Future Cities: Big Data, Resilience & Human Centered Design

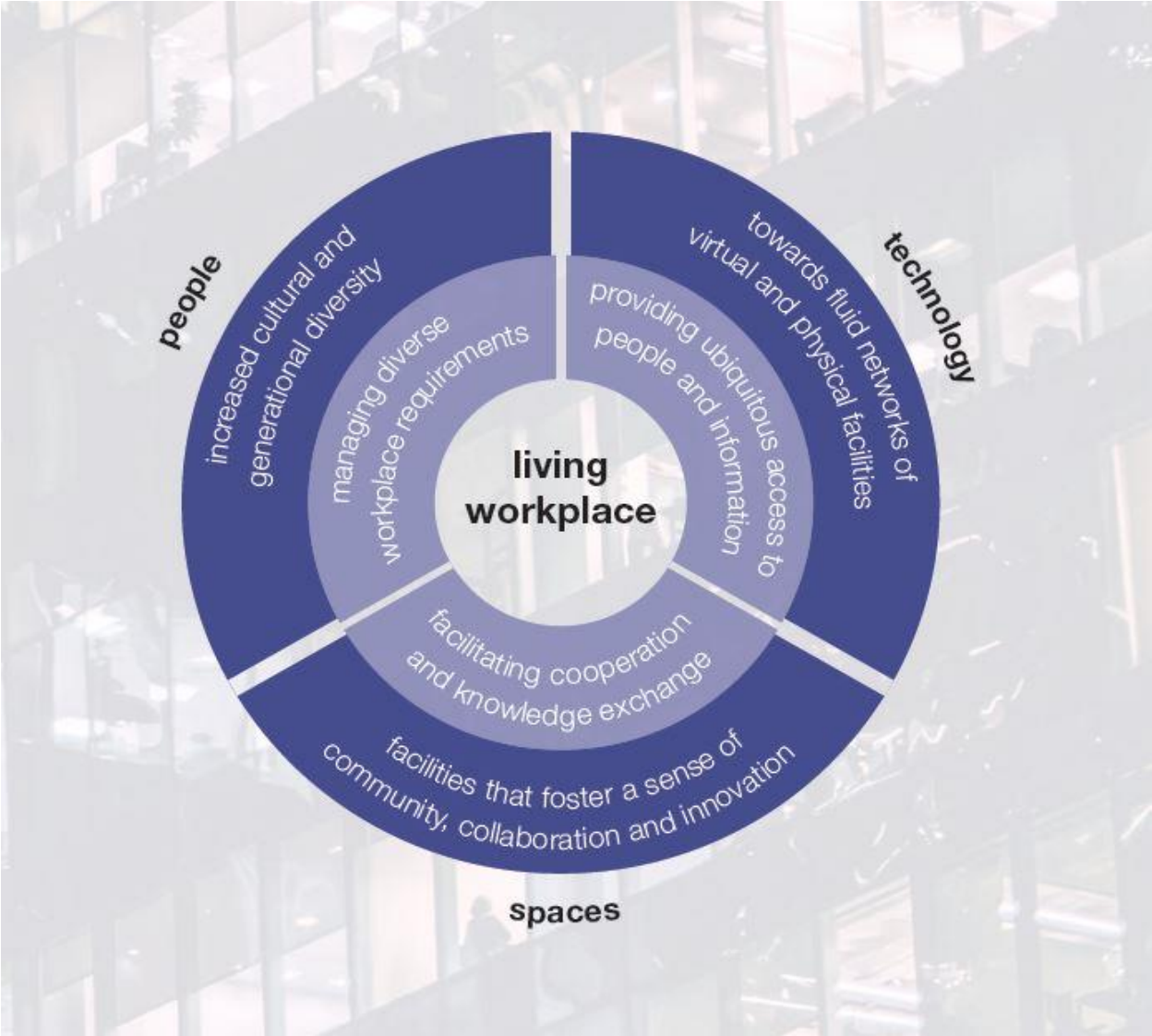
Dr. Sara Diamond, OCAD University

Design + Smart Cities + Quality of Life

Integrated Planning and Execution

Strategic Foresight + Design Thinking

Living Workplace, ARUP



City as a Wealth of Data

iCity concept of city systems as nested structures

Figure 2: Hierarchical Approach to Urban Systems

Meyer & Miller (2013)

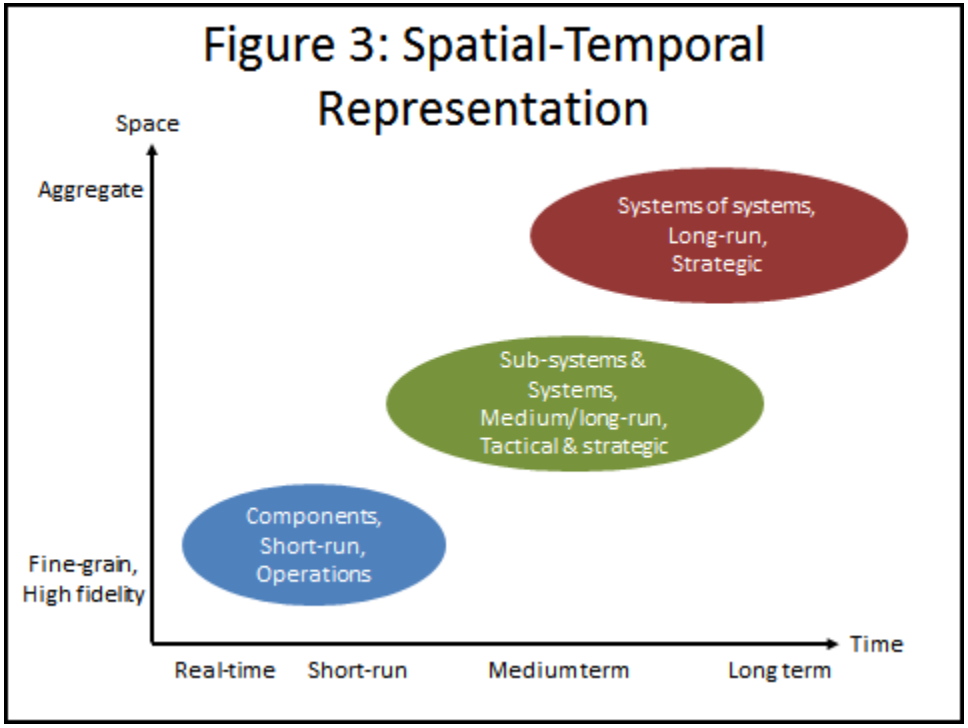
Each system decomposes into sub-systems; E.g., "the" transportation system consists of:

- The road system
- Transit system
- Active transportation system
- Operating agencies
- ....

Each "system" interconnects & interacts with other systems

Cities (urban regions) are "systems of systems".

Modeling systems relationships



Smart Cities Canada

- Focus on inclusion – solving economic disparity in cities
- Efficiency of service delivery – e.g. digital identities
- Citizen engagement
- Predictive Analytics
- Resilience
- Taking Ontario Mobile strategy/Service Canada – integrate three levels of government services, support to businesses

Urban Prototyping Movement

- Urban Data Challenge
- Open data "hackathon"
- Merge and compare mobility data sets from three cities—San Francisco, Geneva, and Zurich—and draw meaningful insights.

Dots on the Bus,

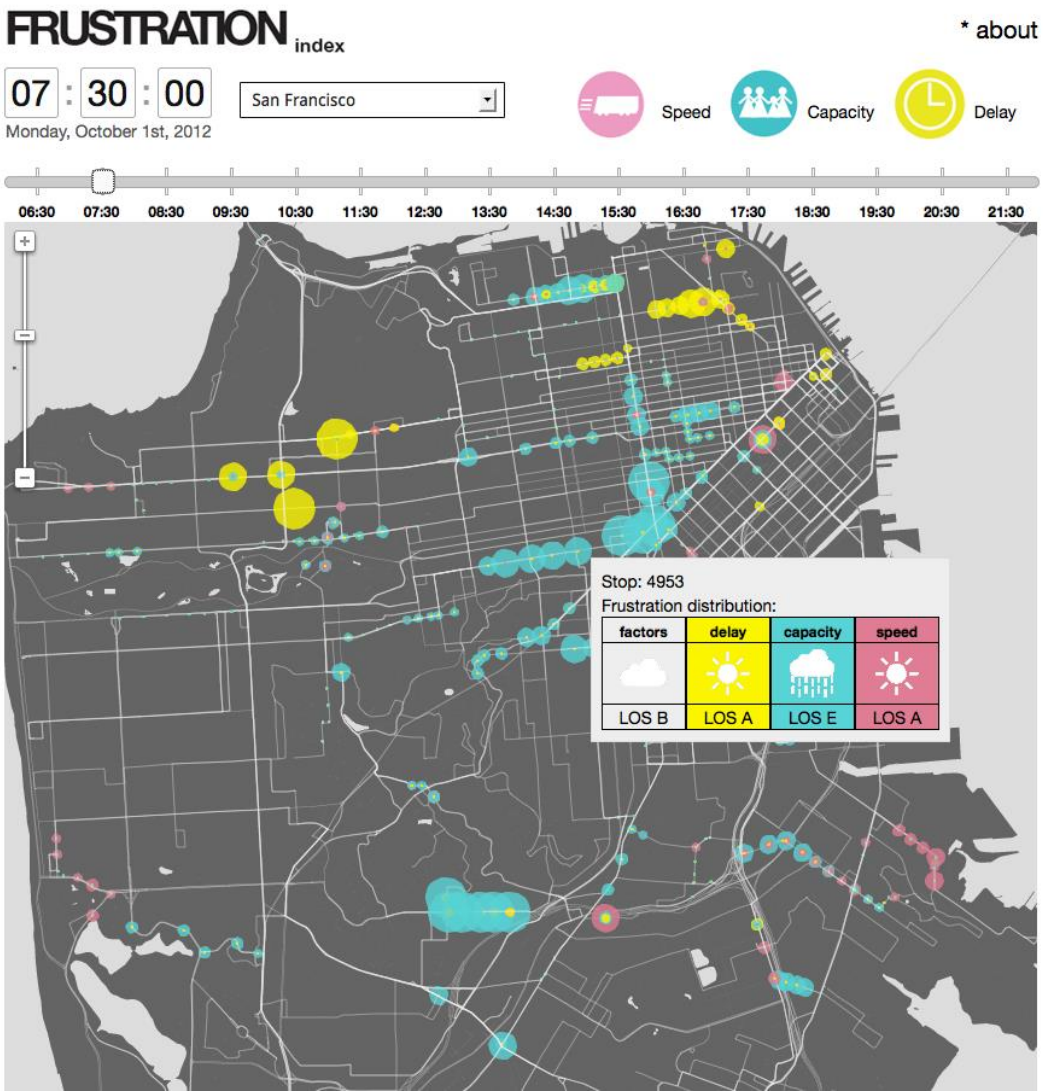
Adam Greenhall, Amelia Greenhall,
Jared McFarland

Transit Quality and Equity,

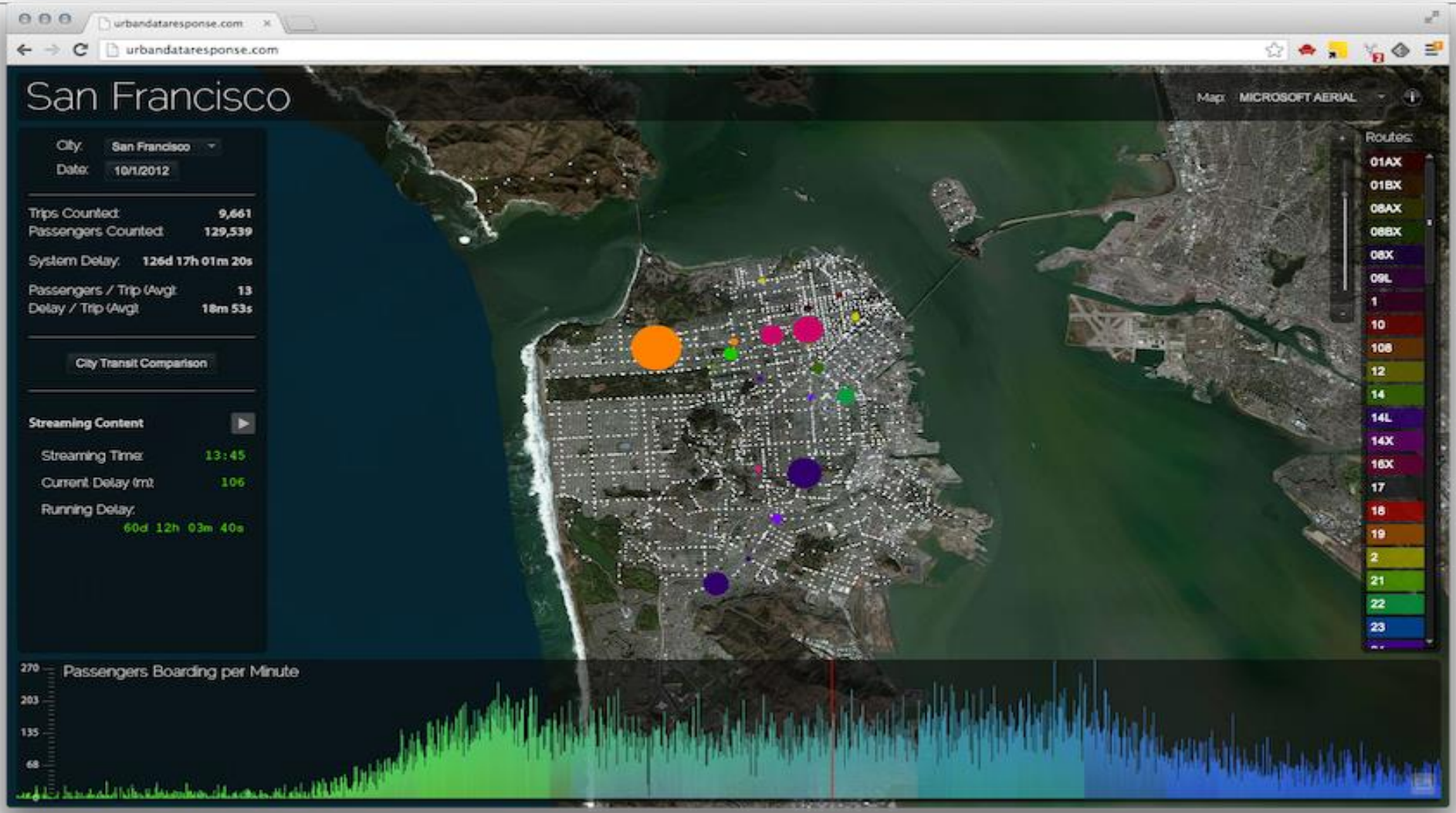
Raymon Sutedjo-The, Sandra Lee

Frustration Index,

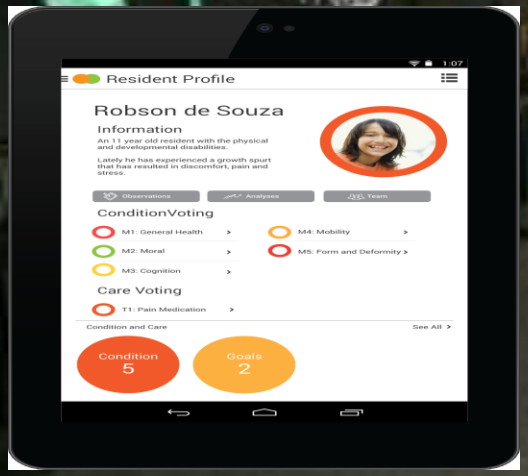
Srivinas Ashok, Daphne Dethier, Carmel Dudley, Steve Pepple



Urban Data Response, Matt Hill

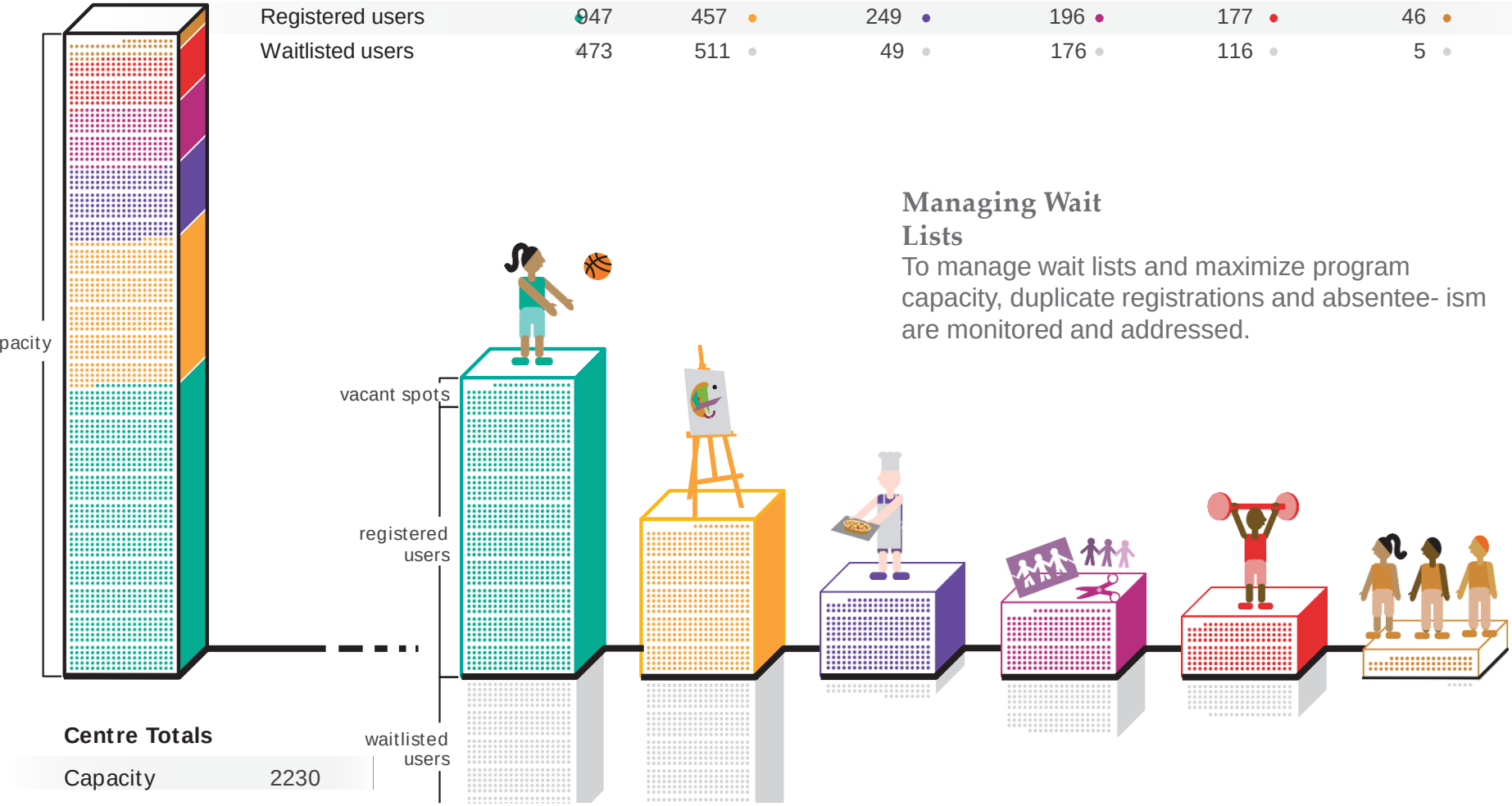


Health Care – Epidemiology, Waitlists



Future Cities – Resident Focused: Toronto Public Library Innovation Hubs

Capacity	1015	511	256	215	177	56
Vacant spots	68	54	7	19	0	10
Registered users	947	457	249	196	177	46
Waitlisted users	473	511	49	176	116	5



Managing Wait Lists

To manage wait lists and maximize program capacity, duplicate registrations and absentee- ism are monitored and addressed.

Centre Totals

Capacity	2230

Edithvale Community Centre

Edithvale Community Centre, established in 1984 in the former Edithvale Public School, quickly became a hub for the community and has housed more than 50 local groups in its history.

The new Edithvale Community Centre was designed with extensive community input and opened in October 2010. It features a double gymnasium, banquet hall, youth lounge, seniors' lounge, two early years rooms, a demo/cooking kitchen, three craft rooms, fitness and dance studios, a weight room and an indoor, elevated walking/running track.

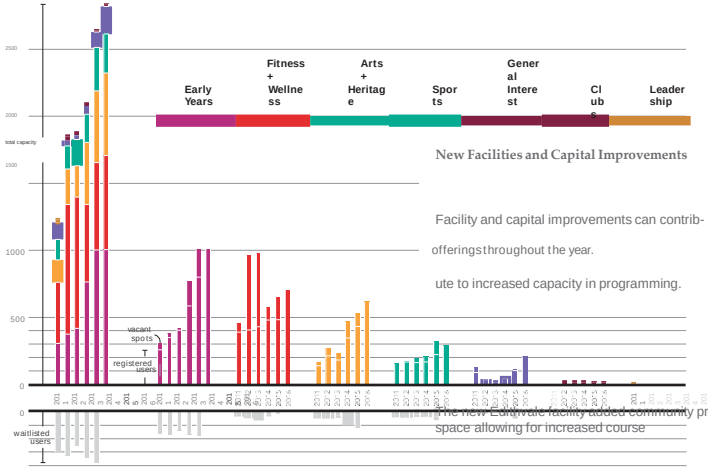
The centre is conveniently located near public transit. There is also a path leading to the centre for walkers and cyclists as well as ample bicycle parking.

Data shown on these graphics does not include drop-in programs.

NORTH DISTRCT

131 Finch Ave W
North York

2011–2016: Fall Registered Program Utilization



New Facilities and Capital Improvements

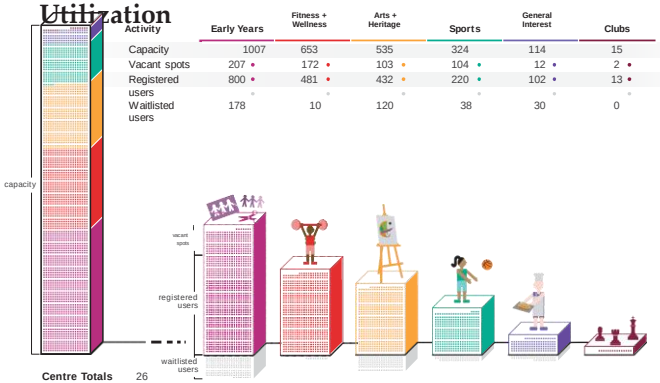
Facility and capital improvements can contrib-

offerings throughout the year.

ute to increased capacity in programming.

The new Edithvale facility added community program space allowing for increased course

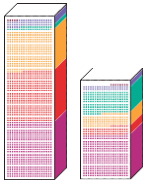
2015: Fall Registered Program Utilization



Activity	Early Years	Fitness + Wellness	Arts + Heritage	Sports	General Interest	Clubs
Capacity	1007	653	535	324	114	15
Vacant spots	207	172	103	104	12	2
Registered users	800	481	432	220	102	13
Waitlisted users	178	10	120	38	30	0

Centre Totals	2648
Capacity	
Vacant spots	600
Registered users	2048
Waitlisted users	376

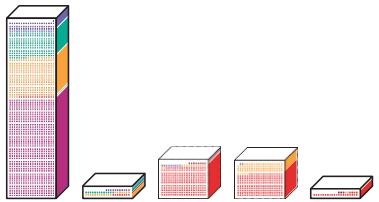
Enrollment by Gender



Activity	Girls + Women (%)	Boys + Men (%)
Clubs	38.5	61.5
General Interest	59.8	40.2
Sports	15.0	85.0
Arts + Heritage	75.9	24.1
Fitness + Wellness	86.2	13.9
Early Years	57.4	42.6

63.5% 36.5%

Enrollment by Age

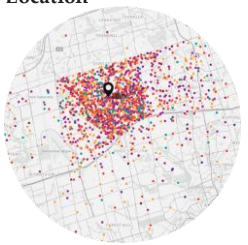


Activity	0–12 (%)	13–24 (%)	25–59 (%)	60+ (%)	Unspecified (%)
Clubs	0.0	7.7	76.9	0.0	15.4
General Interest	80.4	9.8	6.9	2.0	1.0
Sports	94.1	5.9	0.0	0.0	0.0
Arts + Heritage	73.1	4.4	3.0	19.0	0.5
Fitness + Wellness	3.3	1.7	49.5	40.5	5.0
Early Years	100.0	0.0	0.0	0.0	0.0

Girls + Women	Boys + Men
1300 users	748 users

0–12	13–24	25–59	60+	Unspecified
1421 users 69.4%	51 users 2.5%	268 users 13.1%	279 users 13.6%	29 users 1.4%

Enrollment by Location

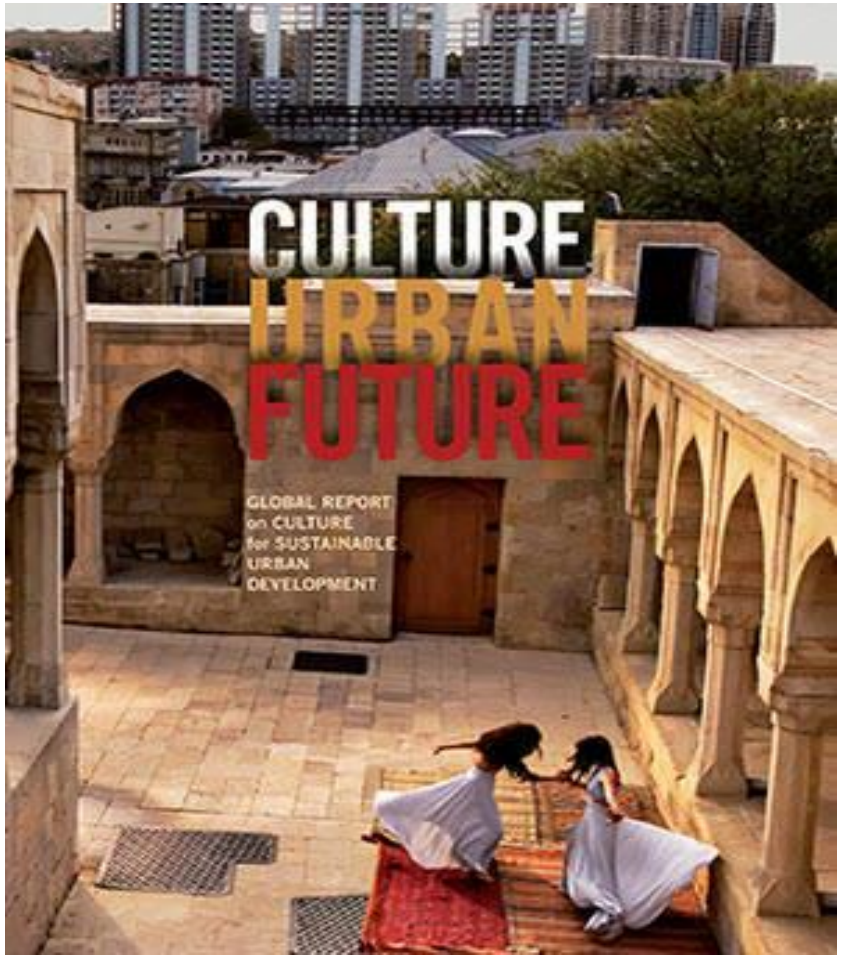


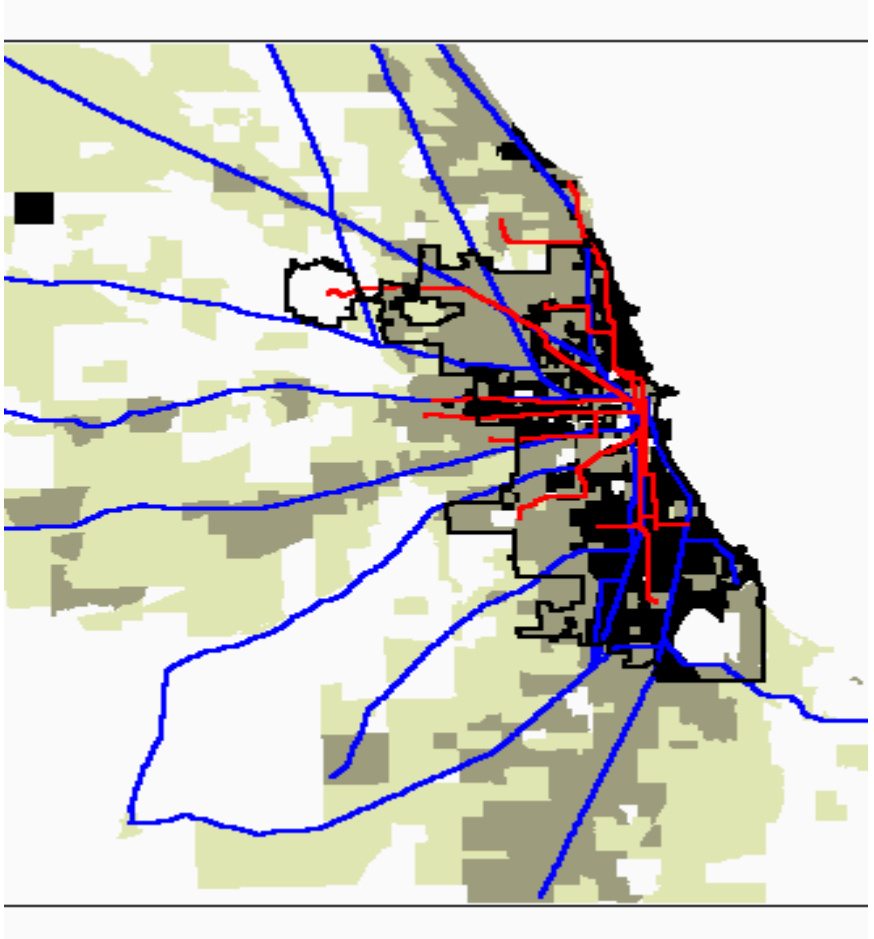
Residents First

Residents are given priority for ten days following the start of a registration period.

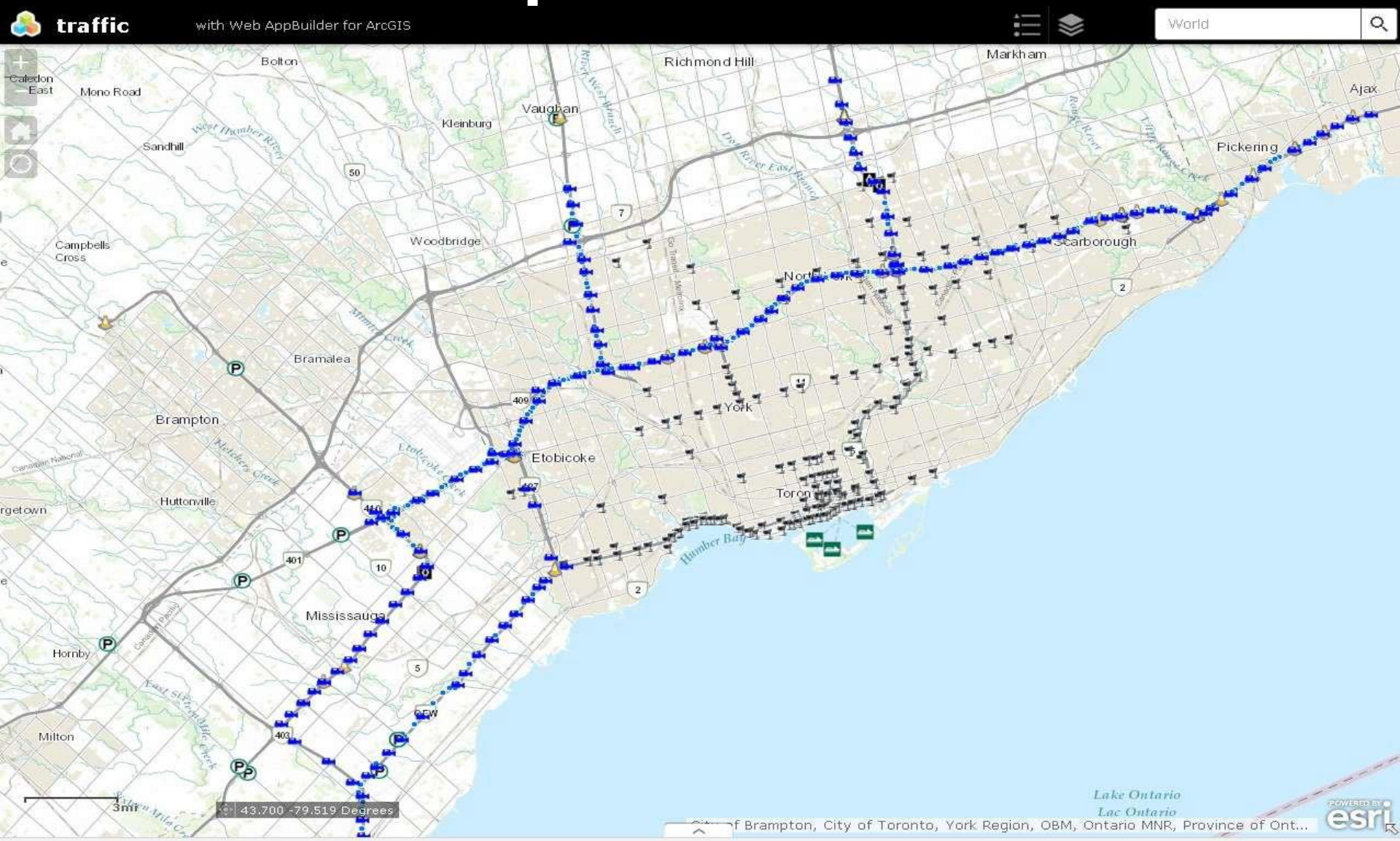
Non-residents must pay a non-resident fee (including at centres where programs are free).

Cultural Analytics and the City

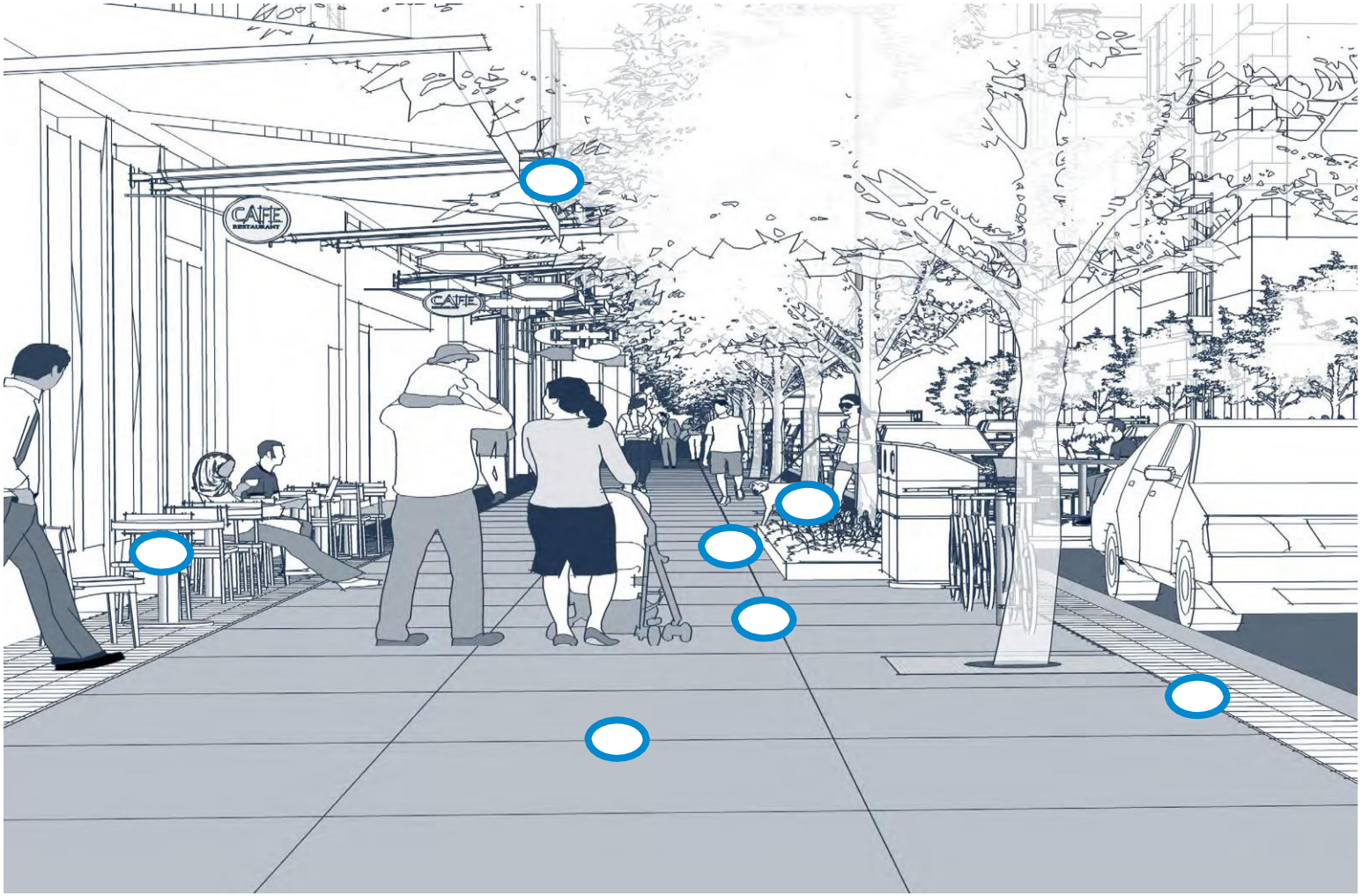




Urban Planning – Transportation Decision Impacts

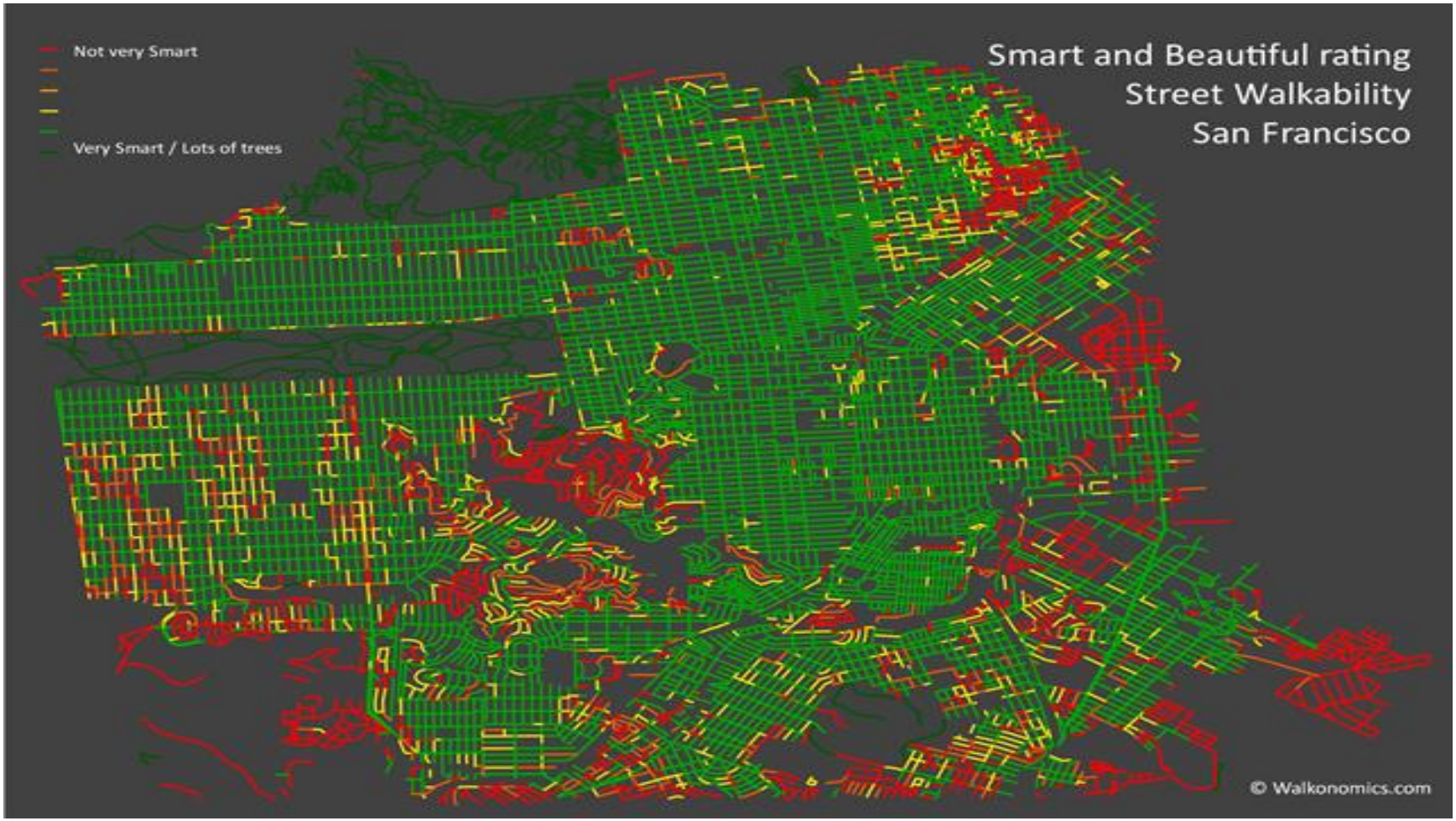


City of Toronto (2013) Toronto: Complete Streets Guidelines: Making Places for People, Place making and Prosperity.

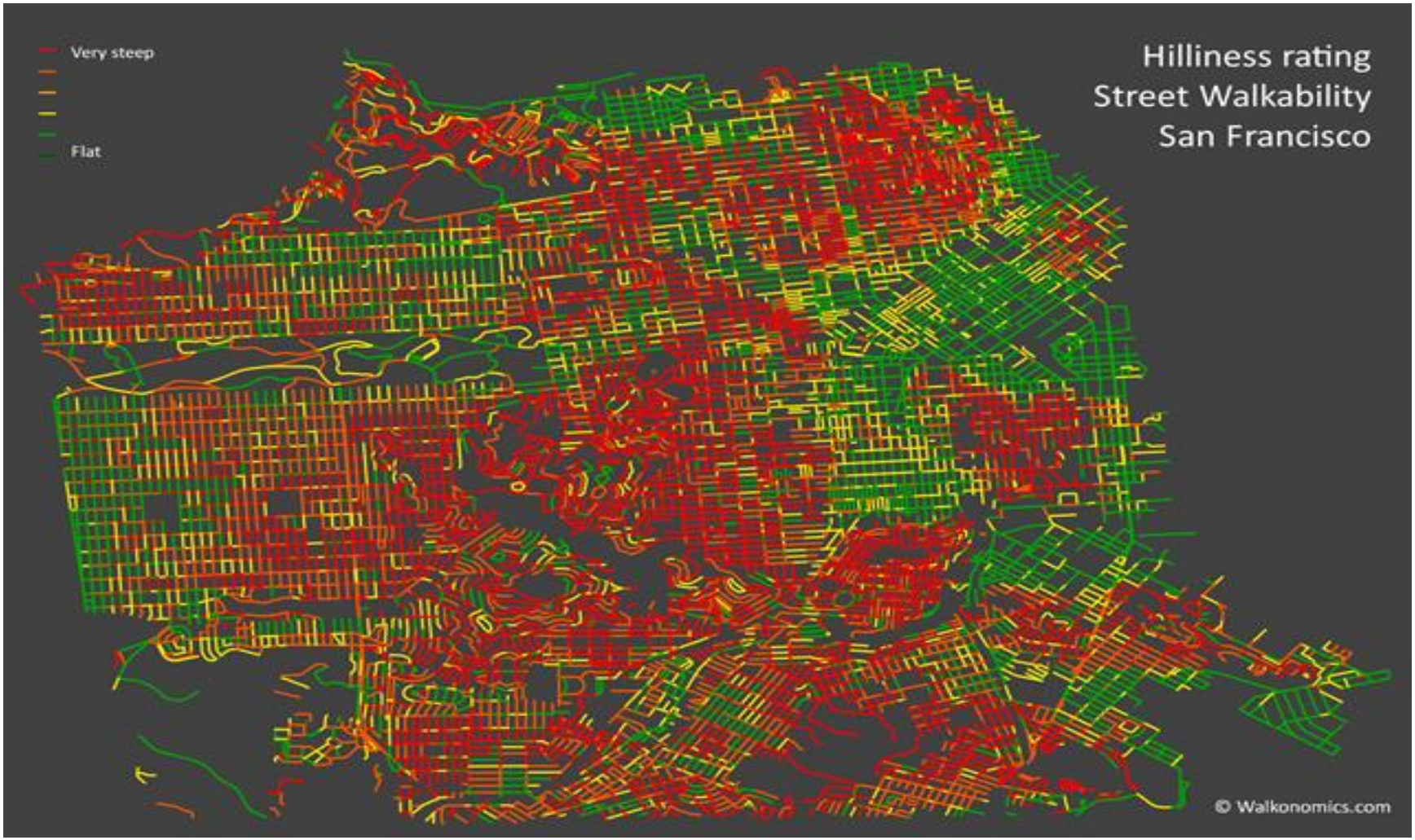


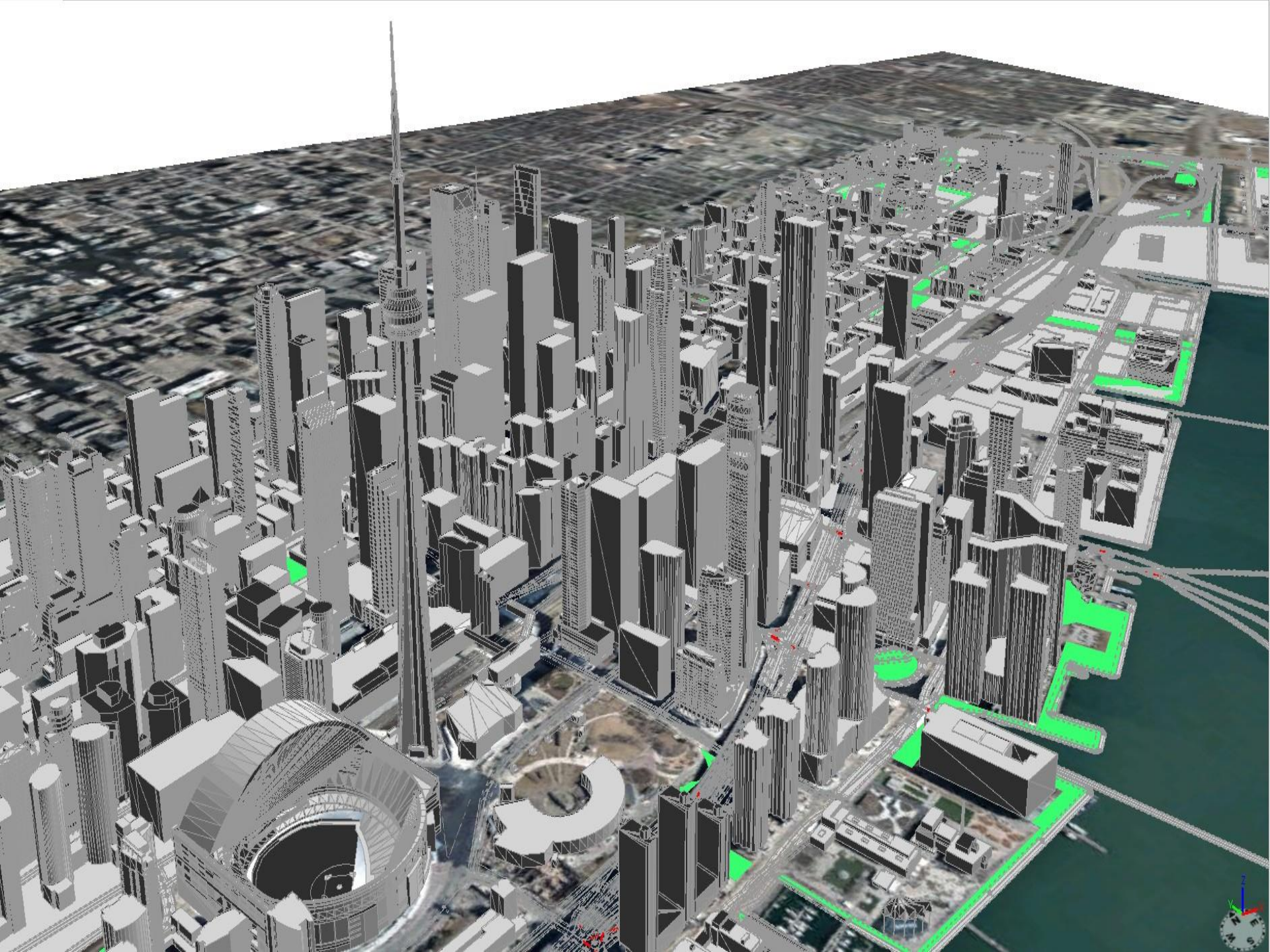
Complete Streets: A mix of complete streets, walkability, public realm + transportation

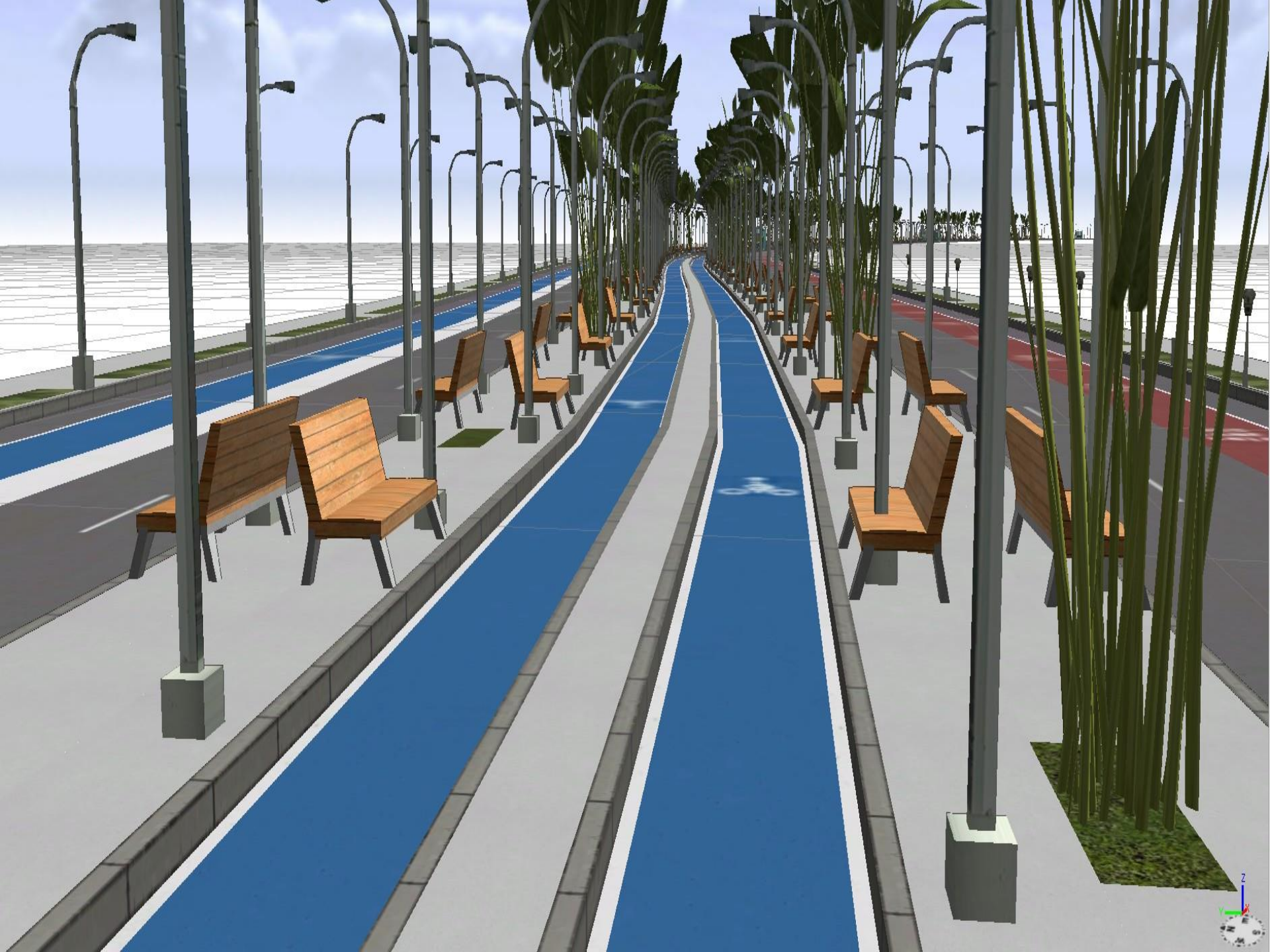
Walkable Streets Project: San Francisco



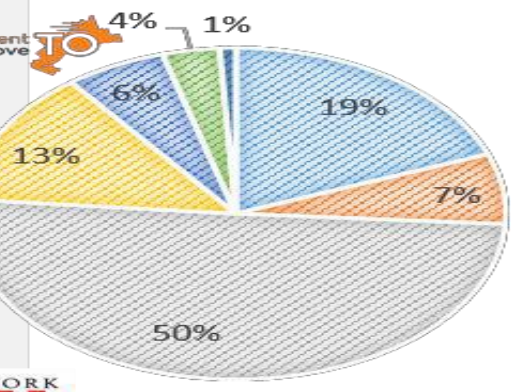
San Francisco

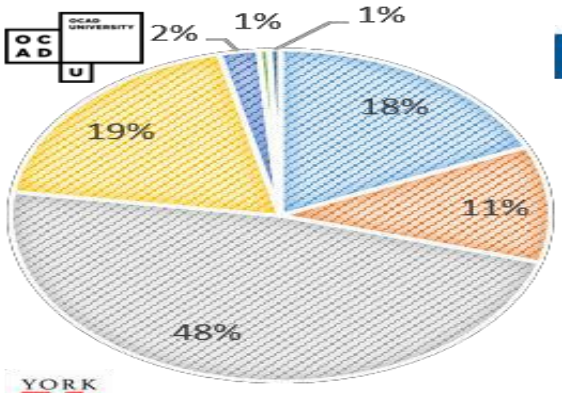


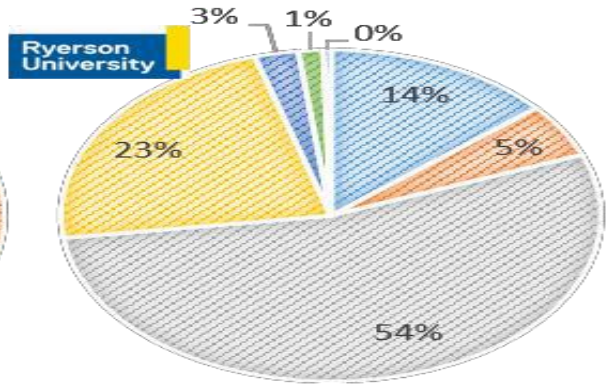


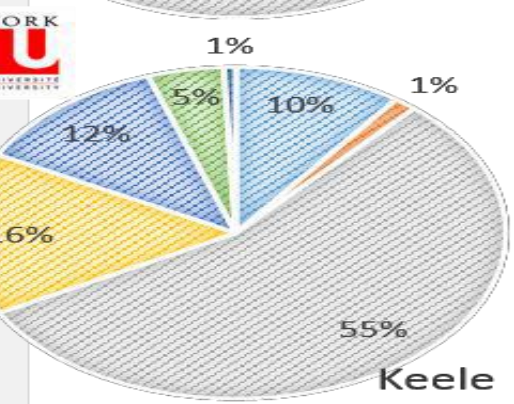


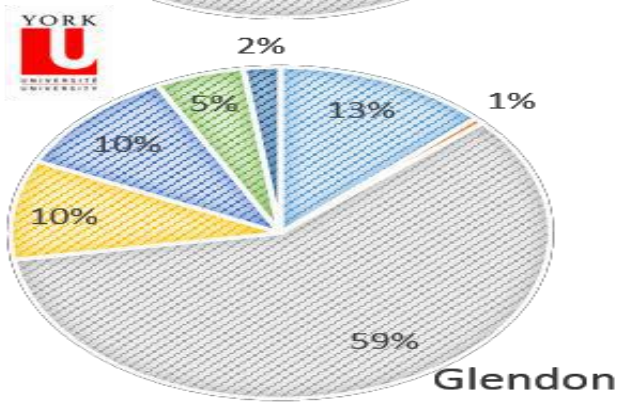
StudentMove TO

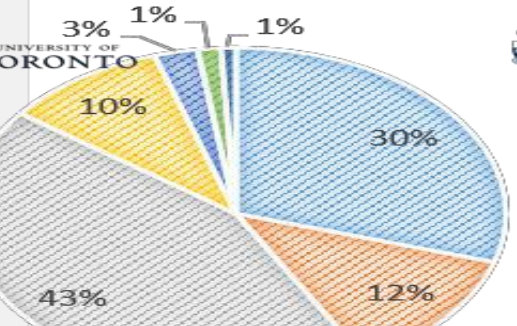


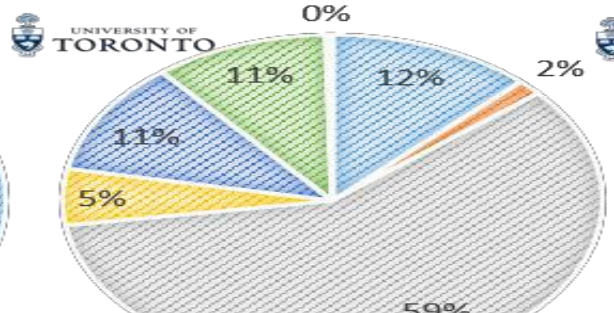


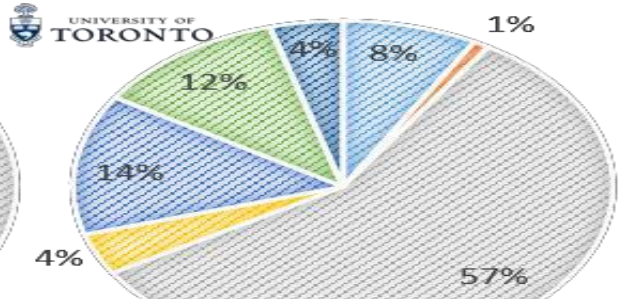










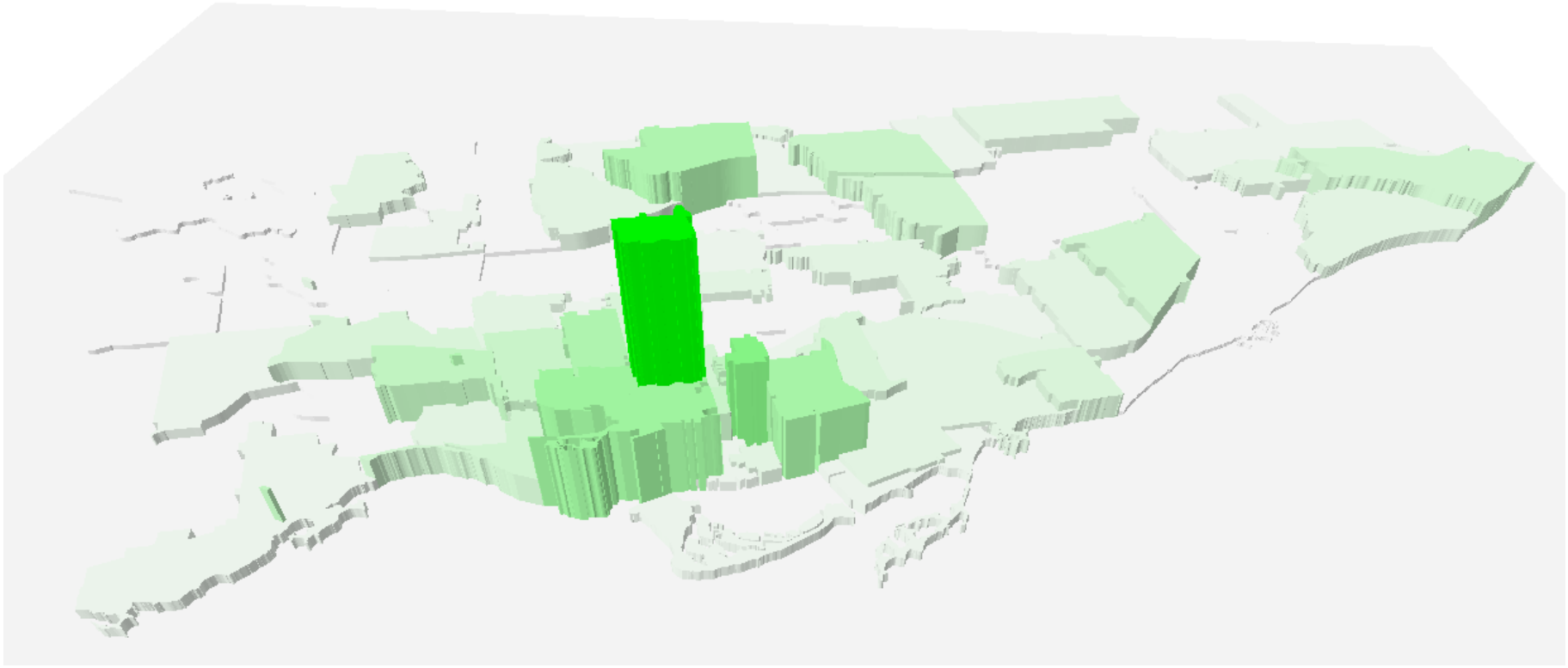


Layers

Custom Plane

Help

Close Controls



ONTARIO COLLEGE OF ART AND DESIGN UNIVERSITY

OCAD UNIVERSITY

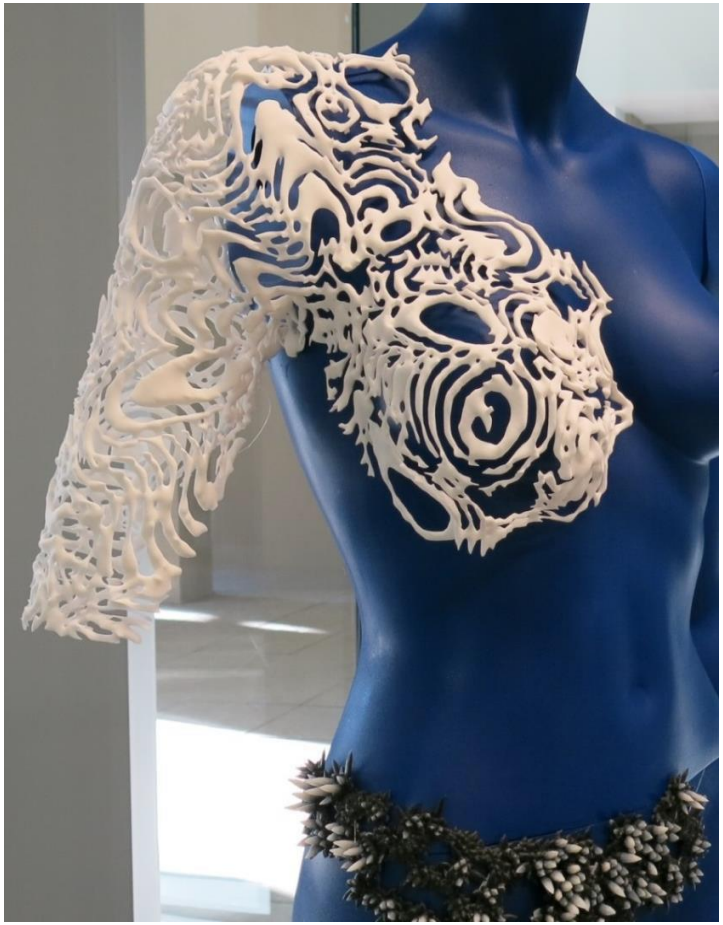
OCAD University: Overview

- Largest, most comprehensive art, design and media university in Canada; 4th largest in North America.
- 16 undergraduate & 7 graduate programs.
- 4,500 students; 12% and 22% international students (undergrad and grad, respectively) from 50+ countries; more than 600 faculty and academic staff.
- Three Canada Research Chairs:
  - Design for the Internet of Things
  - Design for the Future of Health
  - Indigenous Visual Culture and Curatorial Practice
- 21,000+ alumni among Canada's leading artists and designers; **91%** of OCAD U alumni are **employed**. *(SNAAP, 2015.)*

OCAD U Philosophy

Art and Design are central and driving components of all forms of innovation, and unique contributors to research capability in computer science and engineering, AI, health, Indigenous knowledge, material science, biology, and social science.

Imagination + Impact: Our Innovative Approach to Learning and Research



- Vision and mission focuses on seeking the questions of our time and providing creative solutions; bringing together Indigenous knowledge, equity and sustainability with continued growth and leadership in **STEAM + D.**
- Studio-based and studio-laboratory education and research, and experiential learning.
- OCAD University's faculty and student population are highly diverse and able to address global markets and populations.

Alignment with Employers' 21st Century needs

OCAD University is preparing the innovative workforce for the 21st century, which is aligned with current business literature.

- Social perception
- Perseverance
- Leadership
- Collaboration
- Adaptability
- Creativity
- Critical thinking
- Technical proficiency