Using Campuses in the Cascadia Corridor to Advance Smart City Innovation

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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
  - Portland State University
  - 55 acres

- Greenfield development
  - Oregon Museum of Science & Industry
  - 18 acres

- Autonomous
  - University of British Columbia
  - 990 acres
Digital City Testbed Network

OMSI

UBC

PSU

UW Bothell

UW Seattle

UW Tacoma

Microsoft

OR Health & Sci Univ

Oregon Zoo

PDX Airport

2019

2020

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
“Smart” Urban Applications and Technology

- Hello Lamp Post
- Sensible Building Science
- Blue City Technology
- Downtown.ai
- Ike Smart City
- Array of Things
- DigiTel
- “Smart” Urban Applications and Technology
- Numina
- Wayfindr
- WayMap
- GoodMaps
- AccessMap
- Hello Lamp Post
- Sensible Building Science
- Blue City Technology
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- Wayfindr
- WayMap
- GoodMaps
- AccessMap
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

Public Feedback

Restricted Mobility

Public Feedback

Restricted Vision

Outdoor Air Quality

Car-bike hazards

Public Education

Indoor Air Quality

Building Occupancy
PSU-Portland Smart Campus Corridor
UBC AURORA Connected Vehicle Testbed
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

Comprehensive roadside infrastructure gives 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

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

Access Map

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

Occupancy data adjusts airflow for re-opening
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
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

OMSI District
Central Eastside Industrial Preserve

Bellevue Spring District
WA

Central Eastside Industrial Preserve
Expand from City Scale to Metropolitan Scale to Megapolitan Scale

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

Homogeneous  
Green  
Socially aware  
Tech-savvy  
Geologically unstable

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