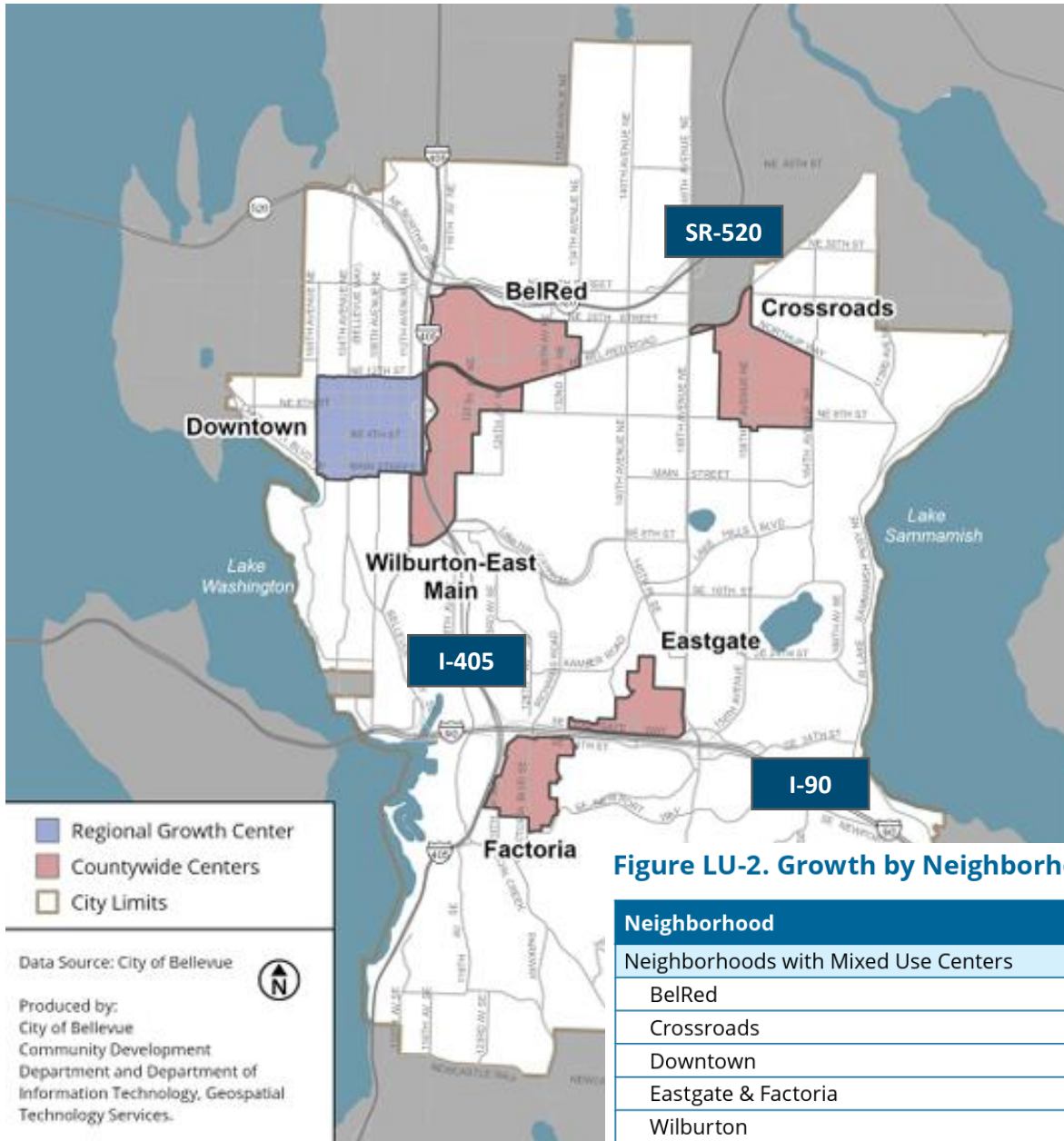


Modeling Study Purpose

Impetus & Related Work

- Sustainable Bellevue Plan (2020-25)
 - C.1.6: assess air quality to inform planning, development, and public health
- Comprehensive Plan (2022-24)
- Wilburton Vision Implementation (2022-25)





Relationship of freeways to Bellevue's Growth Centers...

Figure LU-2. Growth by Neighborhood (2019-2044)

Neighborhood	Jobs	Housing Units
Neighborhoods with Mixed Use Centers	66,300	32,600
BelRed	14,200	7,900
Crossroads	900	700
Downtown	37,600	14,500
Eastgate & Factoria	2,500	4,600
Wilburton	11,100	4,900
All other Neighborhoods	3,700	2,400
Total	70,000	35,000

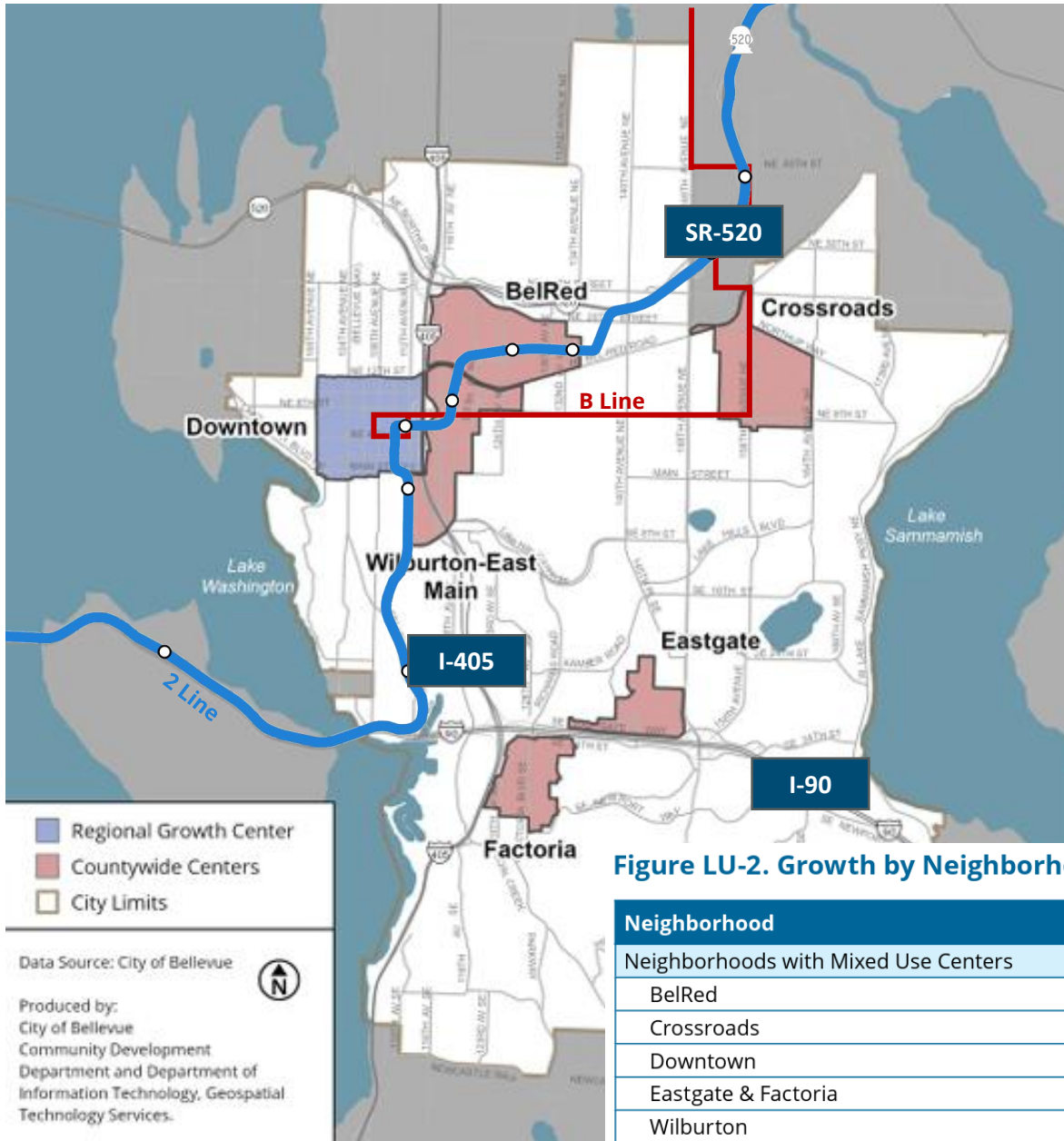


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Relationship of
freeways to
Bellevue's Growth
Centers...

and current HCT...

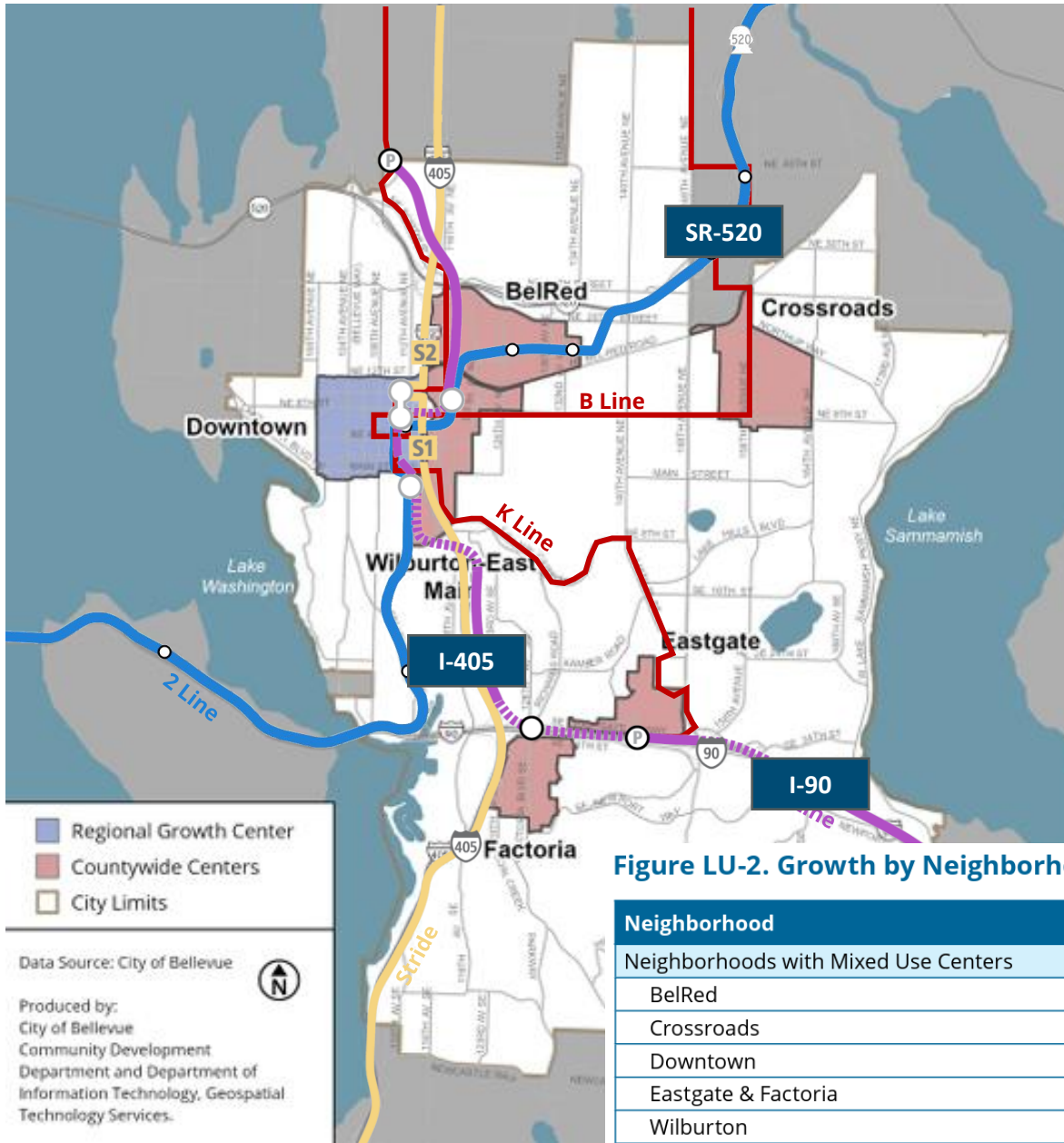


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And future HCT...

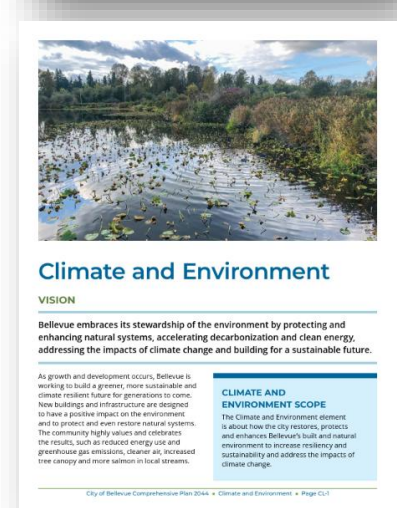
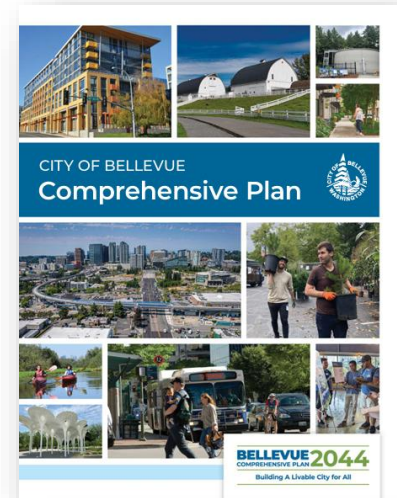
Data Source: City of Bellevue

Produced by:
City of Bellevue
Community Development
Department and Department of
Information Technology, Geospatial
Technology Services.

Policy Framework

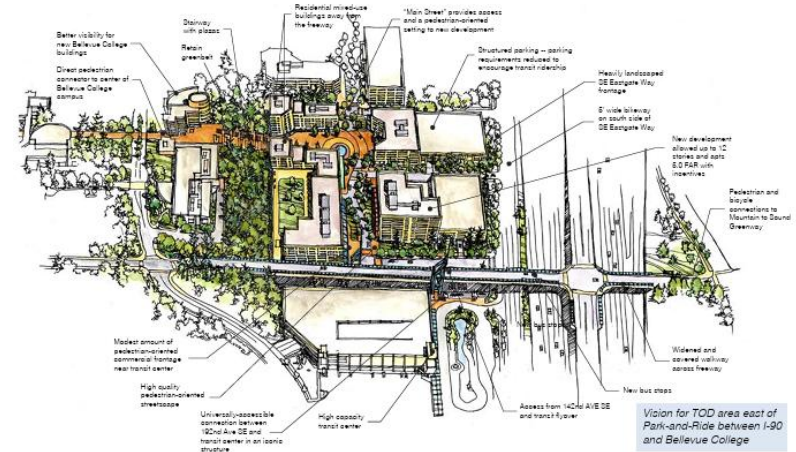
Bellevue Comprehensive Plan

- **CL-2. Eliminate the release of substances into the air...**
- **CL-116. Monitor and mitigate freeway noise and air pollution** in collaboration with the state and other **partners**, prioritizing areas that are the **most burdened...**
- **LU-44.** Promote measures to **protect sensitive uses** from risks of exposure to air and noise pollution by **locating them away ...** or by use of feasible, effective **building and site design measures** to mitigate exposure.
- **LU-45.** Design **new development** and encourage the retrofit **existing buildings** to improve indoor air quality and reduce **resident exposure...**
- **CL-72. Implement projects** that provide significant air quality improvements to **areas with... poor air quality.**



Planning Context: Eastgate and Factoria

- Major commercial and employment center (T-Mobile headquarters, Bellevue College, hotels and office)
- Planning for the future:
 - Growth strategy directs housing and job growth in areas largely low-density commercial and office today
 - Neighborhood area planning underway to support neighborhood identity, mobility, placemaking, and mixed-use development
 - Anticipating future high-capacity transit with the K RapidRide Line and Sound Transit 4 Line



Planning Context: BelRed

- Since 2009, transformation of former 820+ acre industrial area into series of vibrant, urban villages around light rail
- Planning for the future:
 - Increased residential and job growth and density near light rail
 - Walkable street grid
 - Enhanced streams and green spaces
 - Cultivating the BelRed Arts District through public art, artists housing, and creative economy
 - Expansion of medical and life sciences



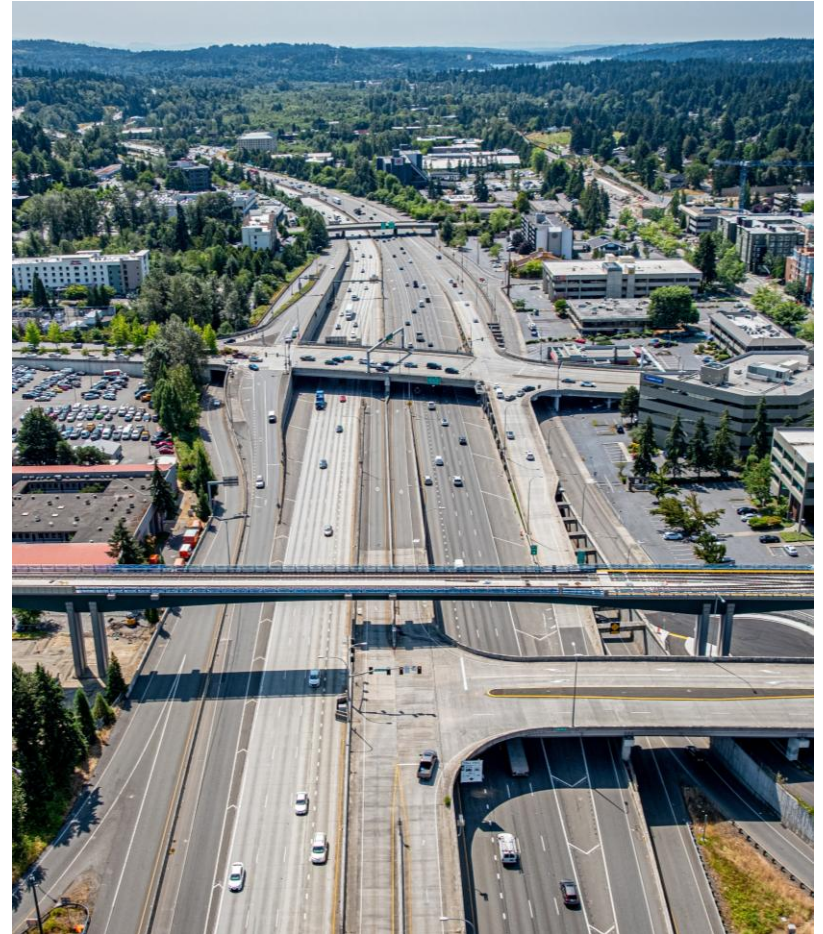
Planning Context: Downtown, Wilburton, and East Main

- Mix of housing, retail, service, office and complementary uses at highest scale and density in Bellevue, close to light rail
- Major planning updates to support vision for Downtown (2017), East Main (2021), and Wilburton (2025) as vibrant, mixed-use centers
- Eastrail, Grand Connection, high-capacity transit envisioned to stitch these neighborhoods together
- Support for a future sustainable district in Wilburton



Challenges & Uncertainties

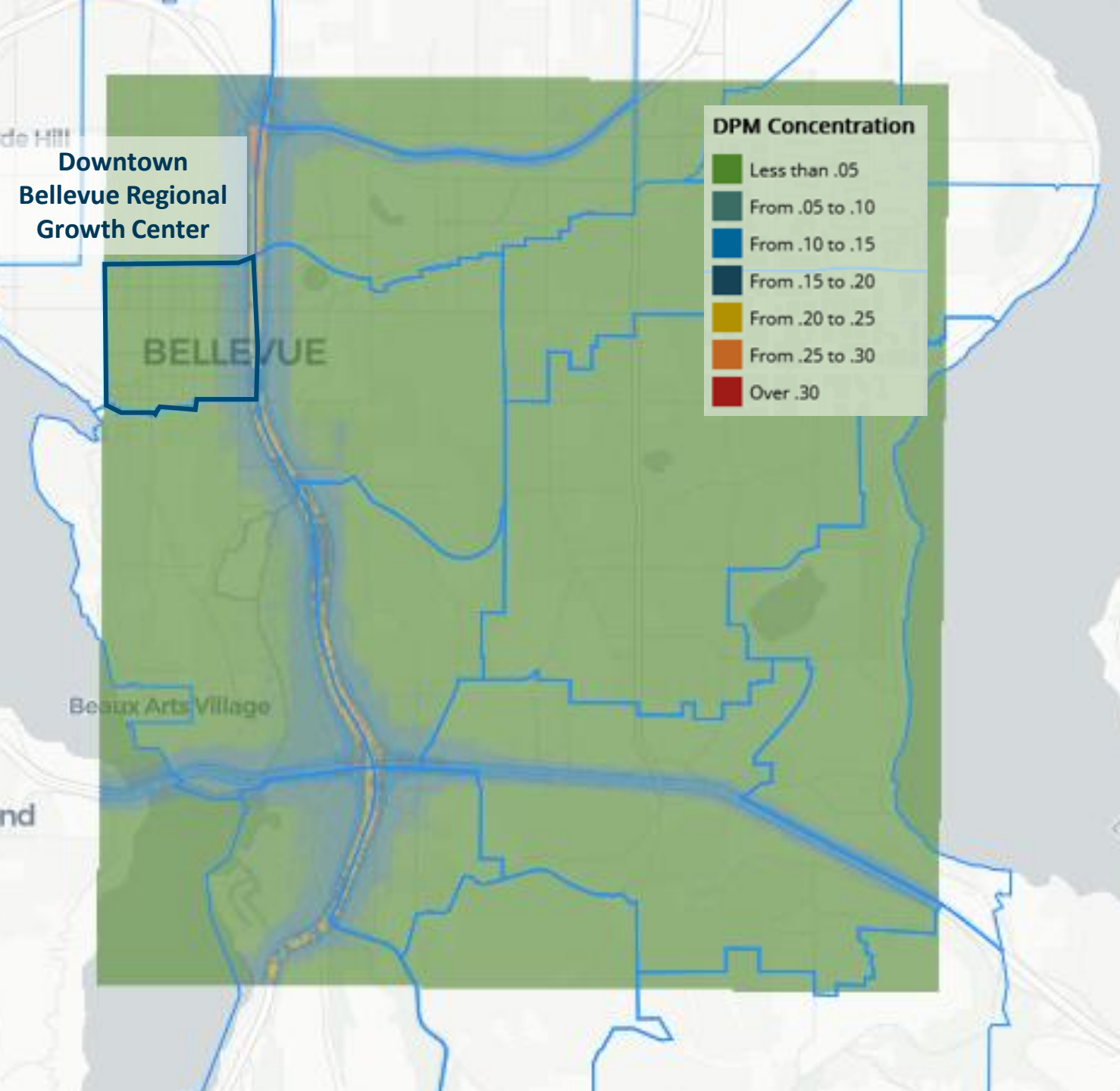
- Competing priorities: housing, affordability, transit, livability
- Addressing future and existing uses
- Co-location of transit, growth centers, and freeways
- No state-triggered action
- Trend assumptions: EV adoption, engine efficiency



Modeling Scope

Overview

- **Pollutants:** tailpipe emissions
- **Modeling:** horizontal and vertical dispersion for future scenarios
- **Inputs:** fleet, traffic, topographical, meteorological (2023, 2034, 2044)
- **Outputs:** dispersion data and analysis, including health risks
- **Geography:** near-freeway zones (I-405, SR-520, I-90)
- **Mitigation strategies:** physical barriers, building systems



Modeling Domain

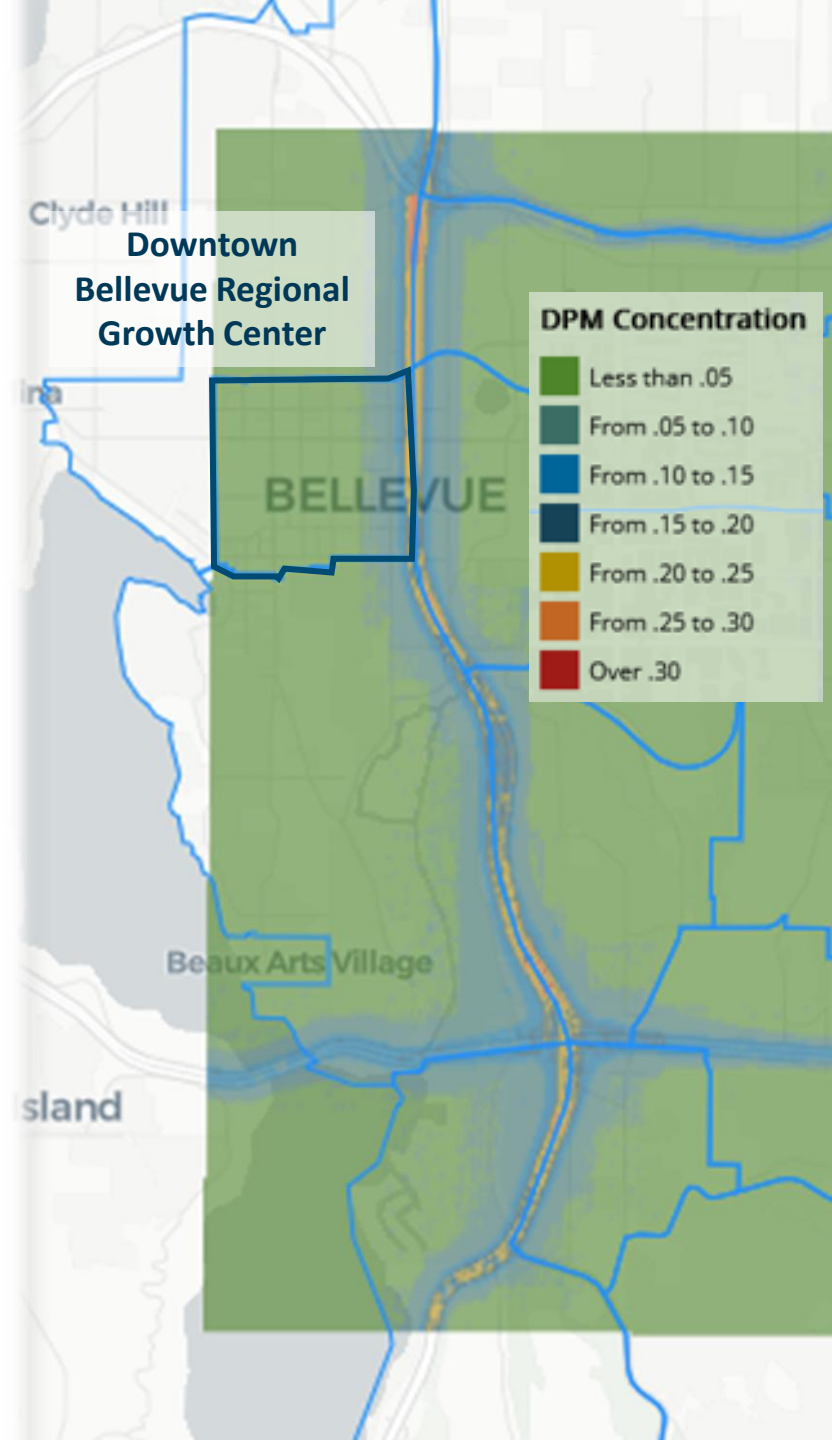
Mobile sources on
Bellevue freeways
I-90, I-405, SR-520

Data: 2023 (present)
conditions

Study Results

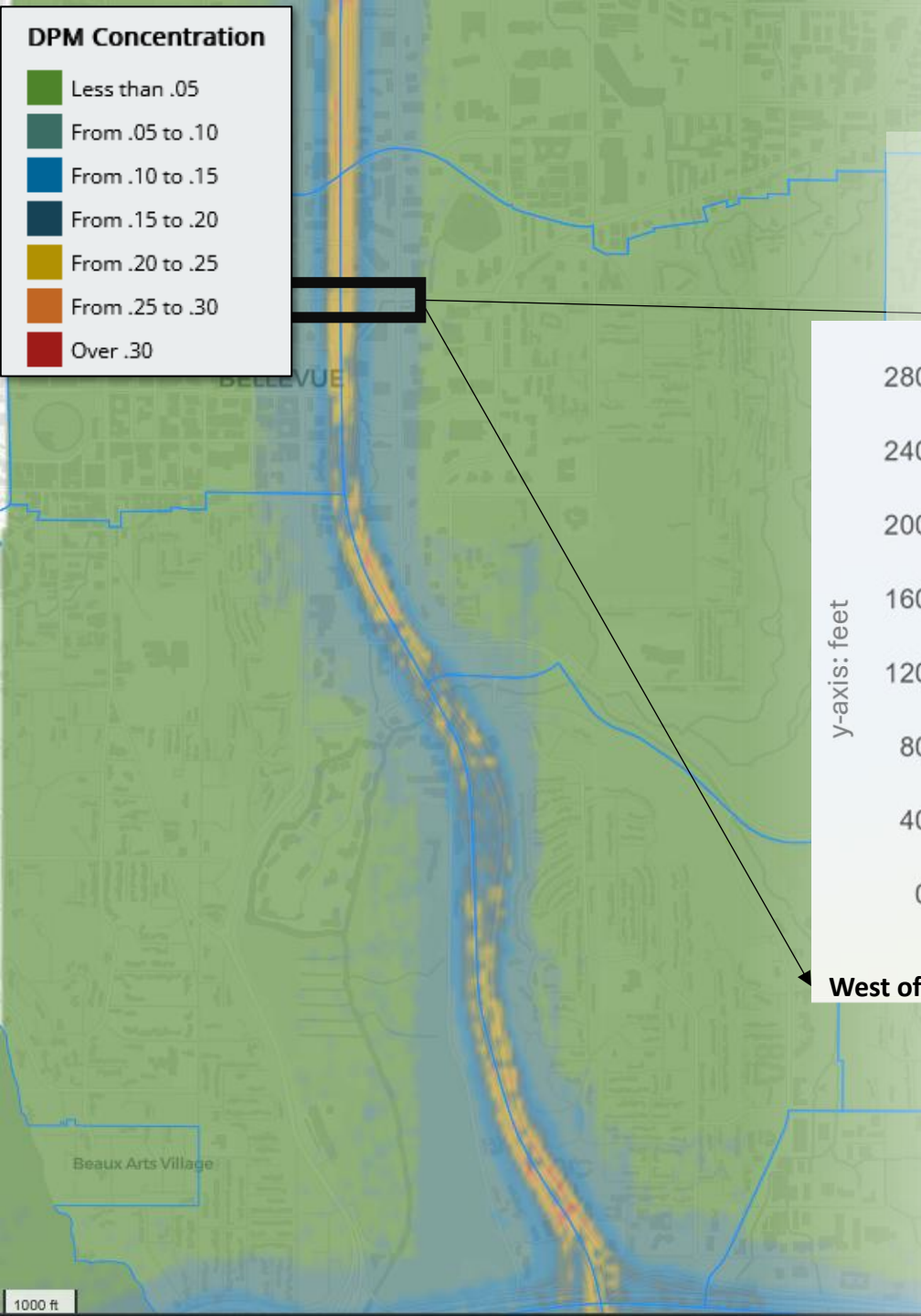
Heightened Air Pollution

- Air Pollution Exposure Zone (APEZ)
 - < 500ft of horizontal range
 - < 40ft of vertical height
- 2023 conditions are worse
- I-405 and interchanges are worse
- Diesel Particulate Matter (DPM) levels up to 10x “no significant risk”

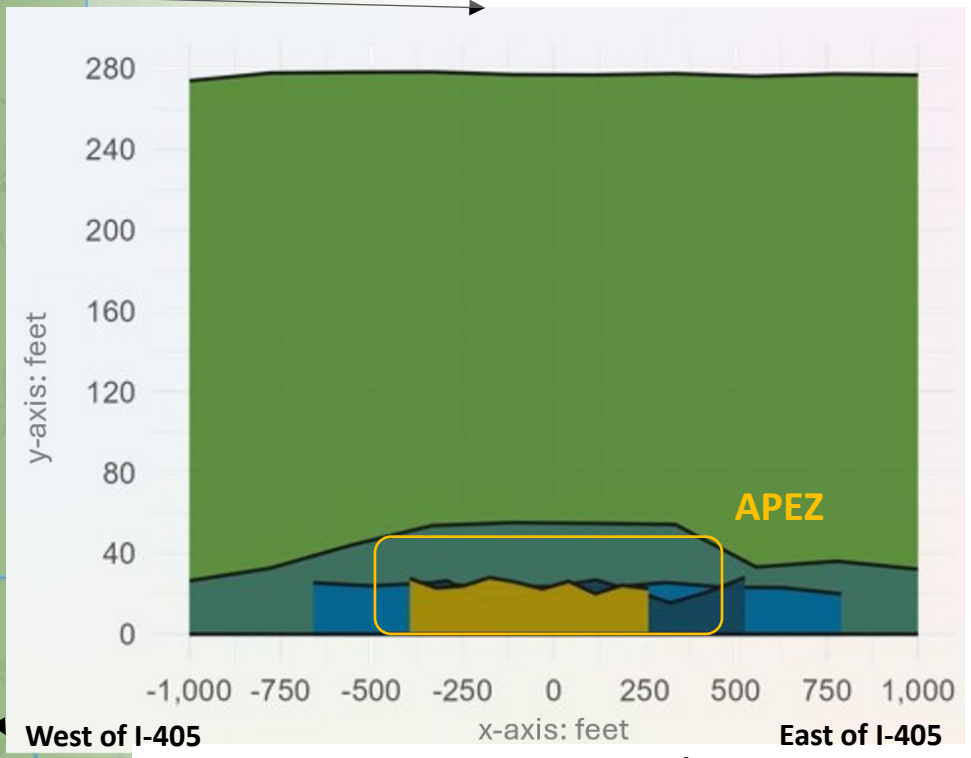


DPM Concentration

- Less than .05
- From .05 to .10
- From .10 to .15
- From .15 to .20
- From .20 to .25
- From .25 to .30
- Over .30

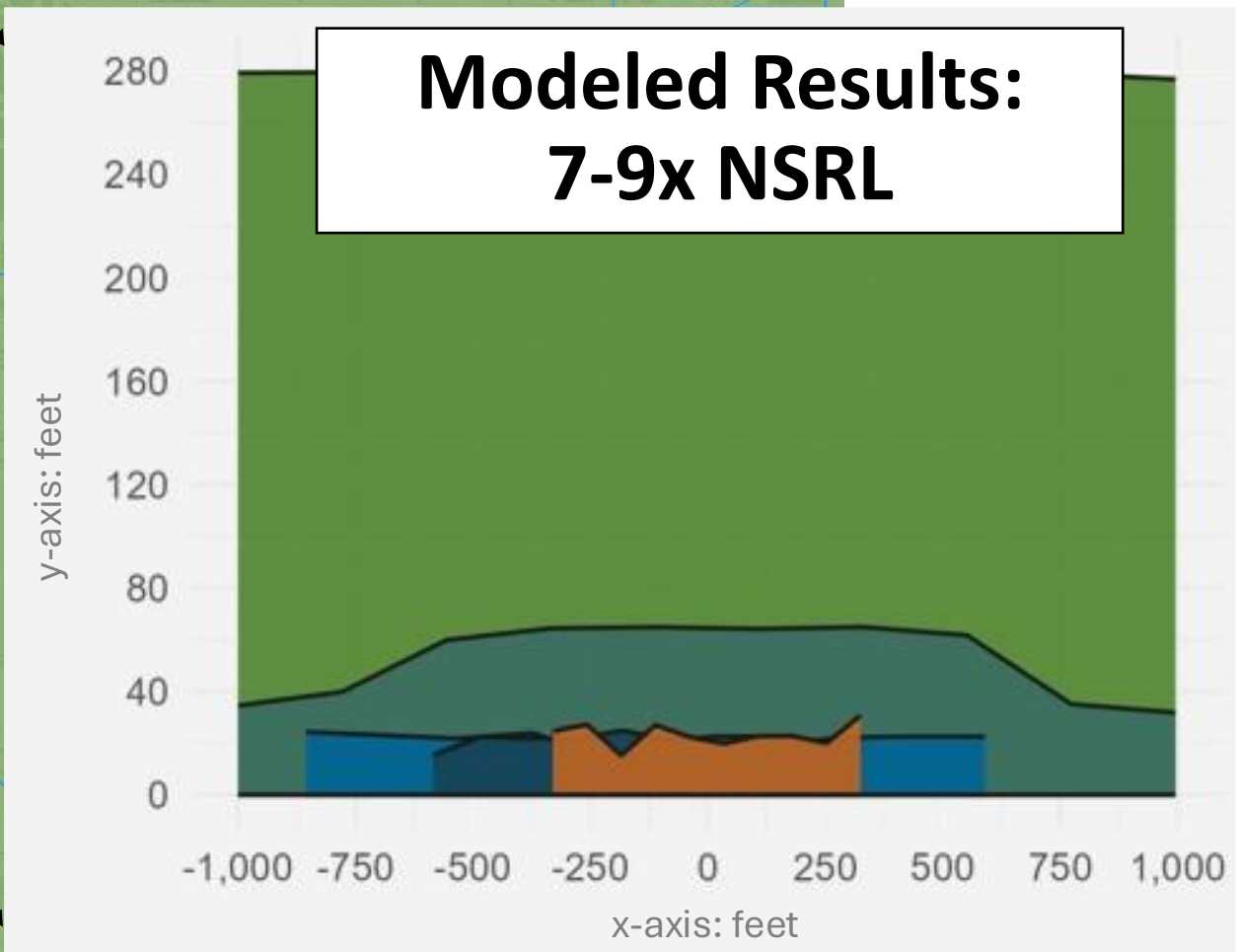
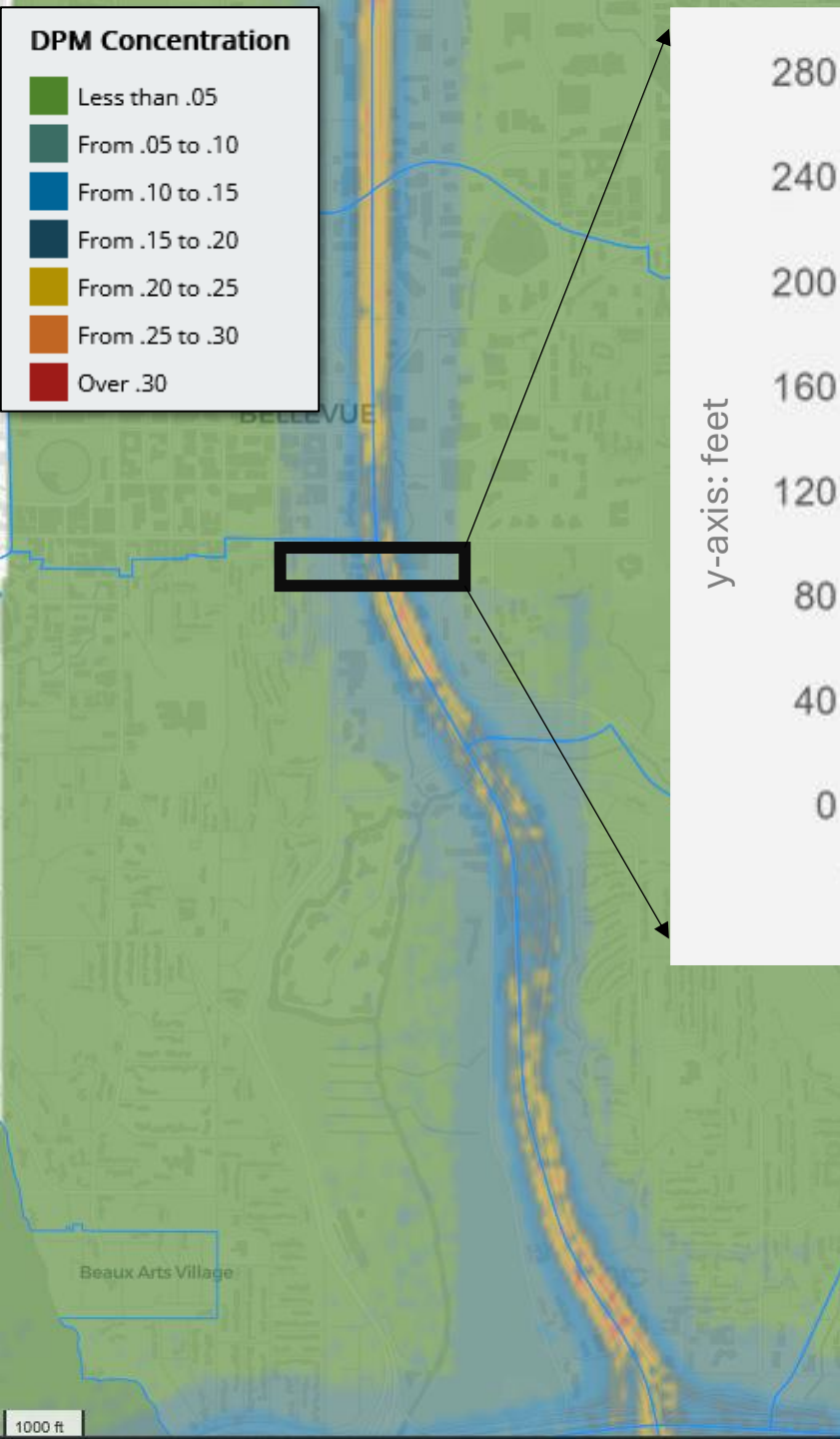


Modeled Results: 6-8x NSRL



I-405 & NE 8th

DPM pollutant concentrations from mobile sources on Bellevue freeway I-405 (2023)

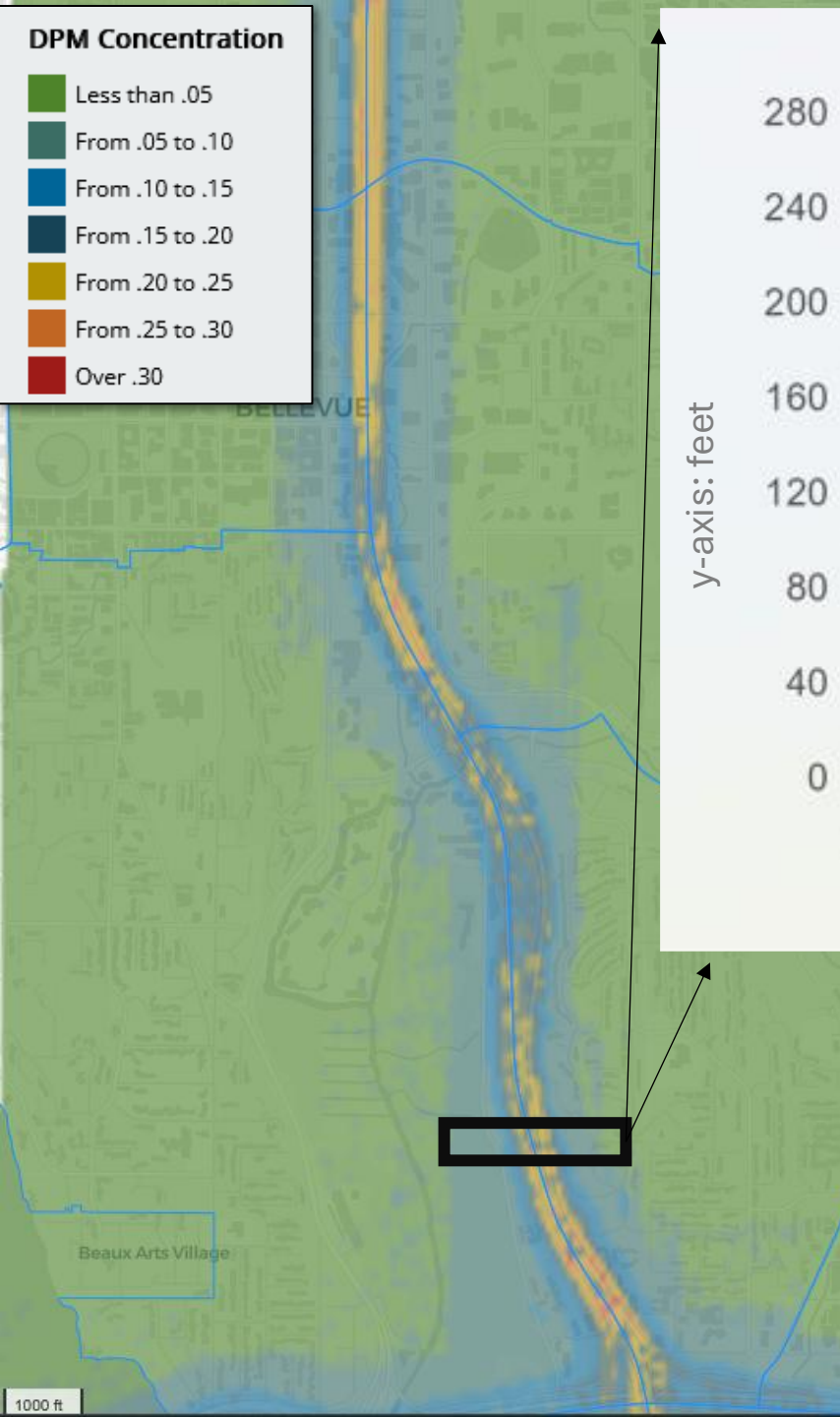


I-405 & SE 2nd

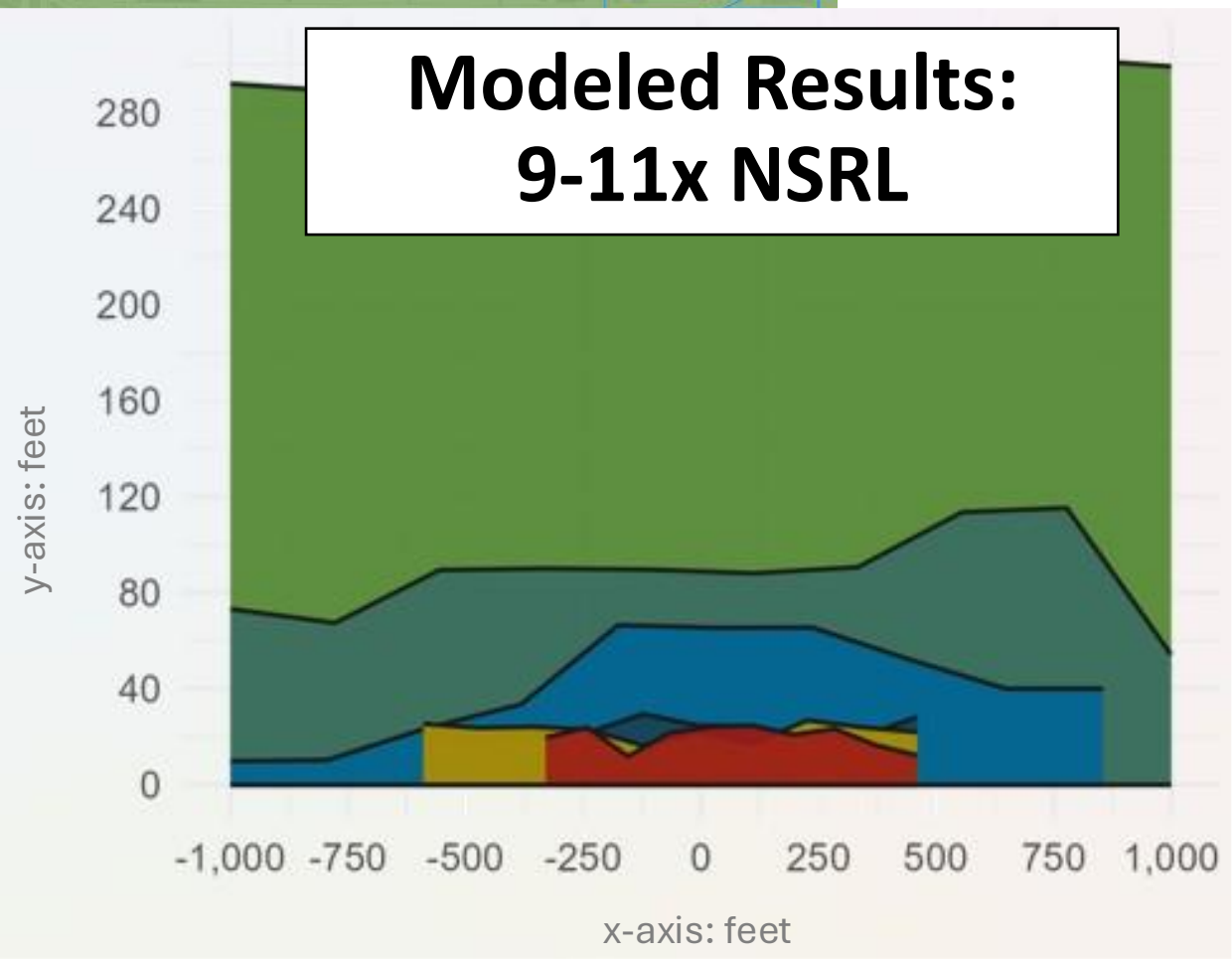
DPM pollutant concentrations from mobile sources on Bellevue freeway I-405 (2023)

DPM Concentration

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- Over .30



**Modeled Results:
9-11x NSRL**



I-405 & SE 29th

DPM pollutant concentrations from mobile sources on Bellevue freeway I-405 (2023)

Mitigation Strategies

(1) Physical Barriers

- Noise walls
- Vegetative buffers



(2) Building Solutions

- Moving air intakes & vents
- MERV-13 & activated carbon filters

What Are Others Doing That's Similar?

Action	Description	Jurisdictions
Physical Barriers + Vegetative Buffers	Noise walls	WSDOT
Incentive Programs	Vehicle upgrades (off-road, on-road, rail, and marine diesel electrification)	PSCAA
Policy, Code, Permitting, and Planning	<p>Long-range plan policies, building or site design policies, and code to protect sensitive uses from poor AQ</p> <p>Community risk assessments or risk reduction plans</p> <p>Construction project permits to demonstrate acceptable health risk levels, or else provide risk reduction measures</p>	Bothell, San Francisco, San Jose, Santa Clara County, San Francisco, Hayward, and Oakland

Bellevue Land Use Code

4. **Interstate 405 Guidance.** On sites within 500 feet of Interstate 405, locate sensitive land uses further east from Interstate 405 where feasible. Sensitive land uses include:
 - a. Residential land uses intended for nontransient occupancy;
 - b. Child care services uses;
 - c. Parks and open space; and
 - d. Primary and secondary schools.
5. **Landscape Buffer Near Interstate 405.** A landscape buffer shall be required from the property line adjoining Interstate 405.
 - a. The buffer shall be no less than 20 feet in width. Where an access corridor is constructed that immediately adjoins Interstate 405, then the buffer shall be no less than five feet in width.
 - b. Deciduous and evergreen trees shall be planted in the buffer with a minimum average of 1 tree every 20 lineal feet. Deciduous trees shall have a minimum caliper of two inches measured four feet six inches above the soil surface. Evergreen trees shall be minimum height of six feet.
 - c. Shrubs shall be planted in a manner that their coverage equals 75 percent of the planting area within 3 years of planting.
 - d. Ground cover shall be planted under deciduous trees, shrubs and other open areas not covered by larger plant material so that the plantings provide 90 percent coverage within 3 years of planting.
(Ord. 6846, 6-17-25, § 22)

Comprehensive Plan

- Updates to the Comprehensive Plan can provide support for specific mitigation strategies at the citywide and neighborhood level

Policy Approaches	Example Policies
Building Design Standards and Guidelines	CL-65. Support the use of emerging best practices in the area of green building and site design, including climate resilience measures, through the use of pilot programs and model ordinances.
Open Space and Building Placement	S-SW-67. Consider building placement and the use of building materials to help reduce noise from I-405.
Transit-Oriented Development	LU-20. Support development of compact, livable and walkable mixed use centers in BelRed, Eastgate, Factoria, Wilburton, East Main and Crossroads.
Changes to Vehicle Emission Rates	S-CX-37. Support efforts to provide electric vehicle charging infrastructure in commercial areas and existing multifamily residential developments to advance equitable access.

Discussion

- What are mitigation strategies that your jurisdictions are employing, or building policy support for, to address air quality issues – especially proximate to TOD areas?
- What do you see as regional opportunities for collaboration?
- What are you hearing from your community about air quality?