Microsoft Urban Futures Summer Workshop

July 29, 2020

Using Campuses in the Cascadia Corridor to Advance Smart City Innovation

Jonathan Fink

Portland State University

Digital City Testbed Center

University of British Columbia

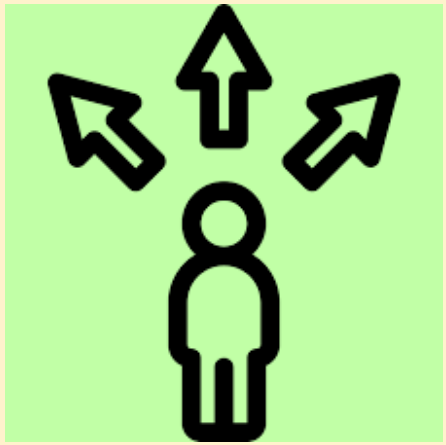
Cascadia Urban Analytics Cooperative

jon.fink@pdx.edu

Three *Challenges* of Smart Cities

How do cities evaluate their smart options?

How does the public assess smart futures?

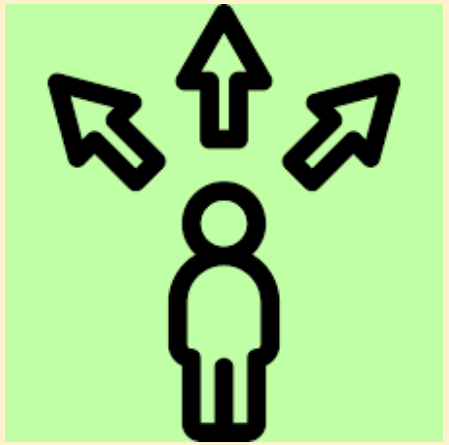


How do companies align smart products?

All Three Groups Need *Tech* to be *Tested*

How do cities evaluate their smart options?

How does the public assess smart futures?



How do companies align smart products?

Campuses can be useful *Smart City Testbeds*

Digital City Testbed Center seeks to fill this gap

Urban-immersed

55 acres

Portland State University

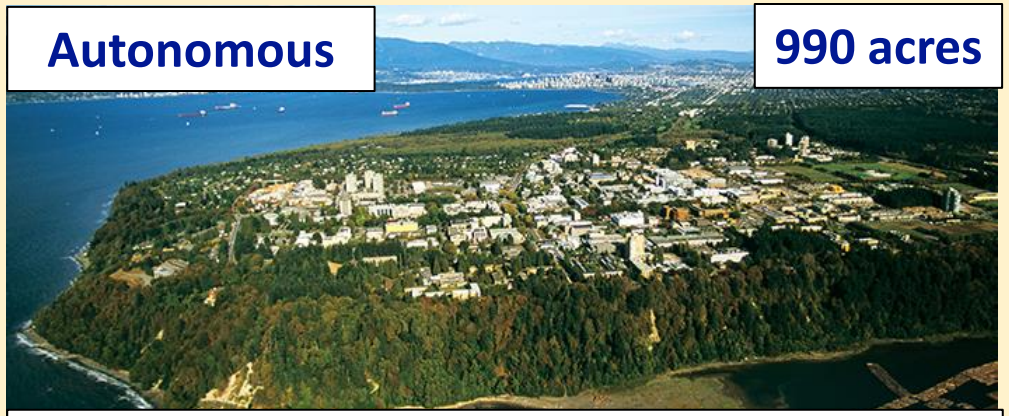
Greenfield development

18 acres

Oregon Museum of Science & Industry

Autonomous

990 acres



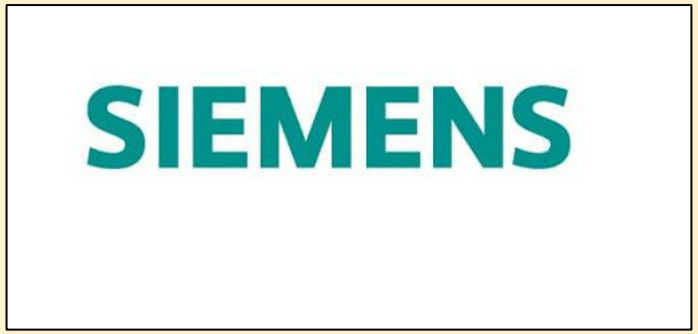
University of British Columbia


Digital City Testbed Network
PSU
OMSI
UBC
2019
UW Bothell
UW Seattle
UW Tacoma
UW
PDX Airport
2020
Microsoft
OR Health & Sci Univ
Oregon Zoo
2021

Digital City Testbed *Rationale*

1. **Test before deployment**
2. **Partner with cities**
3. **Use academic, corporate, non-profit campuses**
4. **Focus on “Cascadia” region of OR, WA, and BC**
5. **Address replicability, interoperability, and data sovereignty**
6. **Applications: Accessibility, Resilience, Public Education**

DCTC & Portland Infrastructure Partners



"Smart" Urban Applications and Technology

Hello Lamp Post

Sensible Building Science

Wayfindr

Downtown.ai

DOWNTOWN.AI

Numina

NUMINA
real-time insights from streets

Blue City Technology

Blue City Technology

WayMap

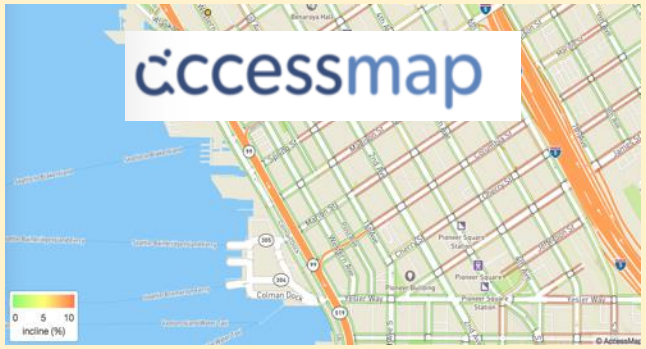
Waymap

Ike Smart City

ike
SMART CITY

Array of Things

AccessMap



GoodMaps

DigiTel

דיגיתל
העירייה מקוונת אליך
ONLINE MUNICIPAL SERVICES

PSU-Portland Smart Campus *Corridor*

Issues

Restricted Mobility

Restricted Vision

Bike-car Collisions

Outdoor Air Quality

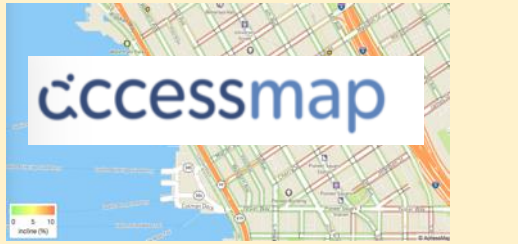
Indoor Air Quality

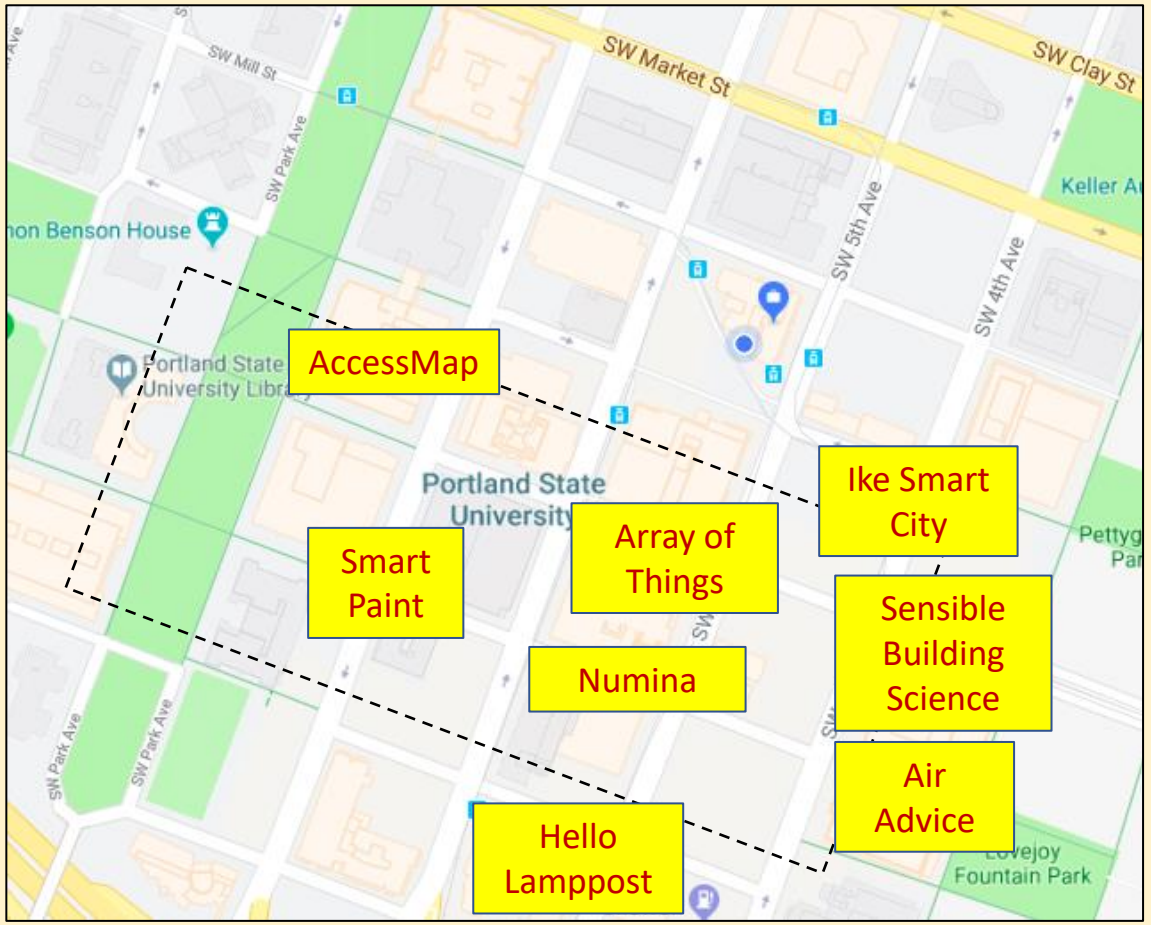
Building Occupancy

Public Education

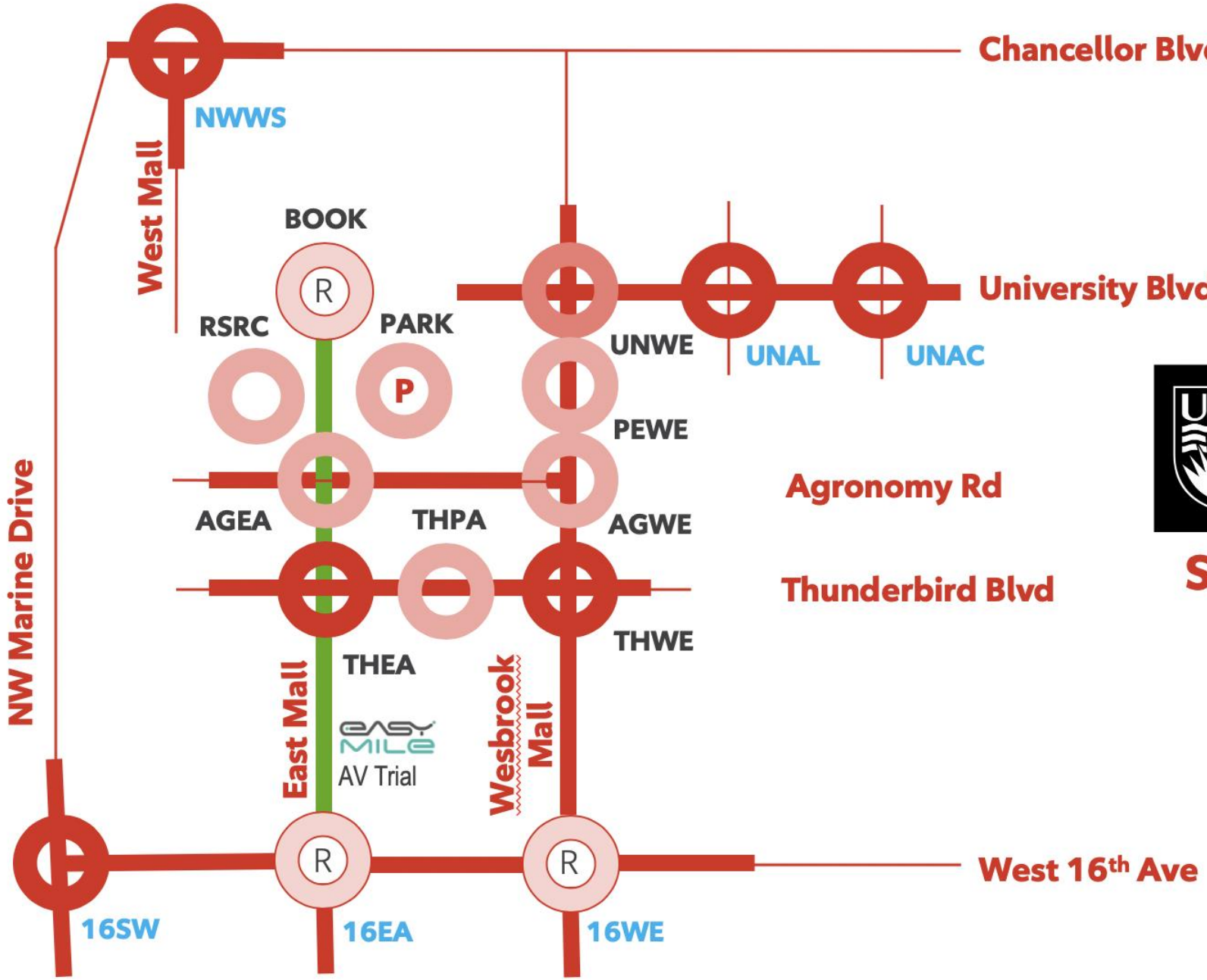
Public Feedback

PSU-Portland Smart Campus Corridor





UBC AURORA Connected Vehicle Testbed



UBC AURORA
Connected Vehicle Technology Testbed
http://aurora.ece.ubc.ca

System Layout - 2.0

- Installed
- Planned
- R Roundabout*

NWWS BC MOTI site

UNWE UBC Site

Co-located technologies: UBC Aurora Testbed

Sensible Building Science

WiFi-based occupancy data linked to HVAC

Numina:

Video monitoring of traffic

Hello Lamppost:

SMS-based info exchange

Downtown.ai:

Maps human motion based on navigation app data

AccessMap:

Help people in wheelchairs avoid slopes

Kapsch:

Connected vehicles technology

Blue City Technologies:

LiDAR monitoring of traffic

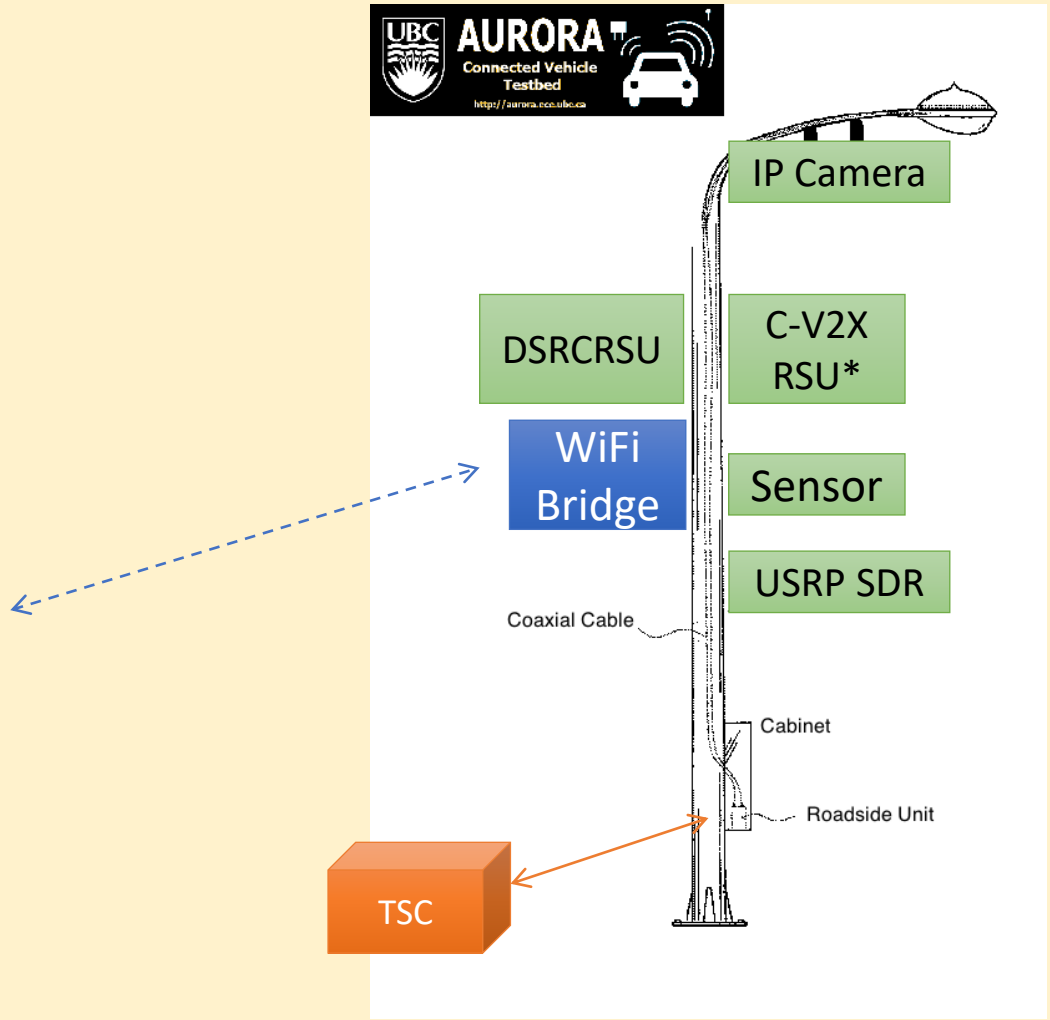
Waymap:

Indoor/outdoor mapping apps for visually impaired

Rogers Communications:

5G testbed at UBC

A Typical AURORA Intersection



ROGERS

5G

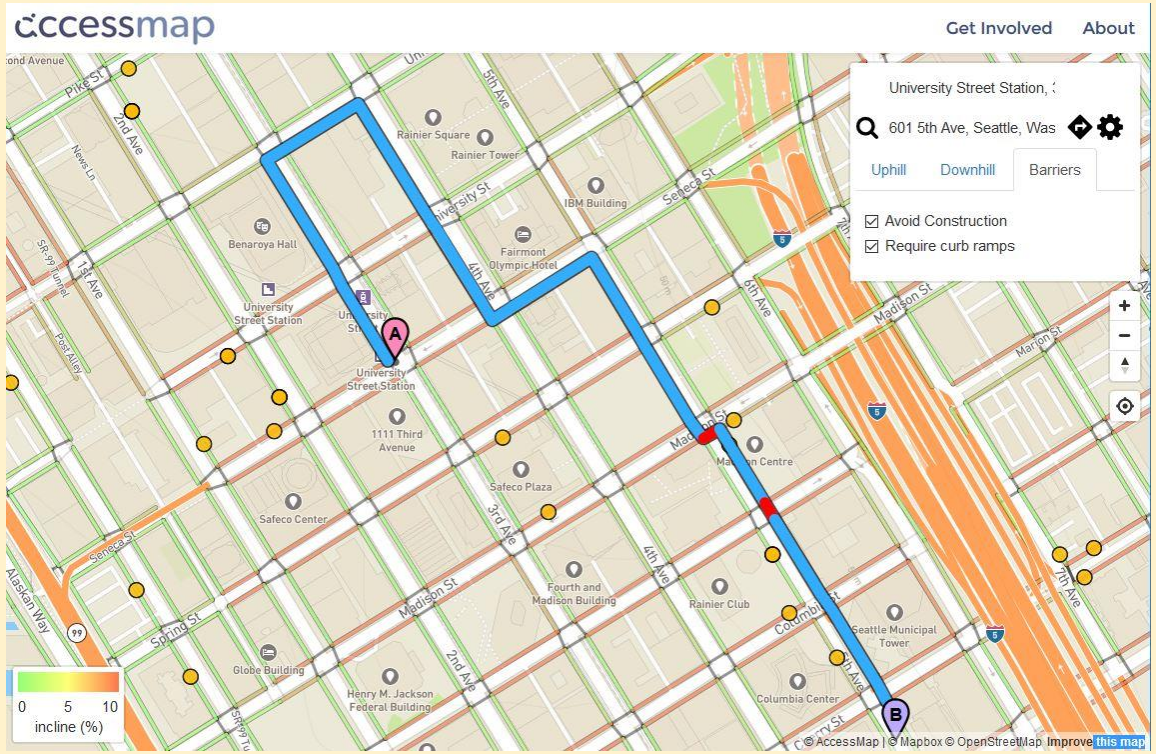
Comprehensive roadside infrastructure givers AURORA flexibility in conducting ITS studies.

Track near-collisions of vehicles with bikes, pedestrians

- **Vehicle tracking**
- **Bicycle tracking**
- **Pedestrian tracking**

- **Smart PDX and DCTC shared cost**
- **Deploying first on UBC campus**
- **Camera anonymizes all images**

Help people in wheelchairs avoid steep slopes



Access Map

- **Maps topography and obstructions**
- **Tracks accessible elevators**
- **Finds routes with gentlest slope**

- **Developed at Univ. of Washington**
- **1st on UW campus, then UBC, PSU**
- **Useful for cities and universities**

Help visually-impaired pedestrians navigate

Audio feedback
Tactile feedback through canes
Indoor/outdoor navigation help

WayMap

Waymap

"Smart Paint"

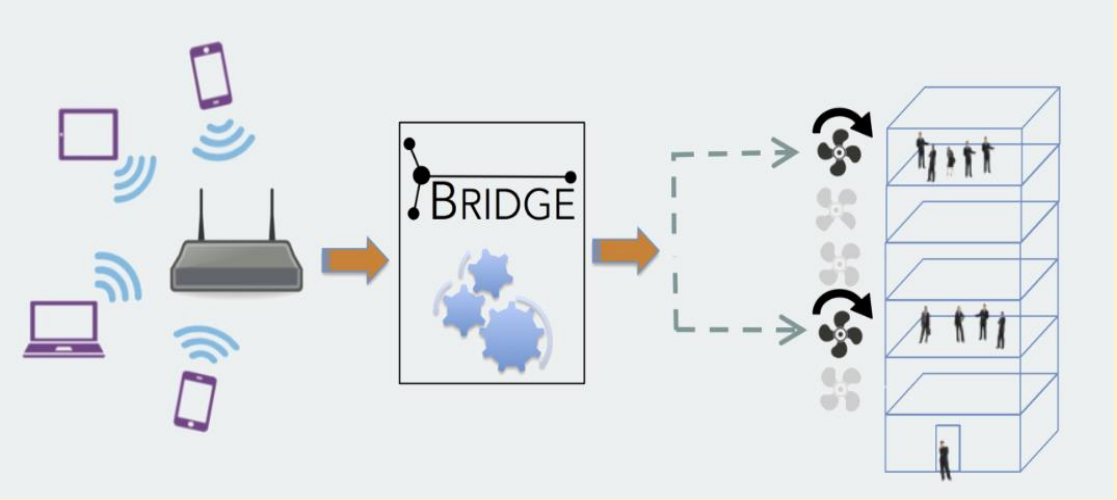
INTELLIGENT MATERIAL

Aira

aira

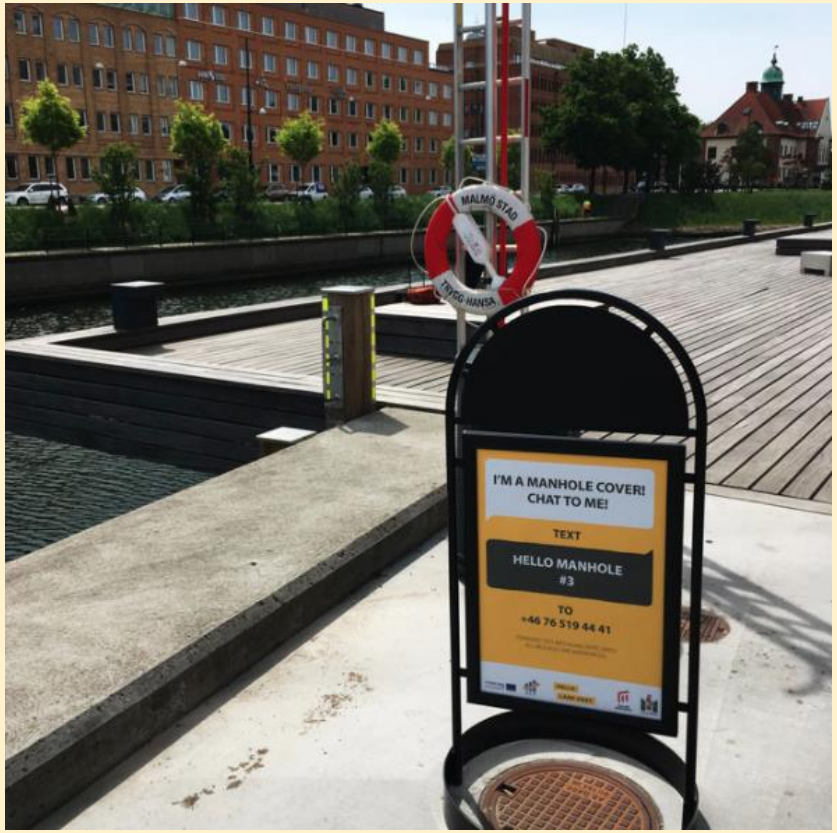
Occupancy data adjusts airflow for re-opening

Sensible Building Science (SBS)



Cisco routers track room occupancy
SBS links occupancy to HVAC controls
Increase airflow where people are

Educate and query the public about technology



Use kiosks to inform

Use Hello Lamppost to engage

Educate and get feedback

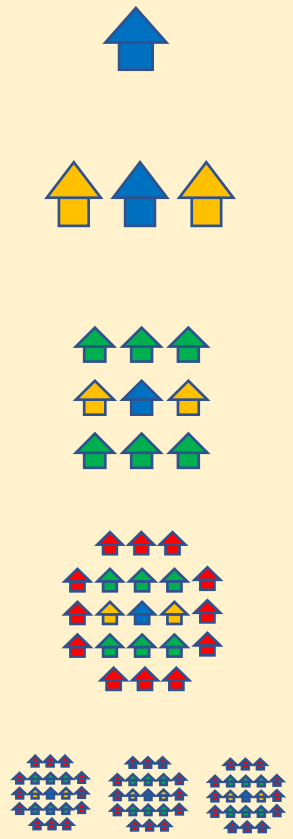
Hello Lamppost

Hello UBC

Hello Kitty (Oregon Zoo)

Smart urban innovation can apply at all scales

- **Household/block**
- **Neighborhood/Campus**
- **City**
- **Metro**
- **Regional (Megapolitan)**



Smaller scales easier to influence

Larger scales have more impact

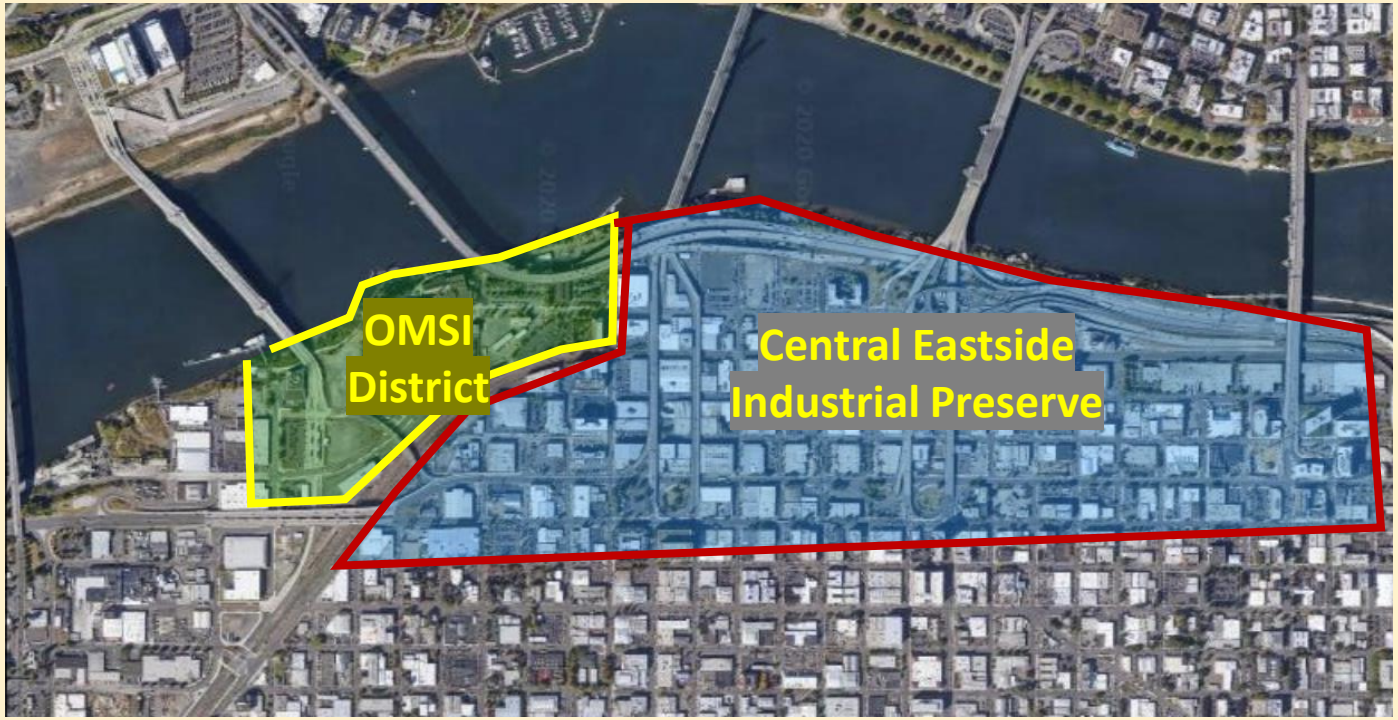

PSU


PSU
OMSI


PSU
OMSI
Central Eastside

Expand from Campus to District Scale

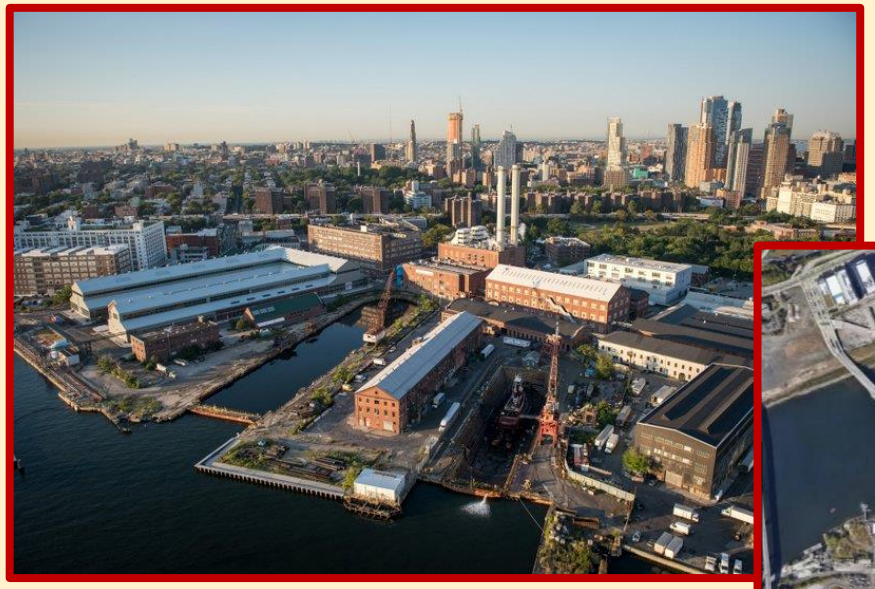
OMSI = 18 acres



Central Eastside = 600 acres

Central Eastside Industrial Preserve

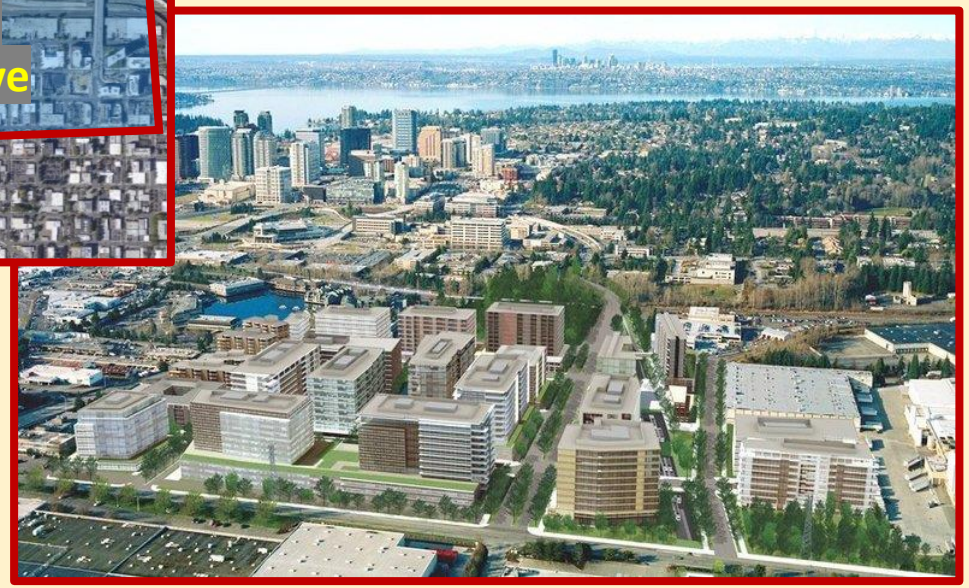
Expand from Campus to District Scale



Brooklyn Navy Yard
NY

Central Eastside
Industrial Preserve

Bellevue Spring District
WA



Vancouver

Seattle

Portland

Expand from

City Scale to

Metropolitan Scale to

Megapolitan Scale

Vancouver, Seattle and Portland form the *Cascadia Innovation Corridor*

Homogeneous
Green
Socially aware
Tech-savvy
Geologically unstable

University of Victoria
UBC
SFU
WWU
Hootsuite
TELUS
BOEING
Microsoft
intel
NIKE
amazon

Summary: *DCTC* and *Cascadia Corridor*

- Cities and universities partner to evaluate tech on campuses
- Assess positives and negatives of urban technology
- Co-locate technologies to look for new synergies
- Scale from campus to district to city to metro to megapolitan