

PLANNING COMMISSION MEETING MINUTES

Vancouver City Hall – Council Chambers – 415 W. Sixth Street
PO Box 1995 – Vancouver, Washington 98668-1995
www.cityofvancouver.us

Marjorie Ledell • Steve Schulte • Larry Blaufus • Zachary Pyle
Nena Cavel • Patrick Adigweme • Melissa von Borstel

June 13, 2023

REGULAR MEETING

Vancouver City Hall - 415 W. Sixth Street, Vancouver WA

CALL TO ORDER

The June 13, 2023, meeting of the Planning Commission was called to order at 4:31 p.m. by Chair Ledell.

ROLL CALL

Present: Marjorie Ledell, Zachary Pyle, Patrick Adigweme, Larry Blaufus, Nena Cavel, and Melissa von Borstel

Absent: Steve Schulte

Motion by Vice Chair Pyle, seconded by Commissioner Cavel, and carried unanimously to excuse the absence of Commissioner Schulte.

ADOPTION OF MINUTES

Motion by Vice Chair Pyle, second by Commissioner Blaufus, and carried unanimously to adopt the May 23, 2023, minutes.

WORKSHOP

BURNT BRIDGE CREEK WEST COMPREHENSIVE PLAN AND ZONING MAP CHANGE

Bryan Snodgrass, Principal Planner, Community Development Department; Charles Ray, Urban Forestry Coordinator, Public Works

Bryan Snodgrass presented an overview of the proposed rezone site and surrounding area, the regional zoning, the anticipated site plan and development details, critical lands on the site, differences between the exiting and proposed zone, a review of the citywide warehouse moratorium, and the anticipated staff recommendation.

Commission Questions and Discussion

- Have there been any other proposals for that site? Staff is unaware of any recent proposals for develop or rezone on this site.
- Estimated 200-300 jobs for the site in comparison to the rest of the City rate for jobs per acre. Staff responded warehouses in general provide lower wages and employment per acre than some other uses such as the tech sector. The applicant's estimate of jobs yield is better than citywide

averages on a per acre basis but less on a per facility basis than some of the data from the warehouse moratorium analysis

- Potential rezone to mixed use in the light industrial zone. Staff responded that has not been evaluated for this site because of the surrounding larger industrial area with limited existing housing. There is housing east of 162nd Avenue.
- Concern that the estimated jobs yield appears very high for warehousing
- What will mitigation for the Oregon white oaks on the site require? The site appears to have wetlands as well as white oaks. Staff responded the critical areas ordinance requires the developer to avoid, minimize, and mitigate impacts to the area. The City works closely with the Washington Department of Fish and Wildlife to determine what the mitigation measures would be. Typically, 6-8 acres of off-site mitigation needs to be provided for every one acre impacted on the site.
- Can the warehouse be built without impacting the existing oaks? Staff responded there would be a study at the time of development to determine what is on the site. Based on high level mapping, it would likely involve some impacts.
- Moratorium timing. Staff responded that prior to the moratorium's likely expiration in December 2023, a future warehouse development application would need to be less than 250,000 square feet in size to proceed, but that it would be unlikely that the rezone could be approved and go into effect before the moratorium expires.
- Recognition that the surrounding area is almost entirely IL zoned.
- Concern that rezone approval increases likelihood of short term development and critical area impacts, and questions about applicant intent regarding critical area mitigation. An applicant statement, as well as more information from city staff about site critical lands, would be useful.
- The parking ratio for this site if it is rezoned. Staff responded there are parking requirements for both OCI and IL zones. Those ratios may be reviewed as part of the Comprehensive Plan update.
- Question about traded sector uses which the existing warehouse moratorium exempts. Staff responded that the moratorium refers to CREDC plans, which define them in Vancouver as including computer and electronics, clean tech, software, metals and machinery, and life sciences.

Commissioner von Borstel recused from the next workshop and left the meeting.

EVERGREEN & GRAND COMMERCIAL CORRIDORS STRATEGY IMPLEMENTATION

Bryan Snodgrass, Principal Planner, CDD; Becky Coutinho, Associate Planner, CDD; Pauline Ruegg & Jamin Kimmell, Cascadia Partners

Jamin Kimmel presented the proposed design standards, drawbacks to a points-based system of standards, the importance of uniform design standards, developer feedback on building heights, the maximum building length, and building setbacks.

Commission Discussion

- Is it possible to reach the goal of 160 units per acre to qualify for a multi-family tax exemption (MFTE) on this corridor? Staff responded they were not sure but will research this question and follow up.
- Impacts of not pursuing the developer's preference for building heights and maximum building length. Staff responded generally the developers were supportive of the overlay zone, particularly parking minimums and increasing the building heights some developers voiced they would prefer

the maximum height larger than 5 stories. The maximum building length requirement was a concern for some, stating this would lessen the overall buildable footprint and could reduce buildable floor area. On building heights, developer feedback was focused on adding stories to build units with a view, but at 4 stories, the sites would still likely be economically feasible.

Pauline Ruegg presented the objectives for the implementation plan and the policies, programs, and tools to support the vision. The four sections of the implementation plan are housing and economic development, urban design, mobility, and parking.

Commission Discussion

- Defining and measuring livability. Staff responded livability is part of the corridor strategy and relates to feelings of safety, walkability, meeting basic needs including access to open spaces and affordable housing, and overall quality of life
- Expected displacement for those who live and work here today. Staff responded they conducted outreach during the development of the strategy document but didn't hear displacement as a major concern. Prior to the public hearing for the implementation plan, staff will conduct further public outreach with open houses and various online platforms to gather feedback. Staff heard from community members concern for displacement and are working on ways to address those concerns. Housing Action 1.3 calls for contacting the Vancouver Housing Authority for a copy of the displacement risk assessment.
- Anticipated additional employment on the corridor and impacts to parking. Staff responded they haven't heard this concern raised in outreach. North of this corridor is the Vine on Mill Plain, which increases transportation option to this neighborhood
- Number of businesses on the corridor and City support for a business cohort. Staff responded there are about 20 businesses in the area. The City would facilitate the start up of a business cohort but it would be managed by representatives of the businesses.
- Displacement of those who live on the corridor today. Staff responded they don't anticipate a lot of direct displacement, as there are not many existing apartment buildings that are zoned commercial. There are some single family houses that could be displaced if the site is redeveloped. Indirectly, there could be displacement due to increased prices due to investment associated with development on the corridor. New housing generally helps to mitigate displacement by increasing the amount of housing as a whole.
- Shared parking. Staff indicated the City's code allows for a shared parking provision to meet the minimum parking requirements. There is also the option for a publicly owned parking lot.

Commissioner von Borstel returned to the meeting.

COMMUNITY FORUM

There were no members of the public present for community forum.

PUBLIC HEARING

ZONING CODE TEXT CHANGE TO ALLOW EXPANDED DOG KENNELS

Bryan Snodgrass, Principal Planner, CDD; Russ Onkka, Clark County Animal Control

Bryan Snodgrass reviewed the current Title 20 requirements for animal kennels and dog day care, the VMC 8.24 requirements, the request to expand the dog kennel standards, and the proposed code change in Titles 20.

Public Testimony

The representative for the applicant, Jamie Howsley, was present to provide additional context and history of local dog regulations, the proposed applicant, and the envisioned location for the dog daycare facility.

Commission Discussion

- Is the size of the site sufficient to support 175 dogs at the facility? Animal Control staff responded it likely would be sufficient, depending on how the dogs are rotated throughout the kennel.

Motion by Vice Chair Pyle, seconded by Commissioner Cavel to recommend to City Council an approval of proposed changes to kennel definitions and standards in VMC 20.160.020.E.3 and 20.895.020.B as described in the staff report.

Roll Call Vote

Commissioner Adigweme	Yes
Commissioner von Borstel	Yes
Commissioner Blaufus	Yes
Commissioner Cavel	Yes
Vice Chair Pyle	Yes
Chair Ledell	Yes

Motion carried unanimously.

COMMUNICATIONS FROM CHAIR AND STAFF

The next joint meeting with the Planning Commission and City Council is scheduled for November 13, to discuss land use in the Comprehensive Plan.

ADJOURNMENT 6:53 P.M.

Marjorie Ledell, Chair

To request other formats, contact Julie Nischik, Community Development Department | 360-487-7813. WA Relay: 711 | julie.nischik@cityofvancouver.us



Fall 2023 Comprehensive Plan and Zoning Amendments Vancouver Planning Commission Workshop July 25, 2023

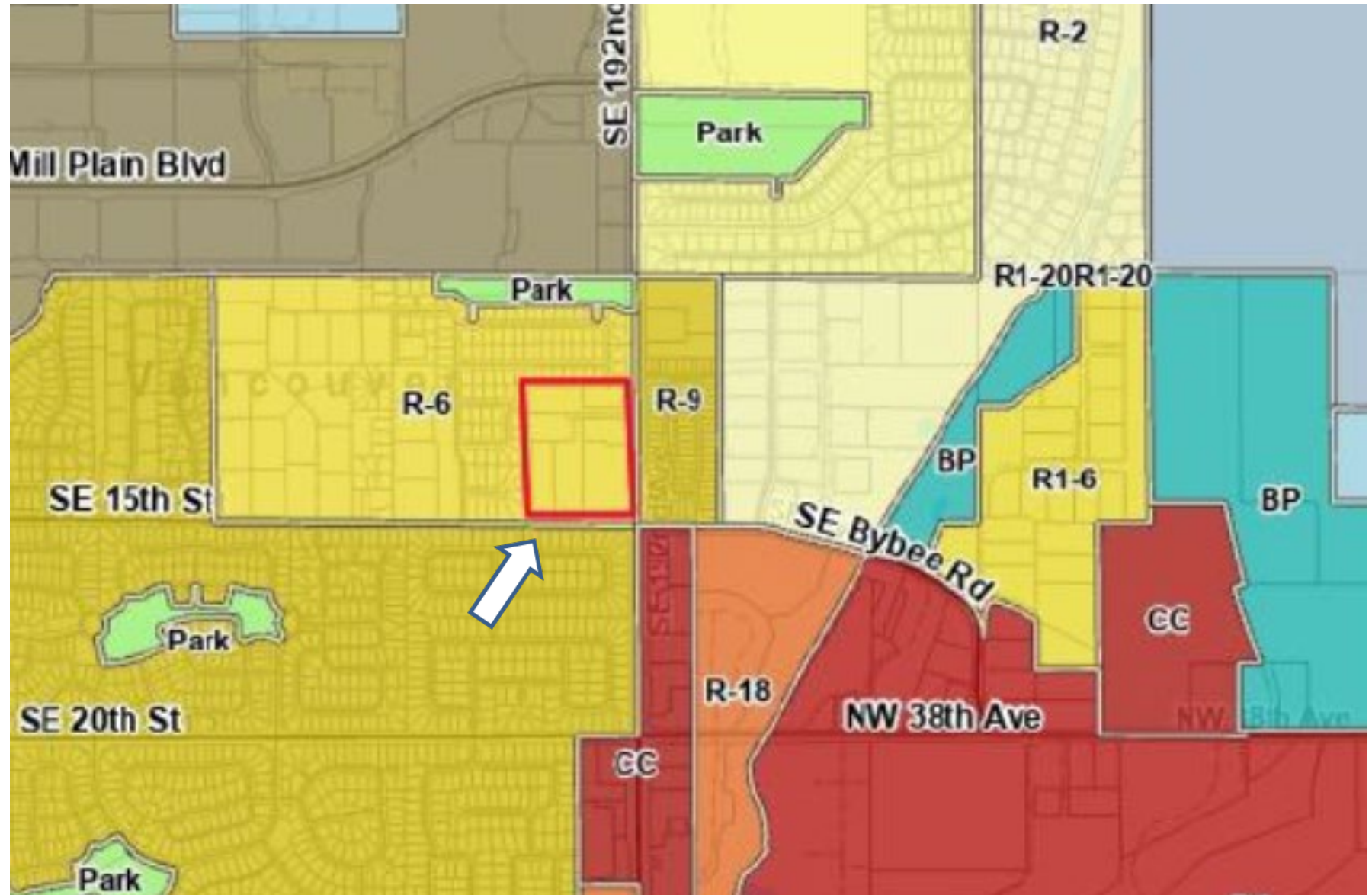


Bryan Snodgrass
Principal Planner
Community Development
Department

192nd Avenue
Comprehensive
Plan and zoning
map change -
UL/R-6 to UH/R-
30 on 9.8 acres
at the
intersection of
192nd Avenue
and 15th Street



192nd Avenue Comprehensive Plan and zoning map change – Regional zoning



192nd Avenue Comprehensive Plan and zoning map change – Conceptual site plan for 296 units in 3 and 4 story buildings, and conversion of existing home



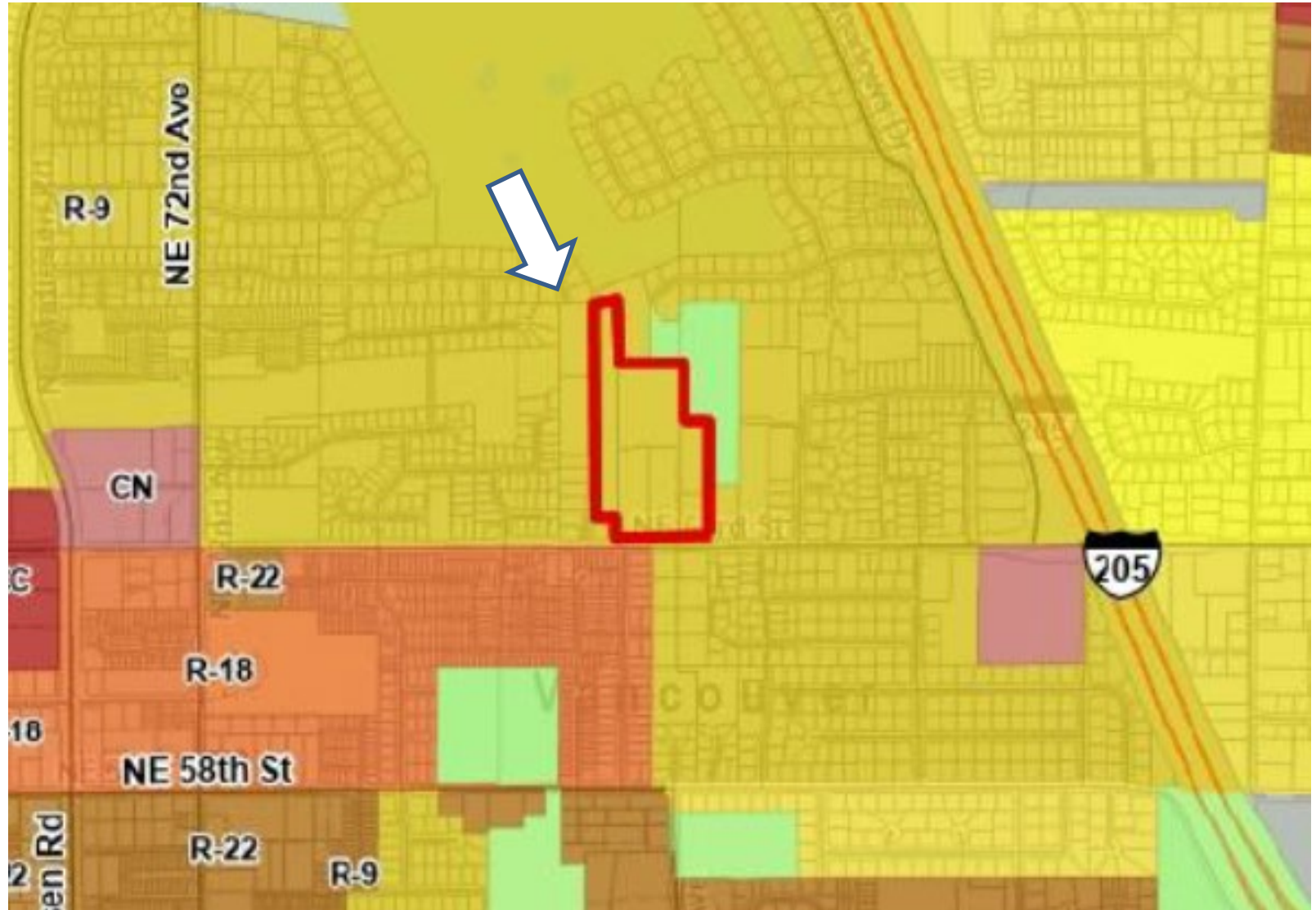
192nd Avenue Comprehensive Plan and zoning map change – Background

- 5% of units affordable at 80% of Area Median Income
- Development Agreement to be provided
- Likely increase of 1,457 daily trips compared to development under current zoning, approximately 89 more in PM peak hour. Additional analysis on traffic distribution and impacts forthcoming.

Wood Duck
Springs
Comprehensive
Plan and zoning
map change -
UL/R-9 to UH/R-
18 on 13 acres
on 63rd Street



Wood Duck Springs Comprehensive Plan and zoning map change – Regional zoning



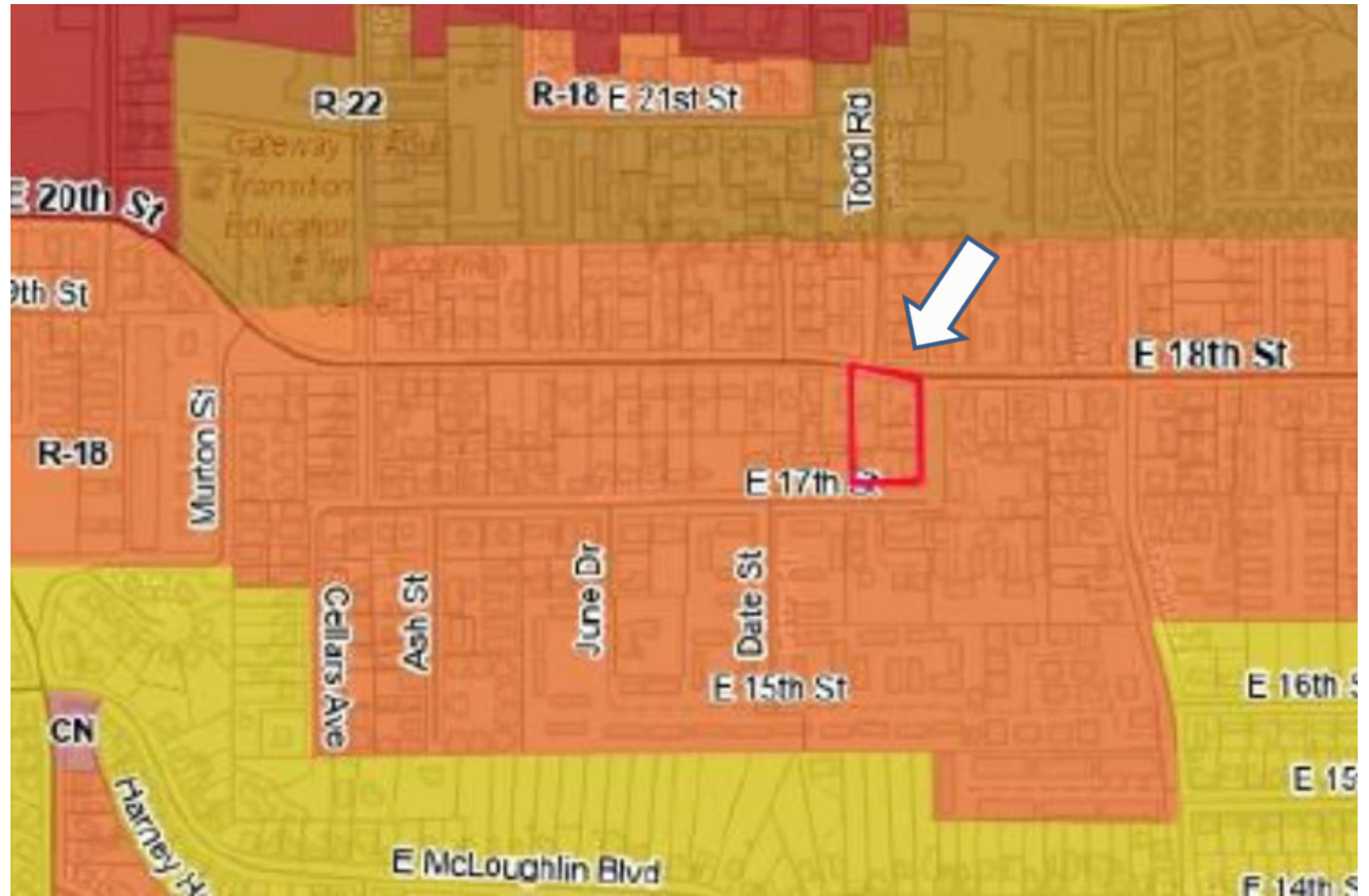
Wood Duck Springs Comprehensive Plan and zoning map change – Background

- Conceptual site plan not included. 224 units of market rate apartments and townhomes envisioned, along with retention of two existing houses.
- Approximately 35% increase in daily trips estimated

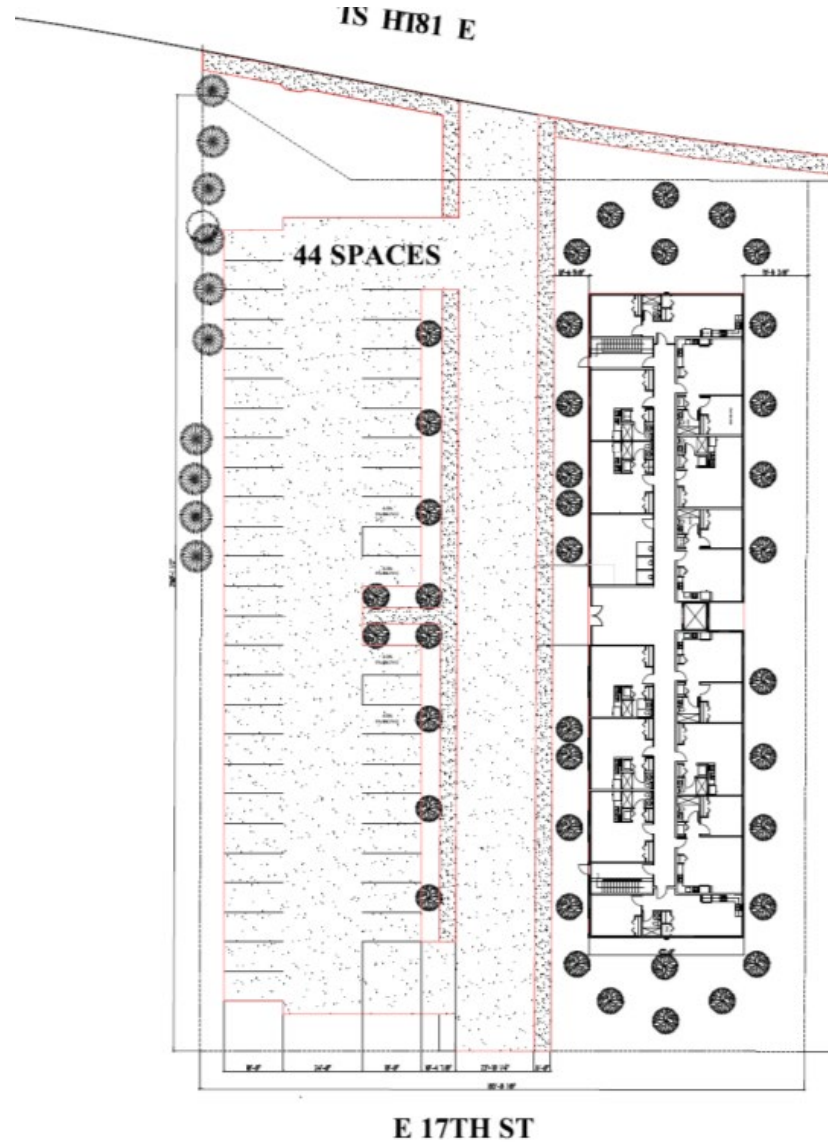
Date Park
zoning map
change –
R-18 to R-30 on
1.2 acres south
of Fourth Plain
Blvd.



Date Park zoning map change – Regional zoning



**Date Park
zoning map
change –
Conceptual site
plan for
replacement of
existing
buildings with
54 affordable
housing units
and parking**



Date Park zoning map change – Background

- Per existing policy for affordable housing rezones, City serves as co-sponsor when applicant commits to at least 40% of units affordable at 60% of Area Median Income (AMI) or below
- Traffic study forthcoming

Comprehensive Plan and zoning text changes

1. Comprehensive Plan capital project list - Add Library Square/Riverwest Parking Structure, and Downtown Parking Extension Project
2. VMC 20.150 Definitions - Define breezeways linking structures (so that a second structure is not separate and accessory) to include a roof
3. VMC 20.160 Use Classifications
 - a. Move bus barns from the VMC 20.160.020.D.5 category of Warehouse/Freight Movement to the VMC 20.160.020.B.14 category of Transportation Facilities
 - b. Add associated fuel storage to VMC 20.160.020.B.14 category of Transportation Facilities to clarify that fuel storage associated with transportation facilities is an allowed use.
 - c. Add description of Temporary Use

Comprehensive Plan and zoning text changes (cont.)

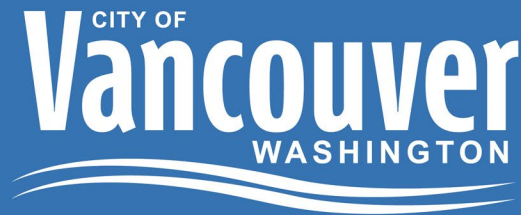
4. VMC 20.170 Measurements - Clarify width and depth for flag lots
5. VMC 20.180 Fees - Eliminate redundant reference to short subdivision
6. VMC 20.245 Conditional Use Permits - Clean up electronic submittal provisions
7. VMC 20.270 Site Plan Review - Include easement location and dimensions
8. VMC 20.330 Binding Site Plans - Fix links and require easements

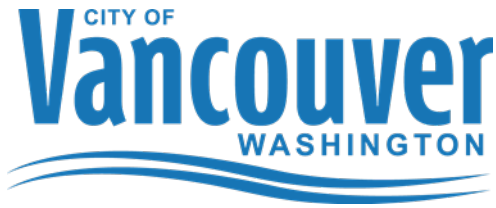
Comprehensive Plan and zoning text changes (cont.)

9. VMC 20.410 Lower Density Residential Districts
 - a. Clarify that single family streetfront standards adopted as part of 2022 Housing Code Updates apply to land divisions submitted after the 7/27/22 ordinance adoption date
 - b. Clarify role of Planned Developments, Infill, and Clusters in maximum density calculations
10. VMC 20.790 SEPA - Pursuant to recent statutory changes, exempt apartments with fewer than 200 units from requiring SEPA review unless critical lands or other factor are present to trigger review
11. VMC 20.950 Cottage Clusters - Clarify definition of density bonus and common area. Address minimum lots sizes and frontages, and allowance for pre-existing homes exceeding cluster requirements.

Questions

Bryan Snodgrass, Principal Planner, Community Development Department
bryan.snodgrass@cityofvancouver.us, 360-487-7946





Memorandum

DATE: July 17, 2023

TO: Chair Ledell and Planning Commission members

FROM: Bryan Snodgrass, Principal Planner, Community and Economic Development Department

RE: July 25 initial workshop review of fall 2023 Comprehensive Plan and zoning code map and text changes

At the July 25 workshop staff will introduce fall 2023 proposals for Comprehensive Plan and zoning map and text changes. The workshop is intended to allow initial discussion and identification of issues, with a more detailed workshop review on September 12, followed by Commission public hearing review on October 10. Under state law Comprehensive Plan changes, map or text, must be reviewed generally concurrently to evaluate cumulative impacts, but zoning map or text changes can be considered at any time. This year's items consist of two Comprehensive Plan and associated zoning map changes submitted by property owners, one standalone rezone map designation change submitted by a property owner, one Comprehensive Plan text change developed by staff, and 10 zoning code text changes also developed by staff.

¹

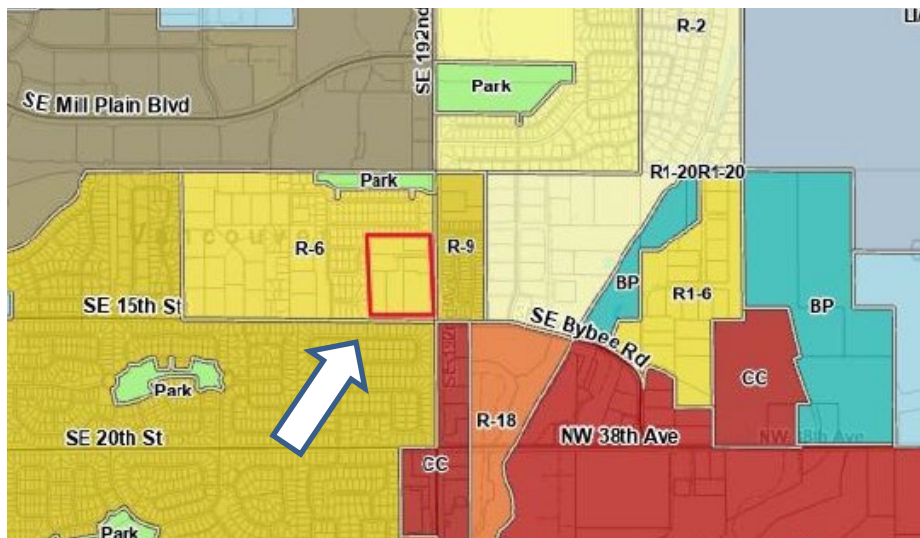
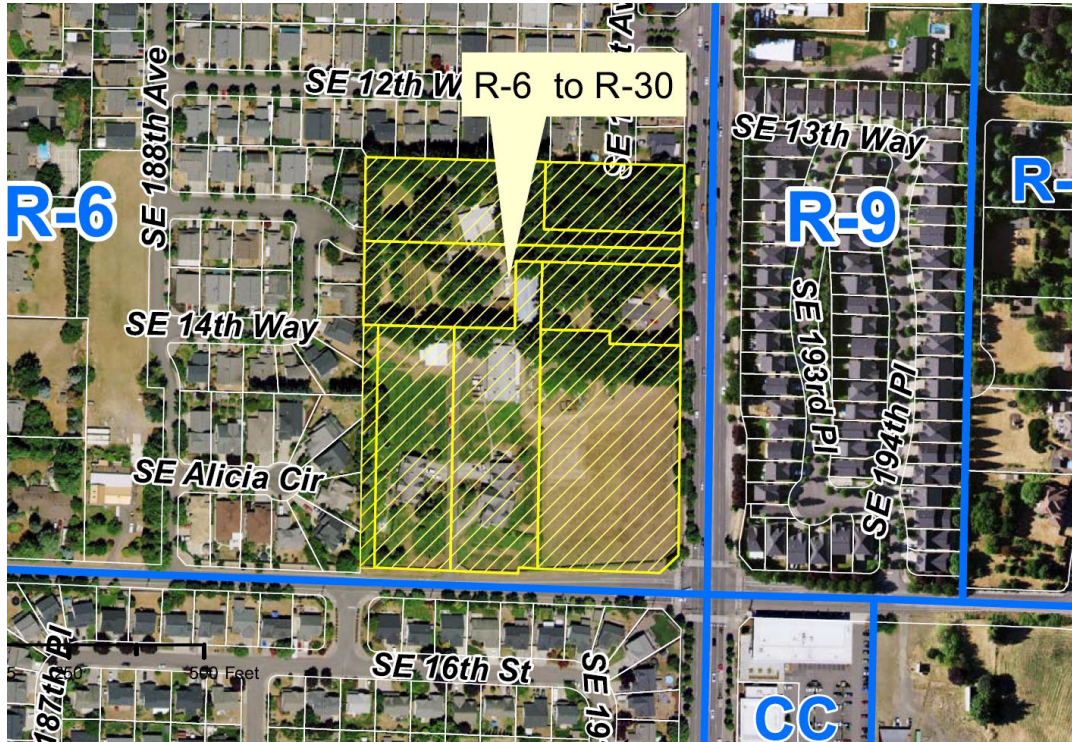
The GMA requirement to review annual Comprehensive Plan changes concurrently is intended to allow for review of cumulative impacts. As indicated in below table, the three Comprehensive Plan changes proposed this year apply in different areas and are very small relative to citywide land supplies, and do not have significant impacts to each other.

Comprehensive Plan Change Proposal	Applicable Area
192 nd Avenue map change – UL/R-6 to UH/R-30	9.8 acres on in east Vancouver
Wood Duck Springs map change – UL/R-9 to UH/R-18	13 acres in northern Vancouver
Text change to add downtown capital projects	Downtown Vancouver

¹ An additional proposed Comprehensive Plan and zoning change has not been included because of a dispute over its eligibility. A change from GC to R-30 is proposed on the west side of 143rd Avenue south of Fourth Plain Blvd. The property is subject to an existing development agreement which City legal staff believes precludes the City from changing to residential zoning without approval of area property owners who are also formal parties to the agreement. The applicant believes the City can do so, and indicates they will appeal the City staff determination, that the rezone application is incomplete without a revised development agreement, to the Hearings Examiner. If the Examiner rules in favor of the applicant, the proposal may be brought forward for Commission review.

1. Comprehensive Plan and zoning map changes

- a. 192nd Avenue rezone – Urban Low Density/R-6 to Urban High Density/R-30 on 9.8 acres at the intersection 192nd Avenue and 15th Street



The site is located in an area of detached single family homes to west and north zoned R-6, across 15th Street and 192nd Avenue to the south and east zoned R-9. On the diagonally opposite corner of the intersection 15th Street and 192nd Avenue are medical offices and restaurants zoned

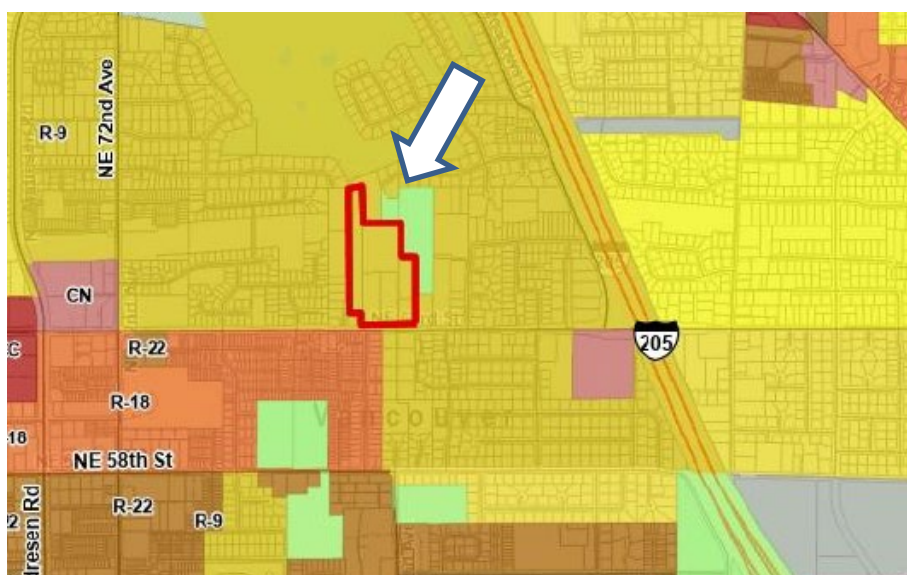
CC. The site is in the Bennington Neighborhood. Approximately 700 ft. north of the site is the Columbia Tech Center with a range of commercial activities.

The application from Vance Development, represented by Dowl, includes a conceptual site plan indicating ultimate development of 296 housing units in three and four-story buildings, and conversion of an existing single-family home on the site. Five percent of the units would be affordable to household earning 80% of Area Median Income (AMI) or lower. Buildings near the north and west property lines abutting adjacent single-family areas would be three stories in height and set back 45 and 50 feet from the property lines, respectively, behind a landscaped buffer. The four-story building is envisioned in the center of the site. The applicant indicates a Development Agreement will be provided to formalize these features.



An initial traffic analysis submitted with the application indicates that future development under proposed zoning would likely result in 1,457 more daily vehicular trips than development under the current zoning, and approximately 89 more trips in the evening peak hour. Additional analysis of the impact of the trips is being prepared by the applicant as requested by City staff.

b. Wood Duck Springs – Urban Low Density/R-9 to Urban High Density/R-18 on 13 acres at 63rd Avenue



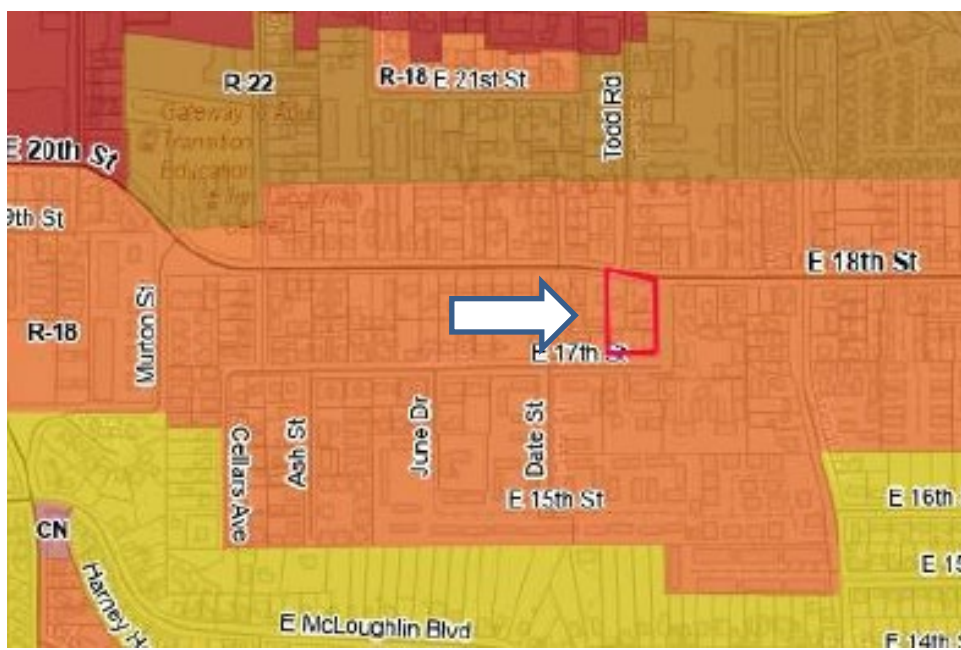
The proposal is located on the north side of 63rd Street approximately one mile north of Vancouver Mall. The rezone site contains several existing single-family homes, outbuildings, and vacant land. North and east of the rezone site is Kelly Meadows Park, zoned R-9. East and west along 63rd Street are large lot single family homesites also zoned R-9. To the south across 63rd Street are smaller single- family homes zoned R-18 and R-9.

The application from Songbird Homes represented by PLS Engineering indicates that the applicant will likely develop the site with two of the existing homes retained, and the remainder developed with a mix of market rate apartments and townhomes. The application indicates townhomes are envisioned on the western portion of the site. A conceptual site plan has not been submitted. The application estimates a maximum of 224 units could be developed. The application estimates development envisioned if the rezone is approved would result in approximately 35% more daily trips than likely development under the current zoning.

As with any larger residential upzone, potential issues that may arise in review include transportation and other service impacts. Because of the relatively large size of the property and its options for development in the interior or east portions of the site with less impacts to abutting neighbors, the absence of higher density or affordable housing components to meet citywide housing needs, and legal requirements may be an issue. A commercial component could also serve the site and surroundings, as the nearest commercial services are approximately 2/3 of a mile to the west, and the nearest undeveloped commercial land over 1/4 mile to the east.

2. Zoning map change

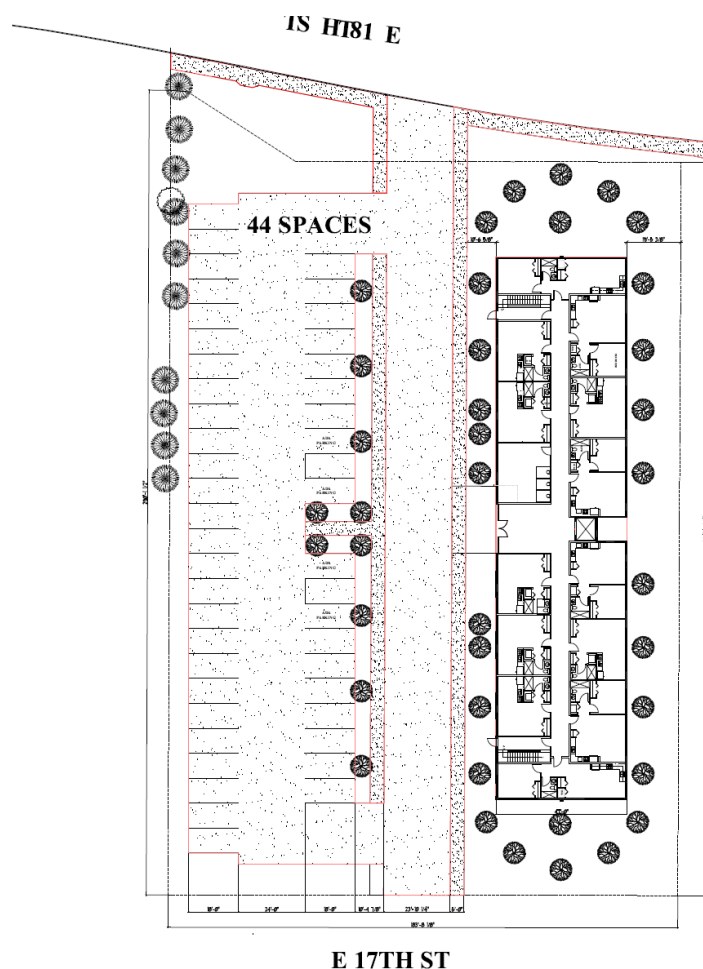
- a. **Date Park – R-18 to R-30 on 1.2 acres in the Mapplewood Neighborhood Association approximately 1000 feet south of Fourth Plain Boulevard**



The proposal is located in an older residential area with a mix of housing types zoned R-18. North of the site across E. 18th Street at the intersection with Todd Road is a small apartment building and a single-family home. West of the rezone site is a single-family home and a duplex. South across E 17th Street is a single-family home and small apartment. East is MyPark, a narrow park owned and operated by the City of Vancouver.

The site contains two existing homes and 13 Second Chance rental units. If the rezone is approved, the application from Datepark Condominiums, Inc, proposes to replace all of the existing structures with four buildings providing 54 affordable housing units consisting of 24 studios and 30 one-bedroom units. The City of Vancouver Community Development Department is cosponsoring the application, consistent with existing CDD policy in support of rezone applications which staff finds are consistent with rezone criteria, and facilitate housing projects where at least 40% of units will be affordable to households earning 60% or less of Area Median Income.

The applicant has provided a conceptual site plan indicating the buildings are proposed on the east end of the site adjacent to the park, with parking on the west side. Traffic and the interface with abutting residential development to the west are issues that may arise during the hearings process.



3. Comprehensive Plan and Zoning Code Text Changes

Plan/Code Section	Issue/Action
1. Comprehensive Plan Capital Facilities Project list (separate document adopted by reference into Comprehensive Pan)	Add two capital projects to citywide capital project list, Library Square/Riverwest Parking Structure, and Downtown Parking Extension Project.
2. Zoning Code Definitions, Breezeway, VMC 20.150	Require breezeways linking structures (so that a second structure is not separate and accessory) to include a roof
3. Use Classifications. VMC 20.160	-Move bus barns from the VMC 20.160.020.D.5 category of Warehouse/Freight Movement to the VMC 20.160.020.B.14 category of Transportation Facilities - Add associated fuel storage to VMC 20.160.020.B.14 category of Transportation Facilities to clarify that fuel storage associated with transportation facilities is an allowed use. - Add description of Temporary Use
4. Measurements 20.170.070	Clarify width and depth for flag lots
5. Fees, VMC 20.180.060 37.A (2-9 lots)	Delete 'short subdivision' reference which is addressed elsewhere in the fee code
6.Conditional Use Permits, VMC 20.245.030	Clean up submittal requirements for electronic submittals
7. Site Plan Review, VMC 20.270.040.C	Include location and dimensions of easements
8. Binding Site Plans, VMC 20.330	Fix broken links, add requirement for binding site plans to show easements with dimensions
9.Lower Density Residential Districts, VMC 20.410.050 Development	-Clarify that single family streetfront standards adopted as part of 2022 Housing Code Updates apply to land divisions submitted after the 7/27/22 ordinance adoption date -Clarify role of Planned Developments, Infill, and Clusters in maximum density calculations
10. SEPA Categorical Exemptions, VMC 20.790.200	Pursuant to recent statutory changes, exempt apartments with fewer than 200 units from requiring SEPA review unless critical lands or other factor are present to trigger review
11. Cottage Clusters, VMC 20.950	Clarify definition of density bonus and common area. Address minimum lots sizes and frontages, and allowance for pre-existing homes exceeding cluster requirements.



Proposed Warehouse Code Amendments

Planning Commission Workshop
July 25, 2023



Chad Eiken, Director, CDD
Becky Coutinho, Associate Planner, CDD
Kara Hall, Fehr and Peers, Inc.

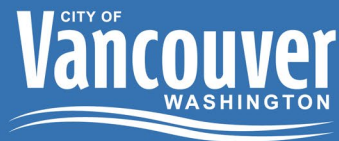
Agenda

- Problem Statement
- Warehouse Study Goals
- Land Availability
- Warehouse Types
 - Key Differences
 - Identified Impacts
- Possible Code Changes
- Next Steps



Problem Statement

Dramatic increase in applications for very large warehouses over short period of time



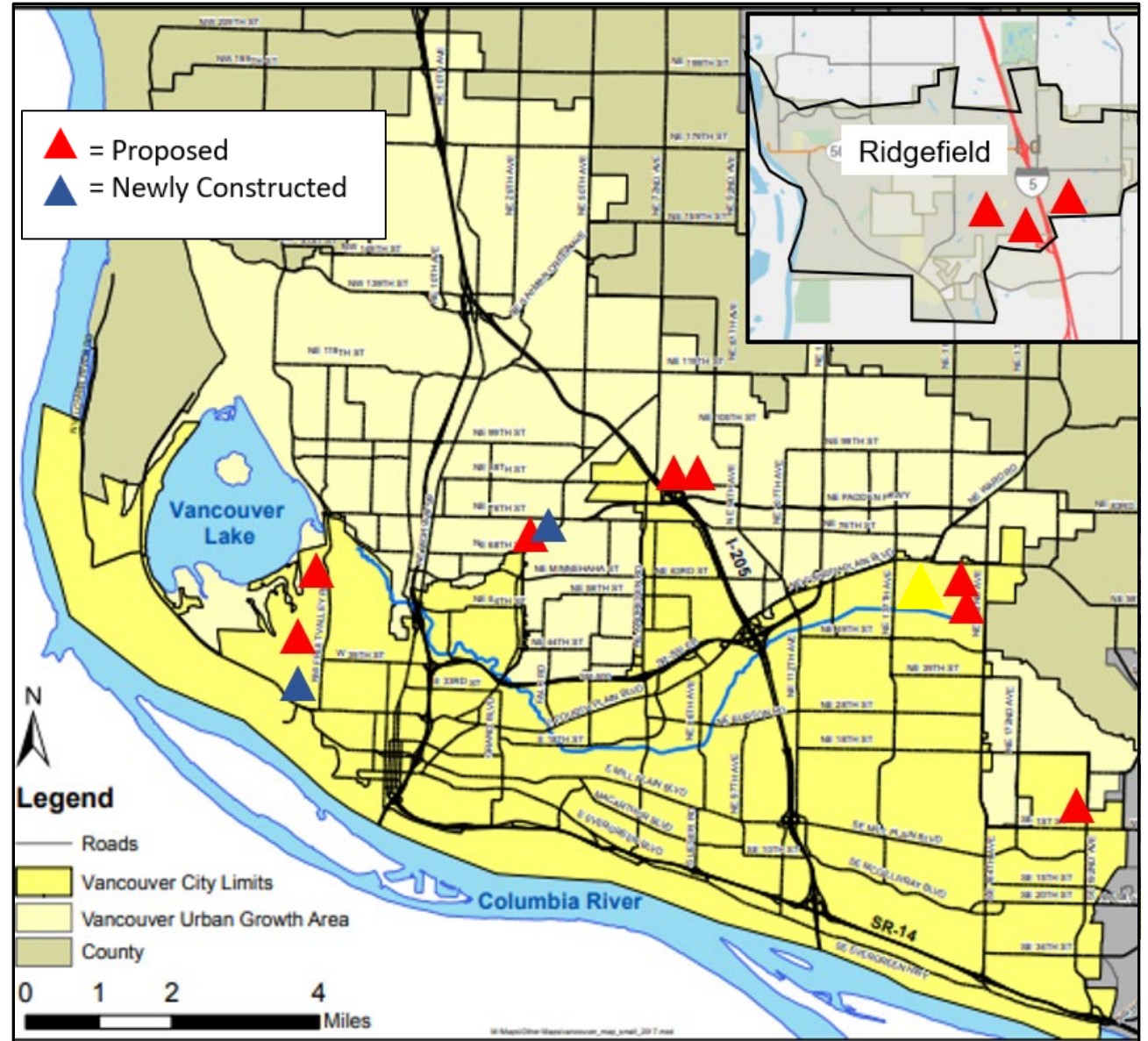
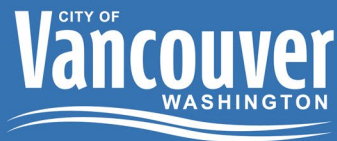
- Late 2022: Mirroring national trends 5 proposed large warehouses in Vancouver, 2.8 million square feet
- Staff concern about potentially rapid loss of industrial land for low-wage, low jobs/acre uses
- Additional concerns: traffic, pollution, visual, energy/climate, impacts to vulnerable areas; adaptive re-use
- Study needed to determine differences and impacts, possible code amendments
- December 2022: Council enacted 6-month moratorium to study impacts; extended by Council in June 2023

Surge in Large Warehouse Applications

Clark County primarily served by Portland distribution centers

Map shows proposed Warehouses >250,000 s.f. in Clark County

5 in City of Vancouver



Warehouse Study Goals



**Understand
Differences
& Impacts**



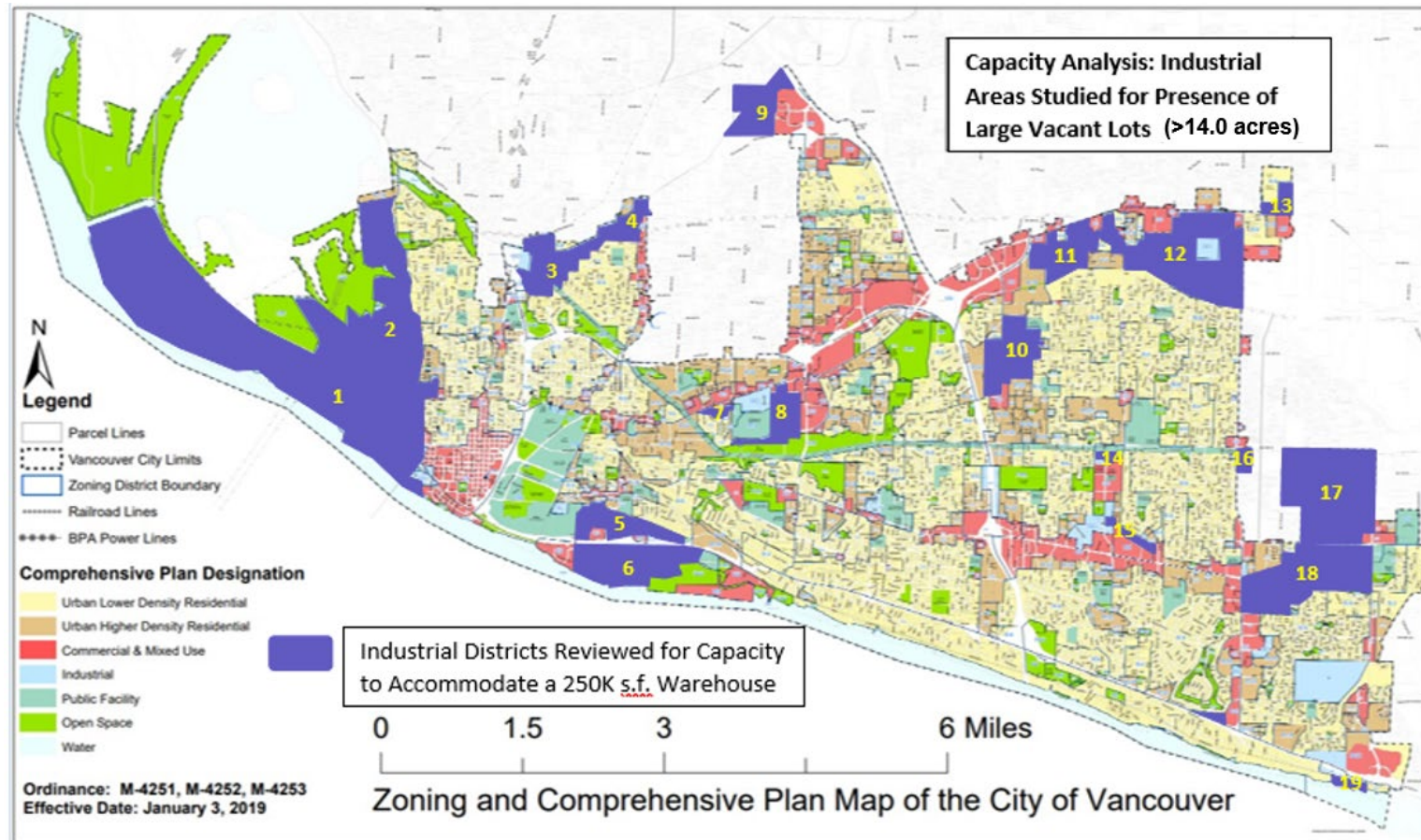
**Gather Public
and
Stakeholder Input**



**Propose Code
Amendments**

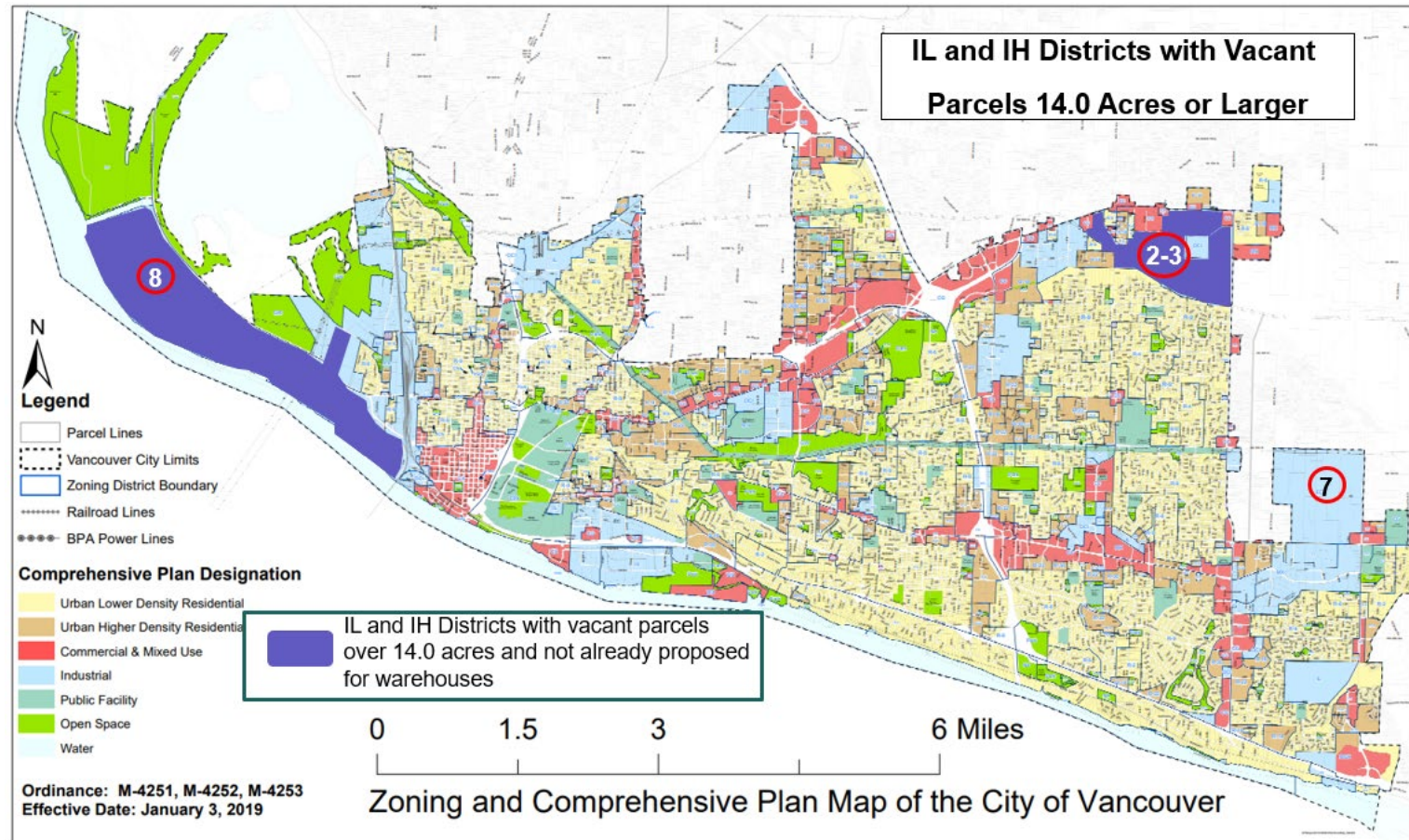
Land Availability Analysis

- 14 acres needed to support 250,000 s.f. warehouse
- 19 industrial areas studied for vacant/underdeveloped parcels > 14 acres



Land Availability Analysis

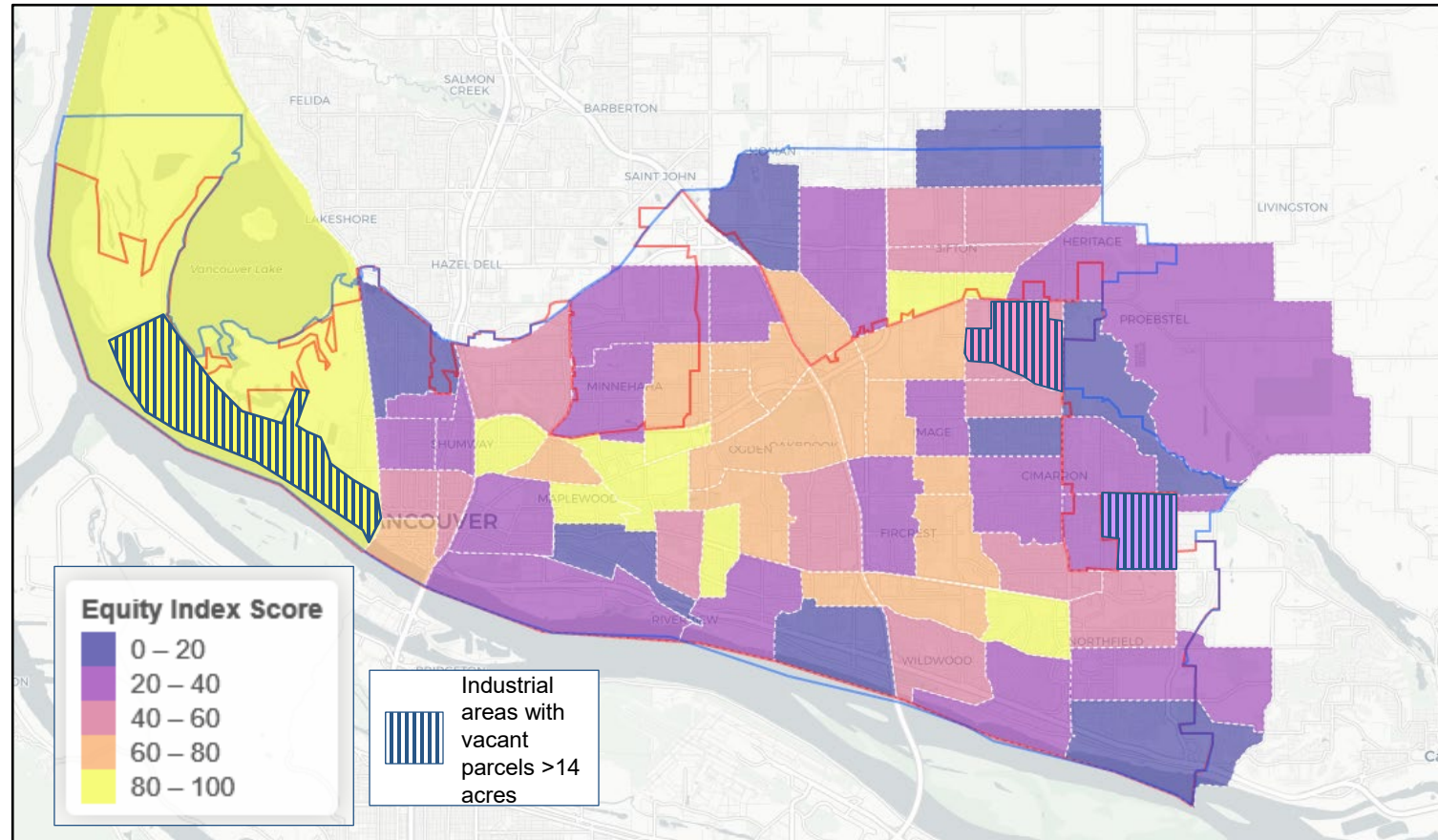
- Discovered very few parcels available to accommodate a 250,000+ square foot warehouse
- Port of Vancouver, East Orchards, Section 30
- Parcels in Sec. 30 have prior agreements that allow warehouses; would be exempt from new standards



Equity & Locational Considerations

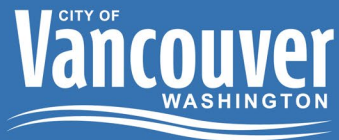
- Identifies priority areas of equity using Census data
- Port of Vancouver is in high priority equity area – increase in truck traffic on Fruit Valley Rd. possible
- East Orchards area is in area of moderate equity priority

Vancouver's Equity Index Mapping Tool



Types of Warehouses

FEHR & PEERS



Traditional Warehouse

- Long-term storage of bulk inventory or business-to-business (B2B) orders

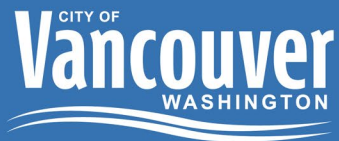
E-commerce Facilities

- Designed to provide value-added logistics services to streamline the supply chain; individualize parcel delivery
- Examples:
 - Distribution Centers
 - Fulfillment Centers
 - Receive Centers
 - Last Mile Delivery Centers

Key Physical Differences

E-commerce vs.
Traditional Warehouses

FEHR & PEERS



E-commerce Facilities

- Variation in building size/footprint
- Higher clear heights; maximize space utilization
- More loading dock doors
- Located near population centers, ports, etc.

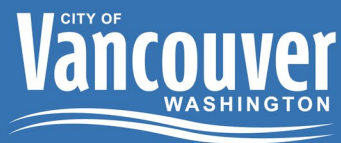
Traditional Warehouses

- Smaller building size/footprint
- Lower clear heights
- Fewer loading dock doors
- Located close to other industrial uses

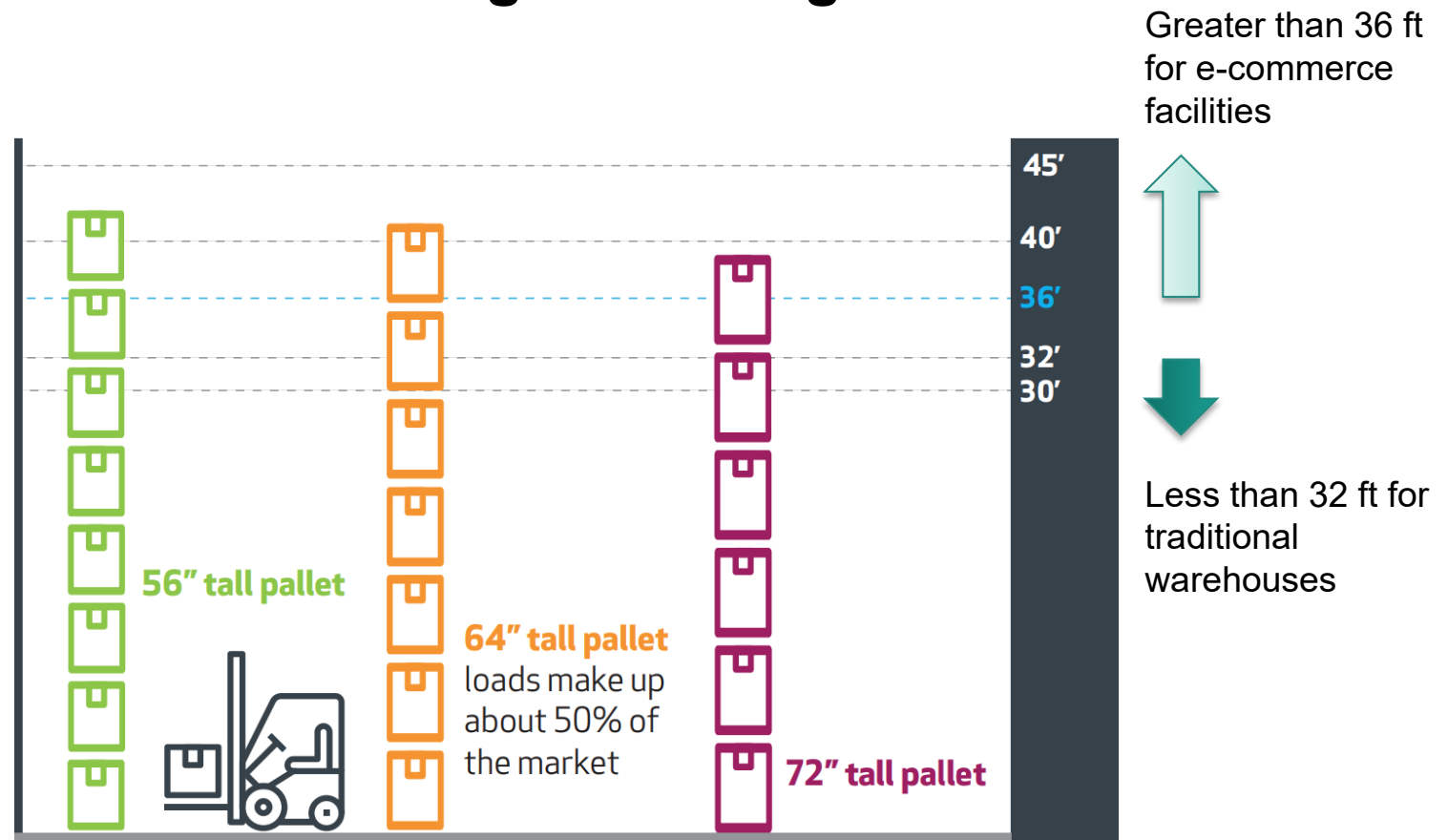
Key Physical Differences

E-commerce vs.
Traditional Warehouses

FEHR & PEERS



Building Clear Height



Source: Modern Architecture

Key Operational Differences

E-commerce vs.
Traditional Warehouses

FEHR & PEERS



E-commerce Facilities

- High turnover of goods
- Around-the-clock operations supported by automation
- More employees, may include a few high paying jobs
- More daily truck and van trips

Traditional Warehouses

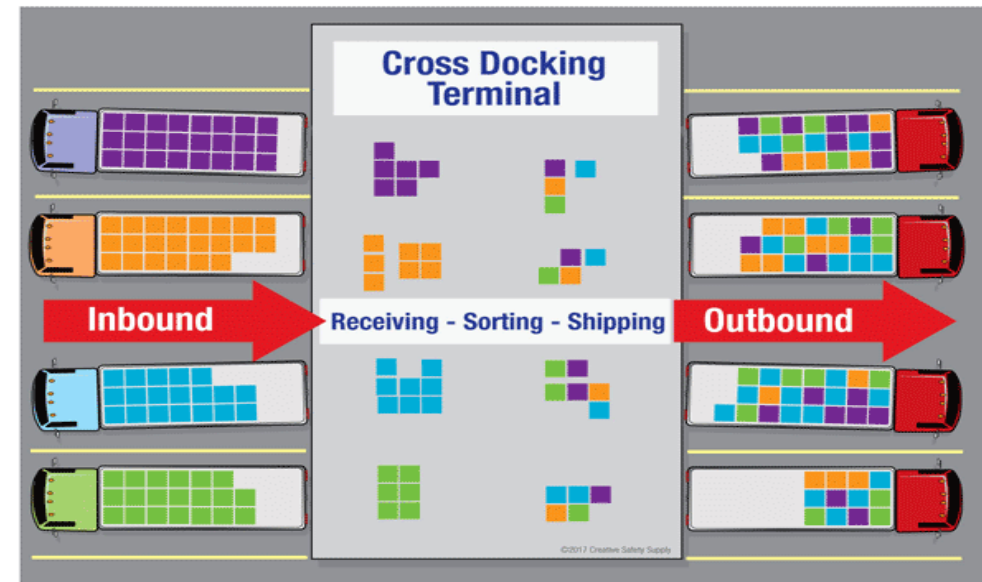
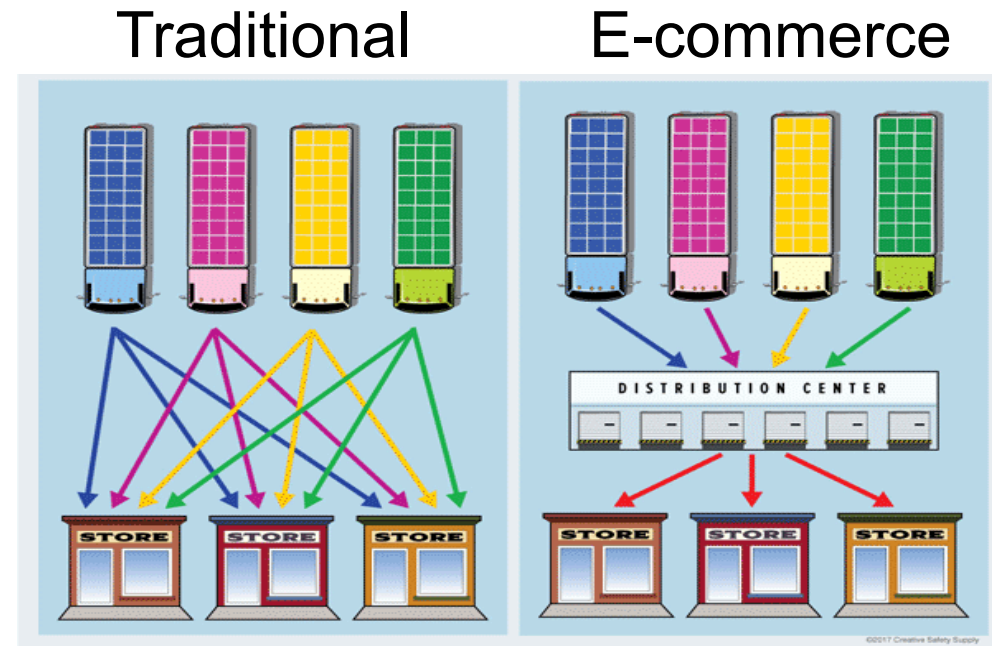
- Slower turnover of stored goods > 1 day
- 8-hour day shifts, 5-day weeks
- Fewer employees, primarily unskilled labor
- Fewer daily truck trips

Key Operational Differences

E-commerce vs.
Traditional Warehouses

FEHR & PEERS

CITY OF
Vancouver
WASHINGTON



Source: Creative Safety Supply

Key Operational Differences

E-commerce vs.
Traditional Warehouses

FEHR & PEERS



Traffic Impacts of a 100,000 sf Facility

Land Use	Daily Trip Rate	
	Vehicles	Trucks
Warehousing (150)	171	60
Mini-Warehouse (151)	145	4
High-Cube Transload and Short-Term Storage Warehouse (154)	140	22
High-Cube Fulfillment Center Warehouse (155)	181 (644)^	23 (19)^
High-Cube Parcel Hub Warehouse (156)	463	58
High-Cube Cold Storage Warehouse (157)	212	75

Source: Institute of Transportation Engineers (ITE) Trip Generation Manual

*Average daily trip rate per 1,000 sf of gross floor area on a weekday

XX(XX)^ – Non-sort facility (sort facility)

Key Economic Differences

E-commerce vs.
Traditional Warehouses

FEHR & PEERS



E-commerce Facilities

- May include a few high paying jobs such as automation engineers
- Generates more indirect jobs
- More local and regional economic impacts

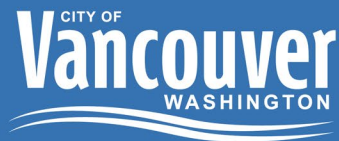
Traditional Warehouses

- Mostly unskilled labor with a few managerial jobs
- Generates fewer indirect jobs
- Less local and regional economic impacts

Key Economic Differences

E-commerce vs.
Traditional Warehouses

FEHR & PEERS



Example Existing Warehouses

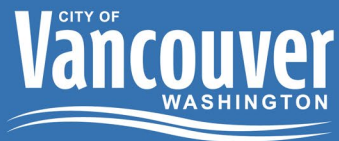
Facility	Building size (sf)	Employees	Annual Payroll	Property Tax	Regional Impact	
					Indirect Jobs	New Dollars*
Traditional warehouse	165,000	126	~ \$5M	~\$90K	177	~\$13M
E-commerce Facilities						
Sortable fulfillment center	800,000	1,500	~ \$60M	~\$290K	2,112	~\$150M
Non-sortable fulfillment center	1,000,000	675	~\$30M	~\$360K	951	~\$70M
Receive center	600,000	400	~\$16M	~\$220K	563	~\$40M
Last mile delivery center	100,000	100	~\$4M	~\$19K	141	~\$10M

*New dollars circulating in the regional economy as result of the warehouse development; this includes annual payroll of warehouse employees and indirect earnings.

Source: GLDPartners

Adaptive Re-use of Large Warehouses

FEHR & PEERS



Large warehouses can be reused for:

- Commercial kitchens
- Office space
- Production or testing facilities for a range of technology
- Gyms and indoor sports space
- Community/ special events centers

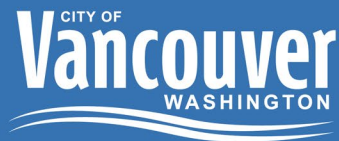
Key design considerations

- High ceilings
- Provision for power expansion
- Multi-story structures

Conclusions Regarding Key Differences

E-commerce vs.
Traditional Warehouses

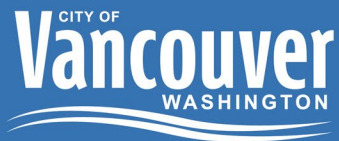
FEHR  PEERS



- **Building size** | There is variation in building footprints/ sizes of e-commerce facilities compared to traditional warehouses
- **Operations** | Around-the-clock operations at e-commerce facilities entail more daily medium/heavy truck and van trips
- **Economic Impact** | E-commerce facilities have a greater economic impact than traditional warehouses (jobs and tax revenue)
- **Adaptive Reuse** | Specific design features are needed to accommodate potential reuse of large warehouse buildings

Possible Climate Action Measures

FEHR & PEERS



Energy Provisions & Conservation

- Power requirements
- Auxiliary power/ electric truck charging
- Alternative energy systems
- Motion sensors, skylights and clerestory windows, high-reflectance roof membranes, climate control

Water Conservation & Waste Management

- Water conservation measures
- Dedicated area for onsite recycling
- Environmentally friendly building materials

Low emission, energy efficient HVAC

Reduce output when building is unoccupied

Cool roofs

Reflect sunlight and repel heat, lowering indoor air temperature

High efficiency roofing and wall materials

Optimize interior temperatures

20-30 percent regionally sourced building materials

Reduce transportation emissions and boost local economies. Use of bio based, circular building materials

Skylights \$

Reduce daytime electricity use

Real-time energy monitoring

Inform employees and create awareness

Solar panels \$

Turn rooftops into sources of clean energy

LED lighting with dynamic controls \$

Improve illumination and reduce energy costs

Energy saving mode of dock equipment \$

Preserve energy when not in use

Dock levers with gap sealing and dock shelters with bottom cushion

Seal interior to the elements

Access to public transportation options

Public transport, shuttles, bicycle rental and car sharing

Drought-tolerant plants and rainwater collection

Decrease water usage, reproduce local ecosystems and support biodiversity with insect hotel, bird houses, edible trees and greenery

Secured bicycle shed with E-bike charging

Carpool/car sharing dedicated parking spots

Electric car (EV) charging stations and dedicated car sharing parking spots

Reduce emissions for daily commuters

Exterior LED lighting

Reduce light pollution and energy costs

Smart energy meters

Monitor energy in real time to reduce energy expenditures

Low-emitting paint, sealants and insulation

Lower environmental impact than conventional paint products

Areas for storage and collection of recyclables

Minimize environmental impact

Source: Prologis

\$ = Direct occupational cost savings



Conclusions

- E-commerce and demand for large warehouses here to stay
- Available large industrial parcels only in 2 or 3 areas of City
- E-commerce warehouses more intensive operationally
- Jobs/economic data is mixed
- Some impacts from larger warehouses could be addressed by amendments to VMC Title 20, Land Use and Development Code

Potential Code Amendments

Issue

Proposed Fix

Use Limitations

Make warehouses $\geq 250,000$ s.f. conditional uses ('C' in use table) IL/IH Districts

Make warehouses $< 250,000$ s.f. limited uses with specific standards ('L' in use table)

Locational Concerns

Require access from a primary arterial; larger warehouses to be within 1.0 miles of a state or interstate highway

Traffic impacts

Base traffic generation on ITE Manual Land Use Category 155 (high cube transload storage) unless specific type of warehouse is identified early on; use SEPA/CUP to address specific off-site impacts

Prohibit large trucks from utilizing non-truck routes

Potential Code Amendments (cont.)

Issue

Proposed Fix

Parking/Loading Min.

Decrease parking and loading minimums so surface lots are not over-sized

Loading Bays

Prohibit loading bays facing residentially-zoned property

Lot Coverage

Reduce max. lot coverage to increase vegetative buffers

Visual Impacts

Require building elevations longer than 300' to be medium-to-dark shade (e.g. no white or light-colored building);

Treed buffer (25-30' deep) adjacent to public street or residentially-zoned property

Potential Code Amendments (cont.)

Issue

Proposed Fix

Climate Action (Energy)

Require 75% onsite energy from renewable sources, to be audited prior to occupancy permit

EV charging ports at all loading docks

EV charging stations at 20% of parking spaces

Rooftop skylights for natural light; use of LEDs

Light-colored roofing material to reduce heat absorption

Recycling of Packaging

Warehouse-specific waste-reduction measures being developed by staff (may be VMC Title 6)

Ongoing Outreach

City's BeHeard Webpage

Alliance for Community
Engagement (ACE)

Identity Clark County (ICC)

Port of Vancouver

Neighborhood Associations

- Fruit Valley N.A.
- Burnt Bridge Creek N.A.
- North Image N.A.



Next Steps



**Develop Code
Changes to
Title 20 VMC**



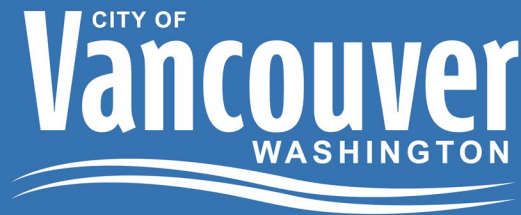
**Additional
Public/Stakeholder
Input**

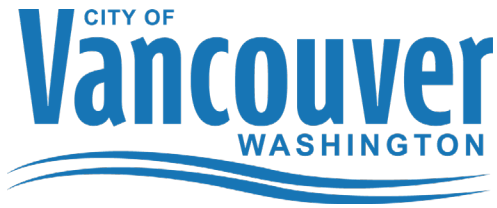


**PC/CC Workshops
Public Hearings**

Thank You

To learn more, visit: beheardvancouver.org/warehouse





Memorandum

DATE: July 25, 2022

TO: Planning Commission

FROM: Chad Eiken, Director, Community Development Department
Becky Coutinho, Associate Planner, Community Development Department

RE: Proposed Warehouse Code Amendments

Problem Statement/Moratorium Background

Toward the end of 2022, city planning staff noticed a trend of very large (as large as 600,000 square feet) warehouses being submitted for development approvals. At the time, there were as many as eight warehouses larger than 100,000 square feet being proposed or under construction, with a cumulative building area of 3.34 million square feet, the equivalent of 58 football fields. Other cities were (and are) experiencing a similar surge in large warehouse projects, and staff was hearing reports of mega-warehouses elsewhere, such as a 2.5 million square foot warehouse in Tacoma.

These extremely large facilities appear to be a growing trend nationally in response to the increasing demand for online retail shopping and parcel delivery as well as supply chain logistics issues, and consume significant swaths of limited industrial land with typically lower jobs per acre ratio than many other industrial uses.

Staff became concerned that if the trend continued, limited industrial lands would be consumed by low-wage, low jobs per acre uses that could otherwise be developed for higher wage skilled manufacturing or research and development jobs. Additional concerns with large warehouses that were identified by staff included an increase in truck traffic and pollution, energy consumption/climate impacts from such large building footprints, visual impacts, and the potential for adaptive re-use of such structures if in the future they are no longer needed for storage of goods.

In December of 2022, planning and economic development staff took their concerns to City Council and recommended that an emergency six-month moratorium be adopted to prevent the submission of any new pre-applications or land use applications for warehouses larger than 100,000 square feet to allow staff time to study these new types of warehouses and understand the physical, operational, and economic differences from traditional wholesale warehouses - as well as key differences in impacts - to inform possible new use and development standards. Because state law only allows land use moratoriums for six months at a time, staff indicated that one six-month extension would be needed to ensure sufficient time to complete needed analysis, public engagement, and development of code amendments.

On December 12 following an executive session, City Council at their regular meeting adopted an emergency ordinance on new large warehouse applications, and the emergency ordinance was affirmed by City Council following a public hearing as required by state law, on January 23, 2023. Three amendments to the initial moratorium ordinance were requested by City Council, which were adopted by ordinance on February 6, 2023, including: 1) an exemption from the moratorium for the Port of Vancouver; 2) increase in the size of warehouses subject to the moratorium from 100,000 square feet to 250,000 square feet and larger; and 3) an exemption from the moratorium for any storage for a publicly-traded product, if formalized through a development agreement. (See Exhibit A)

On June 5, 2023, following a public hearing, City Council approved a six-month extension of the moratorium but also encouraged staff to propose any code amendments as soon as possible so the moratorium may be terminated sooner. The moratorium will end on December 6, 2023 unless code amendments are adopted earlier. Staff's work plan anticipates taking a set of code amendments to City Council for their approval in early October (See Exhibit B).

In April 2023, the City selected Fehr & Peers, a transportation planning and engineering consulting firm based in Seattle, to assist staff with the warehouse study. Together with GLD Partners, a logistics and supply chain consulting firm, Fehr & Peers have prepared a report that analyzes major differences between "e-commerce warehouses" and traditional warehouses to help staff understand impacts and formulate code amendments to Vancouver Municipal Code (VMC) 20, Land Use and Development Code (See Exhibit C).

Local and National Context: Increase in Need for Warehouse and Distribution Facilities

Warehousing, broadly described as the storage of bulk inventory in large facilities, has undergone substantial evolution, from the introduction of forklifts and pallets in the 1920's to automation and cloud computing today. As a result of advances in technology and proliferation of trucking, warehouses are a critical intermediate step between the supplier and consumer. Additionally, trends like e-commerce and online shopping, near-shoring and reshoring of manufacturing have increased global demand for industrial warehousing, resulting in unprecedented warehouse development in recent years.¹ Changes in shopping behavior during the global pandemic have created further demand for warehouse space.

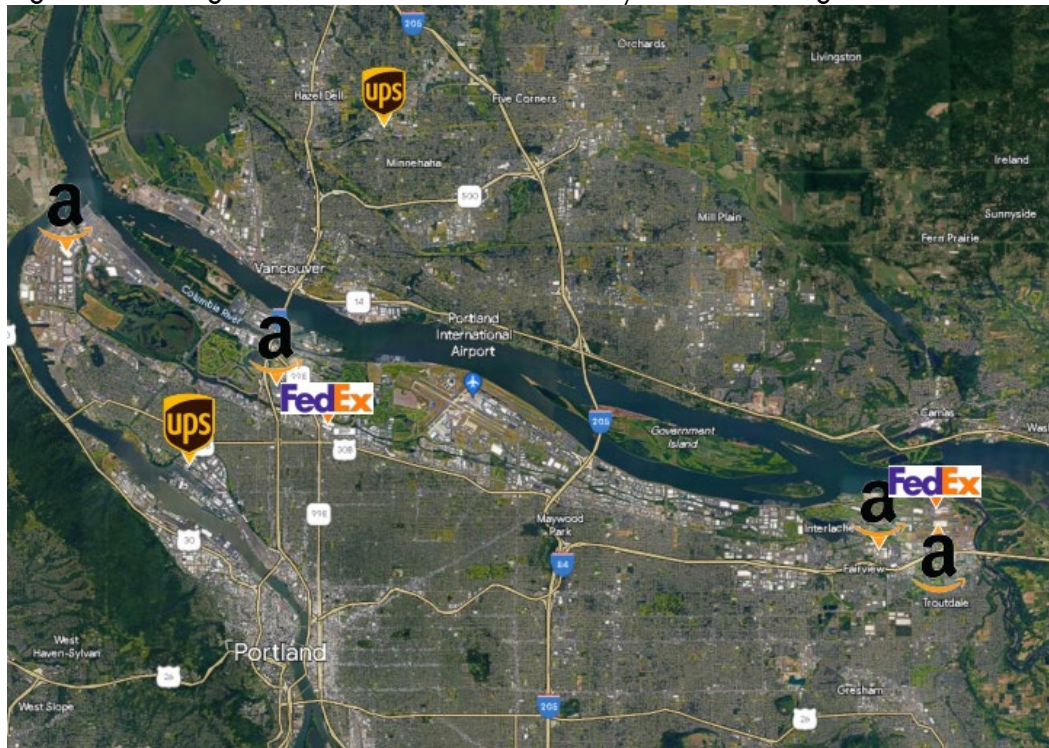
Nationally, warehouse capacity is reportedly at a premium, with almost 96 percent of existing warehouse space in use. E-commerce, with its direct shipments to consumers, represents a fundamental shift in warehouse logistics. CBRE estimates that the U.S. alone needs 330 million more square feet of warehouse space to meet e-commerce demand into 2025; to meet total demand, another firm, JLL, put that number at one billion square feet.² CBRE further indicates that every \$1 billion in new e-commerce sales requires one million square feet of new warehouse space.

In addition to these national trends, one reason for the surge locally in large warehouses is, aside from a single UPS facility, there is no warehouse/distribution facility in Clark County that specifically stores and repackages individual goods intended for direct delivery to residential or business customers. Home deliveries of goods from Amazon and FedEx to Clark County, for example, originate from the Portland side of the river. (See Figure 1)

¹Fehr & Peers, 'Traditional Warehouse Developments vs. Modern E-commerce Facilities,' 2023

2" The Warehouse Space Race," www.Prospect.org

Figure 1: Existing Distribution Centers in Portland/Vancouver Region

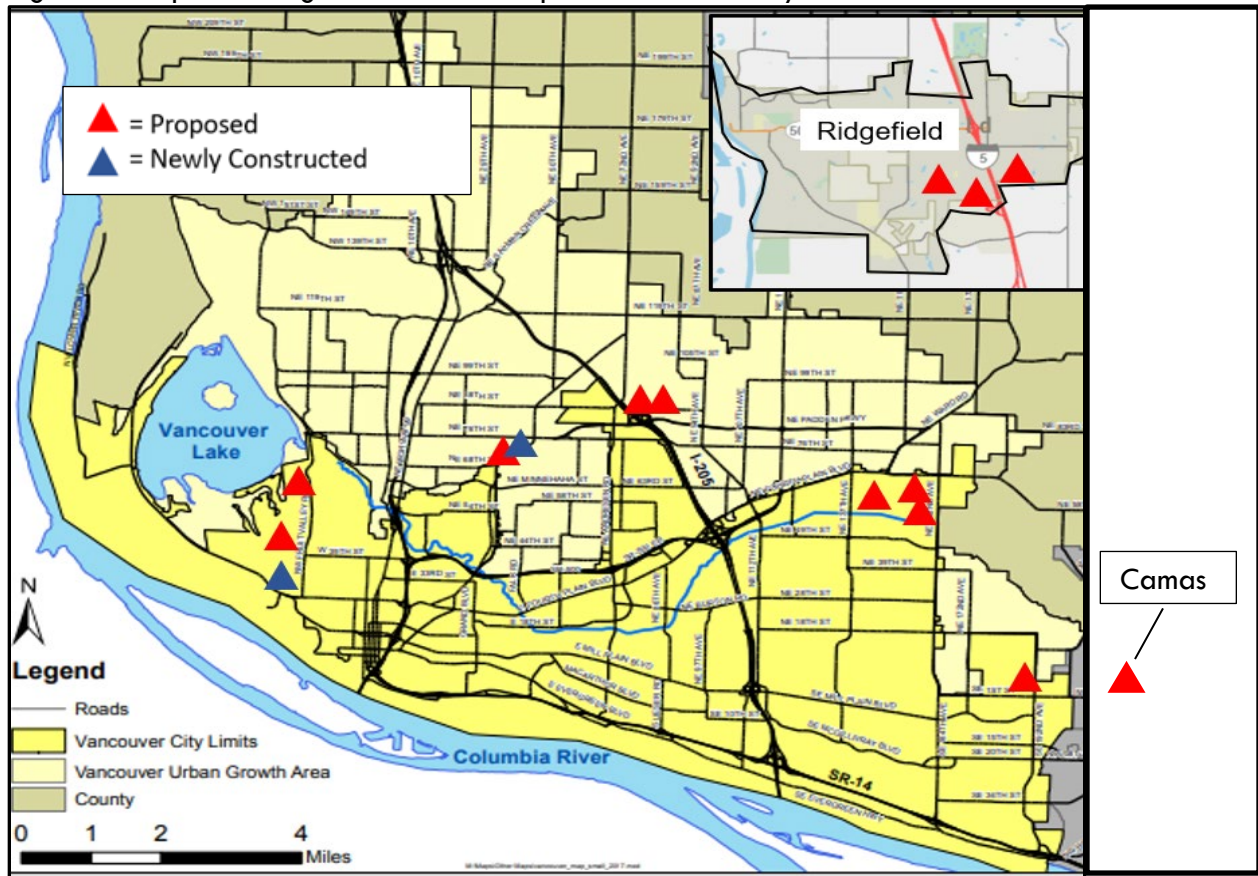


As documented in a [Columbian article](#) last year, there has been a surge of significant recent development of large scale warehouses and distribution centers in Vancouver and elsewhere in Clark County. Planning staff gathered data from Clark County, Ridgefield, Camas, and Vancouver, all of which have one or more large (>250,000 s.f.) warehouses in their development review process or under construction. While initially staff identified eight warehouse pre-applications or applications of concern in Vancouver alone, this was subsequently reduced to five active projects as one that was under construction was completed, one was only 80,000 square feet, and a third required a comprehensive plan amendment and zone change and was therefore not vested to existing use and development standards. The five warehouses, which are vested to current use and development standards, total 2.8 million square feet and will utilize 156 acres of industrial land. (See Figures 2 and 3)

Figure 2: Current Large Warehouse Applications in Vancouver

Project Name	Location	Owner/Applicant	Building SF	Acres
Prologis Park	Tax lot 152382000 (Fruit Valley)	Wellons Group	560,000	30.22
Harmon Logistics Center	NW corner of SE 1 st /192 nd Ave	DIRG LLC	450,000	24.2
Bridge Development	5500 NE 162 nd Avenue	Bridge Dvpmt Partners LLC	640,000	36.45
Burnt Bridge Creek Logistics	5920 NE 162 nd Avenue	Defenbaugh LLC	681,000	38.48
Fruit Valley Logistics	6112 NW Fruit Valley Road	Wilson Oil	365,000	26.74
TOTAL / AVG			2,776,000	156

Figure 3: Proposed Large Warehouse Projects in Clark County



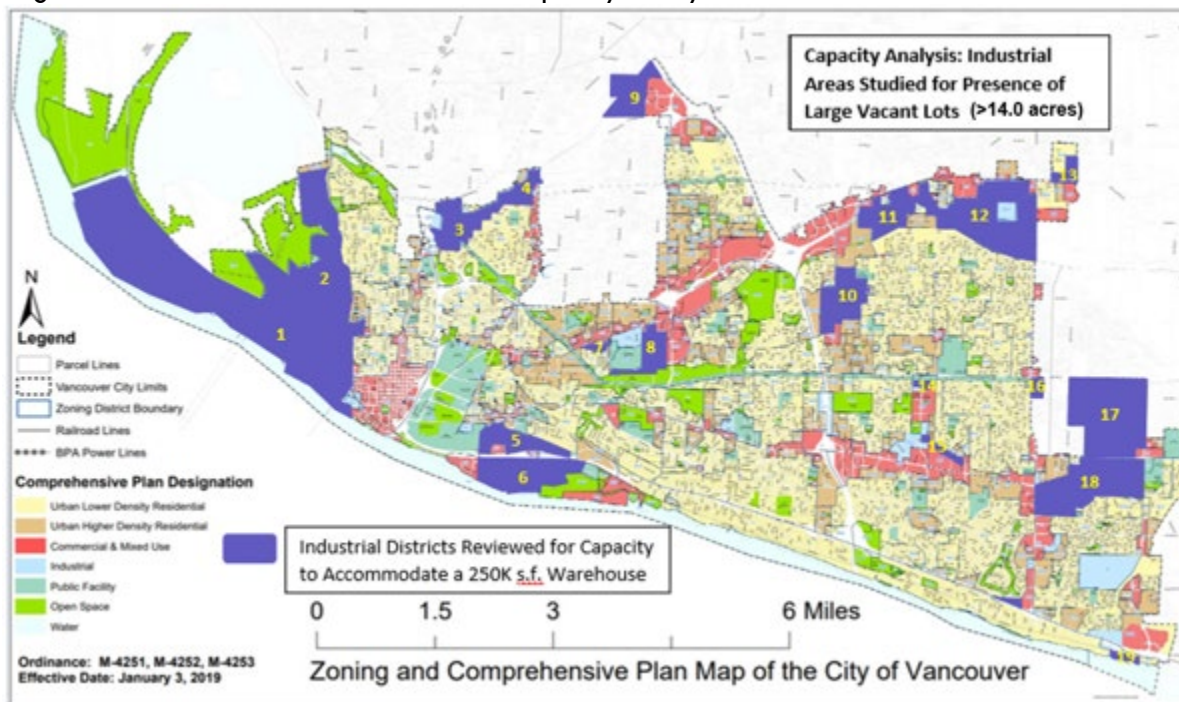
Current Zoning and Land Availability Analysis

Warehouses are classified as “Warehouse/Freight Movement” in the City’s Land Use and Development Code, VMC Title 20. This use is allowed as a permitted use in the Heavy Industrial (IH) zoning district, and as a limited use in the Light Industrial (IL) zoning district so long as all activities, except outdoor storage of materials, are wholly contained within building(s). Pre-existing development agreements apply to certain properties, such as in the Section 30 area of the City, and these agreements would allow new warehouse facilities to be built even though the current zoning would not otherwise allow such uses (vesting to regulations in effect at the time of the agreement). Development rights established by such development agreements would similarly not be superseded by any new use or development regulations that are adopted.

In order to estimate the minimum parcel size needed for a 250,000 square foot building, staff reviewed twelve proposed warehouse projects in Clark County and divided the parcel size by the stated building footprint for each to determine the approximate lot coverage, which were then totaled and averaged. The result of this calculation is that, on average, warehouse buildings occupy about 40% of the parcel that they occupy and so a 14-acre parcel would typically be needed to accommodate a 250,000 square foot building.

Planning staff analyzed every parcel within the IL and IH Districts using aerial photos and Clark County Assessor's property records to determine how many parcels that are vacant or mostly vacant would be large enough to accommodate a 250,000 square foot warehouse, which is the threshold for a large warehouse that Council established in the moratorium (See Figure 4 below). Additionally, staff looked at parcel data in the Employment Center Mixed Use District (ECX) (Section 30) to see how many parcels might feasibly be converted to large warehouse uses if developed under existing development agreement allowances. Note that the numbers shown in yellow in Figure 4 were merely for staff's purposes, to differentiate the various districts studied.

Figure 4. Industrial Districts Included in Capacity Analysis



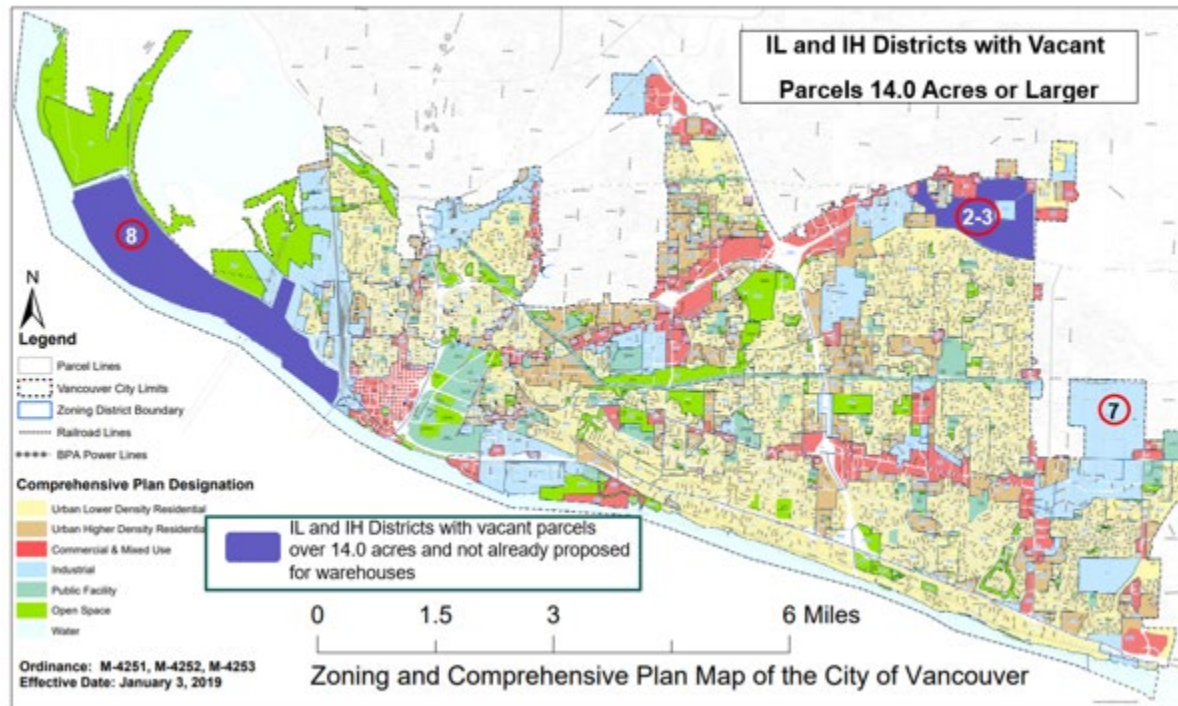
Staff then looked at every parcel in the IL, IH, and ECX Districts using Assessor's property records and aerial photos and discovered that there are surprisingly few 14 acre or larger parcels that are not already developed.

As shown in Figure 5, only three industrial areas have vacant or underdeveloped parcels large enough to accommodate a large warehouse: 1) the Port of Vancouver, 2) 'East Orchards,' and 3) Section 30. The Port has eight parcels larger than 14 acres of developable industrial land, East Orchards in the northeast corner of the City (labeled as such by staff for this analysis) has 2-3 qualifying parcels (the third parcel requires a zone change to allow warehouses, but such a request is currently pending). A total of seven parcels could be developed for large warehouses in Section 30, where warehouses are allowed only if previously vested under a development agreement. While warehouses could be developed elsewhere in the City, no warehouse larger than 250,000 square feet is likely to be developed in any other industrial district. Note that the circled numbers in each of the three identified areas represent the number of undeveloped parcels larger than 14 acres.

One of the key takeaways from this analysis is that the City simply does not have many large vacant industrial parcels capable of handling such large facilities, therefore unavailability of suitable land

may in some ways serve to curtail the trend of more new and very large warehouse facilities. However, this does raise a potentially larger issue: *What are the implications on the remaining capacity of Vancouver's industrial land to support future manufacturing and high tech sectors?* Unfortunately, this is a question that will need to be evaluated separately as part of the City's update to the Comprehensive Plan, which is currently underway.

Figure 5. Industrial Districts Capable of Accommodating a 250,000 SF Warehouse



Equity and Locational Considerations

Large scale warehouse facilities can pose an environmental justice risk, as these facilities often have truck traffic noise and air pollution, visual impacts and light pollution, and are located in industrial zones that are often adjacent to equity priority communities. Planning staff overlaid the three areas most able to accommodate large e-commerce warehouses (from Figure 5) onto the City's Equity Index Mapping Tool (Figure 6) to determine if the location could potentially impact vulnerable and marginalized communities. The Equity Index Mapping Tool uses Census data at the census tract level to identify priority equity areas. These are areas that have a high equity index score which means the census tract has a comparatively higher rate of people of color, renters, people ages 65+, households with children, a smaller proportion with a bachelor's degree or higher, a lower median family income, a lower percentage of English-proficient households, and a higher percent of people with disabilities.

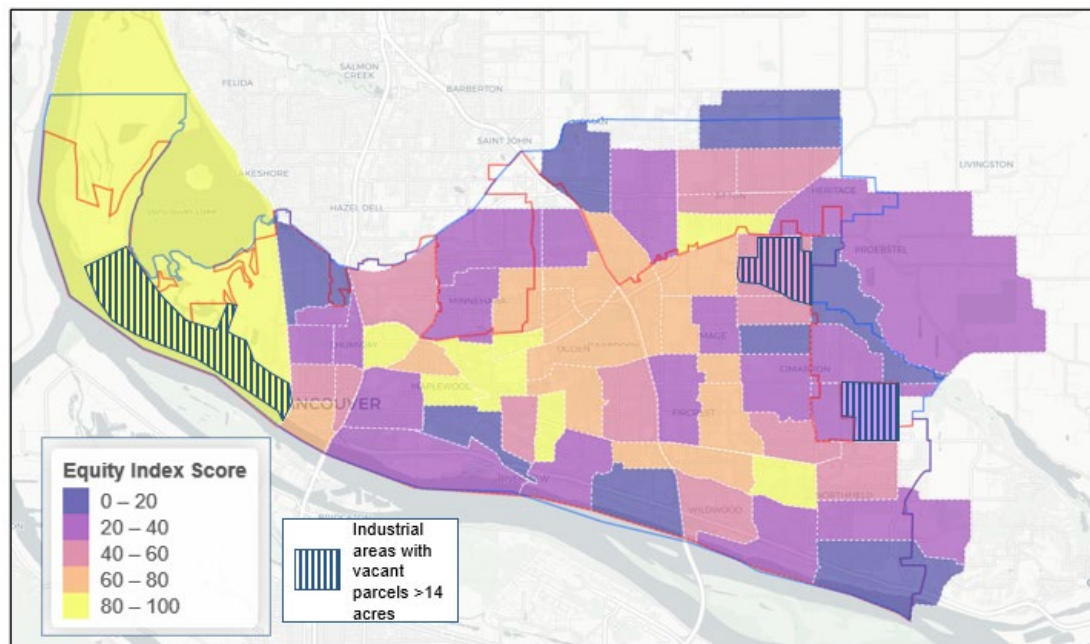
In the below figure, the Port of Vancouver is shown as being located in the Fruit Valley Neighborhood, a high priority equity area (score of 80-100), where the residential population may be more susceptible to adverse impacts (such as to health and safety) from external sources. Two warehouses are already proposed in the Fruit Valley Road corridor and there no other undeveloped parcels large enough to accommodate a 250,000 square foot or larger warehouses outside of the Port of Vancouver.

The “East Orchards” industrial cluster is mostly in the North Image and Burnt Bridge Neighborhoods and is identified as a moderate priority equity area (score of 40-60).

Section 30 is entirely within a low priority equity area (score of 20-40).

Recommended code amendments will take into account the potential for disparate impacts to high priority equity areas and any measures that may serve to minimize such impacts.

Figure 6: Vancouver’s Equity Index Mapping Tool and Areas Capable of Accommodating Large Warehouses



Key Operational, Physical, and Economic Differences between E-Commerce and Traditional Warehouses

E-commerce is, relatively speaking, a newer sector of the global economy, and detailed studies of how warehouses and associated operations may impact communities (either positively or negatively) are fairly limited. City consultants Fehr and Peers and GLD Partners prepared an analysis of the above characteristics from available data and specific projects to help decision-makers understand the differences between traditional business-to-business warehouses and larger warehouses intended for e-commerce shipping.

Key differences between the two types of warehouses are outlined in the consultant’s report (See also Exhibit D), as follows:

Various types of warehouse support retail, commercial, and industrial supply chains. Virtually all industries rely directly or indirectly on warehousing services. Directly related to e-commerce, distribution and fulfillment centers typically provide value-added logistics services, allowing operators to efficiently meet varying customer

demands and streamlining supply chains. These facilities differ from traditional warehouses from a physical, operational, and economic standpoint.

1. Key Physical Differences

Physical characteristics of warehouses include warehousing design (building size, lot coverage, loading bays, and parking spaces) and siting. Key physical differences that distinguish e-commerce facilities from traditional warehouses include:

More varied building sizes/footprints. While traditional warehouses are typically less than 100,000 square feet, e-commerce facilities range from about 100,000 square feet to over 1 million square feet.

- *E-commerce warehouses tend to be taller.* Building clear height, defined as the height of a building from the floor to the bottom of the lowest hanging item on the ceiling, is typically less than 32 feet for traditional warehouses, but often greater than 36 feet for e-commerce facilities.
- *More loading dock doors.* Operations at e-commerce facilities require more loading docks.
- *Different siting locations.* Traditional warehouses are typically situated close to other industrial uses, whereas e-commerce facilities tend to be proposed near population centers and ports.

2. Key Operational Differences

Recent technological improvements have resulted in increasingly efficient use of warehouse space and consolidation of facilities. Modern warehouses operate differently than traditional warehouses, particularly regarding hours of operation and the flow of goods:

- *24-7 operations.* Typical hours of operation for e-commerce facilities span 24 hours a day, seven days per week. The non-stop activity in modern warehouses is made possible by shift workers and automation. In contrast, traditional warehouses with slower inventory turnover are typically limited to normal business hours, i.e., 8-hour shifts, five days per week.
- *More constant flow of goods.* E-commerce facilities typically focus less on long-term storage and more on the flow of goods and services. Modern industrial warehouse facilities are often driven by demand, compared to traditional warehouses, where operations are related to storing the largest amount of goods possible.

3. Traffic Impacts

Warehouses generate some level of traffic (passenger cars and trucks), but this varies significantly based on the operations of the facilities. In addition, the type of trucks (medium- vs. heavy-duty trucks⁴) also varies. Traffic impacts differ between e-commerce and traditional warehouses in the following ways:

- *Much higher vehicle activity.* Based on data from the Institute of Transportation Engineers (ITE) Trip Generation Manual, e-commerce facilities generate up to four times more daily vehicle trips than traditional warehouses, particularly for fulfillment centers that require extensive sorting.

- *Smaller delivery vehicles are more common.* Whereas traditional warehouses generate mostly medium-duty and heavy-duty truck trips, light-duty trucks and vans play a substantial role in the transport of goods from today's e-commerce facilities.

4. Key Economic Differences

Industrial warehouses generate jobs and tax revenue (property, sales and use, and utility taxes). Warehousing jobs provide two important community benefits: 1) pay rates that start above minimum wage, and 2) on-the-job-training for career advancement. Warehouses also generate indirect jobs⁵ that benefit local and regional economies. Regionally, the U.S. Bureau of Economic Analysis (BEA) estimates that 10 new warehouse jobs create about 14 jobs in other industries.⁶ For every \$1.00 of earnings paid to the new warehouse workers, an additional \$1.50 in earnings is generated throughout the economy. Key distinctions in the economic impact of e-commerce versus traditional warehouses include:

- *Higher-skilled labor.* While traditional warehouses rely on unskilled labor and managerial jobs, highly automated e-commerce facilities offer high-paying jobs such as automation engineers with average salaries over \$100,000 annually. With companies such as Amazon investing more in warehouse automation and on-the-job training for skilled labor, the prominence of these high-paying jobs is likely to grow.
- *More ripple effects on the local economy.* Based on building size/footprint and warehouse jobs created, e-commerce facilities typically entail more local and regional economic impacts (tax revenue, indirect jobs, and new dollars circulating in the economy) than traditional warehouses.

Key Takeaways

From a physical, operational, and economic standpoint, there are pronounced differences between traditional warehouses and e-commerce facilities. With the evolving warehousing industry and a market need for e-commerce facilities in Vancouver, the City may benefit from new warehouse developments targeted to store and repackage e-commerce goods intended for various purposes, including retail home delivery. The development of e-commerce facilities will support the growth of the local economy in Vancouver through job creation and tax revenue. Regulatory amendments are needed to ensure that any new development supports the City's economic growth, has adequate transportation infrastructure, and aligns with climate and equity goals and priorities.

For the full analysis, see Fehr and Peer's report, entitled "*Traditional Warehouse Developments vs. Modern E-commerce Facilities*," dated revised July 2023, which is attached as Exhibit D.

Possible Code Amendments to Address Identified Impacts and Climate Action Policy

Planning staff has identified a number of possible code amendments that could help to mitigate impacts from very large warehouses, based on the analysis prepared by Fehr and Peers. Additionally, measures that can further the City Council's stated climate action policy goals have been identified by staff and the city's consultants. Staff will ask Planning Commission for feedback at the July 25 workshop

about the below list of possible code amendments, which will be further refined for discussion at a future workshop.

<u>Issue</u>	<u>Proposed Fix</u>
Use Limitations	Make warehouses $\geq 250,000$ s.f. conditional uses ('C' in use table) IL/IH Districts Make warehouses $< 250,000$ s.f. limited uses with specific standards ('L' in use table)
Locational Concerns	Require access from a primary arterial (or via an industrial street); larger warehouses to be within 1.0 mile of a state or interstate highway to reduce truck traffic through neighborhoods
Traffic impacts	Base traffic generation on ITE Manual Land Use Category 155 (high cube transload storage) unless specific type of warehouse is identified early on; use SEPA/CUP to address specific off-site impacts Prohibit large trucks from utilizing non-truck routes, and use conditional use permit process to attach additional restrictions on traffic (such as through areas of high equity concern)
Parking/Loading Min.	Decrease parking and loading minimums so surface lots are not oversized
Loading Bays	Prohibit loading bays facing residentially-zoned property
Lot Coverage	Reduce maximum allowed lot coverage to increase vegetative buffers
Visual Impacts	Require building elevations longer than 300' to be medium-to-dark shade (e.g. no white or light-colored building); Treed buffer (25-30' deep) adjacent to public street or residentially-zoned property
Climate Action (Energy)	Require 75% onsite energy to be from renewable sources, to be audited prior to occupancy permit EV charging ports at all loading docks EV charging stations at 20% of parking spaces Rooftop skylights for natural light; use of LEDs Light-colored roofing material to reduce heat absorption
Recycling of Packaging	Warehouse-specific waste-reduction measures being developed by staff (may be VMC Title 6)

Council and Public Engagement to-date

- Council Executive Session (moratorium): December 2023
- Council Workshops (moratorium): January, May 2023
- Council Public Hearings (moratorium): January, February, June 2023
- Project information posted to City's BeHeard webpage
- Environmental Roundtables with Alliance for Community Engagement (2)
- Business Roundtables with Identity Clark County and Port of Vancouver (3)

Next Steps

Following the Planning Commission workshop, planning staff will refine the set of proposed code amendments to be more specific and responsive to Commissioners' feedback. After an internal review by city planners, draft code amendments will be circulated to persons and groups that have expressed interest in or commented on the project to-date, and will be posted to the City's BeHeard webpage where the public may ask questions or leave comments for staff to follow up on.

Additional engagement which may consist of in-person or remote meetings will be scheduled with specific stakeholders such as Alliance for Citizen Engagement, Identity Clark County, Port of Vancouver, Fruit Valley Neighborhood Association, North Image Neighborhood Association, and Burnt Bridge Creek Neighborhood Association, as well as any other associations or groups that express interest in staff attending their meeting.

A City Council workshop is scheduled for August 14, at which the results of the consultant's study, public feedback, and specific code amendments will be discussed. Staff has tentatively reserved workshop time with the Planning Commission in September to review specific code amendments. Public hearings with the Planning Commission and City Council are anticipated in late September and early October.

Questions? Please contact:

Chad Eiken, Director, Community Development: chad.eiken@cityofvancouver.us

Becky Coutinho, Associate Planner, CDD: becky.coutinho@cityofvancouver.us

Exhibits

- A. Ord. M-4406 Temporary Moratorium on Large Warehouses
- B. Ord. M-4413 Extension of Temporary Moratorium on Large Warehouses
- C. Staff Work Plan
- D. Warehouse Analysis Report by Fehr & Peers, Inc., dated July 2023

2/27/2023

3/06/2023

ORDINANCE NO. M-4406

AN ORDINANCE amending and restating Vancouver City Ordinance M-4396, an ordinance declaring an emergency and imposing a temporary moratorium for the duration of six months upon the acceptance and processing of applications for permits for the development or expansion of large warehouse and distribution facilities totaling more than 250,000 square feet under the Warehouse/Freight Movement use classification in the Light Industrial (IL) and Heavy Industrial (IH) zoning districts, as defined in Vancouver Municipal Code Title 20 or as otherwise allowed, such as by prior development agreement, based on certain findings of fact justifying such action and adopted by City Council, and establishing an immediate effective date.

WHEREAS, in accordance with to Section 2.12 of the Vancouver City Charter, an ordinance to be revised or amended shall be re-enacted at length as revised or amended, this ordinance amends and restates Vancouver City Ordinance M-4396, originally adopted December 12, 2022; and

WHEREAS, the City has the authority to adopt temporary moratoria pursuant to RCW 36.70A.390 and RCW 35.63.200, provided that such action is justified by adopted findings of fact and a public hearing is scheduled and held within 60 days of adopting this emergency moratorium in accordance with these statutes; and

WHEREAS, this temporary moratorium may be renewed for one or more six-month periods if a subsequent public hearing is held and findings of fact demonstrating the necessity for such an extension are made prior to each renewal; and

WHEREAS, warehouse and distribution facilities have a role in the local and regional

economy but, because they are typically a low skill and low employment use, they are not a high priority sector in the *2018 – 2023 Clark County Economic Development Plan*; and

WHEREAS, as described in the *2018 – 2023 Clark County Economic Development Plan*, certain Traded Sector Industry cluster uses do promote economic development and job growth and may require facilities that would otherwise be delayed or prohibited by this ordinance; and

WHEREAS, permit applications for large warehouse and distribution facilities tend to be speculative in nature and may not have a defined user at the time of application or when land use approval rights may conditionally vest; and

WHEREAS, as set forth in the City's recent climate action plan workshops, building energy and transportation are the most significant sources of greenhouse gas emissions and are unavoidable elements of the large warehouse and distribution facility use; and

WHEREAS, warehouse capacity is reportedly at a premium in the United States with ninety-six percent of available space in use and the continued post-COVID-19 growth in e-commerce represents a fundamental shift in warehouse and shipping logistics requiring more and larger facilities not contemplated by the existing code or evaluated in the context of the City's current climate action priorities; and

WHEREAS, commercial real estate market data and warehouse development standards indicate that warehouses are typically constructed at less than 25,000 square feet or greater than 250,000 square feet for large-scale distribution and that those large warehouse and distribution facilities of greater than 250,000 square feet are developing at an unprecedented and unforeseen rate; and

WHEREAS, the City currently has eight such proposed development projects in the land use application or building permit process, one with 80,000 square feet and seven with between

275,000 to 681,000 square feet of planned large warehouse and distribution facility space resulting in a total of 3.34 million allocated square feet; and

WHEREAS, the City currently allows warehouse and distribution facilities as a permitted use in the Light Industrial (IL) and Heavy Industrial (IH) zones with no limit on size and such facilities may be a permitted pursuant to existing development agreements; and

WHEREAS, the City does not have unlimited industrial land, particularly larger, contiguous parcels, and the consumptive nature of these facilities may foreclose opportunities for higher value employment sectors with lesser climate impacts; and

WHEREAS, the surge in new, large warehouse developments and national trends suggest that more such proposals will be forthcoming with unconsidered and potentially irreversible implications for the City's climate action goals, transportation systems, and stated goal of attracting high-skilled, high-wage employment uses; and

WHEREAS, bulk storage warehouses are integral to the operations of the Port of Vancouver USA, which, since it was established in 1912 as the authorized Port district for Clark County pursuant to Chapter 53.04 RCW, has played a key role in the region's economy and is the primary point of entry for goods arriving by ship and rail in Southwest Washington, and that the Port of Vancouver USA, in accordance with its authorized purposes under RCW 53.04.010 as a Washington port district, requires warehouse space to store goods that are arriving or being shipped to other destinations in fulfillment of its mission as a public jobs-creating agency; and

WHEREAS, an exception to Ordinance M-4396 for warehouse development projects for the transshipment and storage of bulk goods and wholesale distribution on land owned and retained by the Port of Vancouver USA is merited based on the unique character of the Port of Vancouver USA as a public agency, provided that such an exception would not allow the Port of Vancouver

USA to transfer any vested rights that would otherwise be prohibited by this temporary moratorium and were obtained pursuant to this exception to a third party or to develop facilities for home delivery of retail goods; and

WHEREAS, without a temporary moratorium the City could, in the near future, receive applications for development that would conflict with the achievement of the long-range vision for the City's economic development and climate action initiatives but be vested to existing land use regulations before the City can study potential effects; and

WHEREAS, the enactment of this ordinance constitutes an emergency, due to potential land use, climate, transportation, and economic impacts that may result from continued development of large warehouse and distribution facilities without adequate standards to address unintended consequences; and

WHEREAS, a temporary moratorium will require the City to hold public hearings and maximize public input in the development of standards without jeopardizing any possible land use options that may be precluded by unrestricted development; and

WHEREAS, the City Council finds that the adoption of a temporary moratorium promotes the public health, safety, and general welfare and convenience of the people of Vancouver, and will encourage the most desirable and productive use of land and properties; and

WHEREAS, based on the facts recited above, the City Council finds that it would be appropriate to enact a moratorium on new applications for such projects to allow the City time to study the climate, transportation infrastructure, and economic implications from this recent trend and, if merited by such study, recommend regulatory changes to the Vancouver Municipal Code as needed to address concerns;

NOW, THEREFORE,

BE IT ORDAINED BY THE CITY OF VANCOUVER:

Section 1. Temporary Moratorium. As authorized by RCW 36.70A.390 and RCW 35.63.200 and justified by the findings of fact set forth above, the City Council hereby adopts a temporary moratorium for the duration of six months upon the acceptance and processing of applications for permits for the development or expansion of large warehouse and distribution facilities totaling more than 250,000 square feet under the Warehouse/Freight Movement use classification in the Light Industrial (IL) and Heavy Industrial (IH) zoning districts, as defined in Vancouver Municipal Code Title 20 or as otherwise allowed, such as by prior development agreement.

Section 2. Exemptions.

Subsection A. Maintenance. The moratorium established in Section 1 of this ordinance shall not apply to permits required for upkeep, repair, or basic maintenance of existing large warehouse and distribution facilities or to work mandated by the City as necessary to maintain public health and safety.

Subsection B. Port of Vancouver USA. The moratorium established in Section 1 of this ordinance shall not apply to warehouse development projects on land owned and retained by the Port of Vancouver USA for the transshipment and storage of bulk goods and wholesale distribution; provided that such exception will not apply to the transfer of any Vested Rights obtained by the Port of Vancouver USA pursuant to this exception that would otherwise be prohibited by this ordinance and provided that any such warehouse development shall not be for home delivery of retail goods.

Subsection C. Traded Sector Industry Use. Applications for permits otherwise prohibited by the moratorium established in Section 1 of this ordinance that are exclusively for use

by a Traded Sector Industry shall continue to be processed throughout the duration of this ordinance, however no Vested Rights shall attach to any such Traded Sector Industry application until a Development Agreement is entered into with the City and recorded on the subject property in accordance with Chapter 20.250 VMC. For purposes of this ordinance, “Traded Sector Industry” shall be defined as North American Industry Classification System (NAICS) sectors 31, 32, 33, 42, 51, 54, and 55, in accordance with the respective industry sector clusters specified in the *2018-2023 Clark County Comprehensive Economic Development Plan*.

Section 3. Duration. This moratorium shall be in effect for six months following the effective date established in Section 6 of Ordinance M-4396.

Section 4. Vested Rights. The moratorium created by this ordinance does not apply to properties with vested rights existing on the date of enactment of this ordinance. “Vested Rights” shall be defined in accordance with VMC 20.210.110 and VMC 20.250.040.

Section 5. Public Hearing Required. Pursuant to RCW 35.63.200 and RCW 36.70A.390, a public hearing on the adopted moratorium will be held no more than sixty days following the adoption of this ordinance.

Section 6. Effective Date. The City Council hereby finds and declares that an emergency exists which necessitates that this ordinance become effective immediately in order to preserve the public health, safety, and welfare. This ordinance shall become effective immediately upon passage. The City Clerk is directed to publish a summary hereof including the title at the earliest possible publication date.

SIGNED this 6th day of March 2023.

DocuSigned by:

Anne McEnerny-Ogle

6C89D9089EC5424...

Anne McEnerny-Ogle, Mayor

ATTEST:

DocuSigned by:

Natasha Ramras

BCF6734E40E04AE...

By: Natasha Ramras, City Clerk

APPROVED AS TO FORM:

DocuSigned by:

Jonathan Young

9A7DC2E31F694A2

By: Jonathan Young, City Attorney

SUMMARY

ORDINANCE NO. M-4406

AN ORDINANCE amending and restating Vancouver City Ordinance M-4396, an ordinance declaring an emergency and imposing a temporary moratorium for the duration of six months upon the acceptance and processing of applications for permits for the development or expansion of large warehouse and distribution centers totaling more than 250,000 square feet under the Warehouse/Freight Movement use classification in the Light Industrial (IL) and Heavy Industrial (IH) zoning districts, as defined in Vancouver Municipal Code Title 20 or as otherwise allowed, such as by prior development agreement, based on certain findings of fact justifying such action and adopted by City Council, and establishing an immediate effective date.

The full text of this ordinance will be mailed upon request. Contact Raelyn McJilton, Records Officer at 487-8711, or via www.cityofvancouver.us (Go to City Government and Public Records).

05/22/2023
06/05/2023

ORDINANCE NO. M-4413

AN ORDINANCE extending for an additional period of six months the Vancouver City Ordinance M-4406, which declared an emergency and imposed a six-month temporary moratorium upon the acceptance and processing of applications for permits for the development or expansion of large warehouse and distribution facilities totaling more than 250,000 square feet under the Warehouse/Freight Movement use classification in the Light Industrial (IL) and Heavy Industrial (IH) zoning districts, as defined in Vancouver Municipal Code Title 20 or as otherwise allowed, such as by prior development agreement, based on certain findings of fact justifying such action and adopted by City Council, directing staff to continue efforts to develop recommendations addressing the circumstances necessitating the moratorium, and establishing an immediate effective date.

WHEREAS, the City of Vancouver is a Charter City of the First Class and has the authority to adopt and renew temporary moratoria pursuant to the City's constitutional police powers, home rule authority, RCW 36.70A.390, and RCW 35.63.200; and

WHEREAS, on December 12, 2022, the Vancouver City Council adopted Ordinance No. M-4396, enacting a six-month temporary moratorium upon the acceptance and processing of applications for permits for the development or expansion of large warehouse and distribution facilities under the Warehouse/Freight Movement use classification in the Light Industrial (IL) and Heavy Industrial (IH) zoning districts, as defined in Vancouver Municipal Code Title 20 or as otherwise allowed, such as by prior development agreement, based on certain findings of fact justifying such action and adopted by City Council; and

WHEREAS, on February 6, 2023, following a public hearing, City Council passed a resolution affirming the moratorium but requesting certain amendments relating to the threshold of warehouse space covered, warehouses proposed by the Port of Vancouver, and warehouses that will exclusively supply storage intended for the traded sector; and

WHEREAS, on March 6, 2023, held a public hearing and adopted findings of fact supporting the enactment of the moratorium through adoption of Ordinance No. M-4406, amending and restating Ordinance No. M-4396;

WHEREAS, on May 1, 2023 at a City Council Workshop, City staff provided an update of analysis completed to-date, early observations, and a presented a work plan demonstrating remaining analysis to be completed by staff and the City's consultant and staff, which requires an estimated additional four months to complete;

WHEREAS, City Council has determined, pursuant to an additional public hearing and based on the findings contained herein demonstrating the necessity for extending the moratorium, that, pursuant to RCW 36.70A.390, this temporary moratorium must be renewed for an additional six month period; and

WHEREAS, the findings associated with Ordinance No. M-4406, as delineated herein, continue to pertain; and

WHEREAS, in December when the moratorium was enacted there were eight pre-development or development applications for large warehouse and distribution facilities between 275,000 square feet up to 680,000 square feet, which are much larger than typical warehouses, for a total of 3.34 million square feet of proposed new warehouse structures;

WHEREAS, upon more recent review of the warehouses initially identified, one warehouse building was completed and issued an occupancy permit, and a second requires a zone change

approval, and therefore staff reports that there are a total of total of 2.8 million square feet of warehouse building space in the development review or construction process; and

WHEREAS, a primary concern is the land-intensive nature of these large warehouses and low job creation, but other issues such as air pollution, implications on the City's climate action goals, increase in truck traffic to vulnerable neighborhoods, and appropriately locating such warehouses near major arterial routes and highways need to be analyzed; and

WHEREAS, as described in the *2018 – 2023 Clark County Economic Development Plan*, certain Traded Sector Industry cluster uses do promote economic development and job growth and may require facilities that would otherwise be delayed or prohibited by this ordinance; and

WHEREAS, permit applications for large warehouse and distribution facilities tend to be speculative in nature and may not have a defined user at the time of application or when land use approval rights may conditionally vest; and

WHEREAS, as set forth in the City's recent climate action plan workshops, building energy and transportation are the most significant sources of greenhouse gas emissions and are unavoidable elements of the large warehouse and distribution facility use; and

WHEREAS, warehouse capacity is reportedly at a premium in the United States with ninety-six percent of available space in use and the continued post-COVID-19 growth in e-commerce represents a fundamental shift in warehouse and shipping logistics requiring more and larger facilities not contemplated by the existing code or evaluated in the context of the City's current climate action priorities; and

WHEREAS, commercial real estate market data and warehouse development standards indicate that warehouses are typically constructed at less than 25,000 square feet or greater than 250,000 square feet for large-scale distribution and that those large warehouse and distribution

facilities of greater than 250,000 square feet are developing at an unprecedented and unforeseen rate; and

WHEREAS, the City currently allows warehouse and distribution facilities as a permitted use in the Light Industrial (IL) and Heavy Industrial (IH) zones with no limit on size and such facilities may be a permitted pursuant to existing development agreements; and

WHEREAS, the City does not have unlimited industrial land, particularly larger, contiguous parcels, and the consumptive nature of these facilities may foreclose opportunities for higher value employment sectors with lesser climate impacts; and

WHEREAS, the surge in new, large warehouse developments and national trends suggest that more such proposals will be forthcoming with unconsidered and potentially irreversible implications for the City's climate action goals, transportation systems, and stated goal of attracting high-skilled, high-wage employment uses; and

WHEREAS, bulk storage warehouses are integral to the operations of the Port of Vancouver USA, which, since it was established in 1912 as the authorized Port district for Clark County pursuant to Chapter 53.04 RCW, has played a key role in the region's economy and is the primary point of entry for goods arriving by ship and rail in Southwest Washington, and that the Port of Vancouver USA, in accordance with its authorized purposes under RCW 53.04.010 as a Washington port district, requires warehouse space to store goods that are arriving or being shipped to other destinations in fulfillment of its mission as a public jobs-creating agency; and

WHEREAS, an exception for warehouse development projects for the transshipment and storage of bulk goods and wholesale distribution on land owned and retained by the Port of Vancouver USA is merited based on the unique character of the Port of Vancouver USA as a public agency, provided that such an exception would not allow the Port of Vancouver USA to

transfer any vested rights that would otherwise be prohibited by this temporary moratorium and were obtained pursuant to this exception to a third party or to develop facilities for home delivery of retail goods; and

WHEREAS, without a temporary moratorium the City could, in the near future, receive applications for development that would conflict with the achievement of the long-range vision for the City's economic development and climate action initiatives but be vested to existing land use regulations before the City can study potential effects; and

WHEREAS, the enactment of this ordinance constitutes an emergency, due to potential land use, climate, transportation, and economic impacts that may result from continued development of large warehouse and distribution facilities without adequate standards to address unintended consequences; and

WHEREAS, extension of the temporary moratorium requires the City to hold public hearings and maximize public input in the development of standards without jeopardizing any possible land use options that may be precluded by unrestricted development; and

WHEREAS, the City Council finds that extension of the temporary moratorium promotes the public health, safety, and general welfare and convenience of the people of Vancouver, and will encourage the most desirable and productive use of land and properties; and

WHEREAS, extending the temporary moratorium will allow for more time to study the differences in physical and operational characteristics between large e-commerce warehouse facilities and more traditional wholesale warehouses to develop code amendments that address any impacts; and

WHEREAS, several large parcels that appear to be poised for large warehouse development would not be able to vest to existing development code standards, but would instead

be subject to any new code provisions; and

WHEREAS, based on the facts recited above, the City Council finds that it would be appropriate to extend the moratorium on new applications for such projects to allow the City additional time to study the climate, transportation infrastructure, and economic implications from this recent trend and, if merited by such study, recommend regulatory changes to the Vancouver Municipal Code as needed to address concerns;

NOW, THEREFORE,

BE IT ORDAINED BY THE CITY OF VANCOUVER:

Section 1. Temporary Moratorium. As authorized by RCW 36.70A.390 and RCW 35.63.200 and justified by the findings of fact set forth above, the City Council hereby adopts a temporary moratorium upon the acceptance and processing of applications for permits for the development or expansion of large warehouse and distribution facilities totaling more than 250,000 square feet under the Warehouse/Freight Movement use classification in the Light Industrial (IL) and Heavy Industrial (IH) zoning districts, as defined in Vancouver Municipal Code Title 20 or as otherwise allowed, such as by prior development agreement.

Section 2. Exemptions.

Subsection A. Maintenance. The moratorium established in Section 1 of this ordinance shall not apply to permits required for upkeep, repair, or basic maintenance of existing large warehouse and distribution facilities or to work mandated by the City as necessary to maintain public health and safety.

Subsection B. Port of Vancouver USA. The moratorium established in Section 1 of this ordinance shall not apply to warehouse development projects on land owned and retained by the Port of Vancouver USA for the transshipment and storage of bulk goods and wholesale

distribution; provided that such exception will not apply to the transfer of any Vested Rights obtained by the Port of Vancouver USA pursuant to this exception that would otherwise be prohibited by this ordinance and provided that any such warehouse development shall not be for home delivery of retail goods.

Subsection C. Traded Sector Industry Use. Applications for permits otherwise prohibited by the moratorium established in Section 1 of this ordinance that are exclusively for use by a Traded Sector Industry shall continue to be processed throughout the duration of this ordinance, however no Vested Rights shall attach to any such Traded Sector Industry application until a Development Agreement is entered into with the City and recorded on the subject property in accordance with Chapter 20.250 VMC. For purposes of this ordinance, “Traded Sector Industry” shall be defined as North American Industry Classification System (NAICS) sectors 31, 32, 33, 42, 51, 54, and 55, in accordance with the respective industry sector clusters specified in the *2018-2023 Clark County Comprehensive Economic Development Plan*.

Section 3. Duration. This moratorium shall be in effect as an extension of Ordinance No. M-4406 for a period of six months following the effective date established in Section 6, below.

Section 4. Vested Rights. The moratorium created by this ordinance does not apply to properties with vested rights existing on the date of enactment of this ordinance. “Vested Rights” shall be defined in accordance with VMC 20.210.110 and VMC 20.250.040.

Section 5. Public Hearing Required. Pursuant to RCW 35.63.200 and RCW 36.70A.390, a public hearing on the adopted moratorium was held prior to the adoption of this ordinance.

Section 6. Effective Date. The City Council hereby finds and declares that an emergency exists which necessitates that this ordinance become effective immediately in order to

preserve the public health, safety, and welfare. This ordinance shall become effective immediately upon passage. The City Clerk is directed to publish a summary hereof including the title at the earliest possible publication date.

DATE OF FINAL PASSAGE by the Vancouver City Council: June 5, 2023.

SIGNED this 5th day of June 2023.

DocuSigned by:
Anne McEnerny-Ogle
6C89D9089EC5424...
Anne McEnerny-Ogle, Mayor

ATTEST:

DocuSigned by:
Natasha Ramras
BCF6734E40E94AE...
By: Natasha Ramras, City Clerk (or Designee)

APPROVED AS TO FORM:

DocuSigned by:
Jonathan Young
9A7DC2E31F694A2...
By: Jonathan Young, City Attorney (or Designee)

SUMMARY

ORDINANCE NO. M-4413

AN ORDINANCE extending for an additional period of six months the Vancouver City Ordinance M-4406, which declared an emergency and imposed a six-month temporary moratorium upon the acceptance and processing of applications for permits for the development or expansion of large warehouse and distribution facilities totaling more than 250,000 square feet under the Warehouse/Freight Movement use classification in the Light Industrial (IL) and Heavy Industrial (IH) zoning districts, as defined in Vancouver Municipal Code Title 20 or as otherwise allowed, such as by prior development agreement, based on certain findings of fact justifying such action and adopted by City Council, directing staff to continue efforts to develop recommendations addressing the circumstances necessitating the moratorium, and establishing an immediate effective date.

The full text of this ordinance will be mailed upon request. Contact Raelyn McJilton, Records Officer at 487-8711, or via www.cityofvancouver.us (Go to City Government and Public Records).

EXHIBIT C. Staff Work Plan: Warehouse/Distribution Center Moratorium

Phase	Time Period	Tasks/Outcomes
I. Information Gathering & Analysis	Jan. – May 2023	• Industrial Land Supply in Vancouver • Comparison of Local Warehouse vs. Large Distribution Center Characteristics • Examine regional and national warehouse market trends • Jobs/acre comparison to other industrial uses • Review of impacts from Distribution Centers (traffic, pollution, tax base, job creation, land consumption, etc.) • Equity disparities analysis • Analysis of areas where distribution centers may be most appropriate • Contact other jurisdictions regarding lessons learned, response to increase in large warehouses • Review of other jurisdiction codes and best practices • Outreach to key stakeholders (Port, industrial tenants, CREDC, etc.)
II. Moratorium Extension (6 month)	June 2023	• Council workshop to provide updates on background research and preliminary analysis • Council public hearing - approval of a six-month extension of moratorium to complete code development work
III. Code Development	June – Aug. 2023	• Develop use limitations and development standards as appropriate to mitigate concerns • Targeted engagement with Port, industrial stakeholders, CREDC, County, etc. to receive input on draft standards • Planning Commission Workshop(s) to review draft code changes
IV. Code Amendment Approval Process and Public Engagement	Aug. – Oct. 2023	• Complete SEPA Review/Determination • Neighborhood and general public information sharing and opportunities for input (Neighborhood newsletters, meetings, Be Heard webpage, etc.) • Planning Commission Workshops and Public Hearing • City Council Workshops and Public Hearing • Adoption of development code changes • Moratorium expires December 12, 2023

Traditional Warehouse Developments vs. Modern E-commerce Facilities

Prepared for:
The City of Vancouver

June 2023 (Revised July 2023)

PT23-0086

FEHR  PEERS

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Executive Summary

Warehousing, broadly described as the storage of bulk inventory in large facilities, has undergone substantial evolution, from the introduction of forklifts and pallets in the 1920s to automation and cloud computing today. As a result of advances in technology and proliferation of trucking, warehouses are a critical intermediate step between supplier and consumer. Additionally, trends like e-commerce and online shopping, near-shoring and reshoring¹ of manufacturing have increased global demand for industrial warehousing, resulting in unprecedented warehouse development in recent years. These factors have been accelerated by the COVID-19 global pandemic.

Given Vancouver's location near a major airport, seaport, and population center, warehousing demand in the Vancouver/Portland region is particularly robust. Over the past year, the City of Vancouver received five applications to develop large industrial warehouses (>250,000 square feet), which are expected to store and repackage e-commerce goods intended for various purposes including retail home delivery. In response to this regional trend, the City seeks to better understand key characteristics of these larger, typically e-commerce-oriented facilities in comparison to smaller-sized, more traditional warehouses, and how these differences might impact the local economy, street capacity, the environment, and overall quality of life for Vancouver residents.

This report details physical, operational, and economic differences between traditional and modern industrial warehouses, including e-commerce facilities. The report includes strategies for the City of Vancouver to consider in ensuring that future warehouse developments support the City's economic vision, have adequate transportation infrastructure, and align with climate goals and priorities. Given the relevant newness of the e-commerce sector, data about its impacts are evolving and incomplete. This report summarizes insights from a high-level analysis of available literature, data from the US Census Bureau and the Bureau of Economic Analysis, previously collected empirical warehouse traffic data from California², correspondence with developers, and a review of peer cities. This serves as an initial step towards understanding the how Vancouver might respond to the growth of e-commerce-oriented facilities.

Warehousing Trends

The size, design, function, level of automation, and siting of warehouses has evolved considerably over the years in response to market changes and in support of supply chain efficiencies. There has been a

¹ Reshoring describes the process of returning domestic product manufacturing from a foreign country back to the home country of where a business' products are sold. Near-shoring focuses on moving manufacturing operations to nearby countries or close to the point of use.

² The previously collected empirical warehouse traffic data from California is assumed to provide general insights of the differences in traffic impacts between traditional warehouses and e-commerce facilities. An in-depth review of local warehouse developments sites in the Vancouver/Portland region would help inform more representative trends that are context sensitive.

recent trend toward high-tech warehousing that supports e-commerce and Just-in-Time (JIT)³ inventory practices aimed at businesses saving costs by using less space to hold both consumer goods and inputs to production. These are the top three factors influencing warehousing demand in Vancouver today:

- **E-commerce** (electronic commerce), defined as the process of buying and selling goods or services via the internet, has garnered popularity over the past years, particularly due to the COVID-19 pandemic. Growth in e-commerce has impacted supply chain management and increased the demand for industrial property development.
- **Just-in-Time (JIT) versus Just-in-Case (JIC) inventory management**³ played a significant role in the shortages for basic household goods, such as toilet paper and cleaning supplies, over the past years. JIT offers cost savings because less space is needed for storage, but JIC is trending back due to the hardships the lack of inventory created for many companies. Both practices are anticipated to continue, and more warehousing space is needed to support this.
- **Market Need** – warehouse sites near logistics hubs, such as intermodal rail yards, airports and seaports are in high demand. As a City surrounded a major airport and seaport, and population center, there is a market need for warehouse developments in Vancouver to support e-commerce and online shopping. Due to the absence of e-commerce facilities within City limits, households and businesses currently rely on facilities/warehouses in Portland.

Warehouse Characteristics

Various warehouse types support retail, commercial, and industrial supply chains. Virtually all industries rely directly or indirectly on warehousing services. Directly related to e-commerce, distribution and fulfillment centers typically provide value-added logistics services, allowing operators to efficiently meet varying customer demands streamlining supply chains. These facilities differ from traditional warehouses from a physical, operational, and economic standpoint.

Key Physical Differences

Physical characteristics of warehouses include warehousing design (building size, lot coverage, loading bays, and parking spaces) and siting. Key physical differences that distinguish e-commerce facilities from traditional warehouses include:

- **More varied building sizes/footprints.** While traditional warehouses are typically less than 100,000 square feet, e-commerce facilities range from about 100,000 square feet to over 1 million square feet.
- **E-commerce warehouses tend to be taller.** Building clear height, defined as the height of a building from the floor to the bottom of the lowest hanging item on the ceiling, is typically less than 32 feet for traditional warehouses, but often greater than 36 feet for e-commerce facilities.
- **More loading dock doors.** Operations at e-commerce facilities require more loading docks.

³ JIT inventory practices are strategies in which commerce companies receive the exact amount of inventory they need, right when they need it. A contrasting approach is Just-in-Case (JIC) inventory management which centered around keeping a lot of stock/ inventory on hand to reduce the risk of stock-out.

- **Different siting locations.** Traditional warehouses are typically situated close to other industrial uses, whereas e-commerce facilities tend to be proposed near population centers and ports.

Key Operational Differences

Recent technological improvements have resulted in increasingly efficient use of warehouse space and consolidation of facilities. Modern warehouses operate differently than traditional warehouses, particularly regarding hours of operation and the flow of goods:

- **24-7 operations.** Typical hours of operation for e-commerce facilities span 24 hours a day, seven days per week. The non-stop activity in modern warehouses is made possible by shift workers and automation. In contrast, traditional warehouses with slower inventory turnover are typically limited to normal business hours, i.e., 8-hour shifts, five days per week.
- **More constant flow of goods.** E-commerce facilities typically focus less on long-term storage and more on the flow of goods and services. Modern industrial warehouse facilities are often driven by demand, compared to traditional warehouses, where operations are related to storing the largest amount of goods possible.

Traffic Impacts

Warehouses generate some level of traffic (passenger cars and trucks), but this varies significantly based on the operations of the facilities. In addition, the type of trucks (medium- vs. heavy-duty trucks⁴) also varies. Traffic impacts differ between e-commerce and traditional warehouses in the following ways:

- **Much higher vehicle activity.** Based on data from the Institute of Transportation Engineers (ITE) Trip Generation Manual, e-commerce facilities generate up to four times more daily vehicle trips than traditional warehouses, particularly for fulfillment centers that require extensive sorting.
- **Smaller delivery vehicles are more common.** Whereas traditional warehouses generate mostly medium-duty and heavy-duty truck trips, light-duty trucks and vans play a substantial role in the transport of goods from today's e-commerce facilities.

Key Economic Differences

Industrial warehouses generate jobs and tax revenue (property, sales and use, and utility taxes). Warehousing jobs provide two important community benefits: 1) pay rates that start above minimum wage, and 2) on-the-job-training for career advancement. Warehouses also generate indirect jobs⁵ that benefit local and regional economies. Regionally, the U.S. Bureau of Economic Analysis (BEA) estimates that 10 new warehouse jobs create about 14 jobs in other industries.⁶ For every \$1.00 of earnings paid to

⁴ Trucks are placed into classifications based on the gross vehicle weight rating (GWVR). The Federal Highway Administration (FHWA) categorizes medium duty trucks as classes 3-6, with GWVR range of 10,001- 26,000 lbs. and heavy-duty trucks as classes 6-7, with GWVR greater than 26,001 lbs.

⁵ Indirect jobs are jobs generated in supporting industries; these include repair and maintenance jobs, service jobs and third-party vendors.

the new warehouse workers, an additional \$1.50 in earnings is generated throughout the economy.⁶ Key distinctions in the economic impact of e-commerce versus traditional warehouses include:

- **Higher-skilled labor.** While traditional warehouses rely on unskilled labor and managerial jobs, highly automated e-commerce facilities offer high-paying jobs such as automation engineers with average salaries over \$100,000 annually. With companies such as Amazon investing more in warehouse automation and on-the-job training for skilled labor, the prominence of these high-paying jobs is likely to grow.
- **More ripple effects on the local economy.** Based on building size/footprint and warehouse jobs created, e-commerce facilities typically entail more local and regional economic impacts (tax revenue, indirect jobs, and new dollars circulating in the economy) than traditional warehouses.

Key Takeaways

From a physical, operational, and economic standpoint, there are pronounced differences between traditional warehouses and e-commerce facilities. With the evolving warehousing industry and a market need for e-commerce facilities in Vancouver, the City may benefit from new warehouse developments targeted to store and repackage e-commerce goods intended for various purposes, including retail home delivery. The development of e-commerce facilities will support the growth of the local economy in Vancouver through job creation and tax revenue. Regulatory amendments are needed to ensure that any new development supports the City's economic growth, has adequate transportation infrastructure, and aligns with climate goals and priorities.

Regulatory Recommendations

Recent best practices focus on understanding the operations of industrial warehousing and taking a performance-based zoning approach directly addresses the potential impacts of modern warehouse facilities. The following provides some potential conditions of approval for the City's consideration:

General

- **Update conditional use permitting (CUP) requirements** to make applicants describe their proposed operations, such as hours of operation, number of employees per shift, number of shifts, daily and AM/PM peak hour trips by vehicle type, number of dock doors, number of parking spaces for employees, trailers, tractor-trailers, and/or tractors, and anticipated water/sewer usage in volume, and power requirements in megawatts.
- **Address impacts early in the entitlement process.** There are several measures that the City can take to mitigate impacts related to traffic congestion, air and noise pollution, such as identifying

⁶ The region discussed is the Portland-Vancouver-Hillsboro Metropolitan Statistical Area. The provided estimates are based on U.S. Bureau of Economic Analysis (BEA) RIMS II multipliers: 1.408 for each new job and 1.508 for earnings in the Portland/Vancouver/Hillsboro MSA. The multipliers estimate the impact from changes in final demand on one or more regional industries in terms of output, employment, and labor earnings. These multipliers are based on estimates of local area personal income and on the national input-output (I-O) accounts.

truck routes and access, right sizing the employee, truck and trailer parking requirements, and requiring sustainable development standards specific to each facility's anticipated impacts.

Traffic Impacts

- **Develop a traffic impact assessment/analysis (TIA) template** to guide the assumptions to use in preparing TIAs.
- **Update the City's parking and circulation regulations** to address parking and queueing concerns that often arise with warehouse developments. Specifications of truck parking for long duration or overnight parking, trailer storage, and dock spaces in length and width, should accommodate the largest commercial motor vehicle that is anticipated to utilize a facility. The number of spaces offered and their dimensions should be consistent with the proposed use and potential future re-uses of the site.
- **Consider trails, sidewalks, and access to transit facilities** when planning for the location of freight-based operations. This infrastructure serves both drivers and employees accessing the site.
- **Require tenants to establish and promote rideshare programs** that discourage single-occupancy vehicle trips and provide financial incentives for modes like carpooling, public transit, and biking.

Adaptive Reuse

- **Require design features that support broader uses** to accommodate potential future adaptive reuse of warehousing sites. Warehouses have been converted to "ghost" kitchens, segmented artist studios, start-up office space, and production or testing facilities for industries like biotech.

Environment and Climate

- **Further the City's Climate Action Plan** to reduce greenhouse gas emissions and build resiliency to climate change impacts by providing incentives or codifying sustainable design features or business practices, where applicable. Example features include bicycle, hybrid/electric, and carpool vehicle parking for employees, auxiliary power/electric truck charging, alternative energy sources like solar, water conservation measures, dedicated area for onsite recycling, and environmentally friendly building materials.

Introduction

In recent years, the rapid growth in e-commerce and online shopping, near-shoring and reshoring of manufacturing, demand for industrial warehousing, and aging warehouse inventory, has resulted in unprecedented warehouse development.^{7,8} Between March 2020 and November 2021, warehouse space purchases were up 300 percent among the five biggest retailers (Amazon, Walmart, Costco, Target, and TJX companies) compared to the 2019 to 2020 period.⁷ This was largely accelerated by the COVID-19 global pandemic. The nearly two-year boom in warehouse development is being followed by a slow-down in new development as economic factors including inflation and increases in borrowing rates have resulted in a pivot to optimization of available space. In the first part of 2023, only 6,700 warehouses were added to the global building stock, a decline of 35 percent compared to the same time period in 2022.⁸ With warehouse vacancy rates at three percent, a 30-year low, this slowdown in development appears to be more of a reflection of capitalization than decreasing demand.

Despite the indication that demand for new warehousing space is slowing at the global level, warehousing demand in the Vancouver/Portland region remains strong. Over the past year, the City of Vancouver received five applications for the development of new industrial warehouses with gross floor areas greater than 250,000 square feet, shown in **Figure 1**. While the intended use or expected tenants for the proposed warehouses are not known, these developments are expected to be operated as high-tech industrial warehousing facilities, which are likely to include e-commerce operators. This use, along with the size of these proposed developments compared to the size of existing warehouse uses in Vancouver has resulted in a desire to better understand several key characteristics of these larger, frequently e-commerce-oriented facilities. This report will explore:

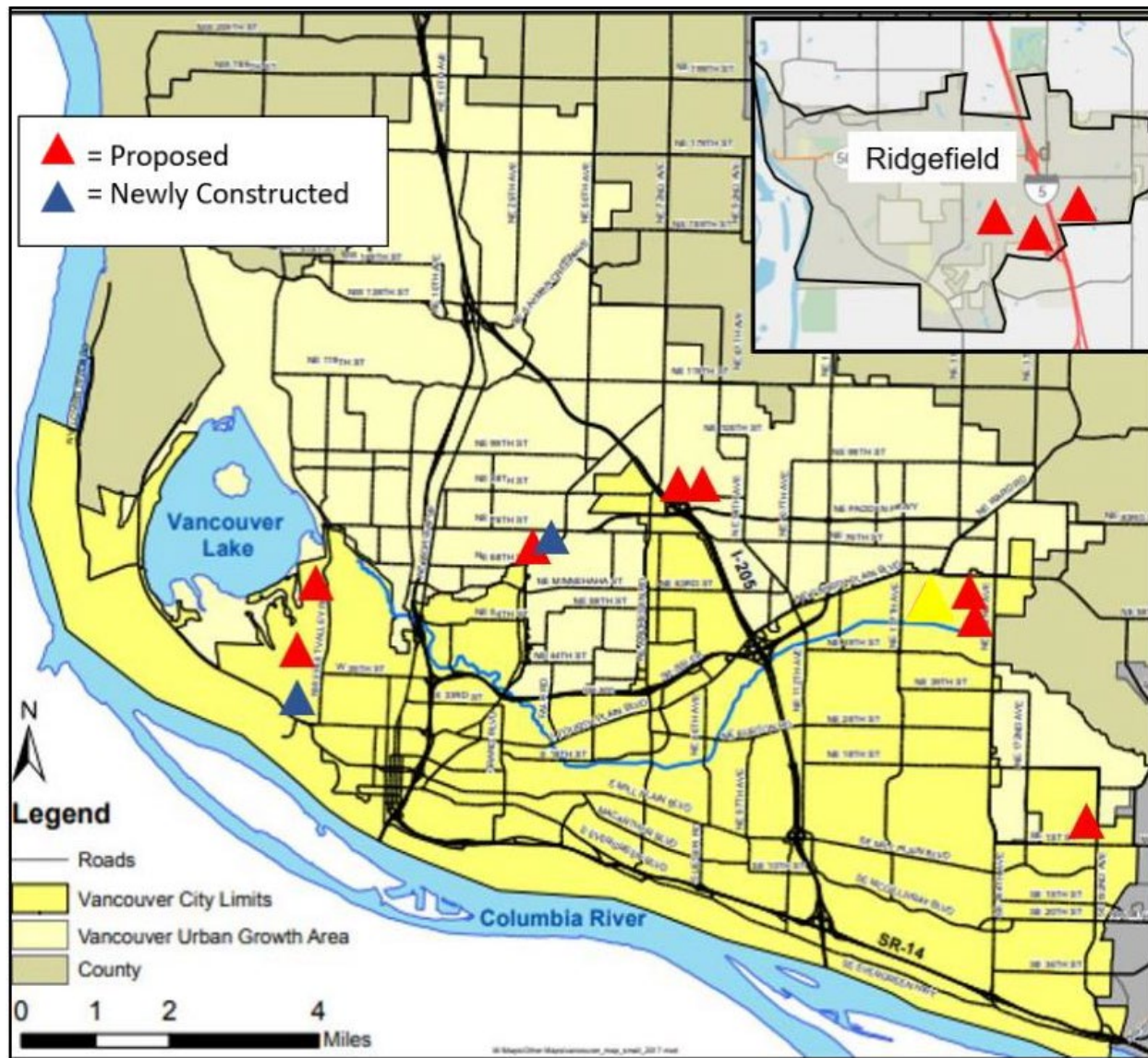
- The typical number of employees per acre compared to more traditional warehouses, as the City has limited buildable land remaining that is zoned for industrial uses
- Anticipated local and regional economic impacts and tax revenue generation associated with these facilities
- How travel associated with these warehouses, specifically by trucks, may impact roadway maintenance costs
- How these warehouses result in increases in heavy truck traffic that adversely impacts air quality, noise, congestion and safety, which are noted community concerns
- If development of these warehouses would conflict with the City's newly adopted Climate Action Plan based on their travel patterns or other factors⁹

⁷ [Bloomberg. Covid E-commerce Boom Sees US Retailers Hunt for Warehouses. 2022](#)

⁸ [Freight Waves. Global Warehouse, Fulfillment Construction Seen Waning. 2023](#)

⁹ [City of Vancouver. Climate Action Framework. 2022](#)

Figure 1: Proposed Warehouse Developments with GFA greater than 100 KSF



Source: City of Vancouver. 2023

On December 12, 2023, Vancouver City Council enacted a six-month moratorium on new applications for the development of warehouses and distribution facilities totaling more than 100,000 square feet (100 KSF) in the Light Industrial (IL) and Heavy Industrial (IH) zoning districts, as defined in Vancouver Municipal Code Title 20.¹⁰ This is consistent with Washington State law (RCW 36.70A.390 and RCW 35.63.200), which allows for a six-month maximum moratorium on land uses, with one six-month extension, if necessary. The moratorium has since been amended to increase the threshold to only include developments that exceed 250 KSF. The City's moratorium exempts warehouses supplying storage for

¹⁰ [City of Vancouver. Six-month Moratorium. 2022](#)

traded sector goods, as defined in the Clark County Comprehensive Economic Development Plan, and a bulk storage exemption for the Port of Vancouver on property owned by the Port in Vancouver.

The moratorium was put in place to provide the City with the necessary time to closely study the emerging trend of applications for warehouse and distribution facilities, understand how those trends may impact the City's economy and transportation system, and develop appropriate land use regulations. This report documents the physical, operational, economic, and environmental/quality of life differences between traditional warehouses that store goods for delivery to businesses and larger, modern industrial warehouses that support today's just-in-time (JIT) inventory practices by storing and repackaging goods intended for retail home delivery or business to business delivery (including e-commerce facilities, grocers, and high-pace manufacturing/assembly).

This report is split into two sections. The first section, **Warehouse Characteristics**, describes the differences in physical, operational, and economic characteristics between traditional warehouses and modern, high-tech industrial warehouse facilities. This section also discusses sustainable warehousing practices which touch on environmental sustainability and adaptive re-use feasibility of warehouses. The second section, **Recommendations**, includes key takeaways from the comparison and strategies the City could consider to ensure that these developments support the City's economic, transportation, and climate goals and priorities. A summary table of the differences between traditional warehouses and e-commerce facilities is provided in **Appendix A**. Additional supporting documentation that informed report findings is included in **Appendix B**.

Warehouse Characteristics

Having space available in a large building, often referred to as a warehouse, where physical goods or inventory can be stored prior to selling has long been a critical piece of the supply chain. Traditionally, warehouses have been used for the prolonged storage of bulk inventory or business-to-business (B2B) orders. In recent years, changing consumer habits have led to the emergence of high-tech warehousing that support e-commerce and Just-in-Time (JIT) inventory practices aimed at saving costs by using less space to hold both consumer goods and inputs to production.

Directly related to e-commerce, distribution centers (DCs) and fulfillment centers (FCs) are designed to provide value-added logistics services, which allow operators to efficiently meet varying customer demand using technology and processes to streamline the supply chain. Even though FCs and DCs have become a prevalent use of warehousing space, modern high-tech facilities are still being utilized for other uses. The subsequent section describes the different types of warehouses which serve different parts of the supply chain process.

Facility Types

There are various warehouse types and functions that support retail, commercial, and industrial supply chains. Virtually all industries rely directly or indirectly on warehousing services.

Traditional warehouses receive goods, store them for prolonged periods, and then send them out again. In contrast, distribution centers (DCs) take in different bulk goods from a variety of vendors, store those products in ways that allow for quickly filling orders, then repack the products to meet multiple customer orders.¹¹ This includes labeling the orders accurately, packing orders together for shipment out of the center, then loading trucks that take orders on the next leg of their journey or to their final destination.

Modern distribution centers are not traditional warehouses. They are high-tech distribution hubs that require significant investment, including building design and construction, as well as advanced technological, safety, and logistical equipment.

The main role of a DC is to store products in bulk and shipped in bulk to a retailer, whereas the main role of a fulfillment center (FC) is to pick, pack and ship the products directly to the consumer.¹² While DC and FC are frequently used interchangeably, they are quite different in design and operation. The main difference in fulfillment centers versus distribution centers is that DCs rarely offer small parcel order fulfillment. Instead, warehouse space for DCs moves large quantities of items in and out quickly. Fulfillment center operations typically work best for e-commerce companies who need small parcel order processing.

¹¹ [ShipBob. Distribution Center Benefits and Key Processes Explained. 2021](#)

¹² [ShipBob. Fulfillment Center: What Is It, Why It's Important, & How Does It Compare to Warehousing. 2018](#)

A distinguishing feature of a DC is that it acts as a hub for shipments. These businesses may take large volumes and redistribute the products into smaller shipments that will be sent to various destinations, including warehouses and fulfillment companies. Another key factor is how products are transported. A DC will often handle multiple modes of transportation when receiving and shipping inventory. A product may arrive by rail but leave the facility by air transport to a fulfillment center. DC Services are as follows:

- **Receiving Inventory:** Materials come on pallets or floor loaded in containers. The distribution center's job is to document and categorize all inbound materials. This way they can be sent to their proper destination such as a fulfillment center or big box retail store.
- **Replenishing Retailers:** One major service that distribution centers provide is restocking or replenishment of inventory for retailers. Considering a store like Target or Walmart as an example, there are thousands of individual SKUs in any given store and thus need a process that ensures inventory replenishes to the store before it runs out of stock.
- **Just-in-Time Materials:** A useful service that distribution centers provide is just-in-time inventory replenishment. Manufacturers use a lot of parts to assemble and build their various products. These parts require storage space. But manufacturers only need a limited number of parts for their output in a particular period. A distribution center can send materials on a regular basis to the manufacturer so they can maintain production. At the same time, the manufacturer can dedicate their warehouse space to their manufacturing activities.
- **Wholesale Marketing:** Wholesale distributors usually operate within a single industry like plumbing, construction, or electronics and offer their own marketing, sales, and product fulfillment. These distributors sell to resellers (and sometimes the general public) at discounted prices. Manufacturers choose to work with them at a lower price point because they come with a larger customer base.

FCs usually rely on a third-party logistics provider (3PL) to handle the storage, packaging, and shipping of products to be sent directly to the consumer (business-to-consumer or B2C) or directly to a business (business-to-business or B2B). Typically, an FC stores all of the products from a web site that are to be individually picked and packaged to be sent out to the consumer. Fulfillment centers are typically used by industries that require fast inventory turnaround and order fulfillment, such as e-commerce businesses. FCs may be used for time-critical and time-sensitive products — including food and pharmaceutical commodities — to fill orders quickly for businesses and consumers. A fulfillment center has three important functions in the supply process. These include:

1. Receiving and storing inventory
2. Fulfilling orders for customers
3. Packing and shipping goods to their final destination

Fulfillment centers are ideal for e-commerce businesses because their warehouse locations are closer to their customers. Fulfillment center services may include:

- **Pick and pack fulfillment services**, which are typically the core component of every fulfillment center. When customers place orders, the fulfillment center generates pick lists for all the items. A warehouse employee collects the items on the list and places the item(s) in shipping packages.
- **Kitting and Assembly**: A kit is a collection of items that your customers order together like a bundle. Fulfillment center services may prepackage and bundle these items beforehand. This assigns each group of merchandise a new stock keeping unit (SKU). Kitting is critical for a business offering products like subscription boxes.
- **Freight Shipping**: Some warehouse fulfillment services include shipping goods in bulk. An example is B2B orders going to big box stores, or retailers. A fulfillment warehouse may also transport oversized goods with less-than-truckload (LTL) service.
- **Cross-docking** is useful in the supply chain when a business needs to transfer cargo from 40-foot marine shipping containers into larger 53-foot over-the-road shipping containers. Not only does this reduce the number of trucks on the road and overall shipping costs, but this is also an efficient means for combining multiple goods that are destined for the same location, such as a local big box retail store. Both distribution centers and fulfillment centers perform this service.

The following sections summarize the differences between traditional warehouses and modern e-commerce facilities¹³ with respect to physical, operational, and economic characteristics.

Physical Characteristics

For the purpose of this comparison, physical characteristics include warehousing siting and design (building size, lot coverage, loading bays, and parking spaces).

City of Vancouver - Code Requirements

Within City limits, warehouse developments are required to adhere to Vancouver's Municipal Code (VMC). Warehouses are only permitted in the IL (Light Industrial) and IH (Heavy Industrial) zones. The siting of warehouses in the IL zone requires that all activities, except outdoor storage of materials, are completely contained within building(s). The IH zone is exempt from this condition. For both zones, setbacks determined by adjacent zone as follows:¹⁴

- When IL and IH zones are adjacent to nonresidential districts, buffering and screening standards are contained in VMC Tables 20.925.030-1 and 20.925.030-2.
- When adjacent to residential districts, buffering and screening standards are also pursuant to standards in VMC Tables 20.925.030-1 and 20.925.030-2, plus an additional 1/2 foot for each foot the building exceeds 20 feet in height to a maximum setback requirement of 40 feet. Buildings in excess of 20 feet may be stepped.

¹³ This report focuses on comparisons between traditional warehouses and e-commerce facilities. However, it should be noted that e-commerce is not the only freight sector that relies on modern industrial warehouse design and operations.

¹⁴ [City of Vancouver. Municipal Codes: Minimum Landscaping and Buffer Setback Standards](#)

Lot coverage, defined as the footprint of a building in relation to the development site, is set to the following requirements for warehouse developments:

- IL: maximum lot coverage of 75%; maximum height of 45 feet
- IH: maximum lot coverage of 100%; no maximum height

VMC 20.945.080 outlines the off-street loading requirements based on the gross floor area of a building. The minimum number of loading berths or off-street loading spaces based on varying floor area thresholds are provided in **Table 1**.

Table 1: Loading Dock Requirements

Gross Floor Area	Required Number of Loading Docks
5,000 sq. ft. up to 25,000 sq. ft.	1
25,000 sq. ft. up to 50,000 sq. ft.	2
50,000 sq. ft. up to 100,000 sq. ft.	3
Each 50,000 sq. ft. in excess of 100,000 sq. ft.	1

Source: City of Vancouver. Municipal Codes: Off-street Loading Requirements.

Physical Differences between Traditional Warehouses and E-commerce Facilities

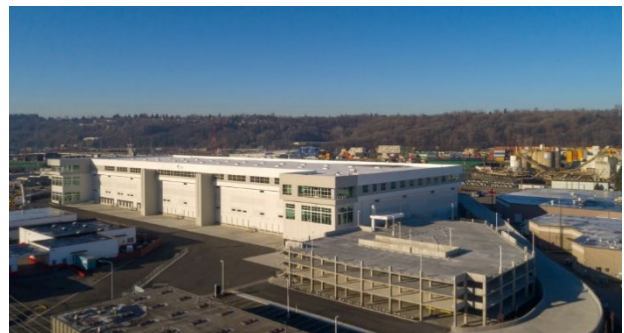
Based on the 250 KSF threshold outlined in the City's amended warehouse moratorium, only a subset of the proposed warehouse developments that exceed this threshold were selected for this study. The building footprints for these selected developments range from 280 KSF to about 570 KSF, while traditional warehouses within City limits are typically under 100 KSF. This variation in size and footprint is depicted in the images below. While size and footprint are typically reliable indicators of the type of warehousing that is occurring, in urban in-fill locations with higher land values and therefore, higher barriers to entry, e-commerce facilities may be closer in size to traditional warehouses.

Example of Existing Warehouse in Vancouver, WA (70 KSF)



Source: LoopNet Commercial Property. 2023

Example of Prologis Georgetown Crossroads Facility in Seattle, WA (590 KSF)

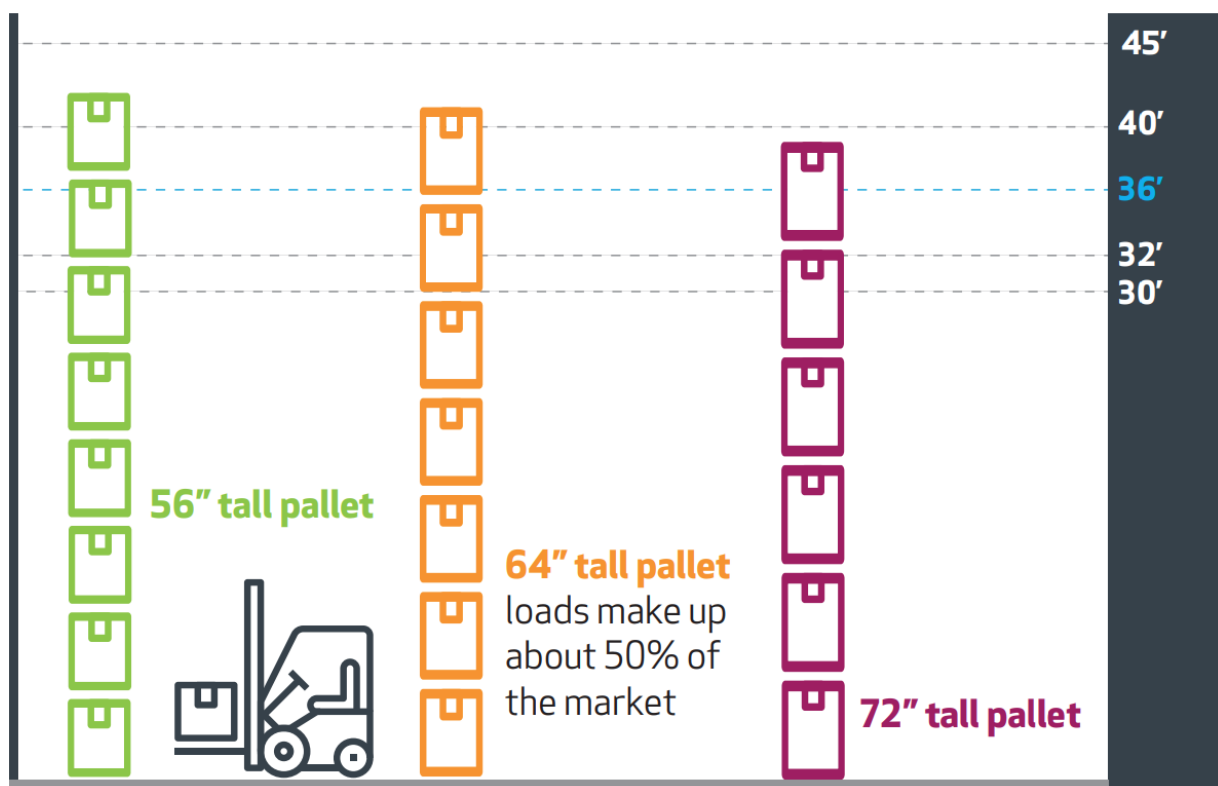


Source: NELSON Worldwide. 2023.

Another notable physical difference between traditional warehouses and modern e-commerce facilities is building clear height. In industrial real estate, building clear height is defined as the height of a building from the floor to the bottom of the lowest hanging item on the ceiling (i.e., sprinklers, lights, etc.). Building clear height dictates the height to which inventory can be safely stored. CBRE Group, Inc, one of the world's largest commercial real estate services and investment firms, noted that e-commerce trends have resulted in an ongoing shift towards increased building clear heights for warehouses and distribution centers. Between 2010 and 2016, the average clear height for all warehouses built by CBRE rose from 30.19 feet to 32.95 feet.¹⁵ Other research indicates that at the national level, the industrial market is moving toward a 36-foot clear height standard for new developments. In comparison, traditional warehouses often have a clear height well under 30 feet. As illustrated in **Figure 2**, taller clear heights allow tenants to store more palletized product, which translates to lower occupancy costs per square foot¹⁶.

In addition to higher clear height, e-commerce facilities have more space for staging and queuing as a result of the operational characteristics, which will be discussed in the subsequent section.

Figure 2: Warehousing Capacity Based on Clear Height



Source: Modern Architecture. 2020.

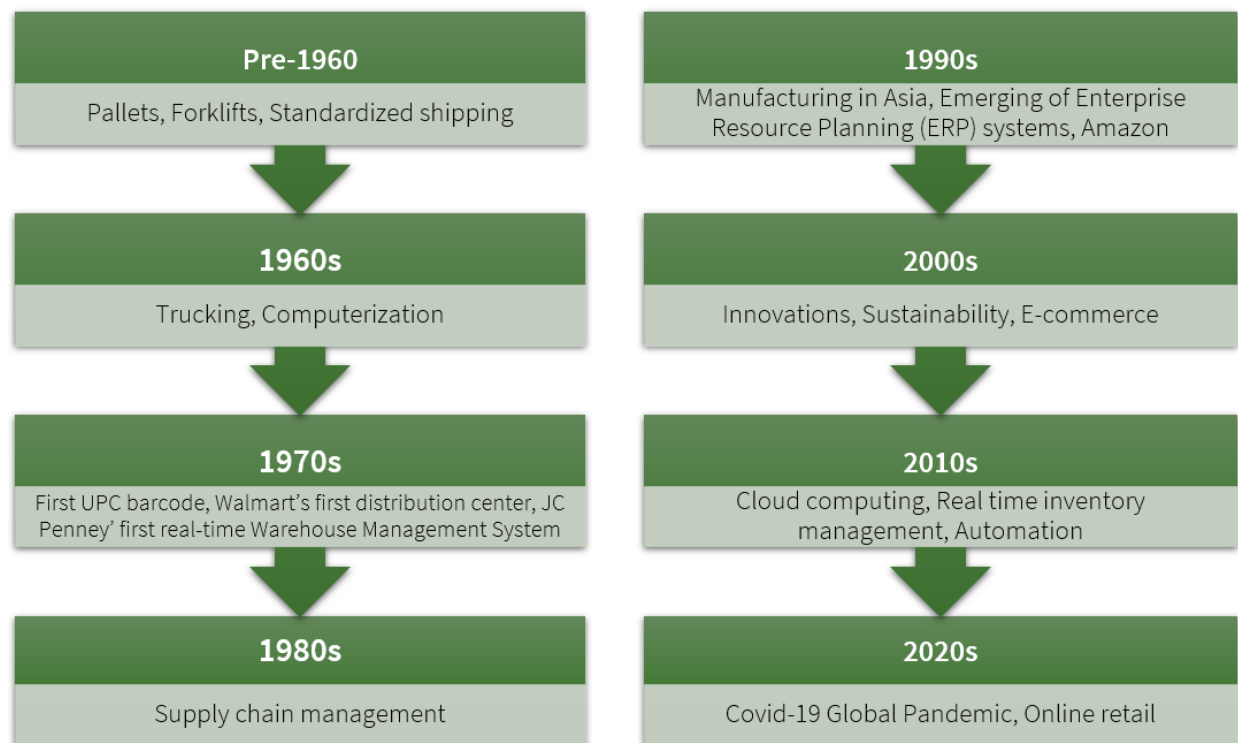
¹⁵ [RoofLifters. As e-commerce grows, so does the clear height of warehouses. 2020](#)

¹⁶ [Method Architecture. 36 is the new 32: Increasing Clear Height for Maximum Efficiency. 2020](#)

Operational Characteristics

Warehousing has undergone operational evolution over the past decades, leveraging technology and adapting to trends as depicted in **Figure 3**. Recent improvements in technology have resulted in increasingly efficient use of warehouse space resulting in an increased consolidation of facilities. Technology, such as barcoding and radio-frequency identification (RFID), coupled with automated warehouse inventory and sortation practices, has resulted in significant efficiency gains and cost savings. In addition to better managing inventory, these systems make it possible to store more goods under one roof, improve safety, and reduce the number of automobile trips and parking demand. As a result of warehouse automation, these new facilities require fewer unskilled workers to drive forklifts and manage inventory and create high-tech jobs to operate and maintain the automated systems, as well as value-added services that are occurring in some facilities.

Figure 3: Evolution of Warehousing



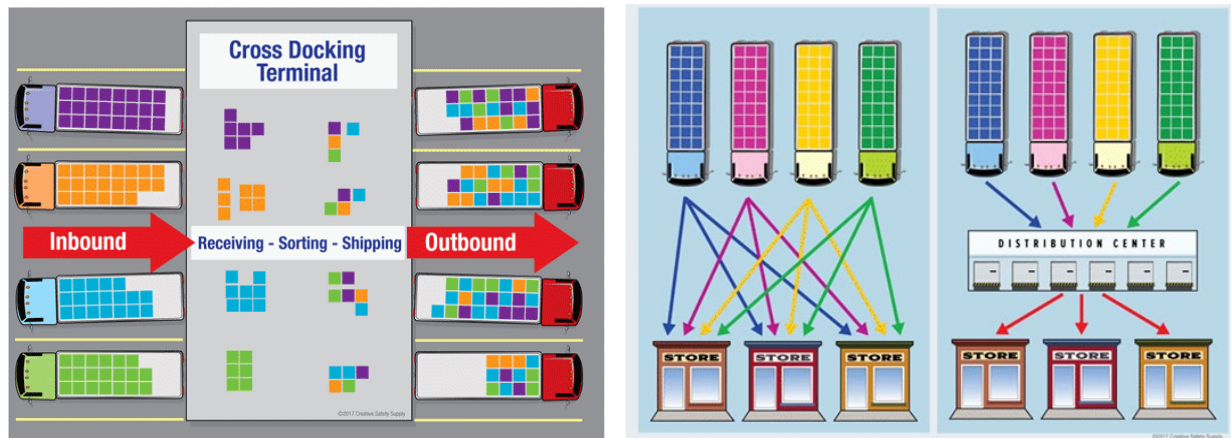
As a result of the advances in logistics operations to support e-commerce and advances in business-to-business supply chains, modern warehouses operate differently than traditional warehouses, particularly regarding hours of operation, the flow of goods, types of vehicles utilized, vehicle trips generated, and related traffic operations.

E-commerce facilities are intended for streamlined and efficient logistics services with typical hours of operation spanning 24 hours a day, seven days per week. The non-stop activity in modern warehouses is made possible by shift workers and automation. Automation has replaced outdated processes, such as

digital bills of lading versus handwritten, use of RFID versus manual paperwork by gate attendants, automated stacking, and retrieval systems instead of forklifts. These modern innovations benefit all industrial and retail sectors because they allow beneficial cargo owners to meet customer (both consumers and businesses) expectations for quick delivery of goods either purchased online, purchased by a retail store, or required as an input to production. To meet those demands, warehouses must operate around the clock.¹⁷ In contrast, hours of operation at traditional warehouses with slower turnover of inventory are typically limited to normal business hours, i.e., 8-hour shifts, five days per week. The noted differences are directly linked to the flow of goods and storage duration.

As described in previous sections, there are several industrial warehouse typologies including distribution centers and fulfillment centers among others. These facilities typically focus less on long-term storage and more on flow of goods and services compared to traditional warehouses. Another key difference is that operations at modern industrial warehouse facilities are often driven by demand, compared to traditional warehouses, where operations are related to storing the largest amount of goods possible. Typical operations at a distribution center, including the combination of similar sized goods with similar destinations, are depicted in **Figure 4**. While the figure depicts distribution to stores, e-commerce has altered supply chains whereby goods flow to fulfillment centers by truck to be moved into a delivery van and delivered directly to the consumer. Transload facilities and distribution centers often both participate in the sorting and combining of truckloads of goods to reduce travel time, vehicle miles of travel, and fuel consumption.

Figure 4: Visual Depiction of Cross Docking at a Fulfillment Center and Operations at a Distribution Center



Source: Creative Safety Supply.

¹⁷ [Multibriefs. Do warehouses still need 8-hour work shifts? 2014](#)

Traffic Impacts

Efficient logistics in warehousing facilities entail higher vehicle activity than traditional warehouses. The Institute of Transportation Engineers (ITE) Trip Generation Manual offers trip generation estimates associated with land use developments and the database includes a breakdown of vehicle types. **Table 2** presents trips generation estimates for warehouse developments per 1,000 square foot of gross floor area. In practice, traditional warehouse developments are assumed to be ITE land use code 150 and e-commerce facilities range from ITE land use codes 154 to 155 and 130 is used for industrial parks. As shown in **Table 2**, e-commerce facilities generate more daily vehicles particularly for fulfillment centers that require extensive sorting (ITE land use code 155). These are estimated to generate almost four times the number of vehicle trips than traditional warehouses.

Because ITE trip generation data is limited regarding the breakdown between vehicle types, the project team relied on an assessment of recently collected data to provide insight into this¹⁸. As highlighted in **Table 3** and **Table 4**, e-commerce facilities such as Amazon generate more medium-duty and heavy-duty truck trips as compared to passenger cars, but these trends are not universal. Notably, the magnitude of trips at an Amazon facility is substantially higher than those at a UPS facility. This illustrates the variation in trip generation at e-commerce facilities. It is also important to note that while the collected data provides general insights, the data are from sites in California. Therefore, reviewing local warehouse developments sites in the Vancouver/Portland region may help inform more representative trends.

¹⁸ Based on extensive comparisons between ITE trip generation estimates and observed traffic data, ITE is limited in capturing the breakdown in vehicle types. Because of this, the team opted for previously collected empirical warehouse traffic data from California which is assumed to provide general insights. Local data would need to be collected to provide context sensitive insights.

Table 2: Warehousing Trip Rate Comparison (Trips per 1,000 square feet of GFA)

Warehouse Type	Daily Average Rate		AM Peak Hour Average Rate		PM Peak Hour Average Rate	
	Truck	Total Vehicles	Truck	Total Vehicles	Truck	Total Vehicles
ITE Land Use: 130 Industrial Park	0.57	3.37	0.03	0.41	0.05	0.40
ITE Land Use: 150 Warehousing	0.60	1.71	0.02	0.17	0.03	0.18
ITE Land Use: 154 High-Cube Transload and Short-Term Storage Warehouse	0.22	1.40	0.02	0.08	0.01	0.10
ITE Land Use: 155 High-Cube Transload and Short-Term Storage Warehouse (Non-sort Facility)	0.23	1.81	0.02	0.15	0.01	0.16
ITE Land Use: 155 High-Cube Transload and Short-Term Storage Warehouse (Sort Facility)	0.19	6.44	0.02	0.87	0.02	1.20
ITE Land Use: 156 High-Cube Parcel Hub Warehouse	0.58	4.63	0.09	0.70	0.06	0.64
ITE Land Use: 157 High-Cube Cold Storage Warehouse	0.75	2.12	0.03	0.11	0.03	0.12

Source: ITE Trip Generation Manual, 11th Edition.

Notes:

ITE Trip Generation provides the following definitions for the tabulated warehouse types:

- An industrial park contains several individual industrial or related facilities. It is characterized by a mix of manufacturing, service, and warehouse facilities with a wide variation in the proportion of each type of use from one location to another. Many industrial parks contain highly diversified facilities.
- A warehouse is primarily devoted to the storage of materials, but it may also include office and maintenance areas.
- A high-cube warehouse (HCW) is a building that typically has at least 200,000 gross square feet of floor area, has a ceiling height of 24 feet or more, and is used primarily for the storage and/or consolidation of manufactured goods (and to a lesser extent, raw materials) prior to their distribution to retail locations or other warehouses.
- A high-cube fulfillment center warehouse is subcategorized into sort or non-sort. A sort facility is a fulfillment center that ships out smaller items, requiring extensive sorting, typically by manual means. A non-sort facility is a fulfillment center that ships large box items that are processed primarily with automation rather than through manual means.
- A high-cube parcel hub warehouse typically serves as a regional and local freight-forwarder facility for time sensitive shipments via airfreight and ground carriers. A site can also include truck maintenance, wash, or fueling facilities. Some limited assembly and repackaging may occur within the facility.
- A high-cube cold store warehouse has substantial temperature-controlled environments for frozen food and other perishable products.



Table 3: Observed Trip Activity at Comparable Sites in California (Distribution by Vehicle Type per Time Period)

Customer	Building Size (sf)	Daily			AM Peak Hour			PM Peak Hour		
		Passenger Car	Medium-duty Trucks	Heavy-duty Trucks	Passenger Car	Medium-duty Trucks	Heavy-duty Trucks	Passenger Car	Medium-duty Trucks	Heavy-duty Trucks
Pratt Corrugated Holdings	350,892	309	13	216	21	1	15	47	2	21
HJ Heinz	500,199	208	13	155	25	0	2	48	1	13
Prism Team Services, Inc.	443,640	113	15	142	4	2	15	14	3	12
Orchard Supply Company	346,524	113	54	22	13	2	1	9	1	1
Fox Head, Inc.	388,000	183	19	15	34	0	0	49	2	0
Amazon.com Services, Inc.	388,183	69	214	241	9	5	12	12	5	11
Niagara Bottling, LLC	512,000	59	5	153	7	0	5	18	0	7
Kraft Foods Group, Inc.	351,788	117	7	169	4	2	11	32	1	13
Coastal Pacific Food	500,004	581	37	283	66	1	21	76	1	7
Restoration Hardware	283,712	540	16	42	47	1	6	60	1	2
Dart Container	340,000	200	13	50	21	2	4	30	1	2
Lowe's	570,000	277	11	164	36	0	6	78	0	16
UPS	560,000	70	10	11	8	2	1	9	0	0
Cargill Food	350,000	457	19	311	39	0	17	44	2	19
International Paper	375,000	312	16	133	70	0	10	75	0	5
IPC Smucker's	403,560	205	12	149	25	0	10	39	4	10

Source: Fehr & Peers. 2022.

Notes: Sites with bold text inform the trip activity comparison discussion.

Table 4: Observed Trip Activity at Comparable Sites in California (% Distribution by Vehicle Type per Time Period)

Customer	Building Size (sf)	Daily			AM Peak Hour			PM Peak Hour		
		Passenger Car	Medium-duty Trucks	Heavy-duty Trucks	Passenger Car	Medium-duty Trucks	Heavy-duty Trucks	Passenger Car	Medium-duty Trucks	Heavy-duty Trucks
Pratt Corrugated Holdings	350,892	57%	3%	40%	58%	2%	40%	68%	2%	30%
HJ Heinz	500,199	55%	3%	41%	92%	0%	8%	78%	2%	20%
Prism Team Services, Inc.	443,640	42%	5%	53%	21%	8%	71%	49%	9%	41%
Orchard Supply Company	346,524	60%	29%	12%	81%	15%	4%	82%	6%	12%
Fox Head, Inc.	388,000	84%	9%	7%	98%	1%	1%	97%	3%	0%
Amazon.com Services, Inc.	388,183	13%	41%	46%	35%	18%	47%	43%	18%	39%
Niagara Bottling, LLC	512,000	27%	2%	70%	58%	0%	42%	71%	0%	29%
Kraft Foods Group, Inc.	351,788	40%	2%	58%	24%	10%	65%	69%	3%	28%
Coastal Pacific Food	500,004	65%	4%	31%	76%	1%	24%	91%	1%	8%
Restoration Hardware	283,712	90%	3%	7%	87%	1%	12%	95%	2%	3%
Dart Container	340,000	76%	5%	19%	78%	9%	13%	89%	4%	7%
Lowes	570,000	61%	2%	36%	85%	0%	15%	83%	0%	17%
UPS	560,000	77%	11%	12%	73%	15%	12%	97%	0%	3%
Cargill Food	350,000	58%	2%	40%	69%	0%	31%	68%	3%	30%
International Paper	375,000	68%	3%	29%	87%	0%	13%	94%	0%	6%
IPC Smucker's	403,560	56%	3%	41%	71%	0%	29%	74%	8%	18%

Source: Fehr & Peers. 2022.

Notes: Sites with bold text inform the trip activity comparison discussion.

On a vehicle-type basis, medium-duty and heavy-duty trucks tend to be the main mode of transportation for goods in and out of traditional warehouses. Whereas, in today's logistics operations, light-duty trucks and vans play a substantial role in goods transportation via e-commerce facilities. Based on the collected data from warehouse sites in California tabulated in **Table 4**, peak activity of these trucks is generally observed between 4 am to 7 am and around 12 pm to 1 pm. This is also indicated by the magnitude of peak hour trips in comparison to daily trips reported in **Table 4**.

Summary of Proposed Development Traffic Impact Analyses

One of the most challenging issues associated with analyzing impacts of industrial land uses is understanding their operations. The National Academies of Science's Transportation Research Board and the Institute of Transportation Engineers have attempted to standardize trip generation rates (**Table 2**) associated with a variety of land uses, including industrial uses, for over 50 years. Unlike many land uses, such as residential and retail uses, the big box design of industrial warehouses makes them flexible, meaning the trip generation is difficult to estimate. For example, two common reuses are mega-churches and indoor trampoline parks. For this reason, many cities are using the conditional use permit (CUP) mechanism for requiring operational data, dictating assumptions for use in traffic impact analysis, and identifying conditions of approval to mitigate potential impacts. In the 11th Edition of the ITE Trip Generation Manual, there are currently ten categories that an industrial warehouse could fit into, and the categories most closely related to the proposed facilities in Vancouver are defined in the industrial trip generation assumptions section. A cursory review of the intersections that have been analyzed in the traffic studies for four of the proposed projects is described herein, as well.

In reviewing the ITE industrial trip generation rates, the variance in size and footprints do not easily translate to the amount of auto, van, and truck traffic that is generated by these facilities. What is needed is more information about the intended operations of the facilities. This can be challenging to obtain, especially when buildings are constructed without knowledge of who the future tenant may be (e.g., spec buildings). In the absence of the necessary information to discern operations of the proposed development, assuming the highest trip generation (ITE land use code 550) presents a conservative approach to address potential traffic impacts.

Table 5 contains data that was abstracted from the traffic studies associated with the proposed projects, as well as trip generation estimates calculated using the ITE Trip Generation web-based app (based on the 11th Edition). ITE provides both average rates and fitted curve rates. And for AM and PM peak rates, analysts are provided with two more options: peak of the site or peak of the adjacent street. It is common to perform impact analysis using data for the peak of the adjacent street, but in the case of major industrial facilities that generate large volumes of trips and could overwhelm the local system, considering peak trip generation of the site may be the more appropriate rate to use. In addition to the effects of these two assumptions on trip generation rates, the validity of the rates in 2023 is questionable considering the small sample of sites that this data is based on and the old age of some of the surveys. More recent, empirical data should be used when available and feasible.



Table 5: Estimated Trip Activity related to Proposed Industrial Warehouse Developments

Development	Building Size (sf)	ITE Trip Generation Code	Daily Truck Trips	Daily Total Trips	AM Peak Hour Truck Trips	AM Peak Total Trips	PM Peak Hour Truck Trips	PM Peak Total Trips
Panattoni Fruit Valley Rd PDC Seattle LPIV BB/TH, LLC	60,050	150	36* 40**	103* 134**	4* 5**	13* 35**	2	34
Harmony Industrial project	460,000	150	787* 765**	787* 765**	28* 29**	97* 79**	28* 24**	106* 89**
Vancouver Wellons Prologis, Inc.	566,527	130	323*	1909* 2134**	17*	232*	28*	227*
Vancouver Innovation Center Building North	200,700	110	50*	977* 805**	6*	183* 153**	10*	161* 137**

* Average Rate

** Fitted Curve Rate

Notes:

Tabulated rates are based on the ITE Trip Generation data on AM/PM peak of adjacent streets

Numbers in bold are assumed rates provided in the traffic studies. None of the traffic impact studies used Passenger Car Equivalents (PCE) factors to assess the potential impacts of trucks at intersections. In general, trucks are assumed to equal 1.5 to 3 passenger cars for the purposes of intersection analysis due to their lengths and slower starting and stopping abilities. None of the four studies appeared to consider this in their analysis. The following section identifies the intersections analyzed by each of the studies.



Intersection Analysis

A list of the analyzed intersections for each of the proposed industrial developments is provided in this section. There is only one identified intersection that is shared by two of the proposed developments, the intersection of Fruit Valley Road and W. 39th Street. Both studies indicate that this intersection will operate at Level of Service (LOS) C in the future. It is unclear if the projects assumed each other as related projects in the analysis, however, the City does have a preproposal process that it could use to collect additional data about the proposed facilities, confirm trip generation rates to use, and identify related projects to consider.

Panattoni Fruit Valley Project

1. NW Lakeshore Ave/NW 78th Street
2. NW Whitney Rd/NW 61st Street
3. Fruit Valley Rd/NW 61st Street
- 4. Fruit Valley Rd/W 39th Street**

Vancouver Innovation Center

1. SR-14/SE 192nd Avenue
2. SE 176th Avenue/SE 20th Street
3. SE 34th Street/SE 192nd Avenue

Harmony

1. 137th Ave – 49th St to Fourth Plain Blvd
2. 192nd Ave & SR 14 Ramps
3. Fourth Plain Blvd & 152nd Ave
4. Lieser/St. Helens/MacArthur
5. 192nd Ave & NE 13th Street
6. 192nd Ave & SE 34th Street
7. 176th Ave & SE 20th Street
8. Grove St/Columbia House Blvd/SR-14 WB Off-Ramp
9. NE 172nd Ave/NE 18th Street
10. NE 179th Place/NE 18th Street
11. NE 187th Ave/NE 18th Street
12. NE 172nd Ave/NE 9th Street
13. NE 9th Street/NE 162nd Ave
14. NE 192nd Ave/NE 9th Street
15. NE 187th Ave/SE 1st Street
16. SE 192nd Ave/Mill Plain Blvd

Prologis

1. 32nd Avenue/La Frambois Road

2. 32nd Avenue/Lower River Road
3. **Fruit Valley Road/39th Street**
4. Fruit Valley Road/Firestone Lane

As discussed in the subsequent sections, warehouse facilities generate truck and passenger car traffic which results in wear and tear of roads, noise pollution, light pollution, and safety concerns. Examples of measures to mitigate the resulting impacts are summarized in **Table 6**.

Table 6: Potential Mitigation Measures¹⁹

Impact	Measure
Truck traffic impacts	Design, construct, and clearly mark truck routes that provide direct access to freight-served facilities and avoid residential neighborhoods and other sensitive receptors (schools, hospitals, etc.).
Truck parking demand	- Review and update zoning that is consistent with the state of industry operations, such as performance zoning that customizes loading, parking, curb returns, on-site recycling, etc., based on the intended operations of the facility. - Require the provision of adequate areas for on-site parking, on-site queuing or staging, and truck check-in to avoid trucks queuing in travel lanes or parking in undesignated areas.
Truck emissions	- Promote fleet electrification by requiring electric charging stations at each warehouse development, so trucks can get recharged while loading/unloading and incentivizing zero-emission vehicles in business operations. - Encourage tenants to enroll in the US Environmental Protection Agency's SmartWay²⁰ program to help companies advance supply chain sustainability by measuring, benchmarking, and improving freight transportation efficiency.
Congestion management	- Nexus impact fee to support funding for capacity expansion projects. - Incentives for off-peak delivery; an example is the Off-Hour Deliveries program in New York City that offers participants financial incentives.²¹ - Right-size on-site employee parking and encourage alternative modes of transportation for employees (e.g., bicycle parking, transit passes, carpool spaces).

¹⁹ [Department of Justice, State of California. Warehouse Projects: Best Practices and Mitigation Measures to Comply with the California Environmental Quality Act, 2022](#)

²⁰ SmartWay is an EPA program that helps the freight transportation sector improve supply chain efficiency.

SmartWay reduces transportation-related emissions by accelerating the use of advanced fuel-saving technologies.

²¹ [New York City. Off-Hour Deliveries.](#)

Impact	Measure
Noise pollution	• Face dock doors and trash receptacles away from residential uses and sensitive receptors. • Limit hours of operations if a facility is within one-quarter mile of a sensitive receptor. • Require all combustion-powered construction equipment to be surrounded by a noise protection barrier. • Paving roads where high truck traffic is anticipated with low-noise asphalt.
Roadway wear and tear	• Require the siting of warehouse developments to be within a mile of the City's designated freight routes. These routes are typically well designed to accommodate truck traffic.
Safety	• Provide off-street or buffered bikeways on shared truck routes to ensure employees working in the industrial areas can safely bike to work. • Provide adequate curb return radii at intersections and driveways into freight generators to avoid trucks overtaking the curb/sidewalk. • Review truck routes designation periodically and modify as needed. Ideally, truck routes should not conflict with major transit and bicycle and pedestrian corridors unless properly designed to serve employees working at freight generators.
Visual impacts	• Require buildings to be dark colored • Provide vegetative buffers

Source: Department of Justice, State of California. 2022.

Economic Characteristics

Warehousing Trends

Global and National Supply Chain System Trends

A range of supply chain logistics system factors influence changes that we are experiencing today. These factors are important to understand as they impact local economics, such as tax revenue and employment rates, and worker salaries. Below is a summarized list of global supply chain trends that are contributing to industrial warehouse development demand in Vancouver:

- **E-commerce:** The emergence of the e-commerce sector from its inception in the 1990s to a major factor in global supply chain management and industrial property development. The e-commerce supply chain requires up to three times more warehouse space than a traditional brick and mortar retail facility. For example, for every \$1 billion in incremental e-commerce growth, 1.2 million square feet of facility demand is generated. Based on this, the U.S. will need up to 330 million square feet of additional space to support e-commerce growth through 2025.
- **Market need:** Sites near logistics hubs, such as intermodal rail yards, airports and seaports are in high-demand. As a City surrounded a major airport and seaport, and population center, there is a market need for warehouse developments in Vancouver to support e-commerce and online shopping. Due to the absence of e-commerce facilities within City limits, households and businesses currently rely on facilities/warehouses in surrounding jurisdictions such as Portland.
- **Just-in-Time (JIT) versus Just-in-Case (JIC) inventory management** played a significant role in the shortages for basic household goods, such as toilet paper and cleaning supplies. JIT offered cost savings because less space was needed for storage, but JIC is trending back due to the hardships the lack of inventory created for many companies.
- **Trucking and equipment shortages** have resulted in more food product production moving nearer to consumption markets.
- **Sector-specific competitive factors**, such as the Apparel sector's focus on fast fashion (e.g., Shein).
- **Highly developed integrated technologies** in support of supply chain efficiencies allow for more products to be stored, retrieved, and sold expeditiously. Large advances like in-building automation, yard automation and expected point-to-point location automation improve storage and retrieval reducing time to market. Integrated inventory tracking systems connecting in-warehouse robotic cargo handling/inventory management equipment, warehouse staff, trucking services, terminal operators, ocean carriers and shippers support same-day shipping to e-commerce consumers, as well as other customers, such as manufacturers. More recent and expected advances in zero emission vehicle and equipment powertrains; in some cases, requiring new distance intervals between inventory and shipment points.

- **Facility Trends:** The size, design, and function of warehouses has evolved considerably in past two decades – so much so that the Institute of Transportation Engineers (ITE) embarked on a study of warehouse trip generation characteristics to add to its Trip Generation Handbook (as shown in **Table 2**). Not only have the size and design of warehouses changed, but the locations for developing new facilities has also changed. In general, warehouse operators need sites closer to consumers, such as in some high-value markets like Seattle. In high-cost urban areas, these facilities are going vertical when land becomes expensive and scarce requiring more sophistication and a smaller footprint on multiple floors. In markets like Vancouver and Portland, region-specific sites may be required. These include small- to mid-sized facilities within the urban areas and larger facilities on the outskirts to serve primary markets.

Warehousing Jobs

Industrial warehouses typically generate both jobs and tax revenue. Warehousing jobs, while often perceived as inferior to manufacturing jobs, provide two important community benefits: 1) pay rates that start above minimum wage, 2) and on-the-job-training that provide opportunities for employees with no college education to make over \$80,000 a year. The salary for automation engineers (a job associated with highly automated warehouses) starts in the high \$80,000s and pay on average over \$100,000 a year with experienced engineers earning closer to \$140,000 annually. US Census County Business Patterns (CBP) provides subnational economic data by industry, including the number of establishments, employment, and annual payroll. This provides insight into the average wage and employees per establishment for "Warehousing and Storage" sector in Clark County and other surrounding or comparable counties in the region (**Table 8** through **Table 13**)²²:

- At a high-level, Clark County's industrial sector average number of jobs per establishment is up by 50% and average annual wage has increased by 10% over the past six years. This is considerably higher than comparable counties, where jobs per establishment increased by only 17%.
- As of 2021, in Clark County, there are more employees per establishment (approx. 42) for "Warehousing and Storage" than other industrial types of employment: "Manufacturing" (approx. 31) and "Scientific Research and Development Services" (approx. 21). At a high-level this is also consistent with other comparable counties in the region. The limitation of this dataset is that it doesn't provide establishment acreage, however, at a high-level, warehouses generate more jobs per establishment than competing uses (**Table 8**, **Table 9**, and **Table 10**). From conversations with warehouse developers, jobs per acre vary depending on the specific use, i.e., distribution center versus sorting, or consolidation versus fulfillment center.
- The average annual wages per employee in 2021 for "Warehousing and Storage" is less than those for "Manufacturing" and both are outpaced by "Scientific Research and Development

²² Data from US Census County Business Patterns (CBP) reports aggregated and averaged data for all warehouse and storage types. Therefore, the warehousing and storage jobs and salaries reported will not highlight any specific warehouse facilities with high employment or high paying jobs.

Services". It is worth noting that this average bundle up management and non-management staff (**Table 11**, **Table 12**, and **Table 13**).

Types of Warehouse Jobs

Safety Manager: This person's responsibilities include oversight of a safety-minded culture in the warehouse through OSHA training and education, investigating onsite accidents to determine the cause and recommend preventative measures, managing the employee health and safety guidelines set forth by both the company and local/state/federal laws, and implementing and creating programs that promote safety and security of warehouse employees.

Warehouse Supervisors: This role supervises, organizes, and monitors inventory receiving, storage, and distribution. They oversee the facility workforce, with management of performance metrics and train new employees.

Operations/Warehouse Manager: The warehouse manager position monitors all day-to-day warehouse activities, including receiving, order filling, shipping, and inventory control. Their responsibilities involve scheduling tasks for personnel, helping negotiate rates with carriers, creating daily work logs, collecting actionable data related to labor, shrinkage, fill rate, etc., planning more efficient operations, and supervising and training warehouse employees and their supervisors.

Inventory Clerk: The inventory clerk is responsible for various clerical duties for warehousing, receiving, and shipping materials. In most cases, this person handles relationships with vendors and/or suppliers and is responsible for monitoring inventory performance and assists in creating purchase orders to replenish stock before it runs out. They are also heavily involved with keeping inventory counts in check.

Material Handlers: Depending on the size of the operation and operator, a fulfillment center may have employees who do only one job or are cross-trained for multiple jobs, as follows:

- Pickers – this role receives orders that drop to the warehouse floor, then collect the item(s) for each order to prepare for shipment.
- Packers – this role takes the picked orders, scan them in as 'ordered', then pack them into appropriate packaging for shipment. They also include any package inserts, custom packaging, and the packing slip in the order.
- Receivers – this role unloads inbound freight from carrier trucks, processing it into inventory.
- Stockers (replenishment) – this role takes inventoried items from receiving and move them to either a storage area or to the warehouse floor. They are also responsible for replenishing products that are out or low.
- Assemblers or value-adders – this role pieces kits of items together, wrap gifts, and personalize orders.

- Returns – this role processes inbound returned orders, removes items from packaging, and conducts visual inspections. They document returns, then refurbish or return it to replenishment for restocking or work with the retailer/manufacturer to have the product returned to them.

Emerging Tech-elated Positions: Highly automated warehousing facilities require skilled labor such as automation engineers to monitor and repair control systems and sensors within a building to ensure efficient handling of goods. These jobs entail average salaries over \$100,000 annually.

Based upon the manner in which the US Bureau of Labor Statistics compiles their data, there are four kinds of employees that work in warehouse/storage positions. In the Portland-Vancouver-Hillsboro MSA there are 47,480 people employed in these positions with 97% of them being in categories A and D, as listed below.

- Laborers and freight, stock, and material movers – manually move freight, stock, luggage, or other materials, or perform other general labor. There are 16,960 people employed in this position in the MSA, with an average mean wage of \$41,260.
- Machine feeders and off bearers – feed materials into or remove materials from machines or equipment that is automatic or tended by other workers. There are 640 people employed in this position in the MSA with an average mean wage of \$41,890.
- Packers and packagers – pack or package by hand a wide variety of products and materials. There are 330 people employed in this position in the MSA with an average mean salary of \$37,120.
- Stock and order fillers – receive, store, and issue merchandise, materials, equipment, and other items from stockroom, warehouse, or storage yard to fill shelves, racks, tables, or customers' orders. May operate power equipment to fill orders. May mark prices on merchandise and set up sales displays. There are 29,880 people employed in this position with an average mean salary of \$38,710.

Warehousing Regional Economic Impacts

The modern distribution centers discussed herein generate more than direct jobs. These facilities also generate and support a number of other industries in a region, such as food and supplies for restaurants and grocery stores, retail goods for brick-and-mortar retail stores, third-party vendors (e.g., Etsy producers), and inputs to local manufacturing and service providers (e.g., auto repair, beauty salons, etc.).

For the purposes of comparison, the following provides detailed employment figures, salary information, cost of new construction (another indirect economic benefit), tax revenue, and the indirect benefits of various existing Amazon facility types and a food redistribution warehouse which is assumed to be representative of traditional warehouses.²³ The comparison highlights that e-commerce facilities typically entail more local and regional economic impacts (tax revenue, indirect jobs, and new dollars circulating in the economy) than traditional warehouses.

Sortable fulfillment centers

These facilities are approximately 800,000 square-feet in size and employ about 1,500 full-time associates. In these buildings, employees pick, pack, and ship customer orders. Depending on the location, facilities are partly automated, with workers and robots working alongside each other. Facilities employ approximately one employee per 1,000 square feet over a multi-shift workday.

- 800,000 sq ft
- 1500 full time employees at an average wage of \$39,980 annually = annual payroll of \$59,970,000
- Average cost per sq ft of new construction: \$175/ sq ft
- Estimated valuation of development = \$140,000,000
- Property tax in the MSA at \$2.06 per \$1000 of valuation = \$288,400 annually
- Multiplier for the total change in number of jobs in all industries within the MSA for each additional job in the warehouse/storage industry = 1.4082. $1,500 \times 1.4082 = 2,112$ new jobs will be created in the regional economy
- Multiplier for the total dollar change in earnings of all households in the MSA for each additional dollar of earnings paid directly to households employed by the warehouse/storage industry = 1.5080. $\$39,980 \times 1.5080 = \$60,290$. Each new job in the MSA created by the warehouse/storage sector creates \$60,290 in the regional economy for a total of \$90,434,760 annually ($1,500 \times \$60,290$)

Non-sortable fulfillment centers

With sizes ranging from 600,000 to 1 million SF, these facilities employ more than 1,000 full-time workers. In these centers, associates pick, pack, and ship bulky or larger-sized customer items such as patio

²³ The analysis was conducted using U.S. Bureau of Economic Analysis (BEA) RIMS II multipliers. The multipliers estimate the impact from changes in final demand on one or more regional industries in terms of output, employment, and labor earnings. These multipliers are based on estimates of local area personal income and on the national input-output (I-O) accounts.

furniture, outdoor equipment, or rugs. Approximately 1500/sq ft per employee over a multi-shift workday.

- 1,000,000 sq ft
- 675 fulltime employees at an average wage of \$39,980 annually = \$26,986,500 annual payroll
- Average cost per sq ft of new construction: \$175/sq ft
- Estimated valuation of development = \$175,000,000
- Property tax at \$2.06 per \$1000 of valuation = \$360,500 annually
- Multiplier for new job creation creates 951 new jobs
- Each new job in the MSA created by the warehouse/storage sector adds \$60,290 to the regional economy for a total of \$40,695,642 annually

Receive centers

Amazon's receive centers support customer fulfillment by taking in large orders of the types of inventories that are expected to quickly sell and allocating it to fulfillment centers within the network. They also receive and consolidate items from vendors. These buildings are about 600,000 square feet in size. Approximately 1500 SF/employee

- 600,000 sq ft
- 400 full time employees at an average wage of \$39,980 annually = \$15,992,000 annual payroll
- Average cost per sq ft: \$175/sq ft
- Estimated valuation of development = \$105,000,000
- Property tax at \$2.06 per \$1000 of valuation = \$216,300 annually
- Multiplier for new job creation creates 563 new jobs
- Each new job in the MSA created by the warehouse/storage sector adds \$60,290 to the regional economy for a total of \$24,115,936

Last mile delivery centers

These facilities operate 24/7. Tractor trailers arrive from fulfillment centers; orders are processed and loaded onto delivery vans. The vans leave the warehouses outside of peak hours with the departure times scheduled in waves. If demand is especially high third-party partners/drivers can make deliveries in their personal vehicles. These facilities generate a large amount of new traffic activity.

- 100,000 sq ft
- 100 full time employees at an average wage of \$39,980 annually = \$3,998,000 annual payroll
- Average cost per sq ft: \$92/sq ft
- Estimated valuation of development = \$9,200,000
- Property tax at \$2.06 per \$1000 of valuation = \$18,952 annually
- Multiplier for new job creation creates 141 new jobs
- Each new job in the MSA created by the warehouse/storage sector adds \$60,290 to the regional economy for a total of \$6,028,984 annually

Food service redistribution warehouse

A food service redistribution company, which offers over 112,000 products from over 800 food industry manufacturers built a new distribution center to serve Southern California, Arizona, New Mexico, Southern Nevada, and Utah. The company consolidates these products and delivers them in less than truckload quantities to distributors on a weekly basis. They have 11 distribution centers nationally.

- 165,000 sq ft distribution center space which includes 20,000 sq ft of refrigerated space
- 126 full time employees at an average of \$39,980 annually = \$5,037,480 payroll
- \$45,000,000 of project costs which includes refrigerated and dry storage areas, installation of new equipment and infrastructure improvements
- City property tax of \$2.06 per \$1,000 valuation = \$92,700 annually
- With a multiplier of 1.4082, the 126 jobs will create 177 new jobs in the MSA
- With a multiplier of 1.5080, each new job in the MSA created by the warehouse/storage sector adds \$60,290 to the regional economy for a total of \$7,596,519 annually

Background Economic Data Specific to Vancouver

The Portland/Vancouver/Hillsboro Metropolitan Statistical Area (MSA) saw an increase of 4.8 percent in Warehouse/Storage employment from September 2021 to 2022. The average weekly wage in that period was \$1,315, which ranked 66th in MSAs in the nation out of 395 MSAs. During the same period of time, Washington State was second in the nation for weekly wages paid to the Warehousing/Storage sector at \$1,657 while Oregon's was \$1,301. This difference is in part due to the higher cost of living in the Seattle region, which requires higher wages to attract and retain warehouse workers. The top five states for highest warehousing job wages include District of Columbia, Washington, Massachusetts, New York, and California. The cost of living in these states ranks equally high.

Based upon 2022 year-end employment numbers in the Warehousing/Storage sector in the MSA:

- 47,830 employees in the Portland, Vancouver, Hillsboro MSA
- 121,950 employees in Washington State
- 80,610 employees in Oregon

In 2022, overall statewide employment growth was 1.1 percent in Oregon (lowest nationally) and 4.4 percent in Washington. Applicable taxes in Vancouver consist of property tax, sales and use tax, and utility taxes. Vancouver property tax levy rate is \$2.06 per \$1,000 assessed value. Washington State law requires that county assessors appraise all property at its true market value in dollars, according to the highest and best use of the property. Washington State sales and use tax is 6.5 percent, whereas Vancouver's sales and use tax is 2.2 percent. Washington State uses a Destination Sales Tax system which means that the sales tax is applied at the destination. A Washington State Department of Revenue exemption is available for warehouses of 200,000 or more square feet. Sales tax on the construction costs for new warehouses (or an expansion of an existing warehouse that meets the 200,000 square feet requirement) qualify for 100 percent exemption. Material-handling equipment and racking equipment in warehouses are eligible for a 50 percent exemption. This applies to the state portion of the tax.

Sustainable Practices

With the significant post-pandemic increase in e-commerce and recent near-shoring and reshoring of manufacturing, the demand for industrial warehousing has grown significantly and shows little signs of waning despite capitalization concerns related to interest rate hikes. This creates both challenges and opportunities for Vancouver to ensure that the development is sustainable – both from an environmental perspective, as well as long-term economic perspective. This section discusses opportunities for applying sustainable building and operations practices to the freight industry to reduce energy and water consumption, as well as emissions, landfill waste, and urban stormwater runoff.²⁴ This section will also discuss flexible re-use designs that support long-term, productive use of large industrial structures.

Environmental Sustainability

As part of the trend toward greener warehouses, businesses are seeking not only energy savings but also more efficient materials handling. Automated storage and retrieval systems (AS/RS), the robotic handling system, and warehouse management systems (WMS), help achieve significant efficiencies by maximizing storage space while reducing operating costs. The WMS has the added benefit of increasing the speed of delivery and deployment of goods, which reduces truck queues and idling, particularly during peak seasons or immediately following a supply chain disruption. Flexible, hybrid AS/RS designs use one or more cranes in an aisle that only need to be as wide as the largest commodities – a substantial space saving in comparison with forklift-operated facilities. Automated racking systems can store products single-deep, double-deep, or up to 12 loads deep in the rack structure. AS/RS systems can be customized based on the warehouse's inventory mix of high, intermediate, and slow-moving products to minimize the cubic space required for storage and handling. Unmanned rack entry vehicles quickly, smoothly, and accurately transport pallets and containers in and out of the storage rack, resulting in faster throughput. These systems benefit small and large warehouses alike. Although the following example focuses on a very large-scale warehouse, it demonstrates the ability of systems like this to perform a vast amount of work in a very small space – a potential opportunity for Vancouver.

Automated systems also deliver the following environmental benefits:

1. Less land usage: A warehouse with an AS/RS uses up to 40 percent less space than a conventional warehouse to store the same number of products.

²⁴ Green building is the practice of creating structures and using processes that are environmentally responsible and resource- efficient throughout a building's life cycle from siting to design, construction, operation, maintenance, renovation, and deconstruction. This practice expands and complements the classical building design concerns of economy, utility, durability, and comfort. Green building is also known as a sustainable or high-performance building. <http://www.epa.gov/greenbuilding/>

2. Less energy consumption: Automated warehouses require less lighting and cooling; regenerative braking on storage/ retrieval machines produce energy for assisting with powering the system; the warehouse maintenance system controls all product flows and optimizes product movements.
3. Less product waste: Automated warehouses reduce product damage caused by human error; require less shrink wrapping to secure pallets; improve accuracy of fulfillment through technology like RFID.
4. Reduced maintenance: Maintenance costs for AS/RS are lower than for forklift operations; automated facilities require less space resulting in facility leasing savings.
5. Safety benefits: Automated facilities have fewer workers moving goods, thus resulting in fewer injuries that are typically inherent in warehouses, such as back and neck injuries and forklift accidents.
6. Result in fewer employees on site and therefore require fewer parking spaces (typically 40 percent less employee parking demand than a typical warehouse).

One of the challenges with AS/RS is the cost and return on investment. AS/RS is most commonly used by tenants who intend to operate a facility for a minimum of ten years. AS/RS also requires minimum ceiling height of 40 feet and perfectly level floors.

Adaptive Re-use Feasibility

The growth rate for warehousing space is flattening due to changing economic trends and optimization of available space (e.g., automation). Therefore, it is important that warehousing properties are adaptive to reuse for different tenants with varying purposes. Over the years, warehouses in several parts of the country have been successfully reused for the following:

- Commercial kitchens to support local food trucks, segmented artist studios, or start-up office space for entrepreneurs or small businesses. Properties with high ceilings and abundant natural light can be converted into attractive office space.
- Production or testing facilities for a range of technology, such as biotech industries, automobile parts, aviation, and 3D printing.
- Gyms and indoor sports spaces.

As an example, St. Ann's warehouse in New York which was initially utilized for tobacco processing was repurposed into a theater for live performances in 2015.²⁵

²⁵ BIM Smith. Functional and Creative: 5 Inspiring Adaptive Reuse Projects. 2022

The feasibility of reuse or multi-use of warehouses is highly dependent on the design nature of a development:

- Warehouse developments that typically work for both warehousing and manufacturing include flexible, dock-high, high-clear height buildings with provisions to expand power in the future, including under slab conduits so that power can be delivered to different ends of a building.
- To accommodate a use that may have more trucking, 185 ft truck courts may be necessary to accommodate trailer storage or truck courts that are 135 ft deep if no trailer storage is anticipated.

The multi-story warehouse concept, centered on building vertically rather than horizontally, is garnering traction. Building vertically helps overcome the limits of property lot sizes. Small trucks are able to easily navigate ramps to upper floors, while the main loading dock accommodates the conventional 53-foot trailers typically used in the US. This concept offers developers and property owners the ability to maximize profit potential. However, multi-story warehouses can be substantially more expensive to build than a standard warehouse.²⁶ An example warehouse is the 590 KSF multi-story warehouse in the Georgetown Crossroads district of south Seattle near the Port of Seattle.

²⁶ [Prologis. The Future is Multistory. 2021](#)

Recommendations

As demonstrated in this report, industrial warehouses can vary significantly based on the types of activities occurring within them. Recent best practices that our team has identified focus on understanding the operations of industrial warehousing and taking a performance-based zoning approach. This type of zoning fosters the creation of a set of conditions of approval that best address the potential impacts of their operations. The following provides some potential conditions of approval for the City's consideration.

Potential Conditional Use Permit (CUP) Requirements

The City could consider updating CUP requirements to require applications for new warehouses or distribution centers to describe the proposed operations, such as hours of operation, number of employees per shift, number of shifts, hours of shifts, daily and AM/PM peak hour medium- and heavy-duty truck volumes, number of dock doors, number of parking spaces for employees, trailers, tractor-trailers, and/or tractors, and anticipated water/sewer usage in volume, and power requirements in megawatts.

Transportation and Parking Analysis

Traffic Impact Review Guidelines and Process

The City may want to consider developing a traffic impact assessment/analysis (TIA) template to guide the assumptions to use in preparing TIAs. As a starting point, the City could request that the following information be submitted by the applicant and approved by the City prior to collecting traffic data and initiating the TIA:

- Trip generation rate (ITE-based rates for both peak hour generator and peak hour of adjacent streets, or other based on empirical evidence)
- Trip distribution
- Parking demand (ITE or other based on empirical evidence)
- Study intersections
- Annual ambient traffic growth rate
- Related projects

Off-Street Parking and Site Access

The City's parking and circulation regulations were adopted before the advent of modern warehouses and distribution centers, which are now serviced by larger trucks. Specifications and design of truck parking for long duration or overnight parking, trailer storage, as well as dock spaces in length and width, should accommodate the largest commercial motor vehicle. In addition, sufficient truck parking spaces or designated areas for staging may be needed to prevent queuing onto public streets. The number of spaces and dimensions should be consistent with the proposed use and potential future re-uses of the

site. Today's standard over-the-road heavy-duty trucks carry 53-foot trailers with a total length (tractor and trailer) of 65 feet. These trucks are typically 8.5 feet wide and 13.5 feet tall. Below are some examples of off-street truck parking provisions developed to reflect the increase in truck sizes and changing parking uses:

- **Staging Spaces:** Two 12-foot-by-75-foot truck staging spaces for each loading dock. A minimum of five percent of required truck staging spaces shall be reserved for outbound trucks which are required to layover or rest due to hours-of-service regulations. Such spaces must be accessible during and after the facility's operating hours as necessary.
- **Loading Spaces:** One 12-foot-by-75-foot truck loading space for each loading dock.
- **Loading Docks:** The minimum number of loading docks shall be determined using the following calculation: *Number of trucks per hour* (at the peak hour of the use) multiplied by the *turnaround time per truck* (in hours). The number of docks determined by the above formula shall be rounded up to the next whole number. For example: 17 trucks are required to be serviced during the peak hour of use, each requiring 45 minutes (0.75 hours) to service. This equates to 17 trucks per hour multiplied 0.75 hours per truck, resulting in the need for 12.75 docks, which would be rounded up to 13 docks. If a particular tenant has not been identified for the facility, a minimum of one loading dock shall be provided per 5,000 square feet of building gross floor area.
- **Reserved Spaces:** Reserve a minimum of 5% of the proposed total tractor-trailer parking spaces for trucks that are required to arrive early or to layover or rest due to hours-of-service regulations. Such spaces must be made available to tractor-trailers 24 hours a day, seven days a week.

Dimensional Requirements and Emergency Response

Industrial warehouses are often characterized by their substantial size relative to other buildings in a community. Today, regional freight facilities typically range between 400 KSF and 1 million square feet. These facilities are often greater than four stories tall, to provide as much space as possible to store goods prior to movement. The combination of square footage and building height can pose visual impacts and potential challenges to emergency responders. Examples of codes from other jurisdictions to address height and building coverage and emergency access:

- Structures higher than a certain height may be permitted as a conditional use, provided that fire protection measures above and beyond those normally required would be provided as the Supervisors determine are necessary, after providing the Township Fire Commissioner with an opportunity for a review.
- Total Impervious Coverage — 50% (At least 30% of the total lot area shall be lawns and/ or vegetation land cover).
- An exterior access stair tower shall be provided to allow public safety personnel direct emergency access to the roof of the building from the ground level. Steps, guiderails, handrails, brackets, gates, and other components shall meet or exceed applicable Uniform Construction Code and Occupational Safety and Health Administration (OSHA) standards. The final location and

specifications for the exterior access stair tower shall be subject to review and approval by the Emergency Services Coordinator and/or Fire Marshall.

- Commercial Knox Boxes²⁷ are required to provide public safety personnel access to any secured areas of the site, the principal building structure, and any accessory structures. The final location(s) and specifications for Knox Boxes shall be subject to review and approval by the Emergency Services Coordinator and/or Fire Marshall.
- Plans that accompany special exception or conditional use applications, or subdivision or land development applications, should clearly identify the location, design, and capacity of water storage facilities intended for fire suppression.
- Municipalities should require requests for special exceptions and conditional uses, as well as all subdivision and land development applications for freight-based development, be submitted to emergency service providers for their comment and review. Thresholds for review, such as a minimum square footage of principal building and trip generation rate, can be used to determine which applications should be reviewed.

Driver and Facility Amenities

Land development plans for freight centric or freight movement dependent operations need to provide accommodations at their facilities to enable the truck drivers essential to their operations to comply with federal laws regulating the hours a driver may operate a commercial vehicle. At federal level, the Federal Motor Carrier Safety Administration (FMCSA) regulates the maximum amount of time drivers are permitted to be on duty including driving time, and specifies number and length of rest periods, to help ensure that drivers stay awake and alert.²⁸ Freight land uses and facilities should incorporate onsite parking for the commercial vehicles that are essential to the operations of the building or use.

It should be noted that drivers of a commercial motor vehicle (CMV) or commercial trucks that fall under the hours of service (HOS) regulations are defined as being used as part of a business, is involved in interstate commerce, and fits any of the following descriptions:

- Weighs 10,001 pounds or more
- Has a gross vehicle weight rating or gross combination weight rating of 10,001 pounds or more
- Is designed or used to transport 16 or more passengers (including the driver) not for compensation
- Is designed or used to transport nine or more passengers (including the driver) for compensation
- Is transporting hazardous materials in a quantity requiring placards. There are special exemptions from these HOS requirements such as:
 - Short-Haul: Driving within 150 miles of the origin and destination and must start and end within 14 hours at the same starting location.

²⁷ Knox Emergency Boxes provide onsite, high security storage for pre-fire plans, key storage, elevator drop keys, Haz-Mat data and other emergency items.

²⁸ Code of Federal Regulations (CFR). Title 49 – CFR 395.3

- Adverse Driving Conditions: Drivers can extend their duty day and driving time by up to two hours when adverse driving conditions are encountered. Adverse driving conditions include snow, ice, sleet, fog, or other weather conditions or unusual road or traffic conditions that were not known, or could not reasonably be known, to:
 - A driver immediately beginning the duty day or immediately before driving after a qualifying rest break or sleeper berth period, or:
 - A motor carrier immediately before dispatching a driver

Long-term or overnight truck parking amenities should provide or enable trucks to:

- Have easy access to trash receptacles
- Adequate lighting to provide security for drivers while sleeping or resting
- Directional signage to major interstates or common freight destinations

Additionally, it is important that the freight-based land use also provide amenities for the driver to utilize while restricted from driving. These amenities may include:

- Driver Lounges with vending machines
- Rest Rooms
- Showers
- Wi-Fi Internet access
- Dog walking
- Multimodal trails

Multimodal Access

Municipalities should plan for the availability of trails, sidewalks, and access to transit facilities when planning for the location of freight-based operations. This infrastructure serves both drivers accessing the site as well as providing employees options for commute trips. The subdivision and land development approval process should require consultation with transit providers on the optimal location for transit stops. Sidewalks and trails should also be required to connect with existing and proposed trail and sidewalk systems.

Dedicated parking spaces for alternative modes of transportation encourage choices that support the City's greenhouse gas (GHG) reduction goals and promote health and well-being. In addition, the City may require tenants to establish and promote a rideshare program that discourages single-occupancy vehicle trips and provides financial incentives for alternate modes of transportation, including carpooling, public transit, and biking.

Possible Project Conditions or Standards to Address Climate Action Goals

Warehouse developments offer opportunities to further the City's Climate Action Plan by providing incentives or codifying sustainable design features or business practices, where applicable. Generally, there are industry efforts to address climate change. From fleet owners to policymakers, various stakeholders are taking the initiative to reduce the impact of e-commerce on GHG emissions. Examples of e-commerce platforms and shippers with climate-related commitments to ensure zero emission deliveries include Amazon, IKEA, Nestle, and Walmart.²⁹ Additionally, developers are also incorporating sustainable design features in their warehouse developments. **Figure 5** illustrates how Prologis developers are incorporating sustainable practices in warehouse developments. The design features the City can incorporate to address climate action goals include the following³⁰:

Energy Provisions & Conservation

Power Requirements: The City should consider requiring the installation of adequate electric infrastructure for charging electric vehicles, charging trucks at loading docks, powering refrigeration units of temperature-controlled trailers, and providing auxiliary power for diesel trucks to allow climate control and use of in-cab electronics without idling.

Auxiliary power/ electric truck charging: Locate plug-ins at dock doors.³¹

Solar, storage, and wind power: Warehouses are viable candidates for alternative energy systems, including photovoltaic solar cells and battery storage. In particular, warehouses have huge, flat, unobstructed roofs that are ideal for solar arrays capable of pumping out torrents of clean, renewable energy. The City should consider requiring warehouse developers and tenants to install alternative energy systems.

As an example, the City of Seattle regulates renewable energy and solar-ready roofs for commercial buildings as outlined in the 2018 Seattle Energy Code (Section C411 and Section C412).^{32, 33} The regulatory requirements centered around solar readiness are based on roof area and electrical service as indicated below. As a general requirement for on-site renewable energy systems, each new building larger than 5,000 sf of gross conditioned floor area is required to include a renewable energy generation system consisting of not less than 0.25 watts rated peak photovoltaic energy production per square foot of conditioned space.³³

²⁹ [Nowlan, A., and Usmani, S. Accelerating Zero-Emissions Delivery: An innovative approach to transforming the last mile. Environmental Defense Fund, 2021](#)

³⁰ [Prologis. Sustainable Design Features & Benefits. 2023](#)

³¹ [SafeConnect. Docking Stations.](#)

³² [City of Seattle. Renewable Energy and Solar-Ready Roofs for Commercial Buildings. 2021](#)

³³ [City of Seattle. 2018 Seattle Energy Code. 2021](#)

Solar Readiness Example

Example: A building with a 10,000 SF total roof area, 1,000 SF skylight area, and a 400 Amp, 240-volt single phase electrical service is required to provide a solar zone area of the smaller of the following:

1. $[40\% \times (10,000 \text{ SF roof area} - 1,000 \text{ SF skylights})] = 3,600 \text{ SF}$; or
2. $[400 \text{ Amp} \times 240 \text{ Volts} \times 20\% / 10 \text{ watts per SF}] = 1,920 \text{ SF}$

Therefore, a *solar zone* of 1,920 square feet is required.

Source: 2018 Seattle Energy Code (Section C411)

Motion sensors: Use of motion sensors to turn on lights for workers when natural light is not sufficient.

Skylights and clerestory windows: Utilize natural light to lower electricity use and associated greenhouse gas emissions and improve indoor environmental quality for warehouse personnel.

High-reflectance roof membranes: Traditionally, warehouse roofing has black ethylene propylene diene terpolymer (EPDM) rubber membranes that absorb heat from sunlight. White thermoplastic polyolefin (TPO) roofing, also known as "cool roofs," offers equal performance at similar costs while comparatively reducing heat absorption and often providing a more comfortable work environment. This design feature can also lower operating costs by reducing energy use in air-conditioned spaces.

Climate control: Ventilation system that utilizes outside air drawn through louvers facing the prevailing winds, supplemented by energy efficient heating and cooling systems.

Water Conservation & Waste Management

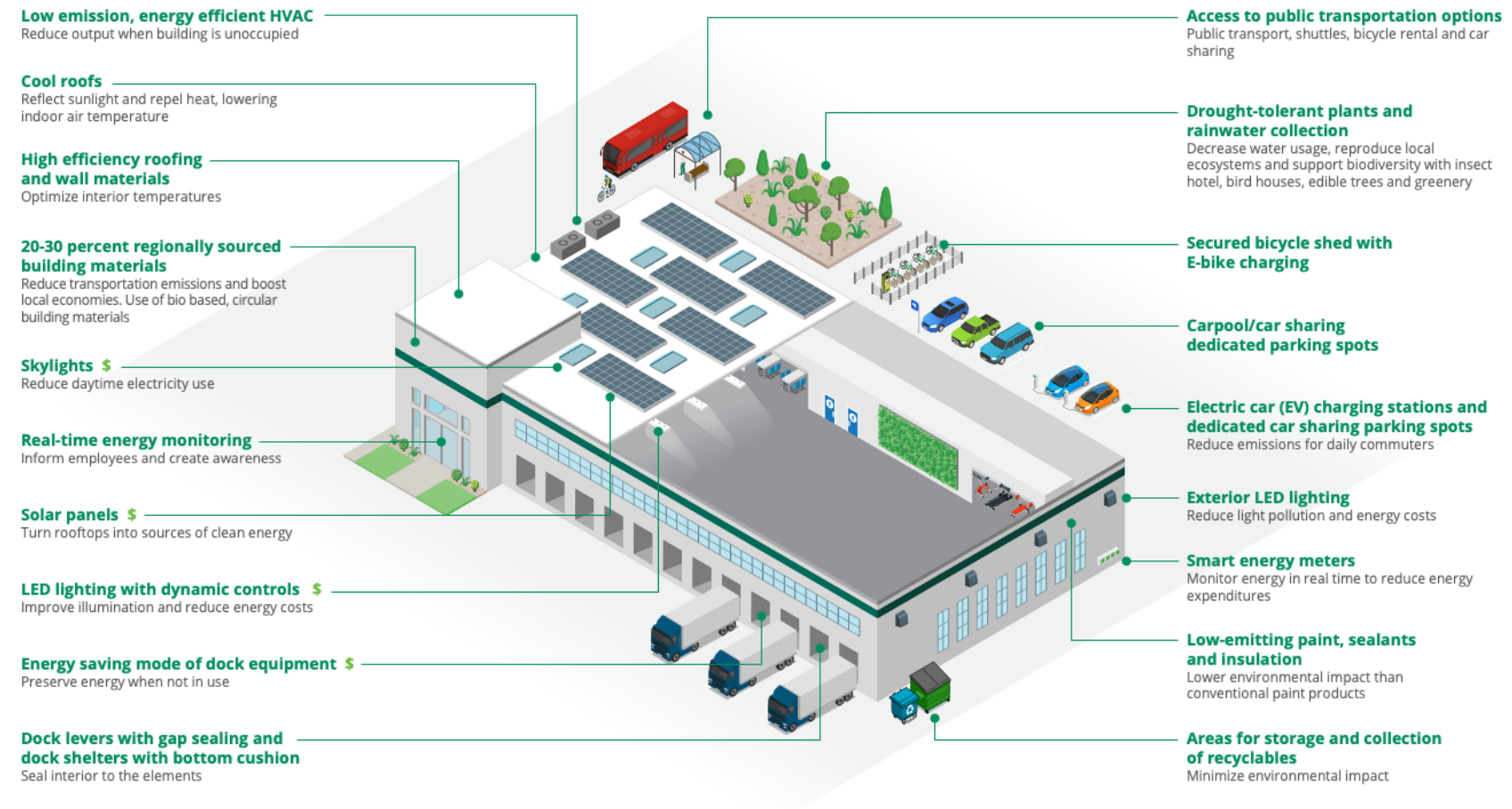
Water conservation measures: Exterior landscaping, motion-activated faucets, low-flow toilets, waterless urinals, and captured rainwater for irrigation all reduce the use of fresh water. Use native plant species and drip irrigation.

Dedicated area for onsite recycling: Support water and waste recycling efforts, such as onsite shredding and compaction of recyclable cardboard and other materials on site.

Physical, structural, and/or vegetative buffers that adequately prevent or substantially reduce pollutant dispersal between warehouses and any areas such as homes, schools, daycare centers, hospitals, community centers, and parks.

Environmentally Friendly Building Materials: Use low emitting VOC materials, such as glues, adhesives, paints etc.; use recycled construction materials to construct buildings.

Figure 5: An Example Warehouse Development that Advances Sustainability



\$ = Direct occupational cost savings



BREEAM®

CASBEE®



HQE®

BOMA



BUILDING CERTIFICATIONS

Demonstrate that we build to the top sustainability standards

PROJECT MANAGEMENT CERTIFIED
ISO 14001

Source: Prologis, Prologis Buildings, A Story of Sustainability. 2023.

Appendix A

Table 7: Differences between Traditional Warehouses and E-commerce Facilities

Characteristics	Traditional Warehouse	E-commerce Facilities
Physical	• Smaller building footprint • Lower clear heights³⁴ under 30 feet • Fewer dock doors • Typically located close to other industrial uses (targeted clients)	• Variation in building footprint; emphasis is on space utilization • Higher clear heights (over 36 feet) to allow for storing multiple stock keeping unit (SKUs) • More dock doors, especially at transload facilities • Near population centers, ports, and/or intermodal railyards with easy freeway access to serve consumers (front porch)
Operational	• Slower turnover of stored goods • Goods are stored in bulk for usually more than a day then distributed • Operations are typically limited to normal business hours, i.e., 8-hour day shifts, five days per week • Fewer employees, primarily unskilled labor • Fewer daily vehicle trips, (includes medium- and heavy-duty truck trips) - limited to less than two total vehicles per 1,000 square feet of building gross floor area	• High turnover of goods • Goods may be sorted, consolidated, and repackaged in less than a day before distribution • More likely to have automation, such as Radio Frequency Identification (RFID) to manage inventory and fully automated sortation, stocking and retrieval • Around-the-clock operations • Fewer unskilled workers; creates high-tech jobs • More daily vehicle trips (ranges from 1.40 to 6.44 total vehicles per 1,000 square feet of building gross floor area) • More van trips for first/last mile deliveries
Economic	• Limited to unskilled labor and managerial jobs with lesser earnings than in high-tech warehouses • Generates less indirect jobs • Less local and regional economic impacts	• May entail some high paying jobs such as automation engineers with average salaries over \$100,000 a year • Generates more indirect jobs as these facilities support several other industries • More local and regional economic impacts

Source: Fehr & Peers. 2023

³⁴ In industrial real estate, building clear height dictates the height to which inventory can be safely stored.

Appendix B

County Business Patterns Data

Table 8: Average Employees per Establishment for Warehousing and Storage

Counties	Employees per Establishment						Change
	2016	2017	2018	2019	2020	2021	2016-2021
Clark County, Washington	28	24	27	33	38	42	50%
Yakima County, Washington	91	89	86	81	80	82	-10%
Lewis County, Washington	97	100	107	108	105	109	12%
Multnomah County, Oregon	34	37	35	36	46	43	26%
Washington County, Oregon	13	36	31	35	59	66	408%
Clackamas County, Oregon	36	41	22	16	16	43	19%
Spokane County, Washington	24	26	29	25	24	25	4%
Pierce County, Washington	75	50	49	50	57	49	-35%
King County, Washington	35	41	42	43	50	49	40%
Average	48	49	48	47	53	56	17%

Source: US Census Bureau, 2016 – 2021. Fehr & Peers, 2023.

Table 9: Average Employees per Establishment for Manufacturing

Counties	Employees per Establishment						Change
	2016	2017	2018	2019	2020	2021	2016-2021
Clark County, Washington	33	33	32	34	33	31	-6%
Yakima County, Washington	39	41	42	39	37	36	-8%
Lewis County, Washington	28	30	31	34	34	32	14%
Multnomah County, Oregon	29	28	30	31	31	27	-7%
Washington County, Oregon	40	55	54	58	59	55	38%
Clackamas County, Oregon	33	30	29	29	30	30	-9%
Spokane County, Washington	29	28	29	30	31	29	0%
Pierce County, Washington	32	32	33	33	35	33	3%
King County, Washington	39	39	39	41	41	38	-3%
Average	34	35	35	37	37	35	3%

Source: US Census Bureau, 2016 – 2021. Fehr & Peers, 2023.

Table 10: Employees per Establishment for Scientific Research and Development Services

Counties	Employees per Establishment						Change 2016-2021
	2016	2017	2018	2019	2020	2021	
Clark County, Washington	14	17	20	20	17	21	50%
Yakima County, Washington	-	-	-	-	-	-	-
Lewis County, Washington	-	-	-	-	-	-	-
Multnomah County, Oregon	14	10	12	13	13	15	7%
Washington County, Oregon	140	-*	162	165	143	138	-1%
Clackamas County, Oregon	6	3	4	3	3	3	-50%
Spokane County, Washington	4	5	5	6	7	7	75%
Pierce County, Washington	30	39	38	28	30	37	23%
King County, Washington	32	33	37	37	37	38	19%
Average	34	18	40	39	36	37	8%

Source: US Census Bureau, 2016 – 2021. Fehr & Peers, 2023.

Notes:

"-"No available data

Table 11: Average Annual Wage for Warehousing and Storage

Counties	Average Annual Wage						Change 2016-2021
	2016	2017	2018	2019	2020	2021	
Clark County, Washington	\$52,774	\$42,494	\$50,093	\$55,299	\$58,491	\$58,146	10%
Yakima County, Washington	\$40,470	\$40,167	\$42,877	\$46,486	\$45,682	\$47,851	18%
Lewis County, Washington	\$43,390	\$37,655	\$38,493	\$40,248	\$42,177	\$43,615	1%
Multnomah County, Oregon	\$59,454	\$56,566	\$58,630	\$56,863	\$53,792	\$55,249	-7%
Washington County, Oregon	\$50,743	\$35,884	\$44,432	\$35,778	\$22,358	\$24,441	-52%
Clackamas County, Oregon	\$49,618	\$48,033	\$37,162	\$42,837	\$46,170	\$55,070	11%
Spokane County, Washington	\$47,417	\$49,716	\$56,143	\$51,159	\$49,452	\$52,692	11%
Pierce County, Washington	\$47,458	\$46,965	\$50,019	\$55,488	\$52,580	\$48,903	3%
King County, Washington	\$60,198	\$54,053	\$54,934	\$58,092	\$55,381	\$59,708	-1%
Average (excluding Washington, Oregon)	\$ 50,097	\$ 46,956	\$ 48,544	\$ 50,809	\$ 50,466	\$52,654	5%

Source: US Census Bureau, 2016 – 2021. Fehr & Peers, 2023.

Table 12: Average Annual Wage for Manufacturing

Counties	Average Annual Wage						Change 2016-2021
	2016	2017	2018	2019	2020	2021	
Clark County, Washington	\$57,339	\$58,211	\$60,167	\$59,664	\$62,305	\$67,683	18%
Yakima County, Washington	\$46,421	\$45,401	\$46,602	\$52,751	\$56,223	\$52,461	13%
Lewis County, Washington	\$47,506	\$51,955	\$53,442	\$55,593	\$55,101	\$61,710	30%
Multnomah County, Oregon	\$52,737	\$56,749	\$61,720	\$61,337	\$57,421	\$64,269	22%
Washington County, Oregon	\$67,890	\$93,612	\$95,915	\$100,181	\$98,181	\$112,930	66%
Clackamas County, Oregon	\$60,528	\$60,813	\$61,615	\$63,875	\$63,122	\$70,637	17%
Spokane County, Washington	\$51,858	\$51,936	\$52,285	\$54,265	\$53,598	\$57,287	10%
Pierce County, Washington	\$54,729	\$55,551	\$57,429	\$59,635	\$56,289	\$62,867	15%
King County, Washington	\$70,054	\$74,031	\$75,578	\$81,671	\$77,961	\$84,535	21%
Average	\$56,562	\$60,918	\$62,750	\$65,441	\$64,467	\$70,487	25%

Source: US Census Bureau, 2016 – 2021. Fehr & Peers, 2023.

Table 13: Average Annual Wage for Scientific Research and Development Services

Counties	Average Annual Wage						Change 2016-2021
	2016	2017	2018	2019	2020	2021	
Clark County, Washington	\$99,175	\$88,833	\$85,088	\$100,811	\$262,809	\$154,401	56%
Yakima County, Washington	-	-	-	-	-	-	
Lewis County, Washington	-	-	-	-	-	-	
Multnomah County, Oregon	\$80,865	\$79,689	\$83,813	\$88,613	\$94,260	\$96,140	19%
Washington County, Oregon	\$156,485	-	\$172,566	\$185,406	\$187,757	\$184,753	18%
Clackamas County, Oregon	\$107,356	\$62,833	\$44,300	\$61,452	\$98,972	\$103,028	-4%
Spokane County, Washington	\$82,134	\$71,500	\$87,275	\$80,366	\$89,741	\$91,474	11%
Pierce County, Washington	\$64,474	\$69,053	\$70,543	\$72,708	\$78,525	\$69,384	8%
King County, Washington	\$107,026	\$110,600	\$114,221	\$132,973	\$142,585	\$154,854	45%
Average	\$99,645	\$80,418	\$93,972	\$103,190	\$136,378	\$122,005	22%

Source: US Census Bureau, 2016 – 2021. Fehr & Peers, 2023.

Notes:

"-"No available data



Proposed Heights HX Plan District Changes



Amy Zoltie

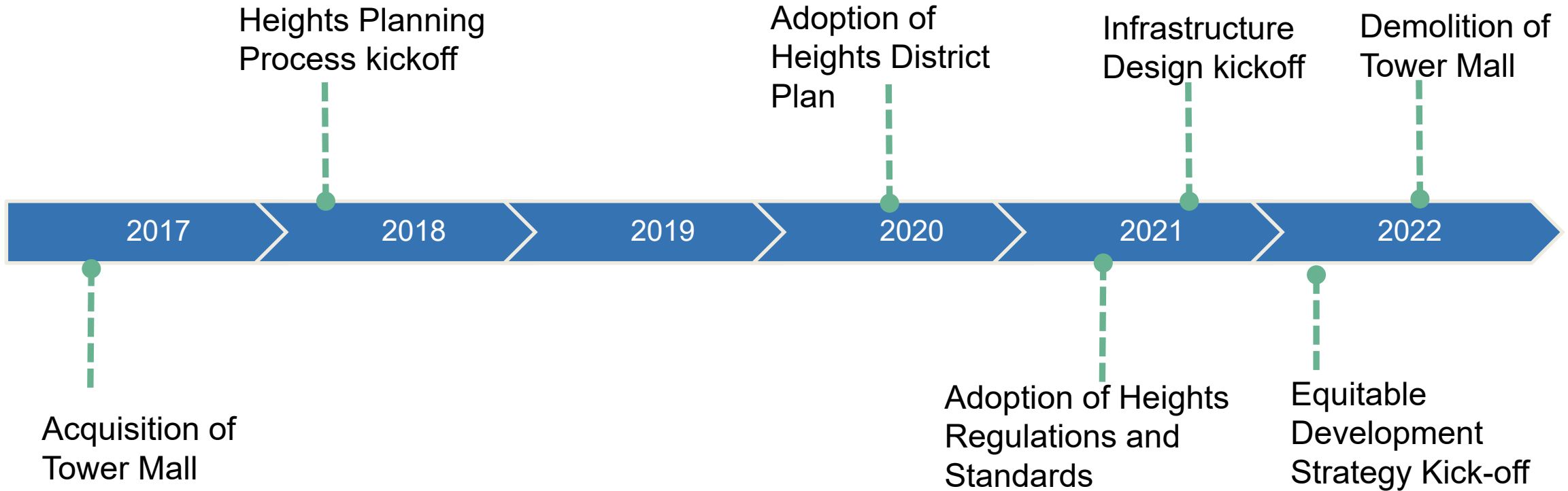
Real Estate Project Manager, Economic Prosperity & Housing

Agenda

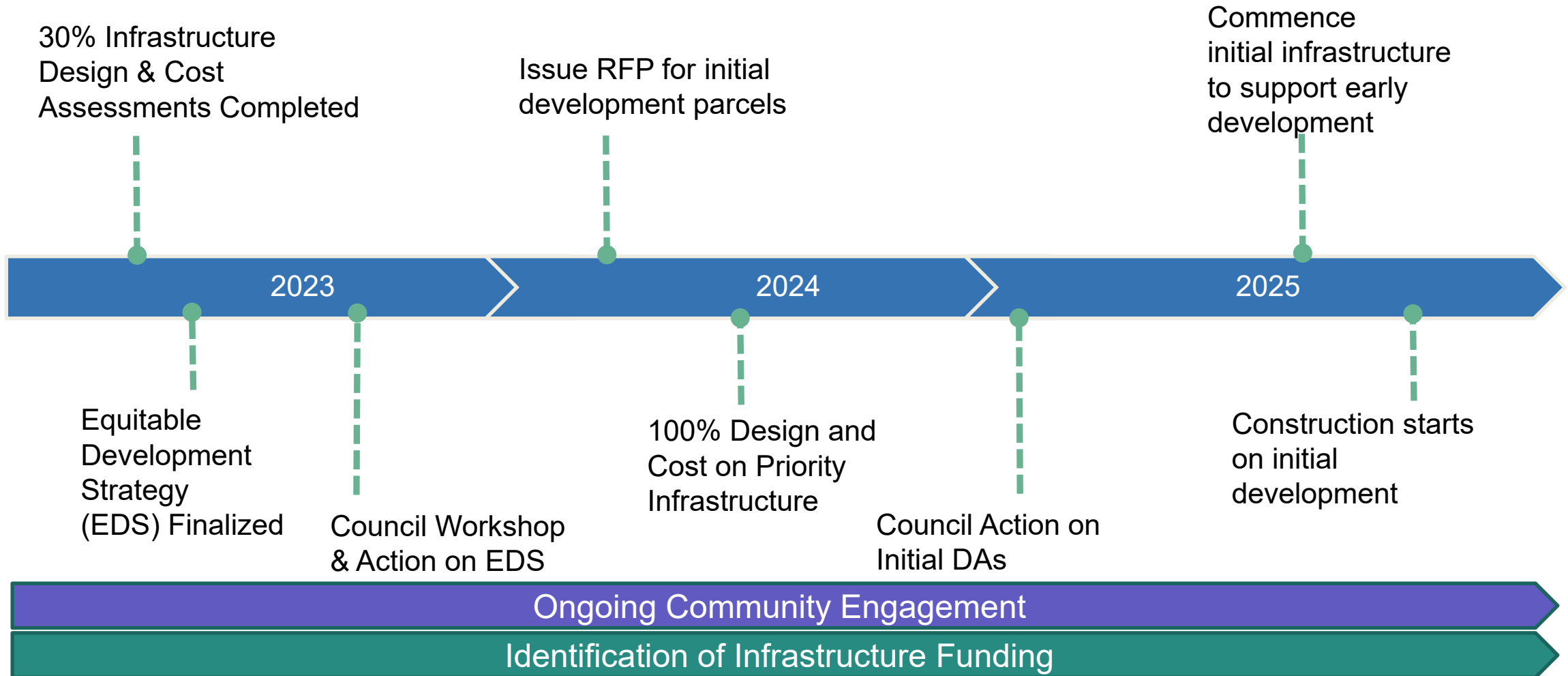
- Project History & Timeline
- Recap of Previously Proposed HX Code Changes
- Review Additional HX Code Changes
- Next Steps
- Questions & Discussion



Project History



Project Timeline



Summary of Previously Proposed HX Code Changes

- Update the *Ground Floor Use Map*, Figure 20.670-2 consistent with the Master Plan refinements for street layout and block formation.
- Modify the Ground-Floor Use Regulations by Frontage Type to promote active retail, entertainment, and dining oriented to the Civic Plaza.
- Adjust portions of text to maintain consistency and delete some unclear or non-essential narrative.
- Add a new standard to regulate off-street parking access by limiting vehicle, pedestrian, and bicycle conflicts and better promote non-motorized access and use of the Grand Loop.

Additional HX Code Changes

Table 20.670.040-2 Maximum Building Heights

Sub-District	Maximum Height
Activity Center	Maximum of 85 feet
Residential Neighborhood	Maximum of 85 feet
Innovation Hub	Maximum of 50 feet
District Gateway	Maximum of 50 55 feet not abutting residentially zoned properties
Sub-District	Maximum Height
	Maximum of 40 feet abutting residentially zoned properties
	Maximum of 35 feet fronting Idaho Street

Note: For the Heights District, abutting is defined as sharing a property line with residentially zoned property

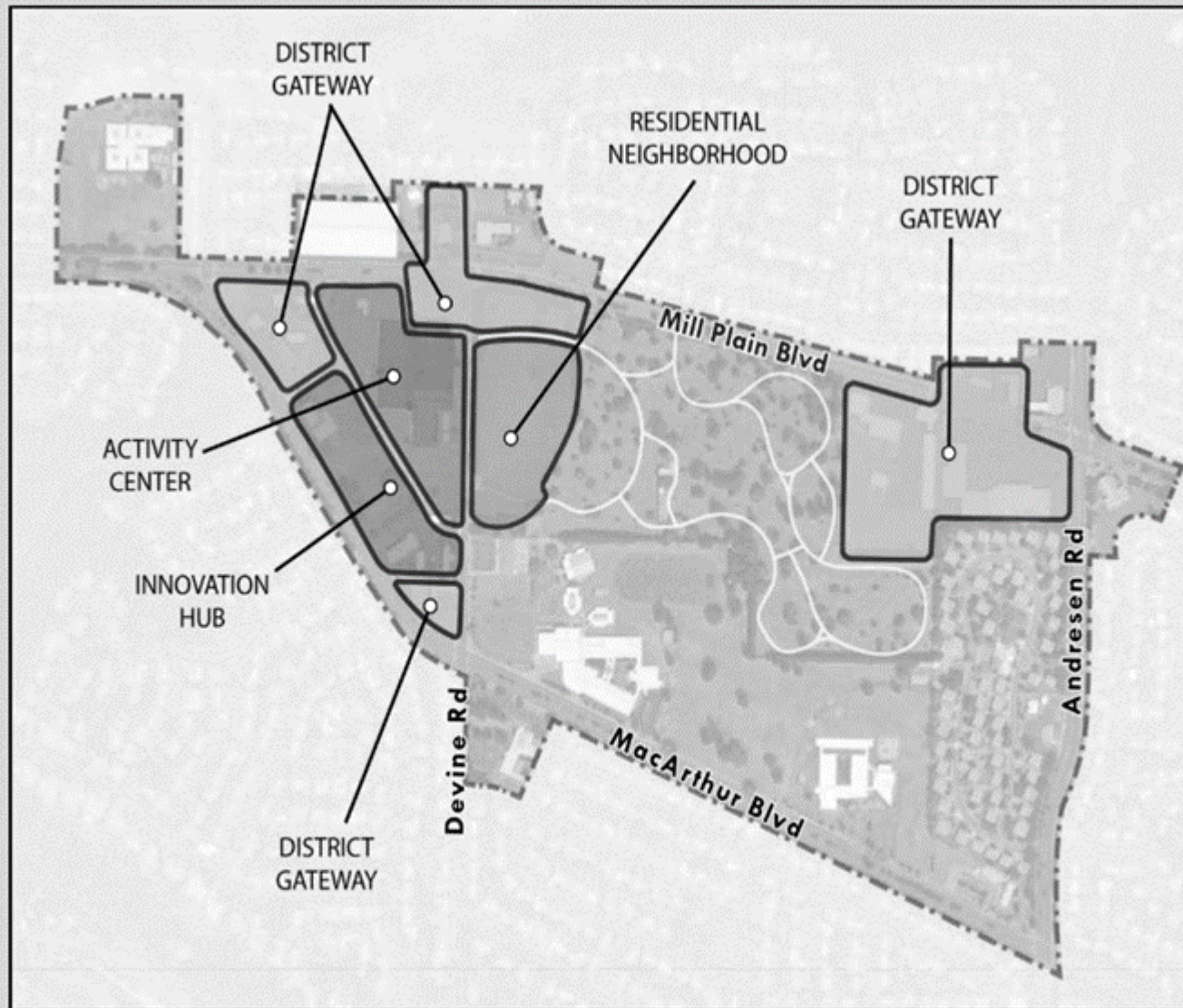


Figure 20.670-1

District and Sub-District Map

Additional HX Code Changes

Divide the definition of commercial frontage in two – Commercial Type 1 to define the active uses such as sales orientated retail and dining establishments and Commercial Type 2 to define all other commercial uses, except office.

- A. *Ground Floor Use Regulation by Frontage Type.* Ground floor uses shall be regulated by Frontage Type as shown in Figure 20.670-2.

1. **Commercial-Type 1 frontage:**

~~a. All commercial uses, except office uses allowed—~~

RECOMMENDATION

a. Only the following commercial uses are allowed—sales-oriented retail; eating, drinking and entertainment establishments; fitness center and community center.

~~a. Residential uses prohibited except residential lobbies and entrances associated with upper story residential uses are allowed but limited to 25% of the total length of the street frontage~~

RECOMMENDATION

b. Residential and office uses prohibited except lobbies and entrances associated with upper story-uses are allowed but limited to 25% of the total length of the street frontage

a. Institutional uses prohibited (No change)

2. **Commercial-Type 2 frontage:**

a. **All commercial uses, except office uses allowed**

Additional HX Code Changes

Modify the Ground-Floor Uses diagram to allow for all types of commercial uses (i.e. Commercial Type 2) at the Safeway site on Mill Plain Blvd. and Andresen Road.

Revised Ground Floor Uses Map

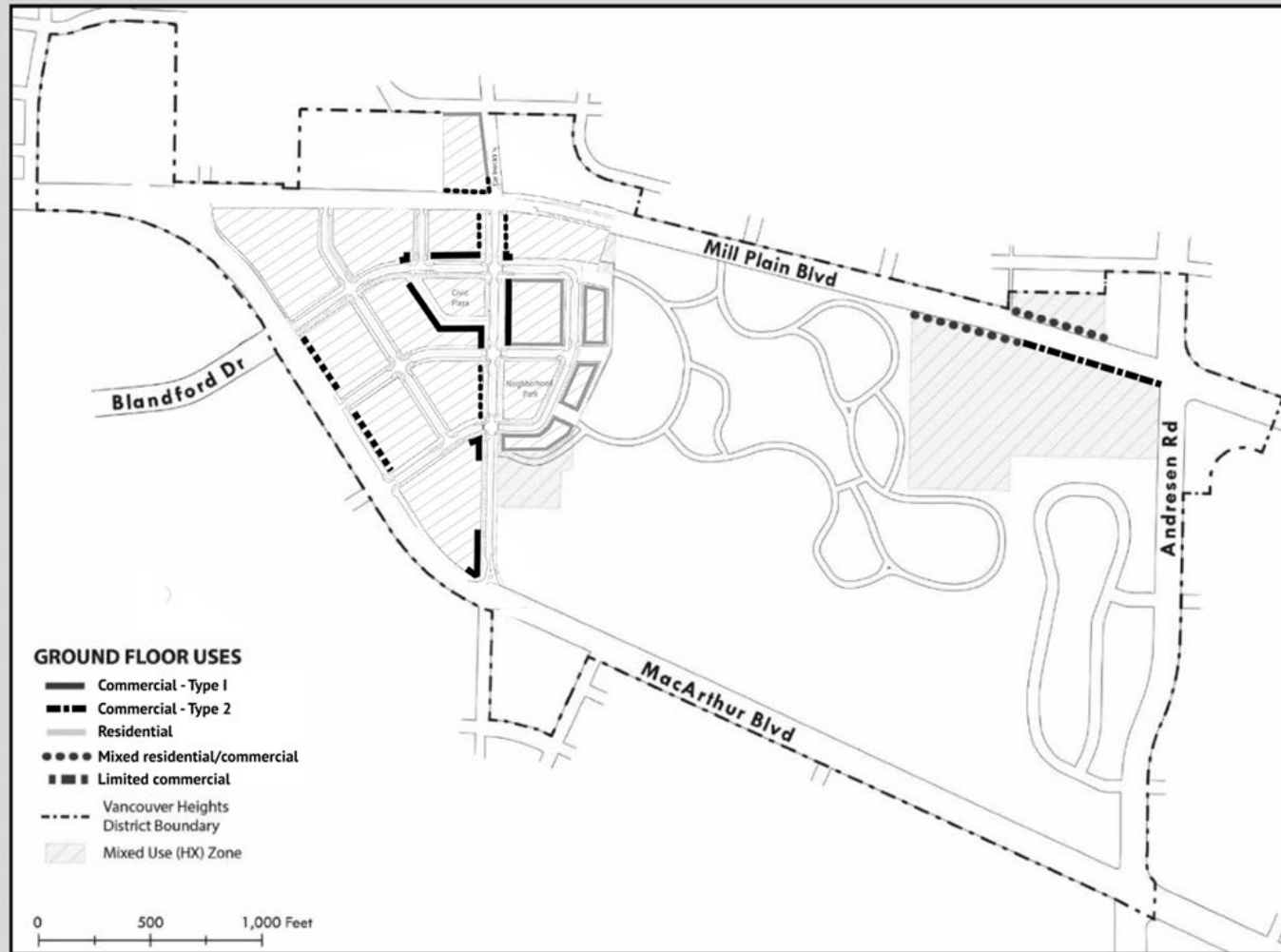


Figure 20.670-2
Ground Floor Uses

Summary of Additional Code Changes

- Increase maximum building height in the District Gateway subdistrict from 50 feet to 55 feet for properties not abutting residentially zoned properties.
- Create two definitions of commercial frontage to differentiate between active retail around the Civic Plaza and all other commercial uses.
- Modify the Ground-Floor Uses diagram to allow for all types of commercial uses (i.e. Commercial Type 2) at the Safeway site on Mill Plain Blvd. and Andresen Road.



Next Steps

- Planning Commission public hearing on all code changes in the Fall
- Council workshop late Summer
- Council public hearing on all code changes in the Fall subsequent to PC public hearing

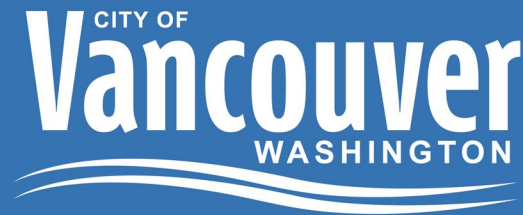
OVERVIEW

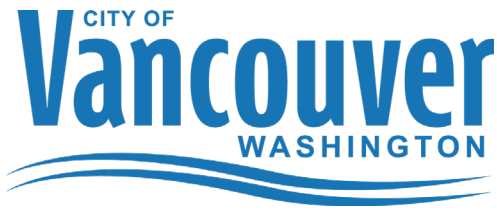


Questions & Discussion

Thank You

To learn more, visit www.beheardvancouver.org/heights-district-plan





MEMORANDUM

DATE: July 12, 2023

TO: Chair Ledell and Planning Commission members

CC: Rebecca Kennedy, Deputy Director Community Development,
rebecca.kennedy@cityofvancouver.us

FROM: Amy Zoltie, Real Estate Project Manager, Economic Prosperity and Housing Department

RE: **Additional Heights Plan District (HX) Code Revision**

Background

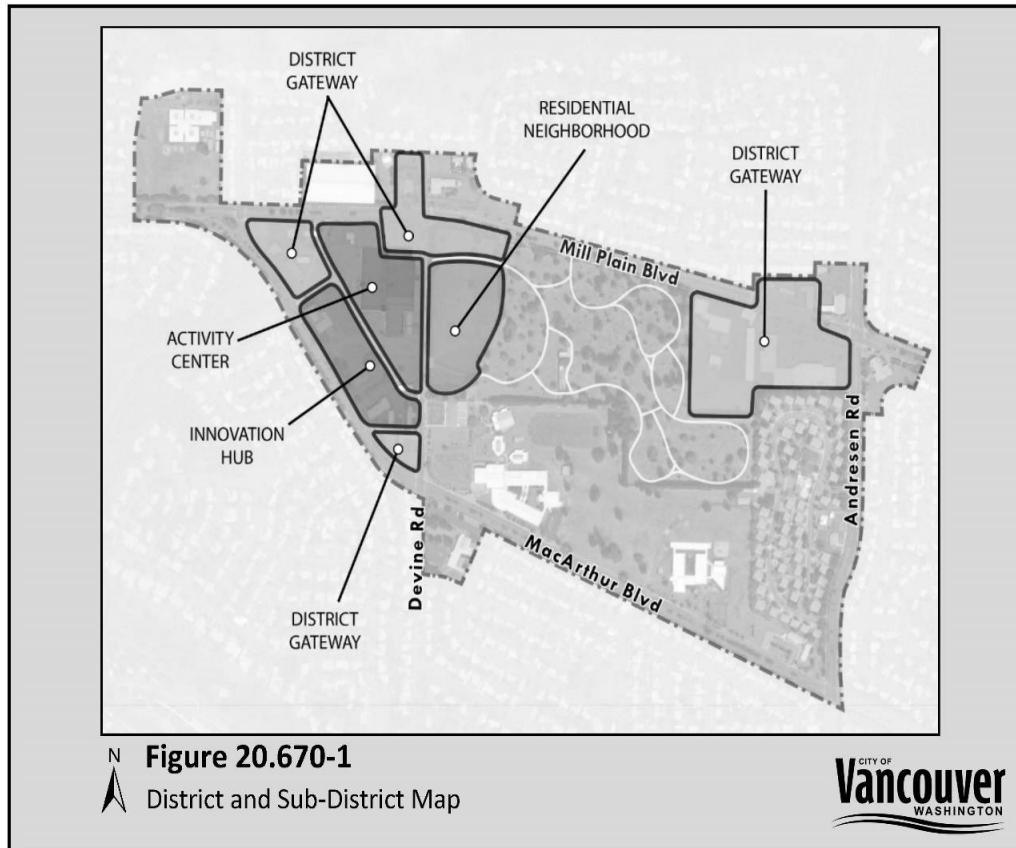
The Heights Mixed Use (HX) Plan District was adopted in 2021 following City Council's approval of the Heights District Subarea Plan in 2020 and after a lengthy community planning process that started with the acquisition of the Tower Mall property in 2017. The Heights District is envisioned as a vibrant 15-minute walkable neighborhood that is safe, accessible, equitable and sustainable, and includes a variety of amenities such as a civic plaza, neighborhood park, linear park spanning almost a mile looping around the Tower Mall site (Grand Loop), mixed-income housing, a variety of commercial space to offer entertainment and services to the community and multimodal travel opportunities throughout the district.

Since the adoption of the HX code, staff has been working to advance the next phases of plan implementation. The City entered into a contract with urban design firm First Forty Feet (FFF) to refine the layout of the district and design the infrastructure. FFF reviewed the Plan recommendations for the Tower Mall Redevelopment Area (TMRA) and recommended a suite of refinements to ensure future development meets the Plan goals and intent, which require several updates to the HX code.

Proposed changes to the Vancouver zoning code text or map not involving Comprehensive Plan changes may be considered at any time, subject to public hearing review before the Planning Commission and City Council. Code amendments were previously brought to the Planning Commission on March 14th and to Council on April 10th, which both indicating overall support for the code refinements. Staff has a couple of additional code changes that was not included in the March 14th discussion to review with the Planning Commission at the July 25th meeting. Staff anticipate bringing all the proposed code amendments forward for future Planning Commission and City Council hearings in the Fall.

Proposed Code Changes

1. Increase maximum building height in the District Gateway subdistrict from 50 feet to 55 feet for properties not abutting residentially zoned properties. For ease of reference, below is the District and Sub-District Map, Figure 20.670-1.



This additional proposed code change addresses a recently raised issue, which is that buildings in the District Gateway subdistrict that do not abut residentially zoned properties cannot develop to their intended building height of four stories and include ground floor commercial, given the requirement in VMC 20.670.040 B 2 that the ground floor of buildings must have a minimum of 16 feet floor to floor height. Increasing the overall building height to address this allows for mixed use buildings that include ground floor retail and three stories of housing above as envisioned in the Heights District Plan and maintain a consistent pedestrian retail experience throughout the district.

To be clear, this increased height limit does not apply to properties abutting residentially zoned properties.

2. Divide the definition of commercial frontage in two – Commercial Type 1 to define the active uses such as sales orientated retail and dining establishments and Commercial Type 2 to define all other commercial uses, except office.
3. Modify the Ground-Floor Uses diagram to allow for all types of commercial uses (i.e. Commercial Type 2) at the Safeway site on Mill Plain Blvd. and Andresen Road.

The proposed changes in bullet points 2 and 3 allow for more flexibility and help differentiate between the active retail uses required around the Civic Plaza and all other commercial uses in the District.

Summary of Previously Discussed Refinements for Reference

As a reminder, the code changes previously discussed at the March 14 workshop are;

- Update the *Ground Floor Use Map*, Figure 20.670-2 consistent with the Master Plan refinements for street layout and block formation.
- Modify the Ground-Floor Use Regulations by Frontage Type to promote active retail, entertainment, and dining oriented to the Civic Plaza.
- Adjust portions of text to maintain consistency and delete some unclear or non-essential narrative.
- Consider adding a new standard to regulate off-street parking access by limiting vehicle pedestrian, and bicycle conflicts and better promote non-motorized access and use of the Grand Loop.

Next Steps

Staff will return to the Planning Commission for a public hearing in the Fall with the complete package of code amendments and will return to Council for a workshop late Summer to address this additional code change with the intent to schedule a Council public hearing after the Planning Commission public hearing in the Fall.

Staff Contact Information

Amy Zoltie, Real Estate Project Manager, amy.stewart@cityofvancouver.us, 360-305-1909

Attachments:

Attached is a tracked changes copy of VMC 20.670 to identify the whole package of proposed changes.

FIRST FORTY FEET

Planning
Urban Design
Place Strategy

412 NW Couch,
Ste 205
Portland, Oregon
97209
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www.firstfortyfeet.com

CHAPTER 20.670

THE HEIGHTS (HX) PLAN DISTRICT

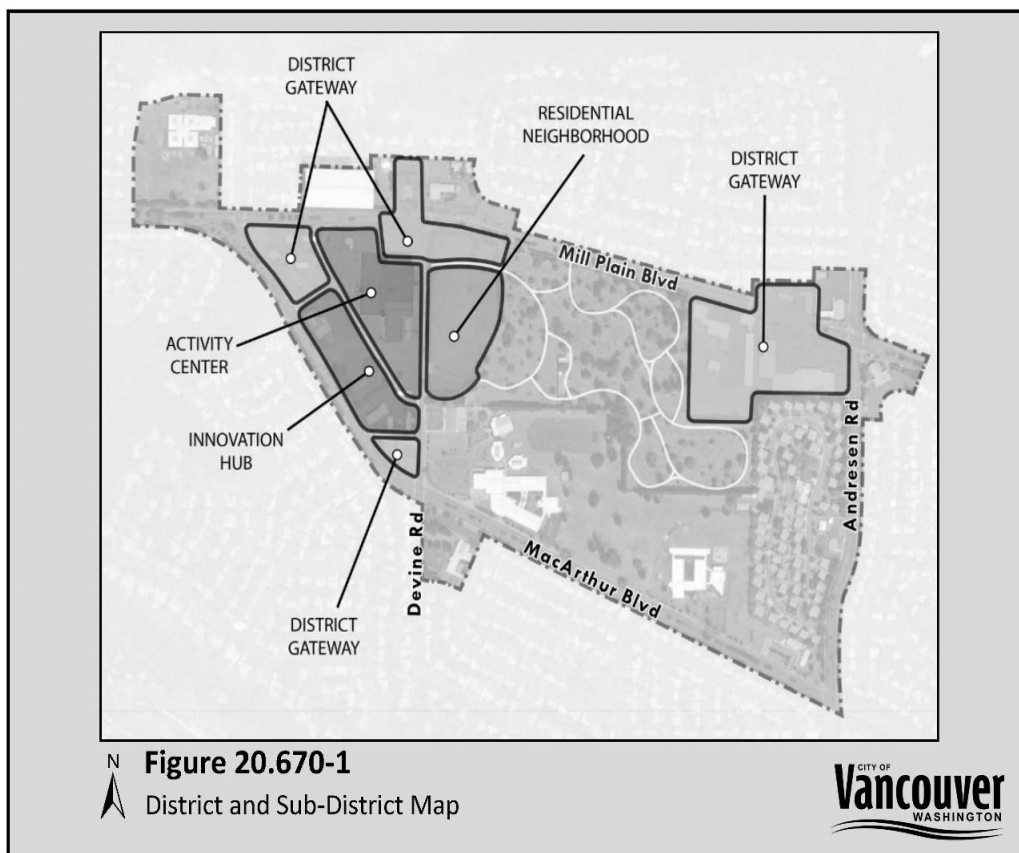
20.670.010 Purpose

The Heights District is envisioned as a vibrant neighborhood center that is sustainable, healthy, equitable, accessible and safe, and includes a mix of complementary uses, engaging public open space, diverse housing affordable to a wide range of community members and safe multimodal travel opportunities within the district and to transit and nearby neighborhoods. The purpose of the Heights Mixed Use (HX) Plan District is to implement the vision, goals, and policies of the Heights District Plan, and ensure future development is integrated, cohesive, context sensitive and contributes to the overall District Vision.

20.670.020 Applicability

These standards apply to the properties within the subdistrict areas shown on Figure 20.670-1. These standards shall be in addition to other applicable standards of Vancouver Municipal Code or state law, and shall supersede those standards where they conflict

Figure 20.670-1. District and Sub-District Map (No change)



20.670.030 Regulation of Uses

A. Uses are allowed as specified in Table 20.430.030-1 and as shown in Figure 20.670-2, subject to standards and guidelines for The Heights District established in this Chapter.

B. *Ground Floor Use Regulation by Frontage Type.* Ground floor uses shall be regulated by Frontage Type as shown in Figure 20.670-2.

1. **Commercial-Type 1 frontage:**

- a.  commercial uses, except office uses allowed

RECOMMENDATION

a. Only the following commercial uses are allowed—sales-oriented retail; eating, drinking and entertainment establishments; fitness center and community center.

- b. ~~Residential uses prohibited except residential lobbies and entrances associated with upper story residential uses are allowed but limited to 25% of the total length of the street frontage~~

RECOMMENDATION

b. Residential and office uses prohibited except lobbies and entrances associated with upper story-uses are allowed but limited to 25% of the total length of the street frontage

- c. Institutional uses prohibited (No change)

2. **Commercial-Type 2 frontage:**

- a.  commercial uses, except office uses allowed

RECOMMENDATION

a. Add this Commercial Type 2 to the Gateway zone at Mill Plain and Andresen to allow all types of commercial uses (Safeway Site- CE Johnson property)

- b. Residential uses prohibited except residential lobbies and entrances associated with upper story residential uses are allowed but limited to 25% of the total length of the street frontage.

RECOMMENDATION

b. Retain this language from the original Commercial frontage definition

- c. Institutional uses prohibited (No change)

c. Retain this language from the original Commercial frontage definition

3. **Residential frontage: (No Change)**

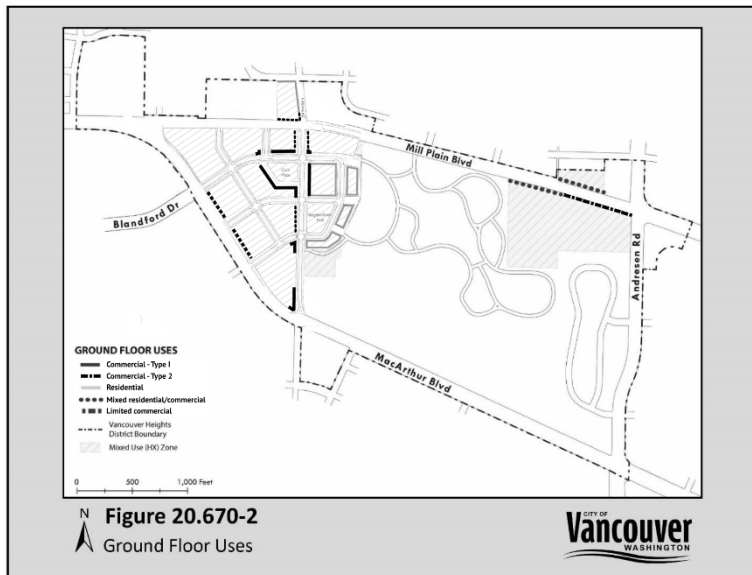
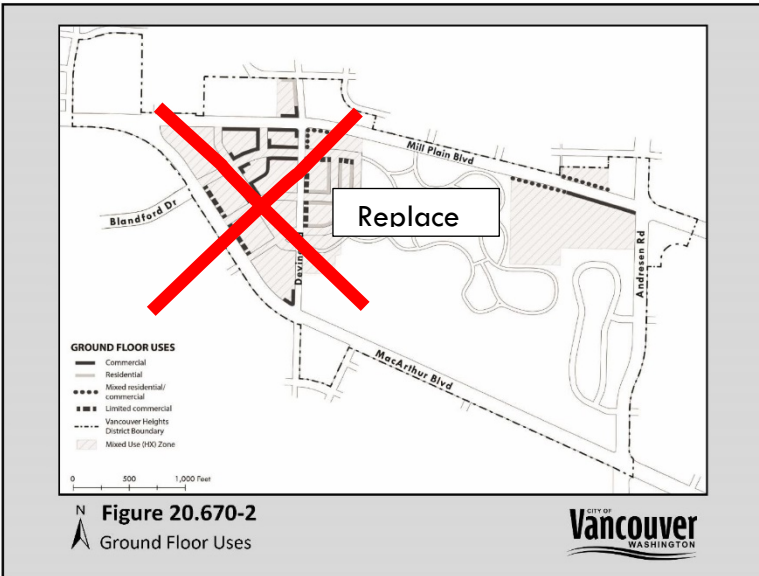
- a. Residential uses allowed
b. Commercial and institutional uses are prohibited

4. **Mixed Residential/Commercial frontage: (No Change)**

- a. Commercial uses allowed
b. Residential uses allowed but limited to no more than 50% of the total length of street frontage
c. Institutional uses prohibited

5. Limited Commercial frontage: (No Change)
 - a. Residential uses allowed
 - b. Commercial uses allowed but limited to no more than 25% of the total length of street frontage
 - c. Institutional uses prohibited

Figure 20.670-2. Ground Floor Use Map



C. Live/work uses and standards.

Live/Work. A commercial space where residential and commercial uses are combined and where the dwelling unit is the principal residence of the business operator/proprietor.

1. Uses.

- a. Live/work uses are permitted where commercial uses are permitted in the District Gateway and Innovation Hub sub-districts of the HX District.
- b. The following commercial uses are prohibited in live/work units.
 - 1. Any use not permitted in the HX District, as specified in Table 20.430.030-1;
 - 2. The retail sale of food and/or beverages with customers arriving on-site. This does not include online (Internet) sales, mail order, or off-site catering preparation;
 - 3. Entertainment, drinking, and public eating establishments;
 - 4. Veterinary services, including grooming and boarding, and the breeding or care of animals for hire or for sale;
 - 5. Businesses that involves the use of prescription drugs.
- c. A live/work unit is allowed instead of, or in addition to, a home occupation.
- d. The residential and the commercial space must be occupied by the same tenant, and no portion of the live/work unit may be rented or sold separately.

2. Standards.

- a. The commercial use may occupy a maximum of 50 percent of the unit floor area.
- b. Residential uses are permitted above, to the side, or in back of the commercial use, provided that there is internal access between the residential and commercial uses;
- c. Signage intended to promote on-site commercial uses shall be restricted to two square foot signs permanently affixed to door or wall of the commercial use;
- d. No more than one employee (excluding residents of the dwelling unit) shall work or report to work on the premises, and the employment of any persons who do not reside in the live/work unit shall comply with all applicable building code requirements;
- e. Off-site impacts of the commercial use, such noise, glare, and vibration, shall be subject to City performance standards in VMC 20.935.030; and
- f. Explosive, toxic, combustible, or flammable materials in excess of what is allowed incidental to permitted residential uses shall not be stored or used on the premises.

20.670.040 Design and Development Standards

A. MASSING AND SCALE

- 1. *Minimum Density.* The minimum residential densities in Table 20.670.040-1 shall apply in the HX District.

Table 20.670.040-1. Minimum Residential Density

Sub-District	Minimum Density
Activity Center	75 dwelling units/acre
Residential Neighborhood	45 dwelling units/acre
Innovation Hub	30 dwelling units/acre
District Gateway	30 dwelling units/acre

2. *Building Heights.* The building height standards in Table 20.670.040-2 shall apply in the HX District.

Table 20.670.040-2 Maximum Building Heights

Sub-District	Maximum Height
Activity Center	Maximum of 85 feet
Residential Neighborhood	Maximum of 85 feet
Innovation Hub	Maximum of 50 feet
District Gateway	Maximum of 55 feet not abutting residentially zoned properties
Sub-District	Maximum Height
	Maximum of 40 feet abutting residentially zoned properties
	Maximum of 35 feet fronting Idaho Street

Note: For the Heights District, abutting is defined as sharing a property line with residentially zoned property

3. *Height exceptions.* In addition to the height exceptions allowed by VMC 20.910.030, maximum height limitations set forth in this Chapter and elsewhere in this Title shall apply to the following in the HX District:
- a. Parapets and railings. Parapets and rooftop railings may extend 4 feet above the maximum height limit;
 - b. Walls or fences located between individual rooftop decks may extend 6 feet above the maximum height limit if the wall or fence is set back at least 4 feet from the edges of the roof;

- c. Rooftop mechanical equipment, any required screening for the mechanical equipment, and stairwell enclosures that provide rooftop access may extend above the maximum height limit as follows, with the requirement that the equipment and enclosures must be set back at least 15 feet from roof edges on street-facing facades:
 - 1. Elevator mechanical equipment may extend up to 16 feet above the maximum height limit; and
 - 2. Other mechanical equipment, required screening, and stairwell enclosures may extend up to 10 feet above the maximum height limit.
- d. Roof-mounted solar energy production equipment may extend up to 3 feet above the maximum height limit; and
- e. Wind energy production equipment may extend up to 30 feet above the maximum height limit.
- 4. *Building step downs and transitions.* In the District Gateway sub-district, building heights shall be reduced to a maximum of 40 feet within 60 feet of a shared property line with residential uses, and a maximum of 35 feet within 140 feet of Idaho Street.
- 5. *Building facades.* Building facades shall not exceed 165 feet in length without an intervening break.
- 6. *Build to Line.*
 - a. Building shall comply with the provisions of VMC 20.630.020 that describe building lines provisions for street frontages except no portion of the structure shall extend into the right of way except as specified in VMC 20.670.040.E.2. Residential uses may include setbacks per VMC 20.670.040.C.2.
 - b. Setbacks for pedestrian amenities. Setbacks up to 20 feet for up to 50% of the building frontage is allowed if the setback is used for a walkway, plaza, courtyard, or other pedestrian-oriented amenity or public space.
- 7. *Ground floor plane.* For buildings five stories and above, the maximum ground floor plate area shall not exceed 16,000 square feet. An option to this standard is to demonstrate significant massing breaks in the building façade to include recessed breaks (minimum of 20 feet in length and depth) and ground plane openings as pedestrian connections.

B. MODULATION AND FAÇADE ARTICULATION

- 1. *Ground floor transparency.* Buildings with ground floor commercial uses visible from the public way or public areas such parks and other publicly accessible space shall have a minimum 75% ground level façade transparency between 2 feet and 8 feet above sidewalk grade.
- 2. *Ground floor to floor height.* The ground floor of buildings shall have a minimum of 16 feet building floor to floor height.
- 3. *Modulation.* A minimum building modulation along the façade shall be one foot in depth and the minimum width shall be five feet.
- 4. *Building entry.* Main entrances shall be easily identifiable through the use of building articulation and modulation. Avoid recessed doorways to provide high visibility from the public way.

C. ENTRANCES

1. *Ground floor level.* Ground floor residential uses shall be elevated above the sidewalk grade a minimum of 2 feet 6 inches to create privacy adjacent to the public realm. For these units, ensure an alternate access point that is accessible (as required by the Building Code)
2. *Entryways.* Ground floor residential entrances shall be setback from the property line a minimum of 6 feet and a maximum of 10 feet to ensure privacy from the public realm. Porches, patios, private spaces allowed within the setback.
3. *Recessed ground floor level.* Recessed ground floors shall be restricted to one level height, except at main entrances.
4. *Vehicle entries.* For mixed use residential and commercial buildings requiring vehicular garage entrances, the garage opening shall be setback from the building frontage a minimum of six feet. Adhere to all required visual sight setbacks.
5. *Townhome Garage Parking.* A minimum of 3-foot setback shall be applied for alleyway garage or tuck under parking.

D. ROOF FORMS

1. *Roof lines.* The length of any continuous flat roofline shall not exceed more than 165 feet 100 feet without modulation. The minimum modulation for roof lines is 3 feet.
2. *Roof Materials.* Roof materials shall meet the minimum SRI (solar reflectance index) standards to reduce urban heat gain. Inappropriate materials such as wood singles, cement tiles and plastic slate and shingles shall be discouraged.
3. *Roof Top Projections.* Elevator cores, stair projections, solar panels and mechanical equipment shall be incorporated into the architecture of the building with consistent building materials. See VMC 20.670.040(A)(3) for provisions regarding height, setbacks, and screening of roof top features.
4. *Roof Decks.* Accessible roof decks shall provide safety setback standards from the roof edge and mechanical equipment as required.

E. SECONDARY ARCHITECTURAL FEATURES

1. *Visual Interest.* Add visual depth to facades where appropriate by incorporating balconies, canopies, awnings, decks, or other secondary elements into the façade design.
2. *Encroachment.* A building's enclosed occupiable space shall not encroach into the right-of-way, with the exception of bay windows or balconies. Bay windows and balconies shall not extend more than 4 feet into the right-of-way and 30% of width of residential units or 50% of the width of hospitality units.
3. *Weather Protection.* Overhead weather protection shall be provided along all streets with a minimum clear height of 10 feet and maximum clear height of 15 feet consistent with the provisions of VMC 20.630.030 except in instances where the pedestrian amenities articulated in section A.6.b of this chapter are utilized.
4. *Pedestrian oriented features.* At least 75% of the width of any new or reconstructed ground-level building wall facing a street shall be devoted to pedestrian-oriented features or material variation, pedestrian entrances and/or windows affording views into retail, storefront, office or lobby space.

5. *Blank walls.* Continuous blank walls shall not exceed 15 feet in length. Where blank walls are present, incorporate a range of design approaches such as green walls, façade articulation, art or other approved applications to create interest at the adjacent pedestrian area.

F. MATERIALS AND COLORS

1. *Prohibited materials.* The following are prohibited exterior building materials: plastic laminate, glossy or large expanses of acrylic or plexiglass, pegboard, mirror, highly polished or plated metals (except as a trim), mirrored glass, fabric or paper wall coverings, plywood or particle board, sheet or modular vinyl, shingles, shakes and horizontal lap siding.
2. *Mechanical equipment.* Mechanical equipment and above grade utilities shall be located or screened with quality materials to minimize visual impact on the public right-of-way.

RECOMMENDED LIMITED ACCESS STANDARD:

The following standard is recommended for restricting vehicular access to off-street parking and loading areas to promote safe and comfortable pedestrian access to the Heights District' Grand Loop, Civic Plaza and multimodal access along Mill Plain Boulevard.

Staff should determine the most appropriate location for this standard as part of the HX Zone or alternatively in the T-08 Series

Limited Access Frontages.

Vehicular access to development sites is prohibited along key frontages, where indicated, to reduce conflicts between automobiles and pedestrians and promote a safe and pleasant experience for walking. Vehicular access is restricted to one-curb-cut per block frontage where indicated.





Burnt Bridge Creek West Zone Change – follow up critical lands discussion Vancouver Planning Commission Communications July 25, 2023



Bryan Snodgrass
Principal Planner
Community Development Department

Change from OCI to IL zoning on 33-acre site at 6103 NE 152nd Avenue





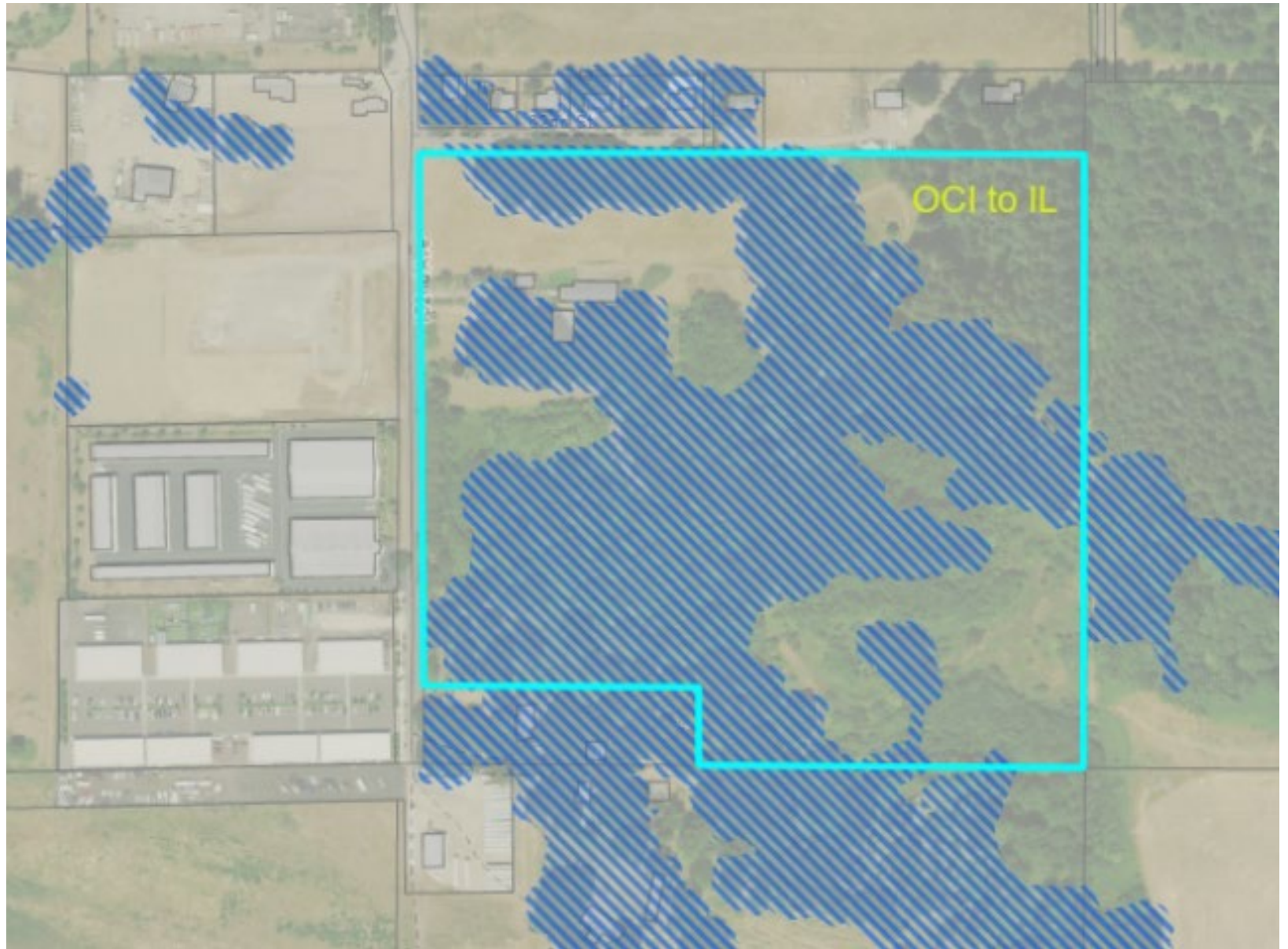
CITY OF
Vancouver
WASHINGTON



Application

- Approval criteria requires demonstration that proposed zoning is more consistent than existing zoning with the City Strategic and Comprehensive Plans, and demonstration of a change in circumstances since adoption of existing designation. Possible and likely development should inform consideration of proposed and existing zones.
- Application argues the proposal offers more flexibility to meet overall industrial goals, will provide 200-300 jobs, help meet current consumer needs, and will provide fiscal benefits.
- Workshop review continued from June 13 for further information on critical lands development implications

GIS mapping of critical lands— Property heavily forested with Oregon White Oak Habitat (blue)



Background – Critical areas review

- Applied by City of Vancouver during development review process with same criteria under any zone. Demonstration of no net loss of habitat function and values required.
- Washington Department of Fish and Wildlife guidance for Oak Habitat under review. Preliminary indication is this proposal may involve need for potential off-site planting of 10-12 new acres, and off-site enhancement of 40 or more acres.
- Applicant's environmental consultant has begun discussion with WDFW.

Discussion and Q&A

- Amaia Smith, Washington Department of Fish and Wildlife
- Keith Jones, City of Vancouver
- Applicant
- Return to Commission for questions and identification of issues in advance of planned September 12 public hearing



State of Washington
DEPARTMENT OF FISH AND WILDLIFE
Southwest Region 5 • 5525 South 11th St Ridgefield, WA 98642
Telephone: (360) 696-6211 • Fax: (360) 906-6776

April 6, 2023

Bryan Snodgrass, Principal Planner
Vancouver Community and Economic Development
415 W 6th St
Vancouver, WA 98660

RE: Burnt Bridge Creek West Zone Change

Dear Mr. Snodgrass

Thank you for the opportunity to comment on the Burnt Bridge Creek West Zone Change. The Washington Department of Fish and Wildlife (WDFW) has reviewed the proposal and offers the following comments for your considerations.

WDFW is concerned that the proposed rezone and subsequent future development of the parcel will lead to unavoidable impacts on the priority Oregon white oak (OWO) woodland. WDFW recommends that the City of Vancouver explore other zoning options that reduces conflict between protecting the resource and reasonable use of property.

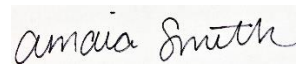
The *Proposed Burnt Bridge Creek West Zoning Map Designation Change* presentation presented by Bryan Snodgrass, Principal Planner for the City of Vancouver on March 14, 2023, indicates that a 275,000 square foot warehouse is proposed in the northern portion of this parcel tentative on zoning approval. We are concerned that changing the zoning to light industrial will not allow flexibility in avoiding impacts to the priority OWO woodland and the resulting development will degrade habitat. While we recognize the need for Light Industrial zoning and development, we do not believe this parcel is best suited to meet those needs. The OWO woodland within this parcel occupies approximately 27* of the 33 acres and is a part of a larger, contiguous OWO woodland that is approximately 41 acres*. Additionally, several acres of this contiguous oak stand are actively managed by the Terrace Oak Mitigation Bank. Stands this large are rare in Clark County and almost completely absent within the City of Vancouver. Because of the rare and valuable nature of the OWO woodland of this size, we recommend for the City of Vancouver to explore ways to keep this parcel as green space while encouraging industrial development on parcels that do not have significant conflict with priority habitats of this significance.

* Calculations are estimates based on WDFW PHS aerial imaging and have not been field verified.

If this zoning is approved, however, we recommend placing the southern portion of this parcel, outside of the proposed development footprint, into a conservation easement. A significant portion of the stand is located outside the proposed footprint and protecting it in an easement would prevent future development impacts that would be difficult, if not impossible, to mitigate for. We also request being consulted for the review of the compensatory mitigation plans prior to the City approving any development on this site. We are currently updating our recommendations for mitigating for Oregon white oaks and the best available science indicates mitigation is needed to offset the temporal loss of habitat *in addition to* the physical loss of trees. Based on this information, compensatory mitigation requirements will likely be greater than what has been required in previous development proposals. Due to the significant acreage of OWO woodland on site, the compensatory mitigation required will likely be complex and we want to ensure that any mitigation achieves no net loss of function.

Thank you for considering our recommendations to protect this priority habitat. We hope that the City gives special consideration to this property due to the size and location of this priority OWO woodland. Furthermore, we encourage the City to have additional conversation to determine the best use of this property, given the valuable habitat on site.

Sincerely,

A handwritten signature in cursive script that reads "Amaia Smith". The signature is written in dark ink on a light-colored background.

Amaia Smith
Habitat Biologist,
Washington Dept of Fish and Wildlife
5525 South 11th St.
Ridgefield, WA 98642



June 14, 2023

Vancouver Planning Commission
415 W 6th Street
Vancouver WA, 98660

Dear Commissioners,

Our firm represents Panattoni Development, applicant for a rezone at 6103 NE 152nd Ave, Vancouver, WA, 98682, parcel number 159112000. We are happy to respond to questions raised by the Commission during its June 13 workshop.

Site Plan:

We submitted a conceptual site plan with the rezone application based on a request from staff. It's been our experience over 20+ years, that jurisdictions often want non-project rezones to submit conceptual site plans to allow for a general analysis of potential impacts. For example, we recently did a rezone in a city that corrected an inconsistency between the comprehensive plan's land use designation (mixed use) and zone (single family residential) where the jurisdiction wanted to see the maximum development potential (even if it wasn't the final site plan proposed) in order to understand potential traffic and other concerns.

The conceptual site plan you have for this proposal is just that, a concept. It is meant to show commissioners what the maximum development footprint could look like given the zone. Given the present uncertainty resulting from the warehousing moratorium, our client has not yet developed a formal site plan and any formal site plan will more specifically reflect site and market conditions.

Further, it should be noted that in the memo for the June 13 workshop, staff states that "a detailed State Environmental Policy Act review would need to be conducted following formal submittal of a site plan." Again, it is the formal site plan review process, not a conceptual site plan presented for a standalone rezone, that will be reviewed for compliance with city codes and standards, including the items that have been commented on by the Washington Department of Fish and Wildlife.

Dimensional Standards:

We fully understand and appreciate the Commission's interest in critical areas and how they may be protected. Regardless of which zone applies, any critical areas that may be on the site are required to be protected in the same manner under the city's code. Thus, a rezone does not change the requirements to identify and protect critical areas.

Comparing the dimensional standards for the current Office Commercial Industrial (OCI) zone to the proposed Light Industrial (LI) zone would result in a reduction in the maximum site coverage allowed according to Table 20.440.040-1, which establishes the maximum site coverage for OCI at 100% versus a limit of 75% in the LI zone.

Additionally, building height in the OCI zone can be as much as 75 feet, while buildings in the LI zone have a maximum height of 45 feet. In sum, the proposed rezone from OCI to LI actually results in greater restrictions on the future development of the site because it does not allow 100% of the site to be covered by development. This should lessen concerns about future environmental impacts including those expressed by the Department of Fish and Wildlife. The most appropriate time for addressing these comments is during the formal site plan review, which process has not been applied for yet. The fact of the matter is that the proposed rezone will allow for more of the site and trees present to be preserved than if it were developed under the current zoning designation.

Warehousing Moratorium:

As the city council and city staff continue to work on the warehousing moratorium, it is important to reiterate that this rezone stands independent from those deliberations. Our client does not have a formal or final development plan for this site. It is important to note that our client submitted an application for this rezone nearly a month before the warehousing moratorium was passed and their goal

has been to gain approval of the LI zone so that whatever their formal site plan proposes, it can be marketed to the greatest range of likely industrial tenants.

We look forward to the opportunity to present at the Planning Commission hearing in July and can further address any questions you may have at that time.

Thank you.
Sincerely

Peter Condyles
Senior Project Manager

FIRCREST NEIGHBORHOOD ASSOCIATION’S STATEMENT RE:
PROPOSED SEPA THRESHOLD CHANGES

The Fircrest Neighborhood Association met on June 6, 2023, to discuss the proposal to adopt loosened state environmental regulations for new residential developments.

The Fircrest Neighborhood Association understands the need for increased housing in the City of Vancouver and recognizes that these changes would increase the construction of single- and multi-family housing projects.

However, one role of government is to balance competing goals, and the goals that are supported by the SEPA process are important.

The State Environmental Policy Act known as SEPA has been around since 1971. The SEPA process helps cities analyze the environmental impacts of proposed construction projects while (1) protecting environmental impacts on floodplains, wetlands, trees, archeology and water and (2) mitigating impacts from traffic and surface run-off. These issues can affect other residents in the area.

The SEPA process acts as a safeguard, providing another “**pair of eyes**” to ensure our environmental and archeological treasures are preserved. SEPA offers an explicit “**guideline**” for environmental protection as well as providing an important process to appeal decisions. Changing the thresholds, especially the multi-family housing threshold from 20 units to 200, increases the probability that environmental and archeological issues will be overlooked, resulting in damages in the very areas that SEPA is intending to protect. It is also very concerning that there would be **no opportunity to appeal decisions in order to address SEPA-related concerns**.

The memo presented by the City Manager states that developments under 200 units rarely have issues arise through the SEPA process, but “rarely” indicates that there have in fact been instances when the SEPA process has discovered problems and led to mitigation measures.

The Fircrest Neighborhood Association (FNA) has consistently advocated for the environment and supported Vancouver’s rich culture of caring for the natural resources around us. The City of Vancouver has shown time and time again the value it places on green spaces and the environment. Loosening the state environmental regulations tilts the balance too much toward development and away from protecting the environment. It would be sad and concerning to see the City of Vancouver shift away from its own principles of environmental sustainability and the value it places on “parks, green spaces, and other natural systems” (December, 2022 Climate Action Framework).

Votes in favor - 14

+ 2 who had to leave the meeting early before all the revising/editing was done.

Votes opposed - 0

+1 who had to leave the meeting early before all revising/editing was done.

Reasons for opposition: Concerns about limited housing in the city and the resulting high cost of housing

Abstained - 0

From: [Don Steinke](#)
To: [Planning Commission](#)
Cc: [Cathryn Chudy](#); [Heidi Cody WCA](#)
Subject: Written comment re Warehouse ordinance
Date: Tuesday, July 25, 2023 11:24:44 AM

CAUTION: This email originated from outside of the City of Vancouver. Do not click links or open attachments unless you recognize the sender and know the content is safe.

To the Vancouver Planning Commission

I hope to provide the following public comment at your meeting today, July 25, 2023

Hello, my name is Don Steinke. I'd like to discuss resource adequacy. That's a common term in the field of electric energy. Will we have enough energy and will we have enough transmission. The answer is a triple NO.

No, we don't have enough energy, and No we don't have enough transmission, and No we can't even count on existing resources because the law requires us to phase out polluting resources such as the gas plant at Terminal 5.

Suggestions:

1. Consider adding a requirement that the roofs of all new warehouses (both small and large) be solar ready.
2. If possible, require new warehouses to have solar plus batteries and be net zero energy by 2030. The Inflation Reduction Act is providing huge incentives for solar and batteries between 2026 and 2032.
3. Require that all heating systems be heat-pumps.
4. Require the fleets to comply with the advanced Clean Fleets rule of California, within one year of California's requirement.
5. Make the facility transit friendly and bike friendly. Consider some e-cargo bikes.
6. Use traffic impact fees to reduce congestion and improve safety for the bike/ped/transit sector.
7. Require landscaping equipment to be battery electric.
8. Forbid truck idling. Provide compatible electricity for refrigerated trucks and crew-cab HVAC.
9. If gasoline or diesel fueling stations are included, require financial assurances up to \$50 million, in the event of a leak from a underground storage tank. The Federal requirement (\$1 million) is not adequate.

From: [Cathryn Chudy](#)
To: [Planning Commission](#)
Subject: Citizen Communication
Date: Tuesday, July 25, 2023 12:03:56 PM
Attachments: [2023-07-25 City of Vancouver Planning Commission Public Comments.pdf](#)

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Please accept these comments for the July 25th meeting re: Proposed Warehouse Code Amendments

Thank you,

Cathryn Chudy

Vancouver resident

To: City of Vancouver Planning Commission and Staff
Public Comments/July 25, 2025/Cathryn Chudy
Re: Proposed Warehouse Code Amendments

I really appreciate the work of City staff reflected in the materials that are included in the presentation and Memo for the Warehouse Code Amendment process.

I am glad to see the thoughtful consideration of measures to minimize potential negative impacts on our community, and ensure that permitted large warehouses will not just provide economic benefit for Vancouver (job creation and tax revenue) but also address transportation infrastructure issues as well as align with climate and equity goals and priorities.

The listing of “fixes” to identified issues, addressing predictable impacts, and especially those relating to Climate Action Policy/Energy, are listed in the Memo and outlined in the slide presentation. I see these as a listing that is minimum and that can be strengthened.

The illustration on p.20 is more detailed and thorough, than what is listed in both the Memo (pp. 9-10) and slide presentation pages (pp. 22-24) and should be considered as additions for potential proposed code amendments .

Onsite renewable energy will require permitting that specifies that the warehouses be rooftop solar ready, so I would like to see this included explicitly in the code amendments, as well as many of the energy use and emissions reduction features that are seen in the p. 20 illustration.

The impacts that come with this size facility must be balanced with as many mitigation measures as possible built into the permitting and approval process, in order to ensure that our community has the protections it needs and that the alignment with our climate and equity policies is as strong as possible.

Much appreciation for your careful consideration of the Proposed Warehouse Code Amendments and public feedback on this.

Cathryn Chudy
Vancouver WA resident

From: [Don Steinke](#)
To: [Planning Commission](#); [Eiken, Chad](#); [Person, Mark](#)
Cc: [Snodgrass, Bryan](#)
Subject: Don Steinke"s revised comments, on warehouse ordinances
Date: Tuesday, July 25, 2023 8:24:43 PM

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Hello, my name is Don Steinke.

Great presentations today.

Here are my revised comments [in blue](#) regarding warehouses.

I'd like to discuss resource adequacy regarding warehouses. Resource adequacy is a common term in the field of electric energy. Will we have enough energy and will we have enough transmission. The answer is a triple NO.

No, we don't have enough energy, and No we don't have enough transmission, and No we can't even count on existing resources because the law requires us to phase out polluting resources such as the gas plant at Terminal 5.

Here are some suggestions to consider for your warehouse ordinances.

1. Consider adding a requirement that the roofs of all new warehouses be solar ready. That's for both small and large warehouses. [That's more than orientation. It means the roof needs to be strong enough and the conduit in place before sheetrock is installed.](#)
2. Going beyond that, require new warehouses to actually have solar plus batteries and be net zero energy by 2030. The Inflation Reduction Act is providing huge incentives for solar and batteries between 2026 and 2032. [Your suggestion to require that 75% of the on-site energy consumption be renewable could increase demand for electricity from Clark PUD's fossil fuel power plant. The law requires them to phase it out by 2045, but we can and must phase it out sooner.](#)
3. Require that all heating systems be heat-pumps. [District heating with ground-source heat-pumps is ideal for large projects. Kudos to Melissa Von Borstel for bringing it up.](#)
4. Require the fleets to comply with the Advanced Clean Fleets rule of California, within one year of California's required schedule.
5. Make the roads near the project safe for pedestrians and bikes. Consider e-cargo bikes instead of trucks where appropriate.
6. Use traffic impact fees to improve mobility and safety for the bike/ped/transit sector.
7. Require landscaping equipment to be electric.
8. Forbid truck idling. Provide compatible electricity for refrigerated

trucks and crew-cab cooling and heating.

9. If gasoline or diesel fueling stations are included, require financial assurances up to \$50 million, in the event of a leak from an underground storage tank. The Federal requirement of \$1 million is not adequate.

10. Instead of lawns, plant native trees.

11. Ban diesel trucks built before 2010. (California has done that.)

12. Regarding building color, consider solar windows. They exist. I believe they're made in Germany.

13. Regarding proximity to SR 500 – the Orchards Intersection is one of the most congested in the County

14. ^{re} Brian Snodgrass's presentation on other developments. The conversation about trips generated seems to be business as usual, BUT, the Climate Amendment to the GMA requires we reduce per-capita vehicle miles travelled.