

The **APA Sustainable Communities Division** supports planners who are committed to planning for **sustainable communities** by **integrating all aspects of sustainability** into our work through the combined **economic, social, and ecological factors** that shape our communities.

**SUSTAINABLE COMMUNITIES
DIVISION**

APA

Sustain

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- Lehigh Valley Planning Commission
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- Teska



Division Contact Information

- **Website:** planning.org/divisions/sustainable
- **Blog** (sign up for e-bulletin): www.sustainableplanning.net
- **LinkedIn:** APA Sustainable Communities Division
- **Facebook/Twitter:** APASCD
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SUSTAINABLE COMMUNITIES
DIVISION



Today

Smart Cities and Decision-Making: The Art of Building a Better Haystack with Data

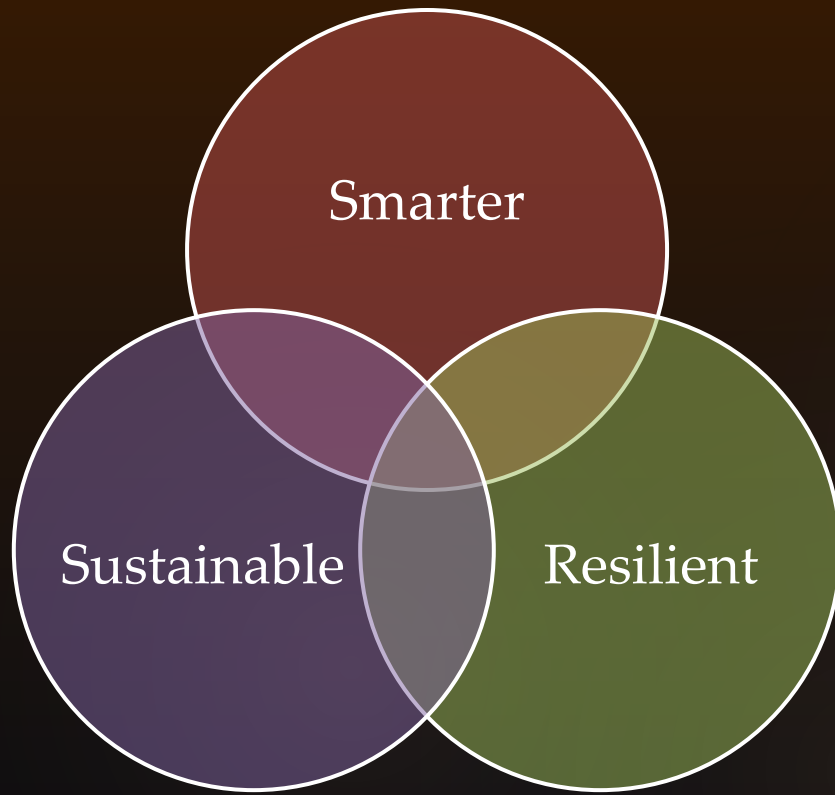
- **Rob Kerns, AICP** - Development Division Chief, City of Alexandria (and former Chair of SCD)
- **Nick Bowden** - Chief Engagement Officer, mySidewalk by MindMixer
- **Fred Merrill, FAICP** - Principal, Sasaki
- **Ken Goulding** - Principal, Sasaki

SUSTAINABLE COMMUNITIES
DIVISION



Smart Cities & Sustainability

{ America Planning Association – Task Force



Mission:

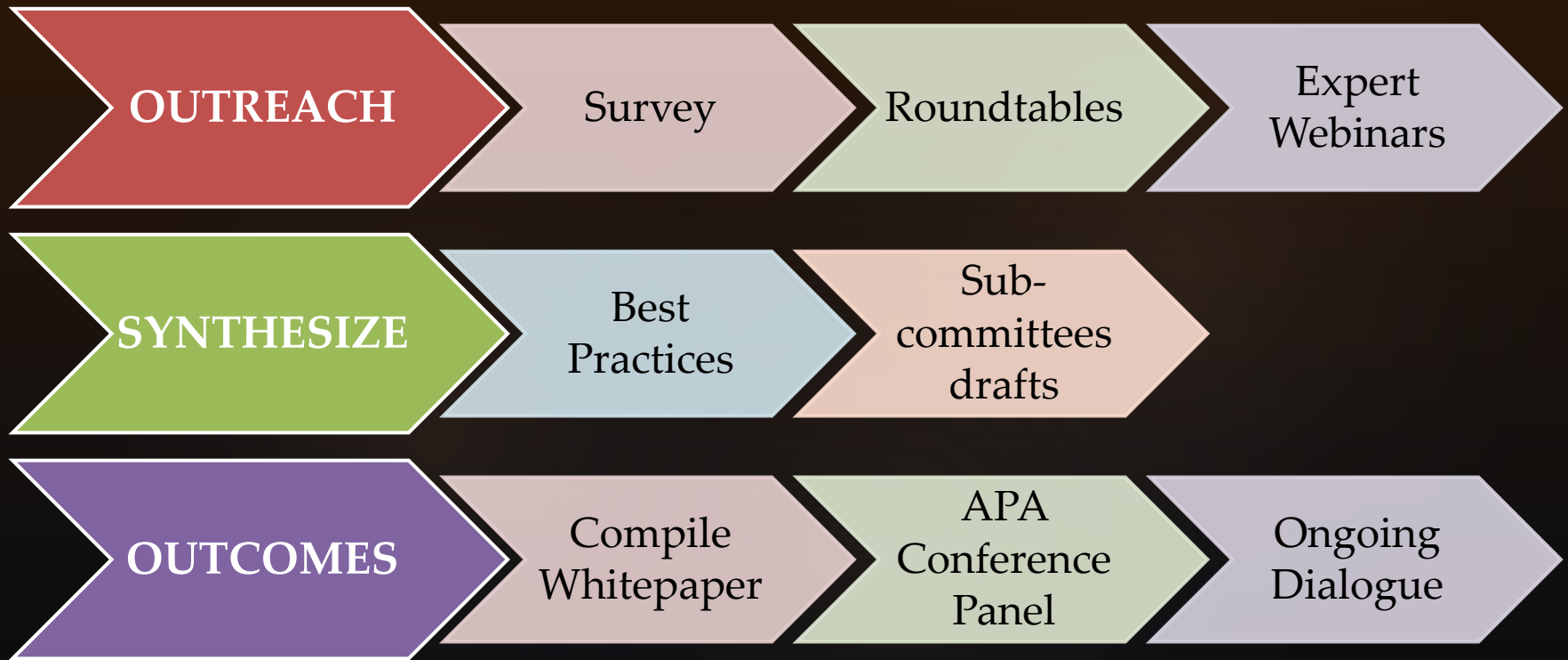
Focus on sustainability by addressing recent advances in technology and innovation to cultivate cities which are smarter, more resilient, and sustainable.

Smart Cities and Sustainability Task Force

Goals

- Anticipate and prepare planners for trends and emerging issues.
- Generate the big ideas to advance in our communities.
- Educate through documentation of best practices and increase the use of smart city innovations by planners, citizens and elected officials.





Task Force Work Plan

DEFINITION

Digital technology and intelligent design = smart, sustainable cities with high-quality living and high-quality jobs.

APPLICATIONS

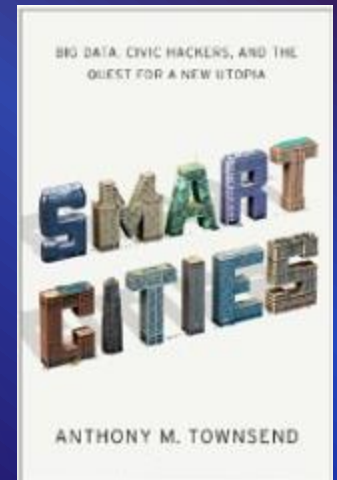
- Smart devices and sensors embedded in its roadways, power grids, buildings and other assets provide data
- Smart communications systems with wired and wireless technologies
- Smart software to create valuable information and digitally enhanced services.



Anthony Townsend

DEFINITION

Smart cities as places where information technology is combined with infrastructure, architecture, everyday objects and even our bodies to address social, economic and environmental problems.



APPLICATIONS

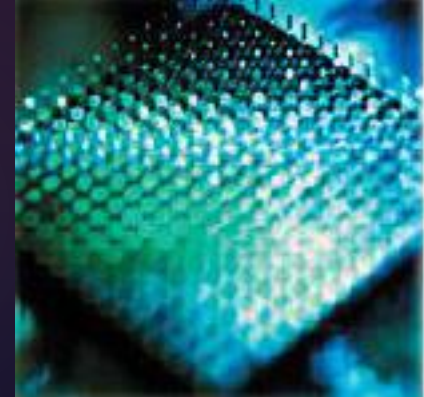
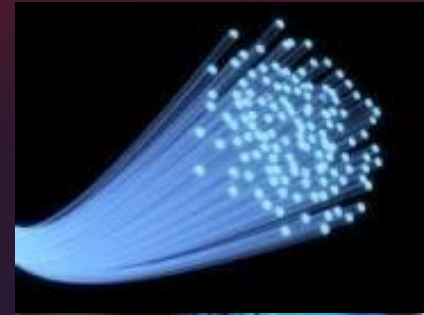
- Open-source software – Participatory governance
- Free Wi-Fi, community networks
- Web and mobile apps for city services. Big Data.

- Real time transportation data
- Smart Grid
- Crowdsourcing thru mobile apps
- Smart water meters
- Big data analysis of environmental data
- Remote monitoring of water/sewer systems



Smart City Applications

1. Supporting Infrastructure
2. Technology Applications / Big Data
3. Sustainability / Resiliency / Energy
4. Equity / Digital Divide
5. Roles / Governance/ Planners



Smart City Components

Thank You

For more info:

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<https://www.planning.org/sustainingplaces/smartcities/>

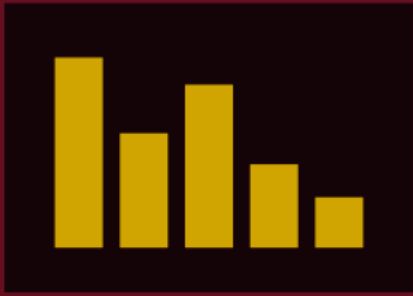
<https://www.planning.org/resources/ontheradar/smartcities/>

Visualization

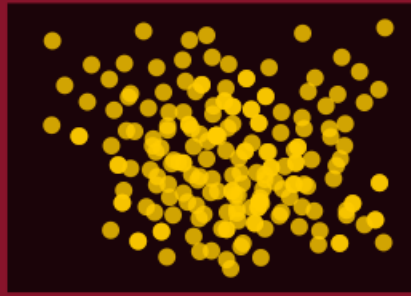


Data Scales





Tiny
Data



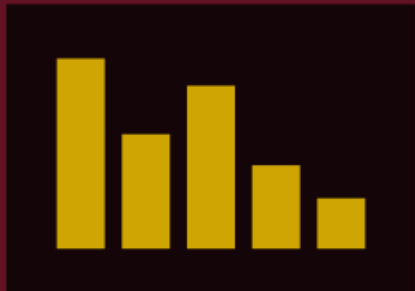
Visual
Data



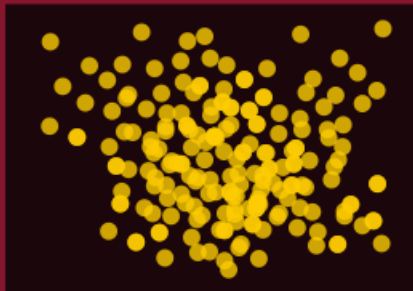
Queryable
Data



Big
Data



Tiny
Data



Visual
Data



Queryable
Data



Big
Data

Ranges

As much as you
can keep in your
head at one
time.

Not more than a
few dozen

As much as can
be visualized in
dense display
without losing
granularity.

Typically 5-10K
points, but can
reach 100K or
more.

More than can
be seen on
screen.

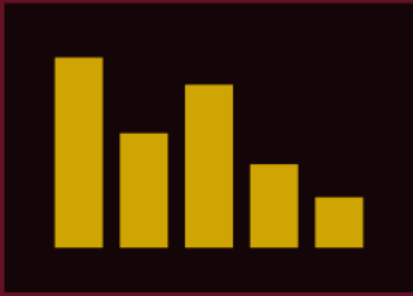
100s of
thousands to
millions of
points.

Real-time
queries possible
at smaller scales

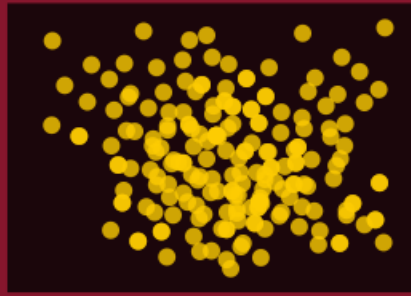
More than can
be queried using
standard
database tools.

Scalable to
billions of
points.

Queries take
time.



Tiny
Data



Visual
Data



Queryable
Data



Big
Data

Tools

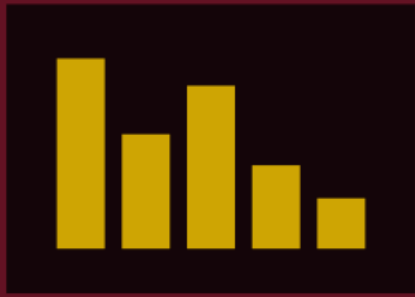
Excel

Tableau \ Qlik

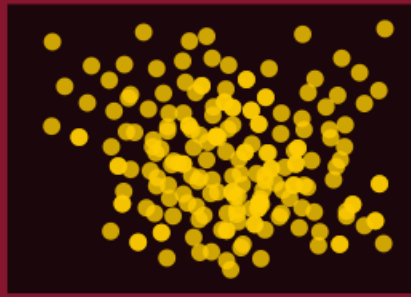
SQL Databases

Spark

Hadoop



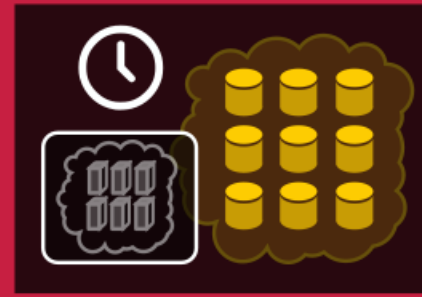
Tiny
Data



Visual
Data



Queryable
Data



Big
Data

Tools

D3

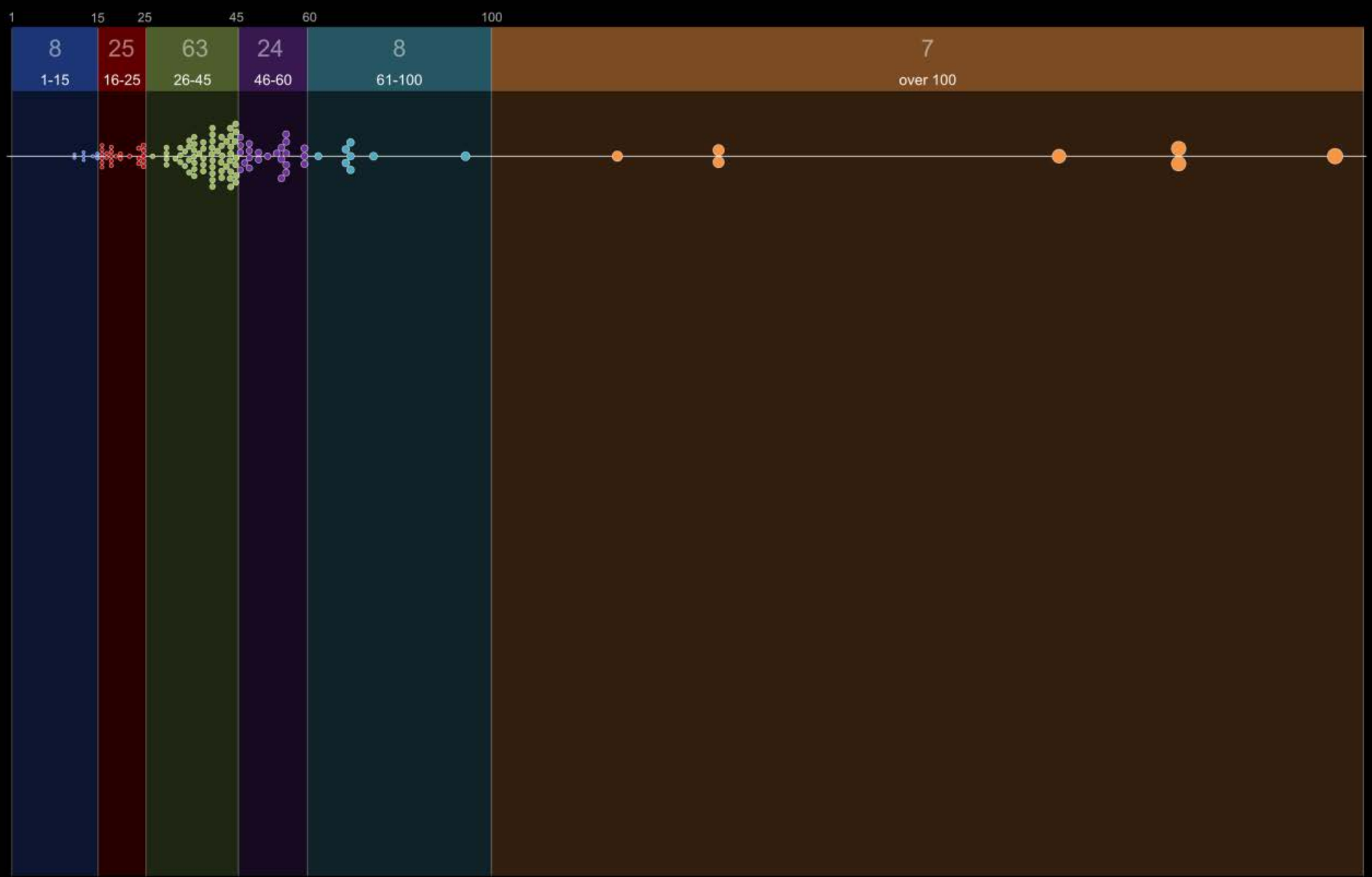
Processing

Gephi

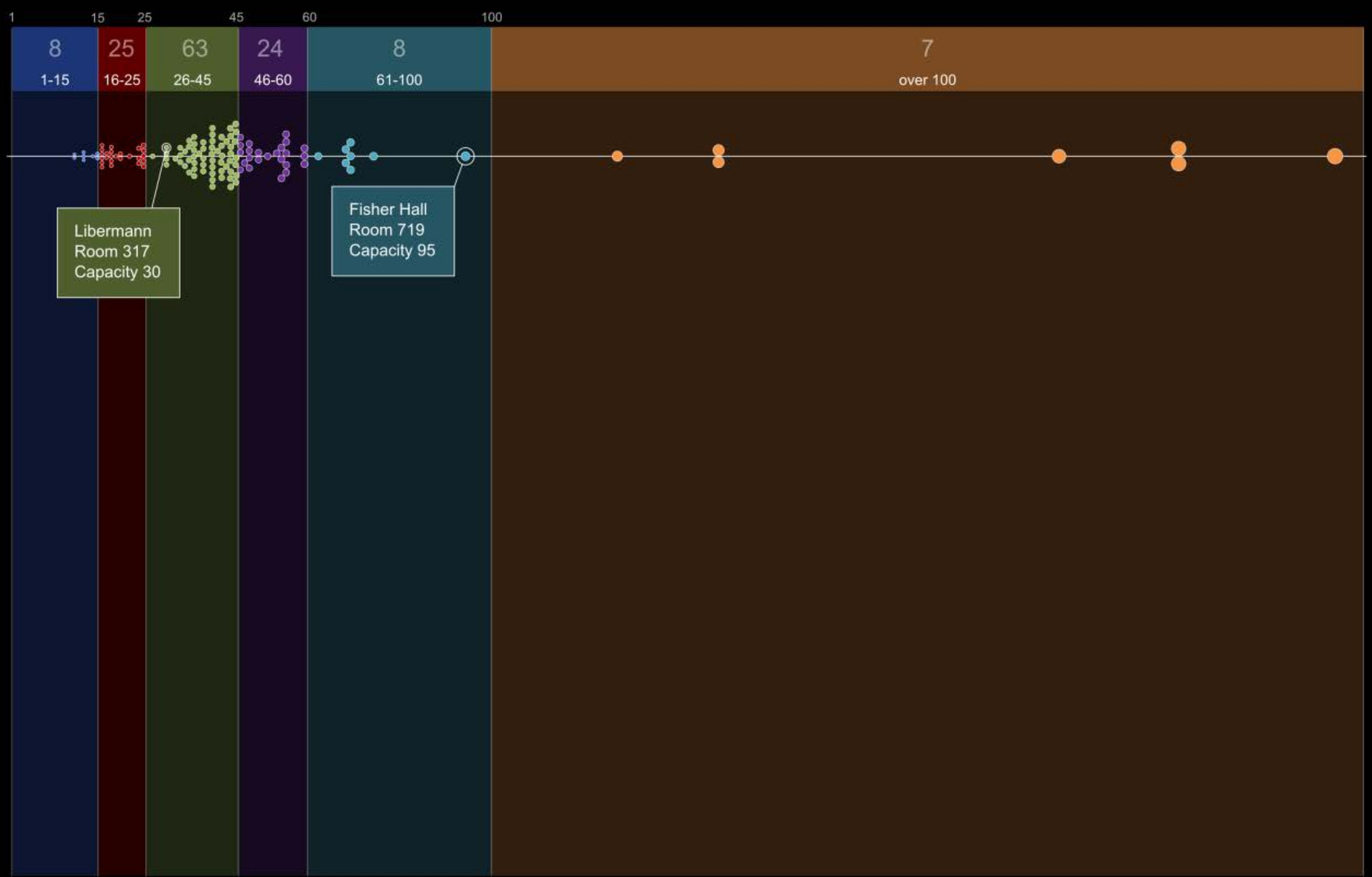
WebGL

Mapping \ GIS

Duquesne Classrooms

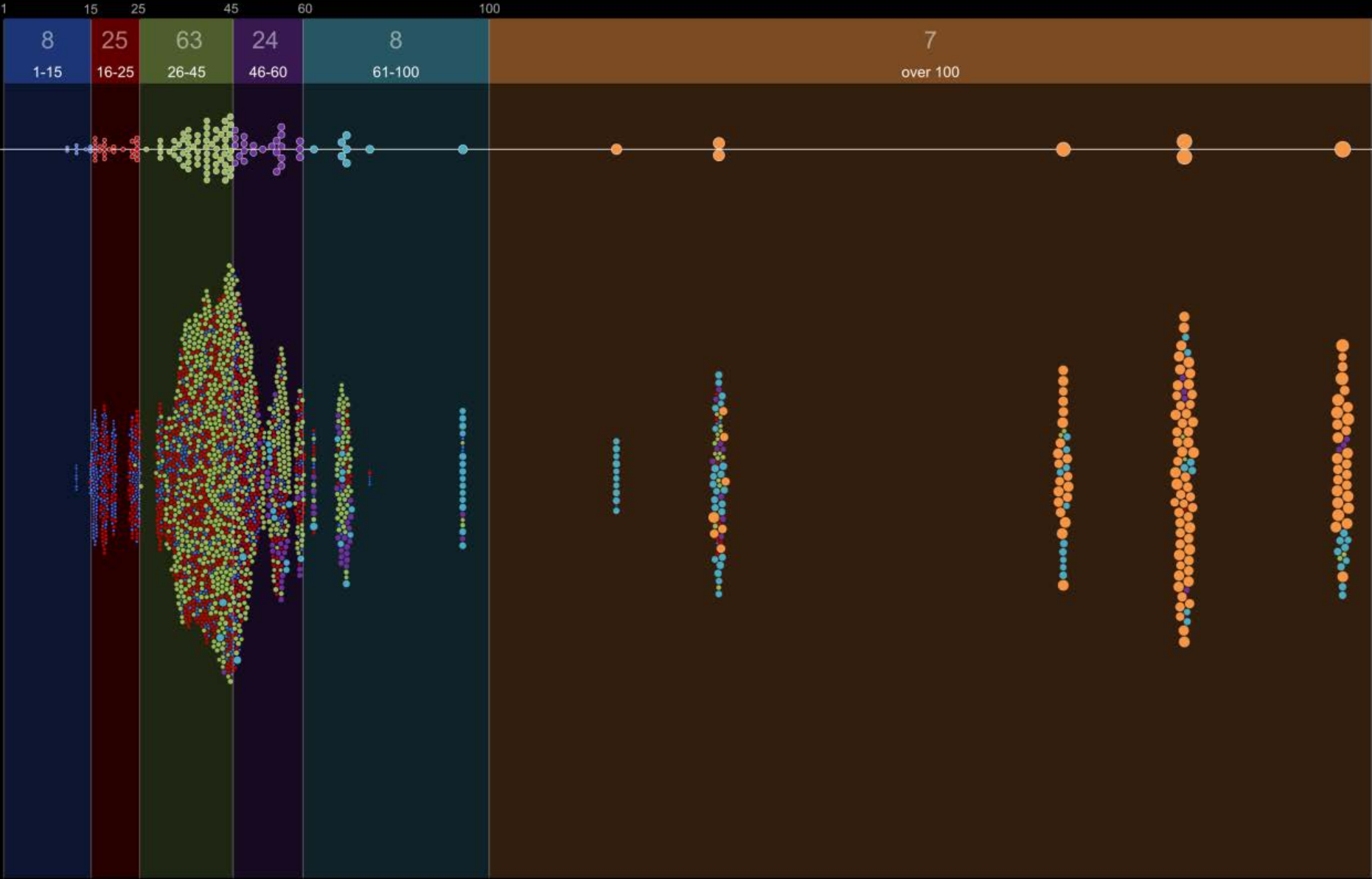


Duquesne Classrooms



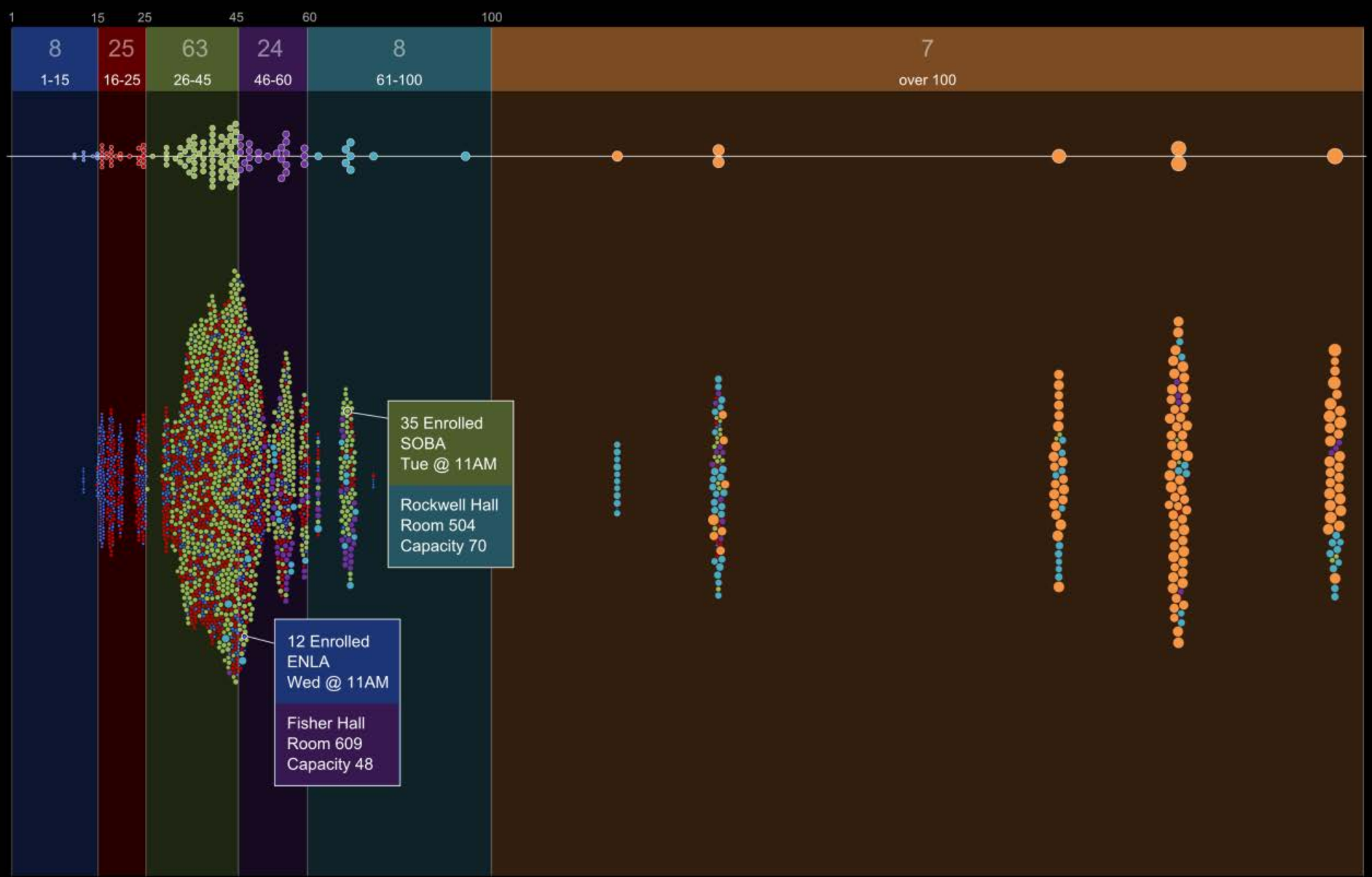
Duquesne Classrooms

2,832 points

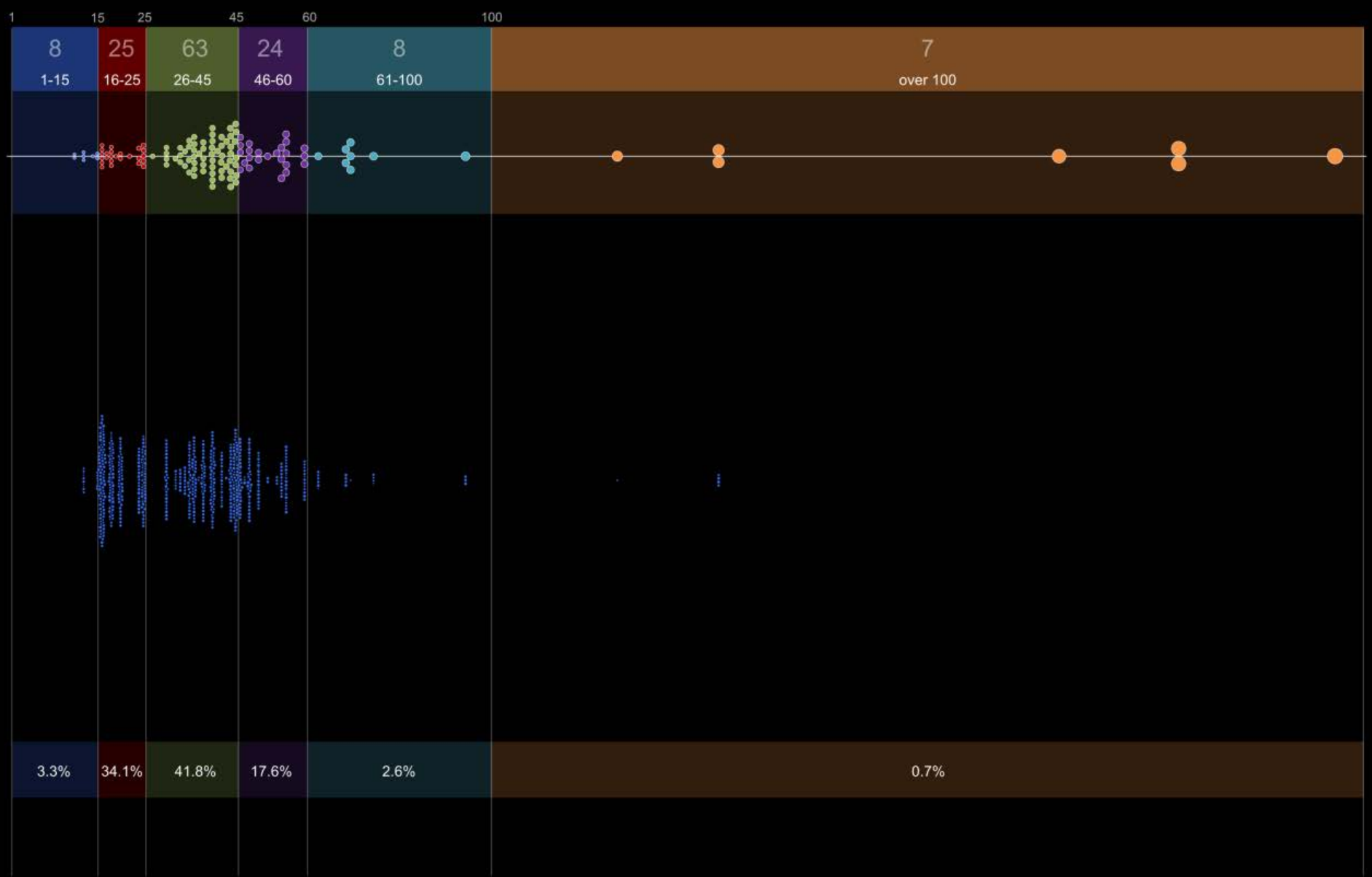


Duquesne Classrooms

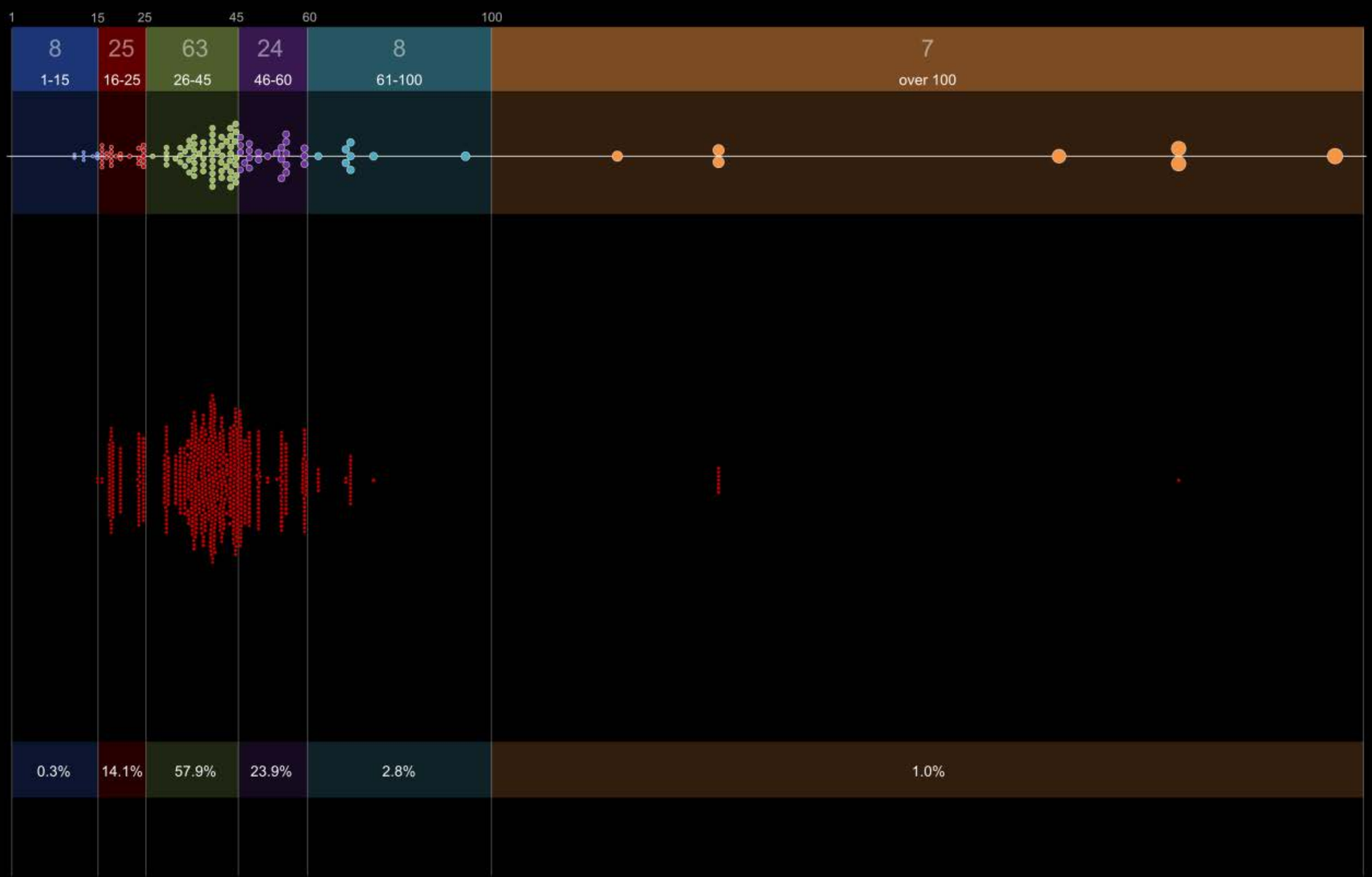
2,832 points



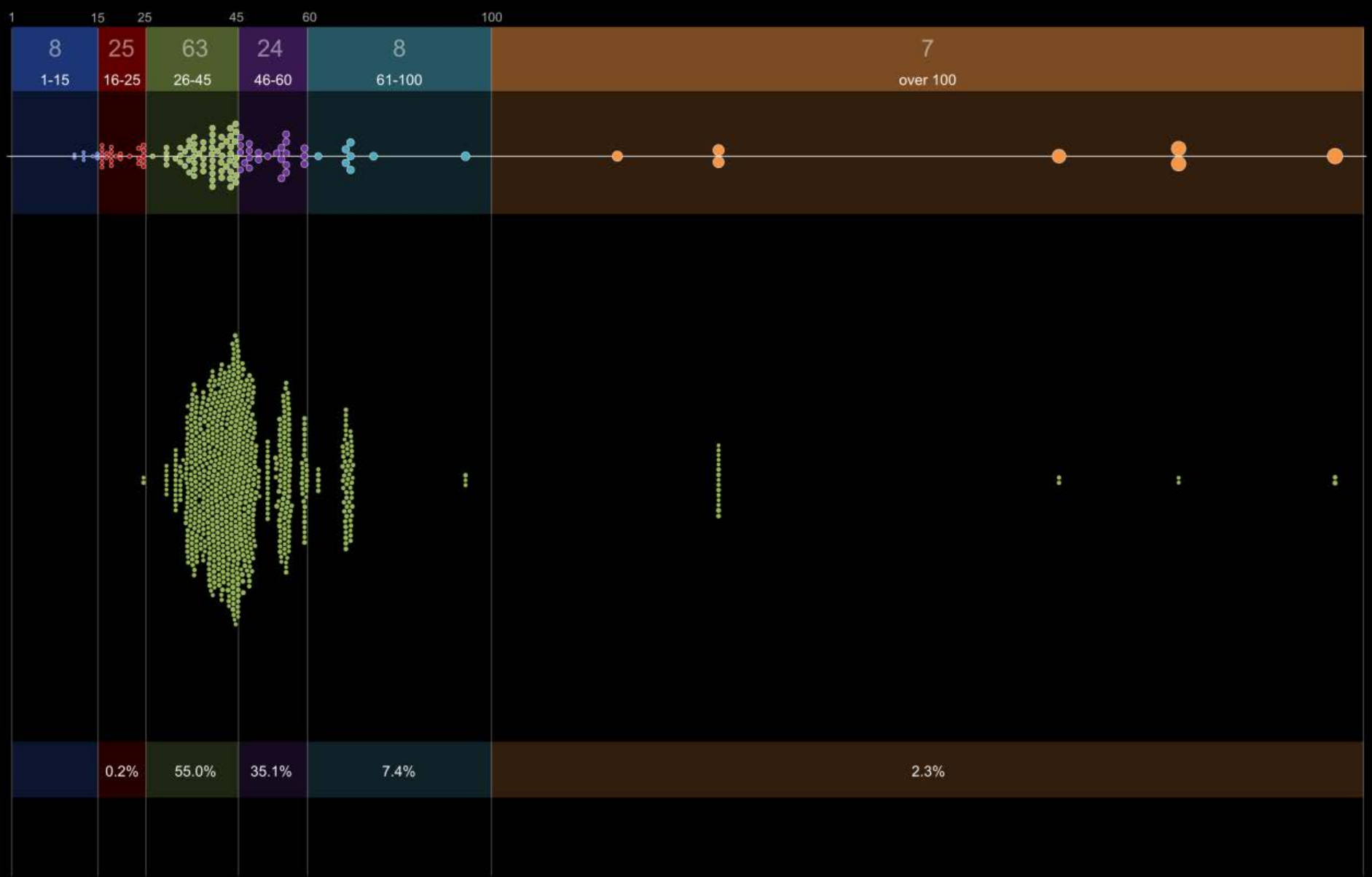
Duquesne Classrooms



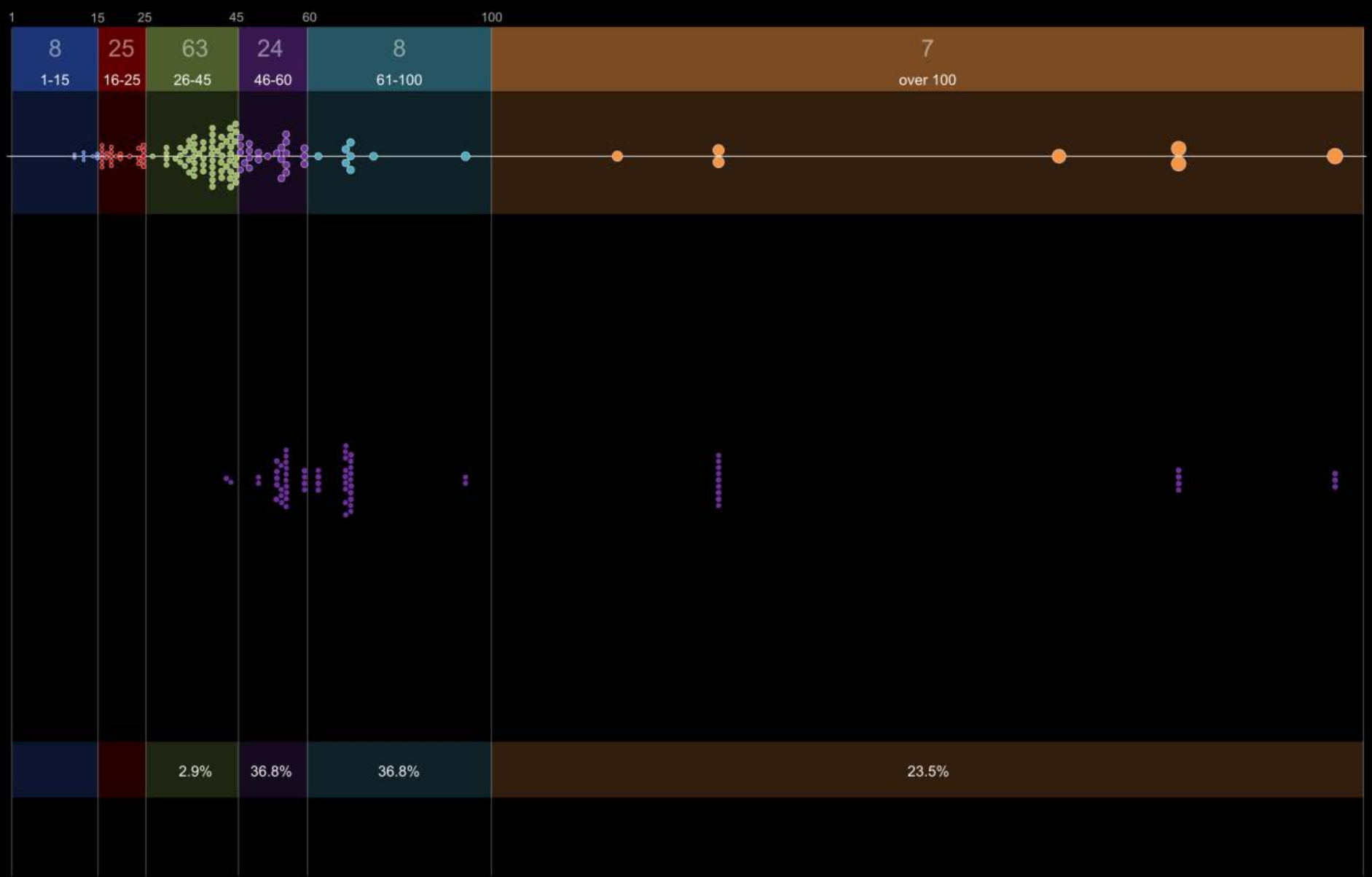
Duquesne Classrooms



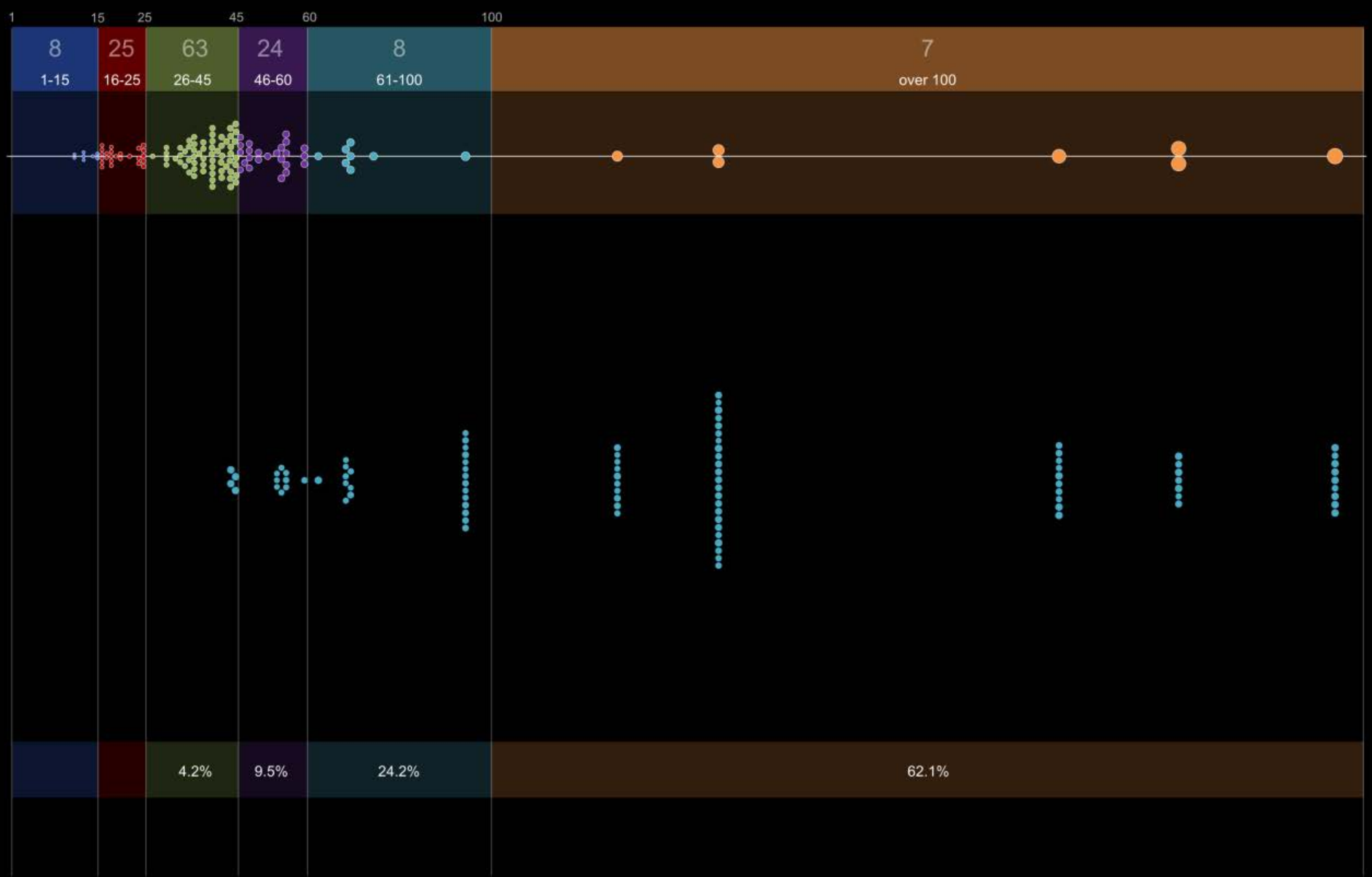
Duquesne Classrooms



Duquesne Classrooms

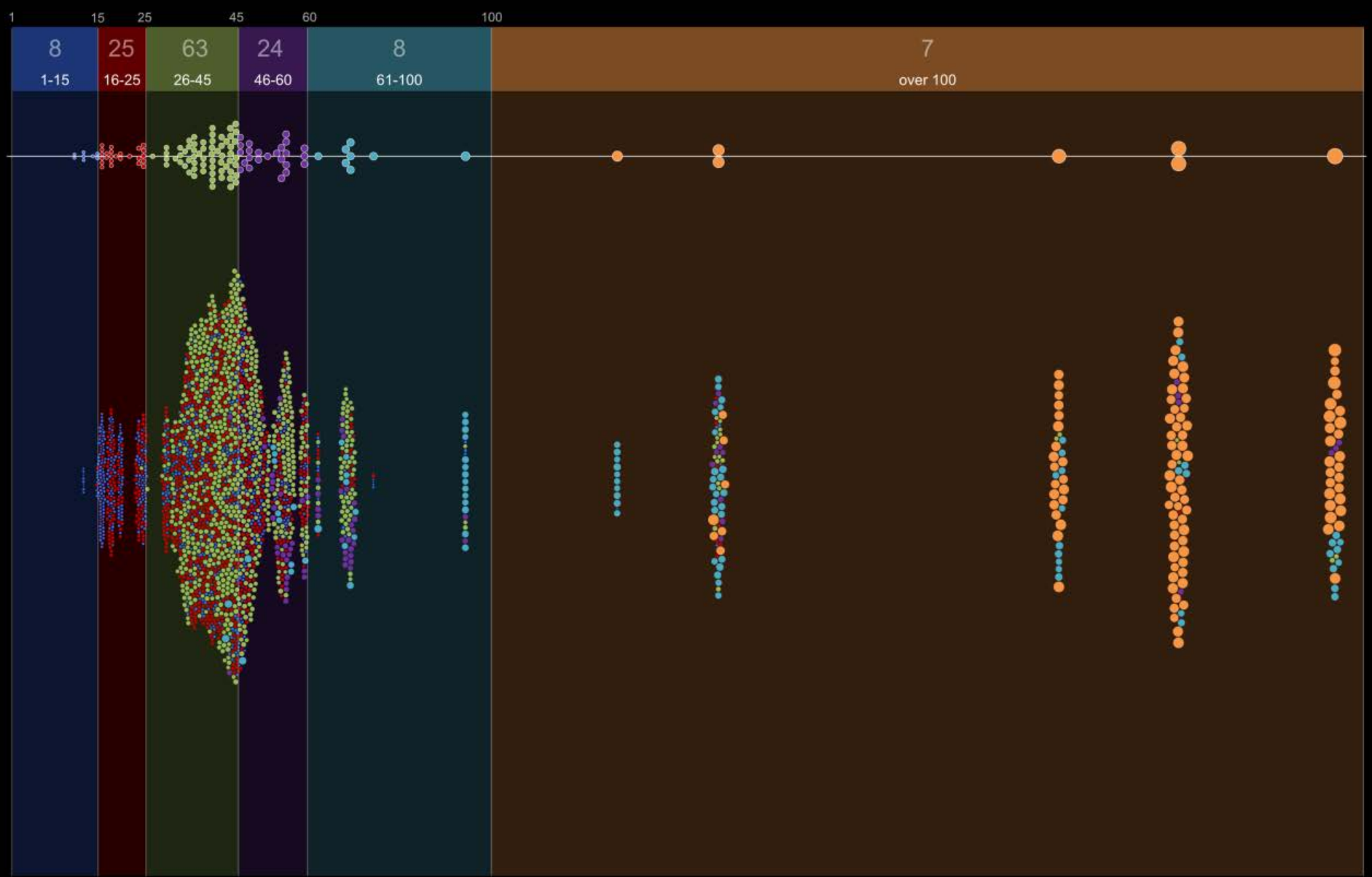


Duquesne Classrooms



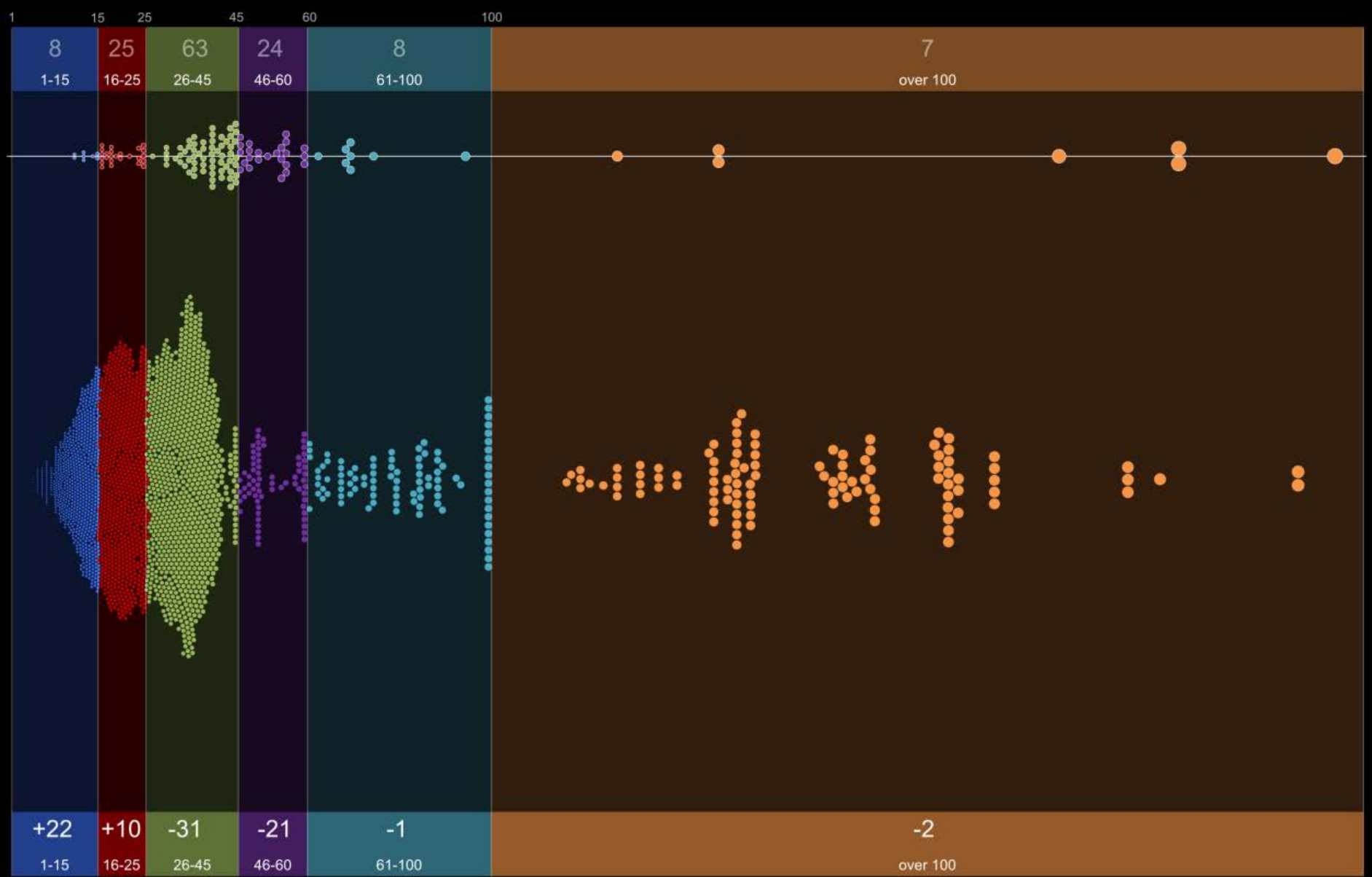
Duquesne Classrooms

2,832 points



Duquesne Classrooms

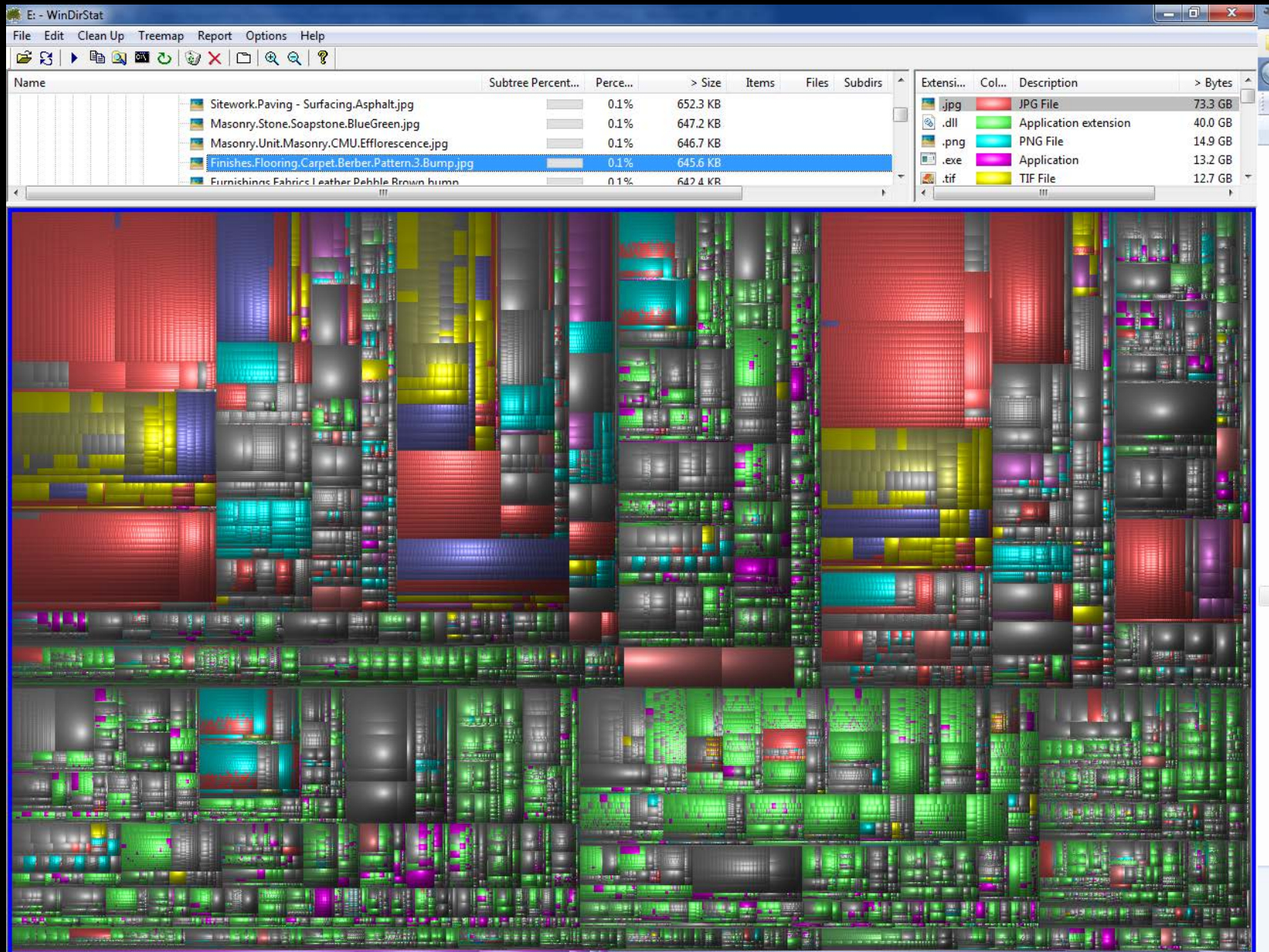
2,832 points



WinDirStat TreeMap

<http://windirstat.info/>

1.7 M points (not all visible)

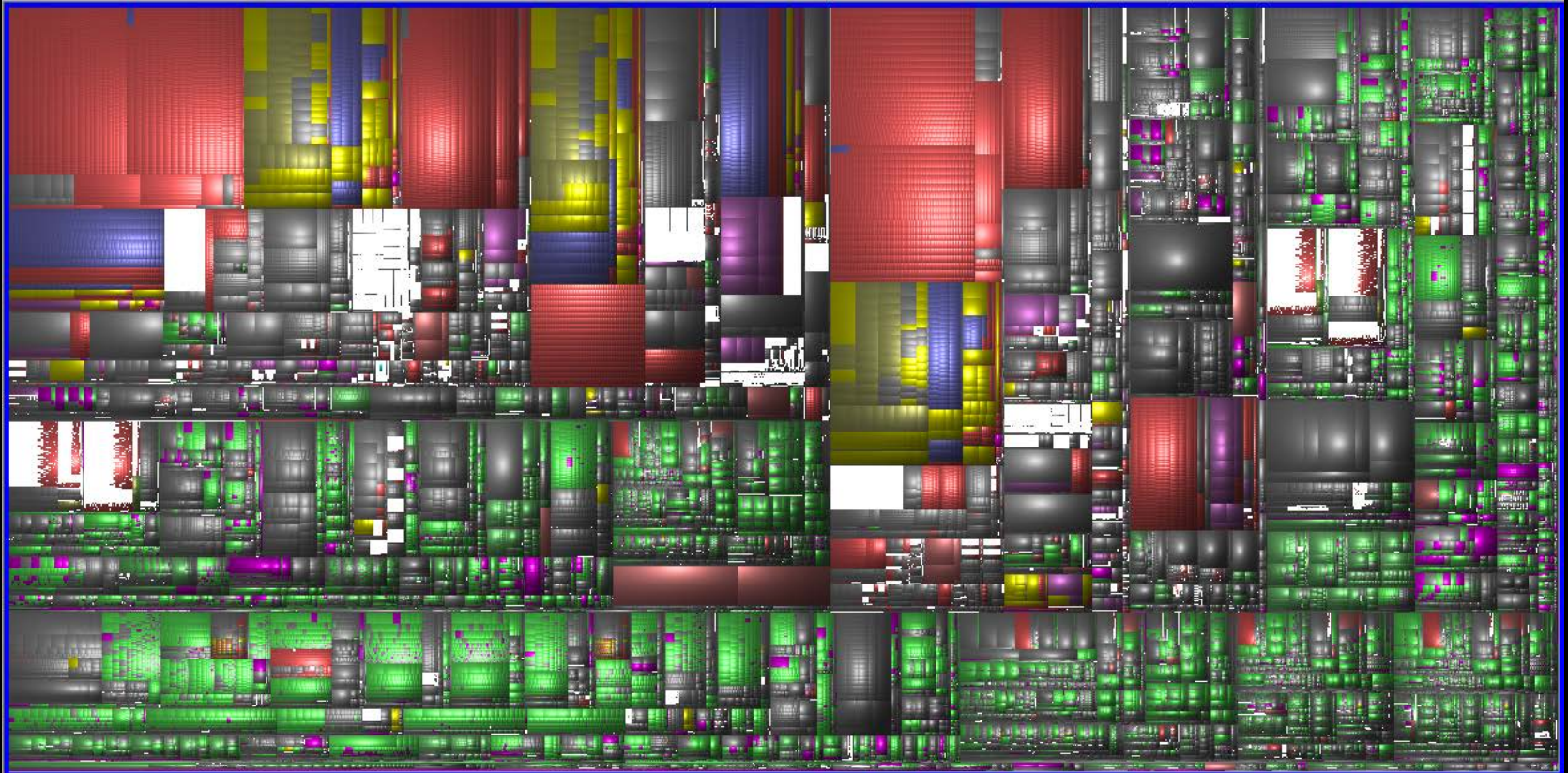


WinDirStat TreeMap

<http://windirstat.info/>

1.7 M points (not all visible)

E: - WinDirStat											
File Edit Clean Up Treemap Report Options Help											
Name		Subtree Percent...	Perce...	> Size	It...	Extensi...	Col...	Description	Bytes	% By...	> Files
Sitework.Paving - Surfacing.Asphalt.jpg			0.1%	652.3 KB		.png		PNG File	14.9 GB	2.4%	372,797
Masonry.Stone.Soapstone.BlueGreen.jpg			0.1%	647.2 KB		.jpg		JPG File	73.3 GB	11.9%	249,135
Masonry.Unit.Masonry.CMU.Efflorescence.jpg			0.1%	646.7 KB		.htm...		Chrome HTML Document	3.3 GB	0.5%	121,622
Finishes.Flooring.Carpet.Berber.Pattern.3.Bump.jpg			0.1%	645.6 KB		.		Local Disk	3.3 GB	0.5%	98,179
Furnishings.Fabrics.Leather.Pebble.Brown.bump....			0.1%	642.4 KB		.cs		Visual C# Source file	673.3 MB	0.1%	98,108
Finishes.Flooring.Carpet.Berber.Pattern.2.jpg			0.1%	639.3 KB		.dll		Application extension	40.0 GB	6.5%	85,922
Masonry.Stone.Travertine.DarkRed.jpg			0.1%	637.3 KB		.js		JScript Script File	1.3 GB	0.2%	79,521
Masonry.Unit.Masonry.CMU.Ribbed.Stacked.jpg			0.1%	634.3 KB		.json		JSON File	1.0 GB	0.2%	77,508
Concrete.Cast-In-Place.Exposed Aggregate.Mediu...			0.1%	627.6 KB		.xml		XML Document	5.9 GB	1.0%	63,992
Finishes.Masonry Flooring.Terrazzo.Brown.jpg			0.1%	626.7 KB		.kml		KML File	99.4 MB	0.0%	59,437
Finishes.Flooring.Tile.Square.Tan.png			0.1%	626.0 KB		.idrc		IDRC File	129.0 MB	0.0%	52,838
						.sv...		SVN-BASE File	2.4 GB	0.4%	45,906
						.ac		ΔC File	1.1 GB	0.7%	35,793

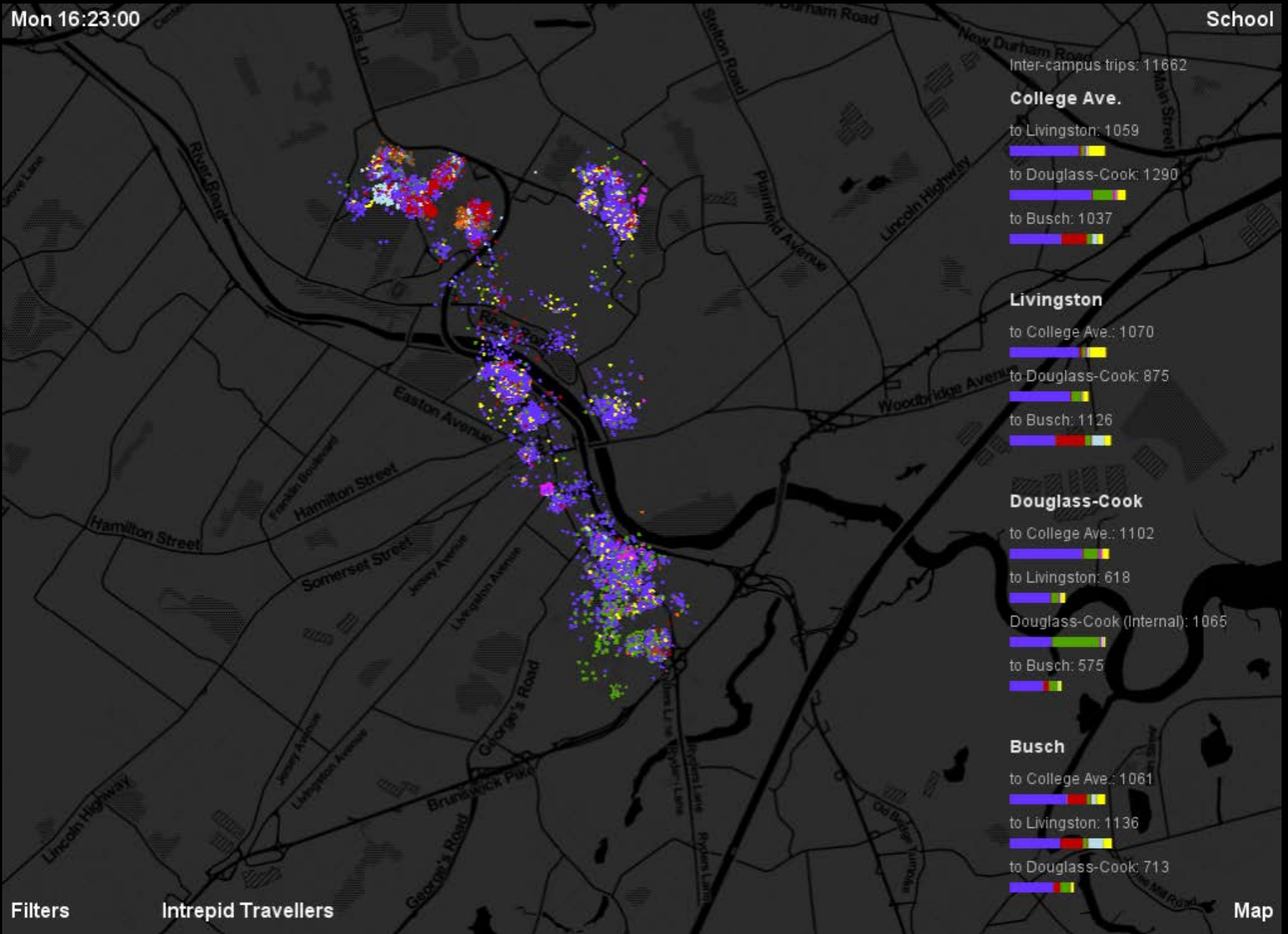


Rutgers Swarm Visualization

11,600 points

Mon 16:23:00

School



Filters

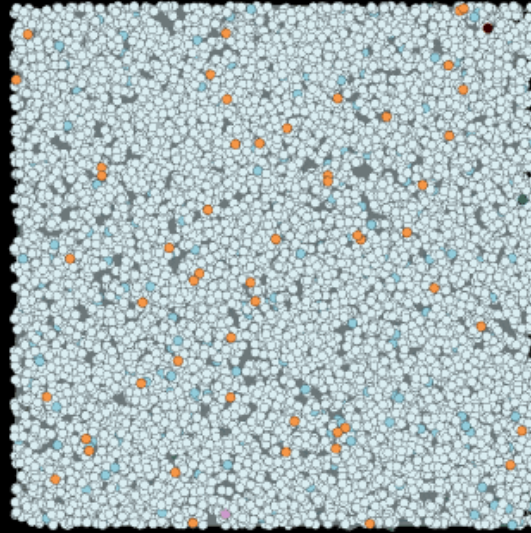
Intrepid Travellers

Map



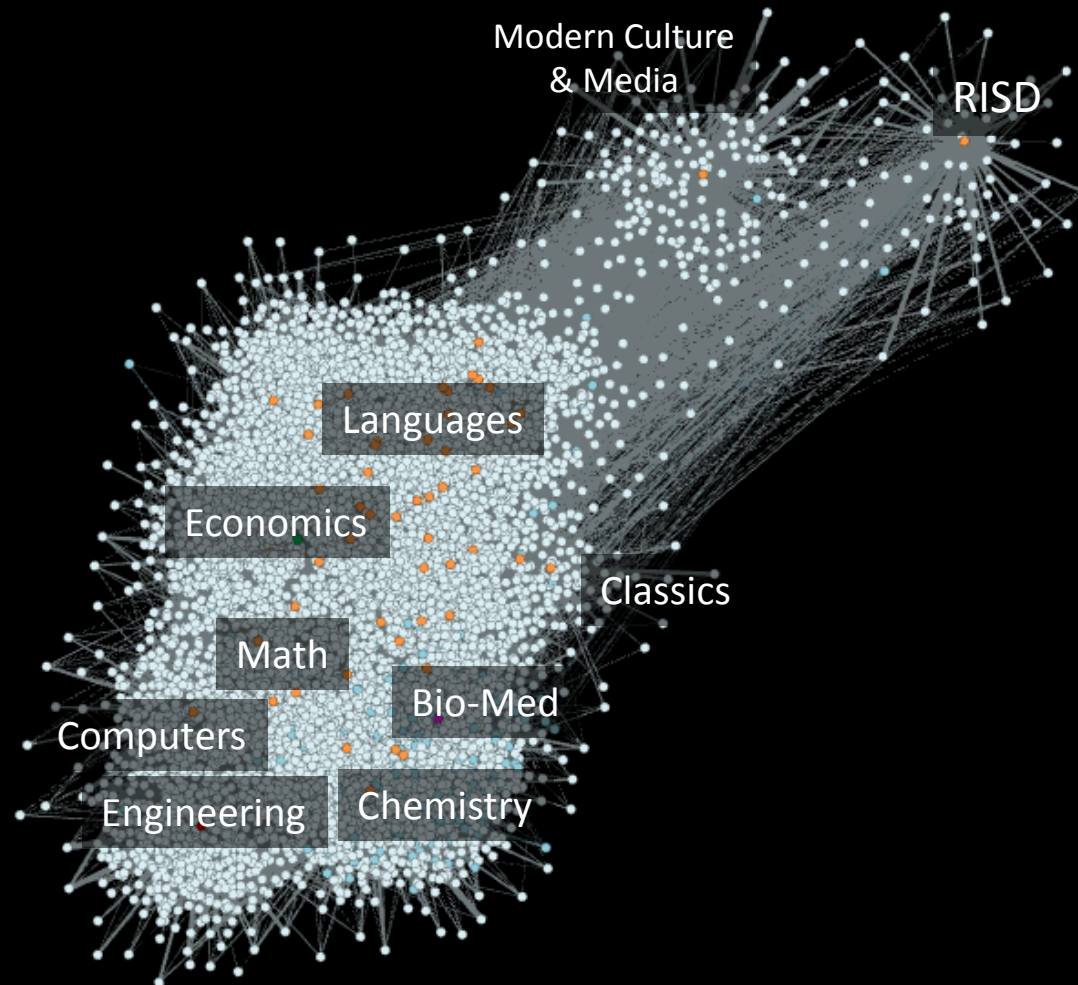
Brown Galaxy Visualization

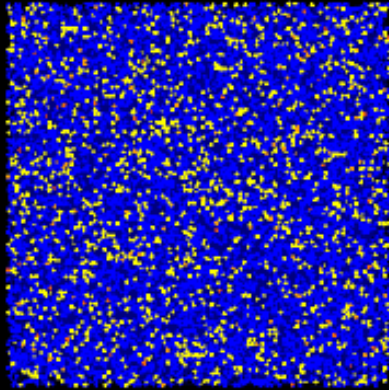
9,726 points

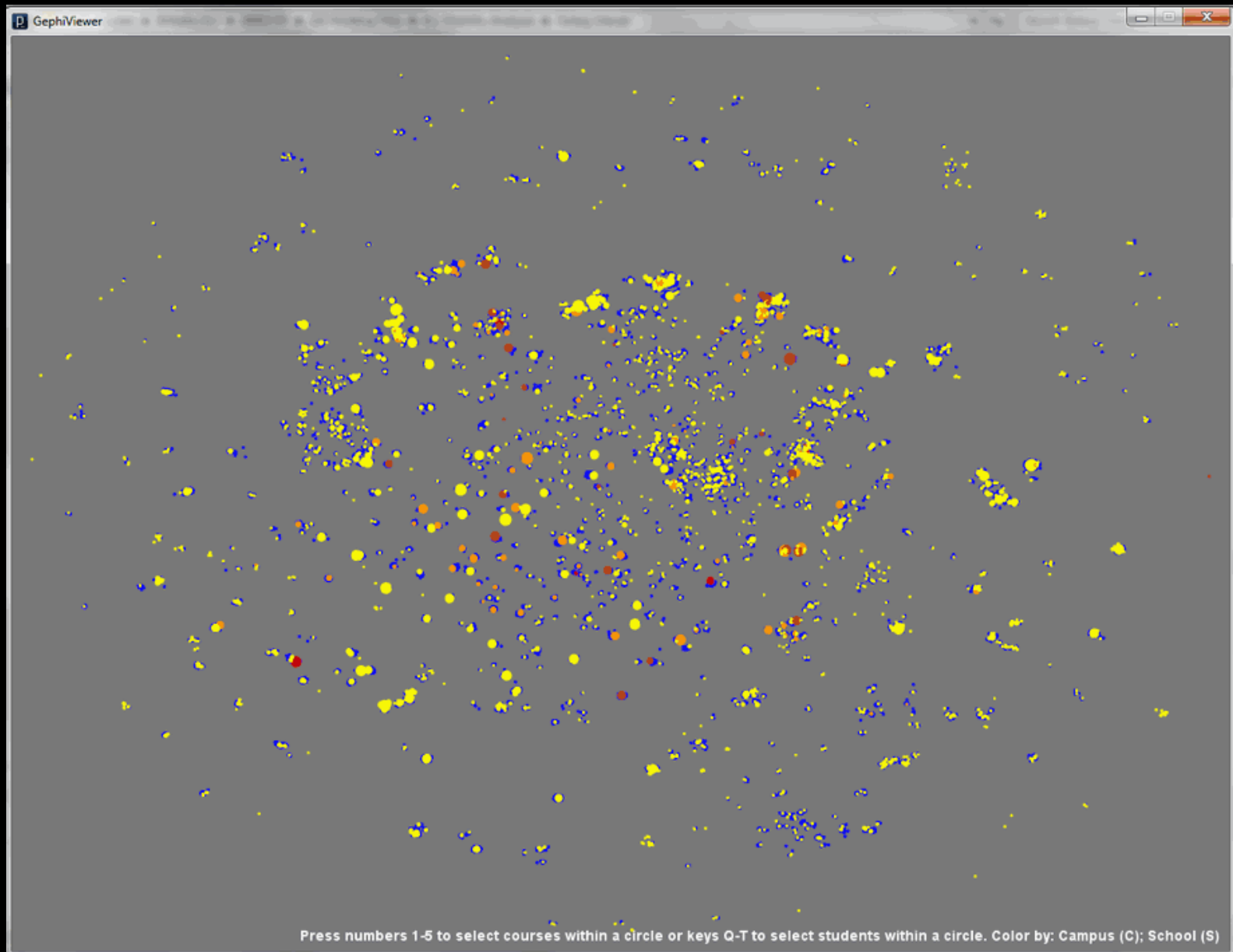


Brown Galaxy Visualization

9,726 points

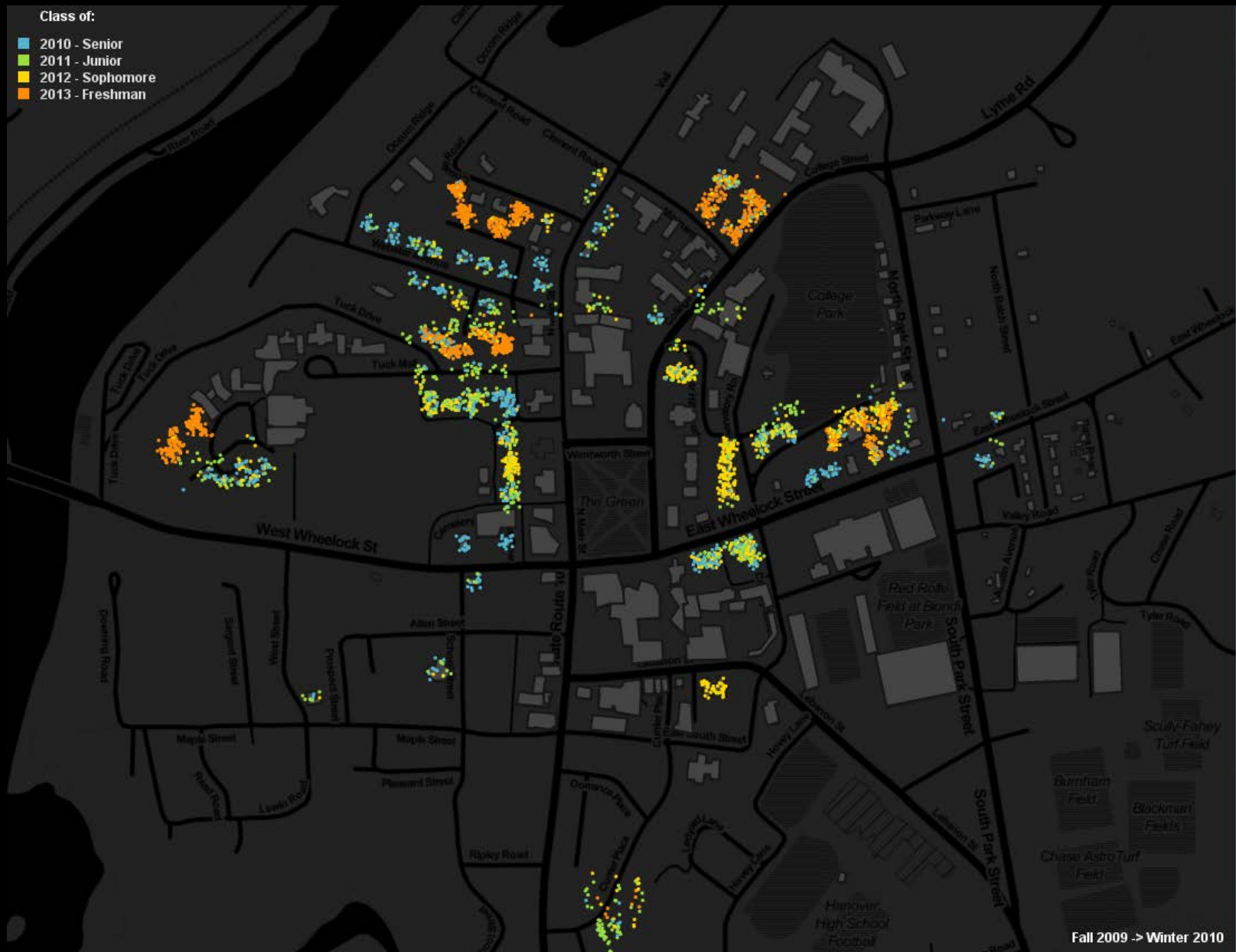






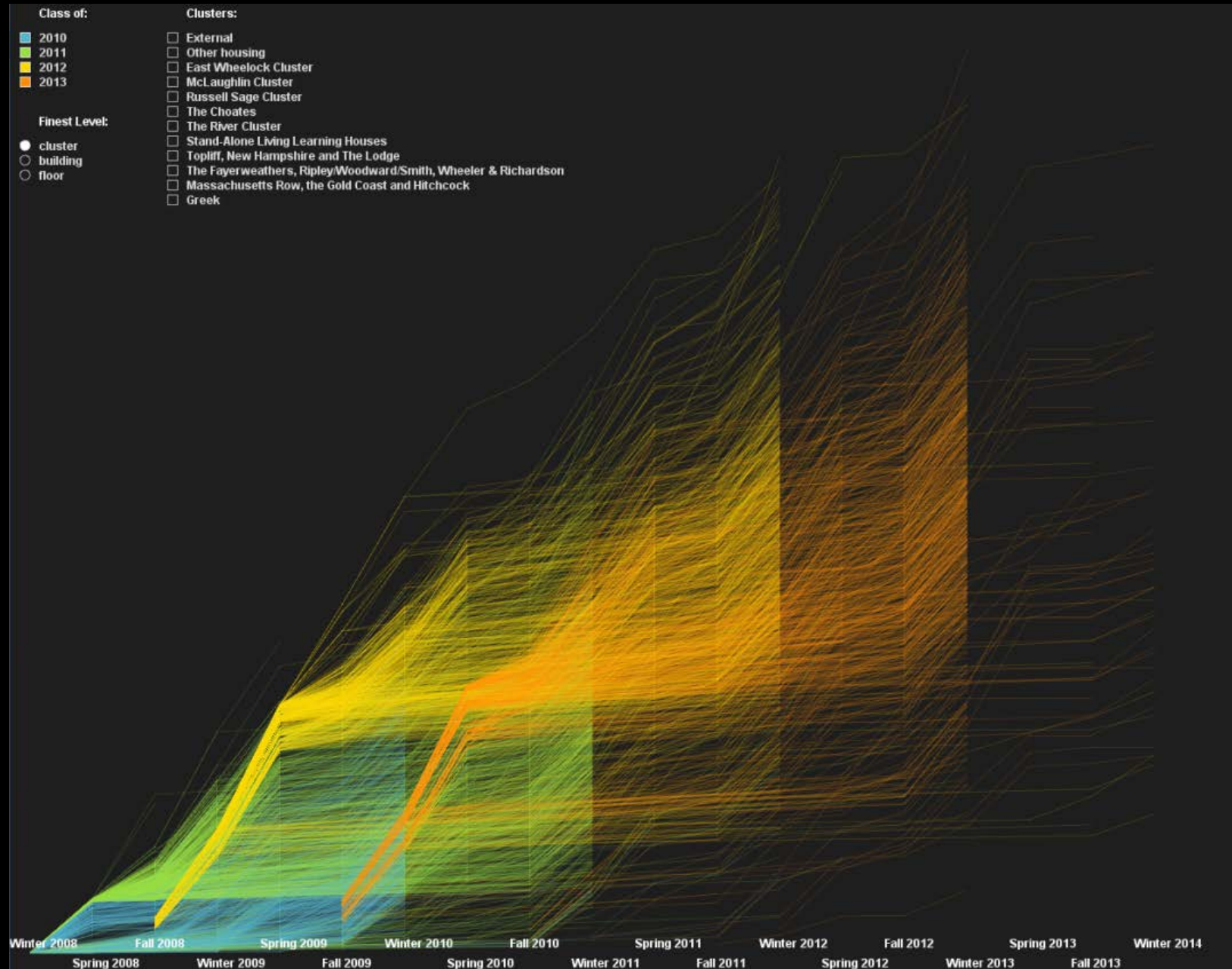
Dartmouth Student Housing

4,425 points



Dartmouth Student Housing

4,425 lines



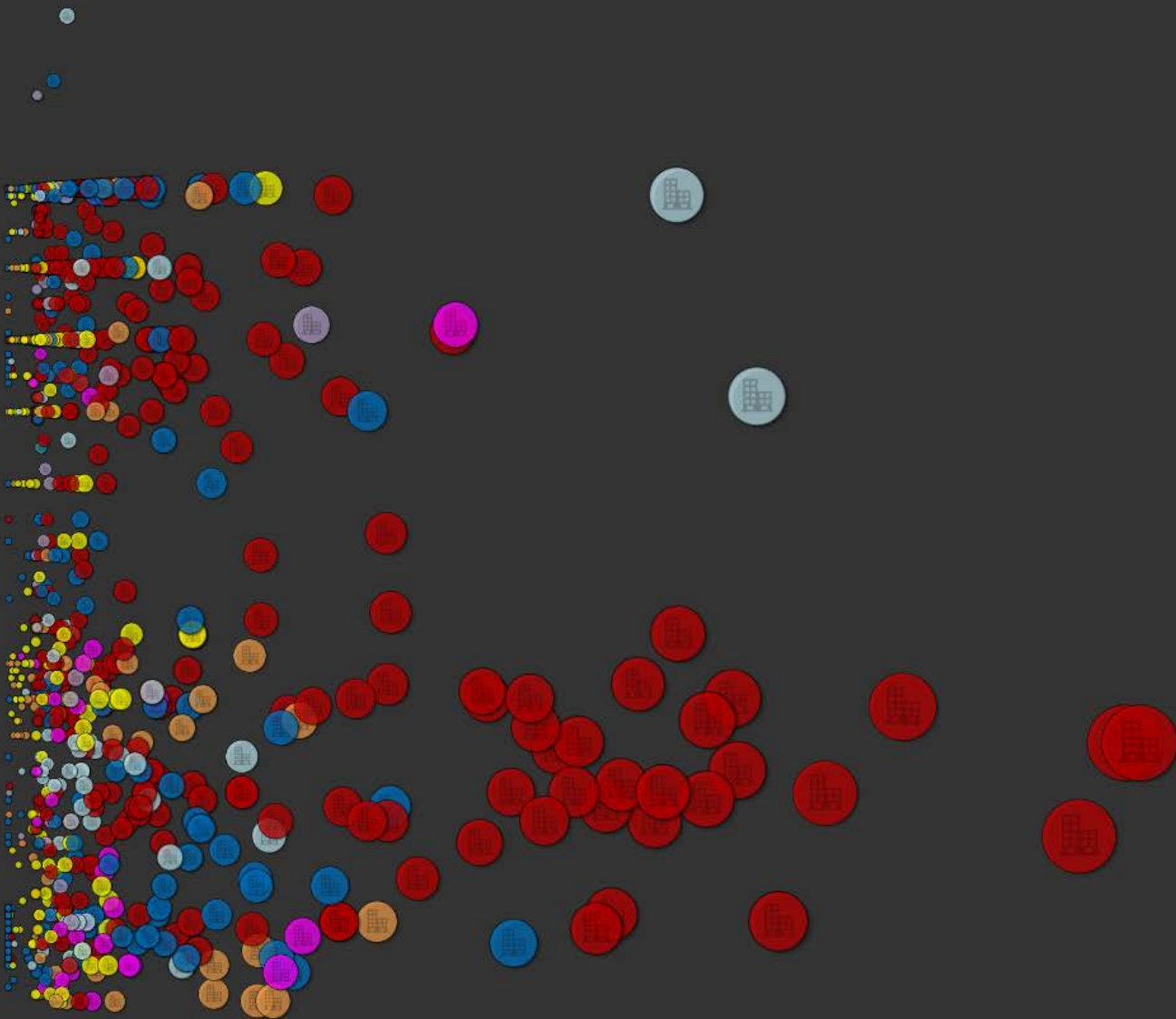
Boston Assessor Data

1,260 points

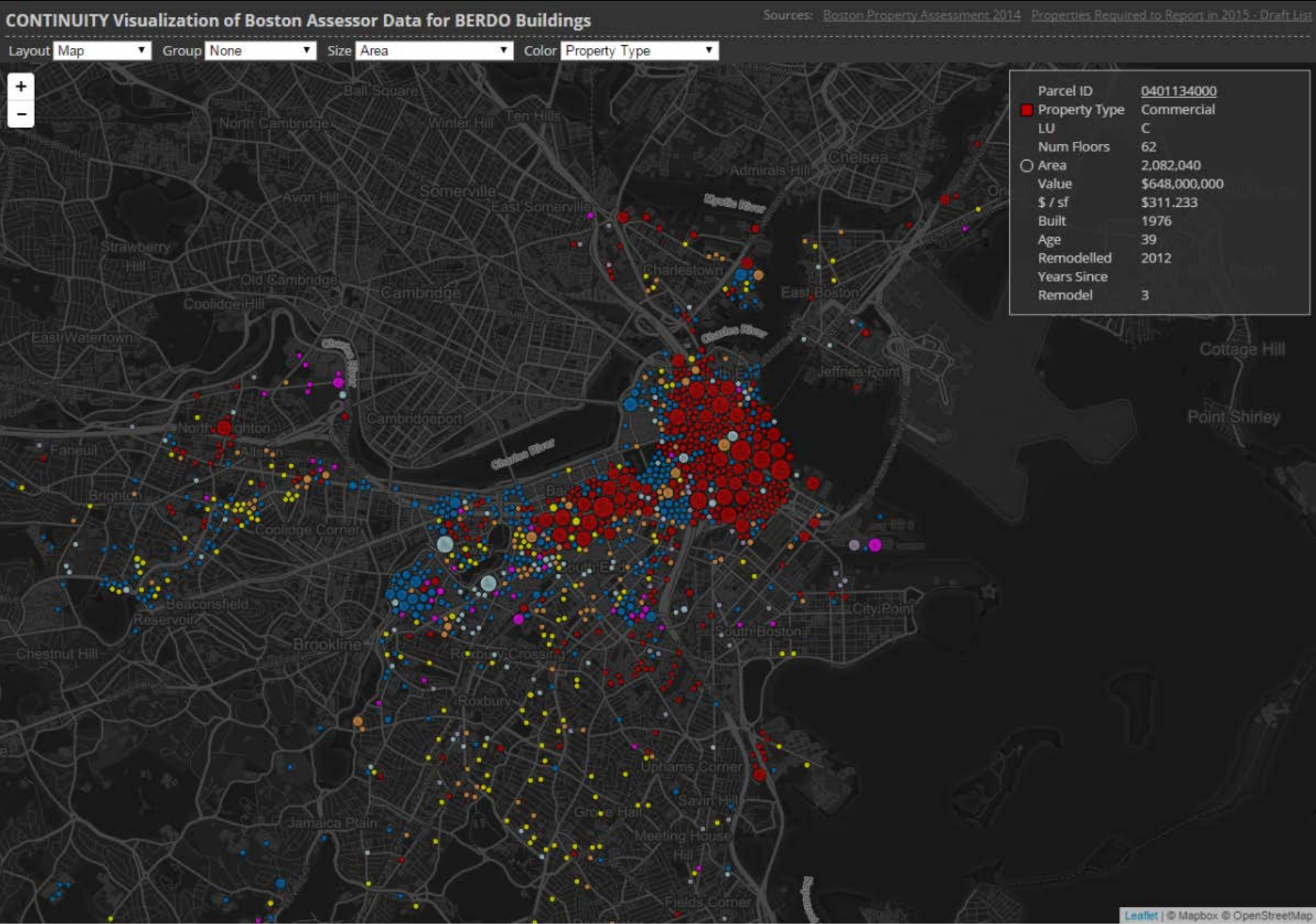
CONTINUITY Visualization of Boston Assessor Data for BERDO Buildings

Sources: [Boston Property Assessment 2014](#) [Properties Required to Report in 2015 - Draft List](#)

Layout **Scatter Plot** X **Area** Y **Age** Group **None** Size **Area** Color **Property Type**



Parcel ID	2205268030
Property Type	Exempt Ownership
LU	E
Num Floors	3
Area	108,832
Value	\$14,892,500
\$ / sf	\$136.839
Built	1875
Age	140
Remodelled	2011
Years Since Remodel	4



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Communities Division

Smart Cities and Decision-Making: The Art of Building a Better Haystack

October 23, 2015

The background is a solid teal color. Overlaid on this are several thin white lines that connect small white dots. These lines and dots form abstract geometric shapes, including triangles and polygons, scattered across the slide. The lines are thin and white, contrasting with the teal background.

We all want to make better
decisions

HOW BIG IS THE HAYSTACK?



- Every public agency, big and small, has thousands of “active” data sets
- Data.gov has 141,192 open data sets

WHAT KIND OF DATA DO YOU HAVE?



- Boundary Data (districts, neighborhoods)
- Line Data (streets, transit lines, infrastructure)
- Point Data (public building, public assets)
- Financial Data
- Crime Data
- Traffic Data
- Service Delivery Data (311)
- Sentiment Data (citizen satisfaction survey, online engagement)
- Property Management Data
- Census Data
- Vendor Management
- Seemingly unending list..

PUBLIC STRUCTURES



- Government agencies are vertical (functional) in their structure
- Budgets fund functional projects (transportation master plan)
- Functional projects generally do not enable experimentation

“CREATIVE” PROBLEM SOLVING



- “Creativity is the power to connect the seemingly unrelated.”
- Requires lateral thinking
- The freedom to explore and experiment

OPEN DATA PORTALS



- Allow government to be functional and the public to be creative
- “Just because you buy a new Iphone, doesn’t mean more people call you.”
- Means to an end...