

# **Public Trust (by the numbers)**

# Analysis, notes, and terms

## Qualification of data sources and types, key terms, and analytic methods.

**Observing activity and usage of a public space during the run of an installation is currently the best method to determine the reach and impact of public art, but it is highly anecdotal and relies on the subjective perception and interpretation of the observer. While such methods are critical to our understanding of the impact of public art, they can be complimented and strengthened by quantitative data from new sources such as smartphones and other mobile devices, which a significant percentage of the population owns and carries throughout their daily routines.**

Getting accurate demographic information about participants in an activity generally requires asking those participants about themselves. This pulls participants out of the activity and makes them answer questions, but it also tends to discourage answers from shy or hard-to-reach groups of people who may be the intended audience. Public census demographics only tell us about who lives in an area instead of who visits.

Mobile device data, while less comprehensive than on-the-ground observations and less detailed than survey responses, is able to provide measurable information, collected uniformly across locations, and without disrupting the installation itself.

This analysis uses this granular urban data to take a fresh look at both direct consumers of public art as well as the local populations the public art is most likely to impact, based upon urban proximity.

### Data Sources and Types

The analysis in the following pages uses anonymized mobile device data as a primary mechanism for analyzing populations most likely to have encountered (actively or passively) the recent Public Trust art installations in Kendall, Copley, and Dudley Squares. The mobile device data is complemented by open GIS data from the City of Boston to allow for site measurements and analysis of the open spaces themselves.

The mobile device data source is CraveLabs, a Boston-based location intelligence company. Data records for mobile device users include fields such as location (latitude and longitude), time of impression (when user is recorded in a particular location), digital activity on phone (app or URL type) at time of impression, mobile device make and operating system type, and for a subset of those records, some demographic information as well.

### Data

This analysis shows age as relative years above or below an overall value, instead of specific ages. By comparing the ages to themselves, we can more comfortably show how many years 'older' one site seems than another. While young people do use smartphones more heavily, overall use of the smartphone today crosses age, gender, ethnic, and income lines.

Similarly, this analysis uses operating system type – based on the make of the mobile phone – as a kind of proxy for socio-economics. Maps showing the usage patterns of types of cell phone (in this analysis, simplified to iOS phones versus non-iOS phones) correlate quite closely to maps that show socioeconomic segregation in cities, which themselves reflect larger societal history. The example map in red and green (see following pages) shows tweets tweeted by iPhones and Android phones in Boston, and the distribution lines up with how communities differ by race and income.

### Public Trust Locations

From left to right: Kendall Square, Copley Square, and Dudley Square



**Why do these metrics matter?**

- Age and socioeconomics (or, at least, socioeconomics proxied through type of phone) say a lot about an individual's access to art. Given constrained resources and cities' general difficulty systematically investing equitably in all locations, any successful outreach should be measured when it happens.
- The "reach" of a location describes a different kind of social or civic effect. Showing where visitors to an art installation also show up in a city demonstrates how the installation fits into the overall connections and disconnections in the city.

**Smartphone Ownership Highest Among Young Adults, Those With High Income/Education Levels**

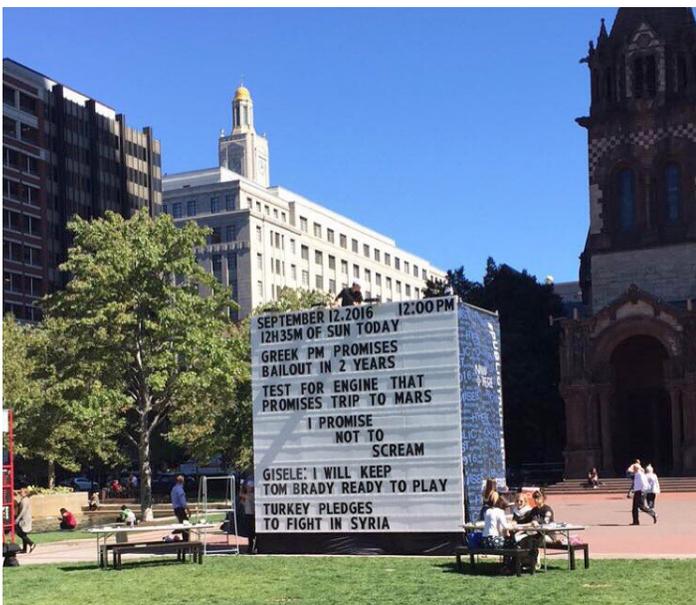
*% of U.S. adults in each group who own a smartphone*

All adults	64%
Male	66
Female	63
18-29	85
30-49	79
50-64	54
65+	27
White, non-Hispanic	61
Black, non-Hispanic	70
Hispanic	71
HS grad or less	52
Some college	69
College+	78
Less than \$30,000/yr	50
\$30,000-\$49,999	71
\$50,000-\$74,999	72
\$75,000 or more	84
Urban	68
Suburban	66
Rural	52

Combined analysis of Pew Research Center surveys conducted December 4-7 and 18-21, 2014.

PEW RESEARCH CENTER

For general reference, the Pew Research Center 2015 report on smartphone ownership.



# Who saw Public Trust?

**A look at visitor demographics suggests that Public Trust reached very different demographic groups across the three locations.**

**By using anonymized mobile device data, we have been able to measure some demographics of the visitors across the three sites.**

This analysis focuses primarily upon demographics in relationship to generalized socioeconomic type and age. Findings suggest that Public Trust reached very different populations in terms of socioeconomic status across the three locations.

Visitors to the Kendall plaza appearing in our mobile device dataset during the exhibit week were on average three years older than the age of the average user across our entire dataset, while visitors to Copley and Dudley were 5 and 7 years younger than average. Some piece of the older age in Kendall may reflect the concentration of working professionals in the neighborhood.

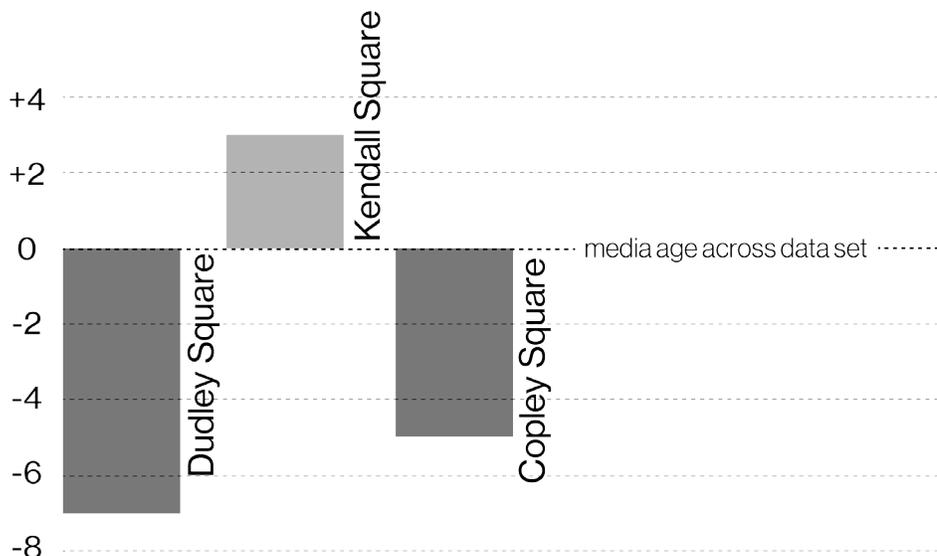
As mentioned before, there is a connection between use of a non-iOS smartphone and minority representation or lower household income. In lieu of trying to deduce specific characteristics of the individual visitors, we will look at the spread of

operating system usage during the exhibit weeks and compare it to the usage spread in the overall neighborhood.

Copley Square's installation, located right by Back Bay, had a very high proportion of iOS users, and that percentage was in line with the average for the neighborhood. Kendall Square's installation was slightly lower, but still had a number that may reflect its position within a biotech hub. There were fewer iOS users at the plaza itself than in the neighborhood, which may speak to the importance of the art being near a main path to a transit stop, and the draw of the installation as a public event.

Dudley Square was a major outlier. While a much lower number of iOS users would be expected by statistics in the overall neighborhood, usage on the plaza itself during the installation week showed that almost all phone activity measured was with non-iOS phones.

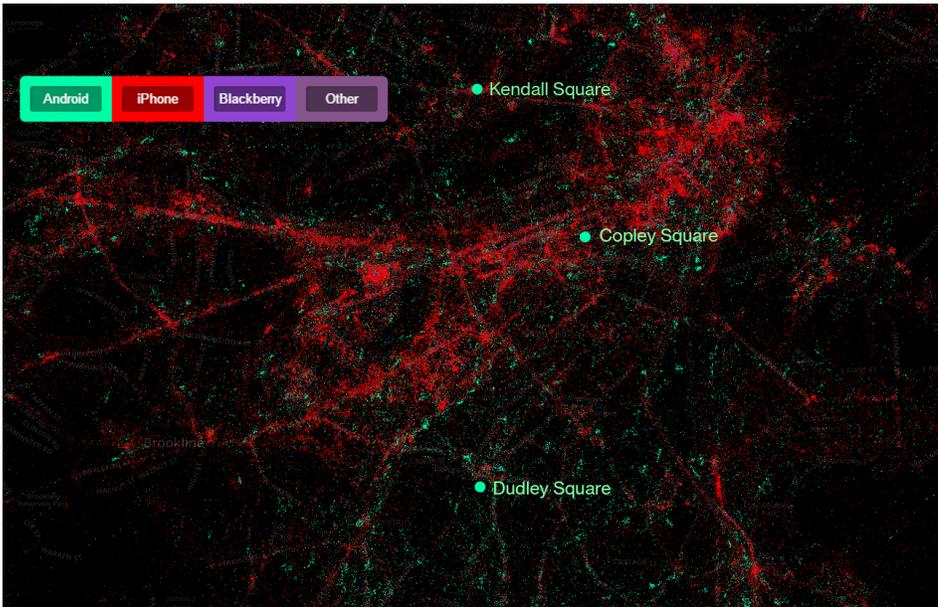
Being near a civic building that is a major draw on its own within a community does, demographically, seem like a good way to reach harder-to-reach audiences.



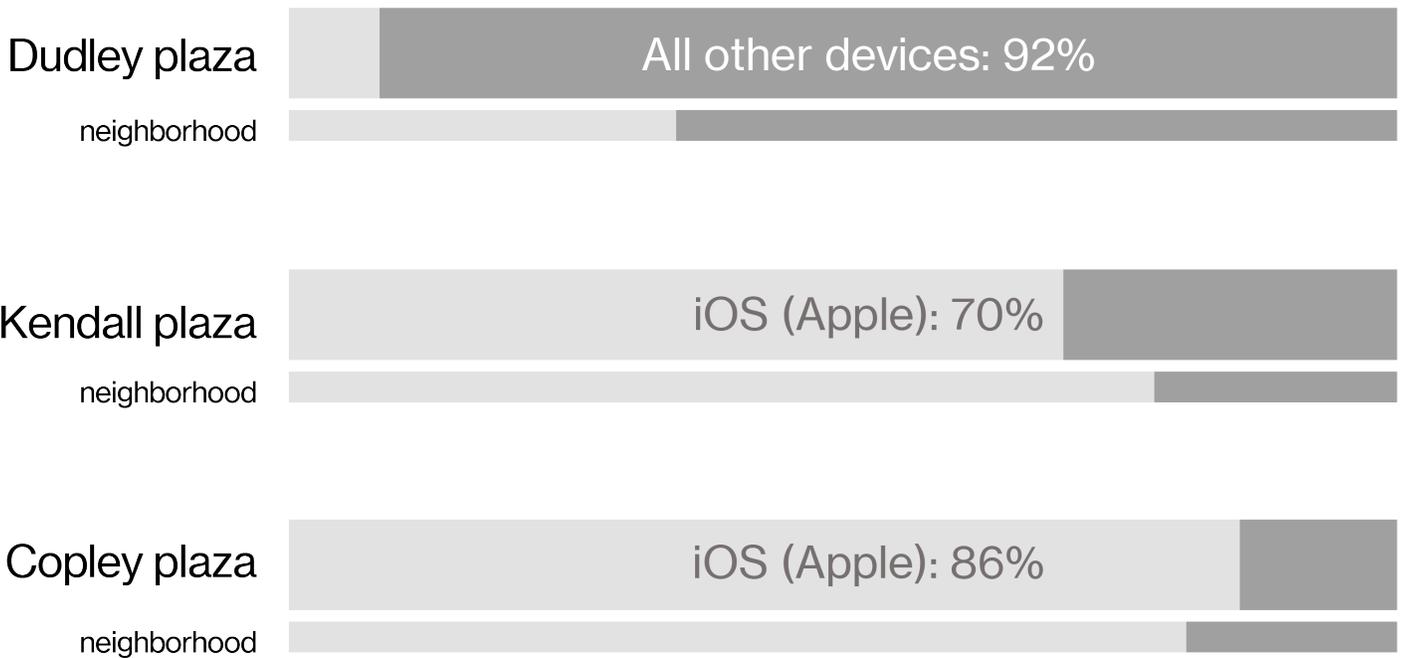
#### Deviation from median age of all data records (by Public Trust location)

A comparison of visitors to each Public Trust location to the median age of all data collected. Kendall Square visitors were, on average, 3 years above the median age while Copley and Dudley visitors were respectively 5 and 7 years younger than the median.

Data Source: CraveLabs mobile device data



**GNIP.com map of Boston area Tweets since 2011 by mobile device operating system type**  
 Tweets by location, mapped and classified by mobile device type. This map generally correlates to the city's racial and socioeconomic distributions, where Android-heavy areas also tend to have lower household incomes and higher minority makeup. This pattern, seen in greater detail by zooming in on the Public Trust locations, is consistent with the operating system distribution present in the data collected by Supernormal citywide during these specific site analyses.  
 Source: GNIP.com



**Device and Operating System Type by Location**  
 A demographic comparison of visitors can be made by examining the operating systems used across the three Public Trust locations.

Data Source: CraveLabs mobile device data

# The reach of Public Trust

**Visitors to the locations are connected to their surrounding community in a more concentrated version of the pattern connecting the neighborhood to the city.**

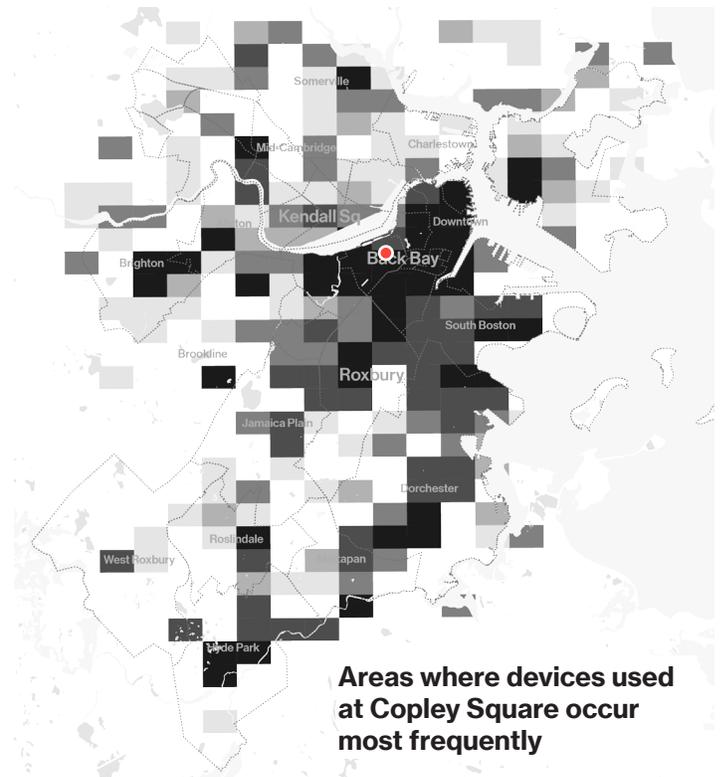
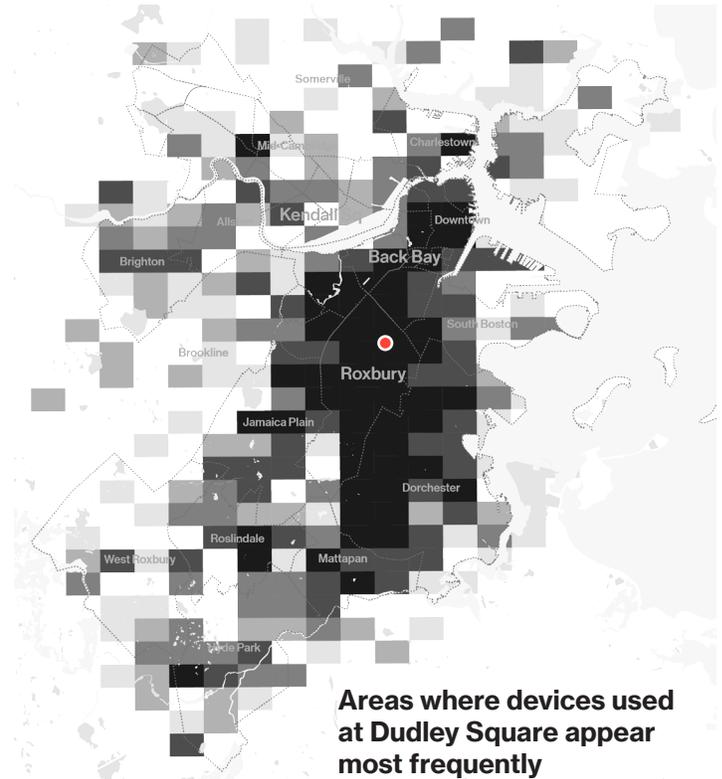
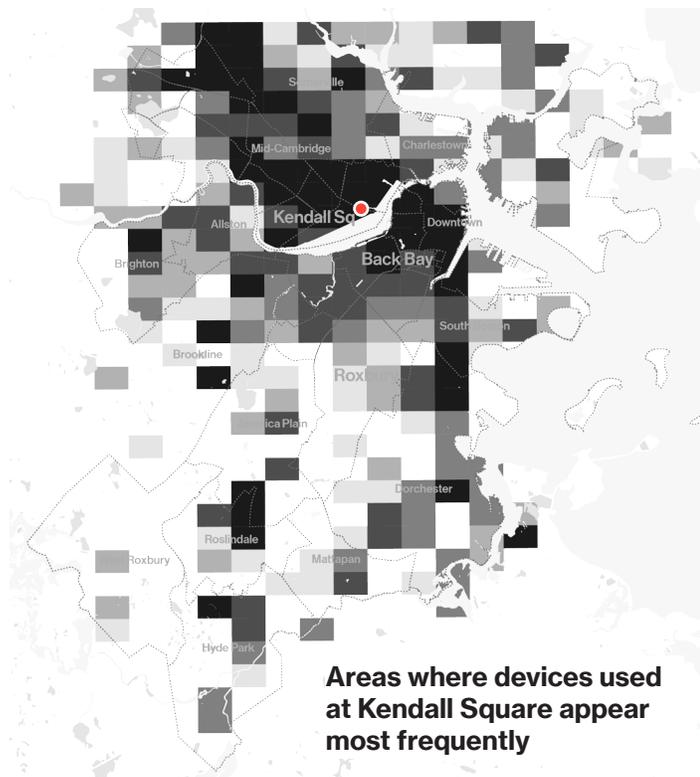
This activity analysis of the Public Trust locations shows the reach of the Public Trust squares (top) and neighborhoods (bottom): what areas of the region and city are places where devices that show up near Public Trust installations also show up.

Visitors to Copley are concentrated in downtown Boston, visitors to Kendall are distributed along the path of the Red Line, and visitors to Dudley are concentrated along the roads and transit corridors in the southern parts of Boston as well as transit nodes and line endings across the metro area. The differences in these patterns shows just how differently the choice of locations was able to draw from different audiences in the city.

## The metropolitan reach of plaza visitors during active Public Trust hours

For the metropolitan Boston neighborhoods, areas where devices that appear on the plaza at each Public Trust location at least once appear more frequently. This map shows use patterns of visitors that are most likely to have encountered Public Trust directly.

Data Sources: CraveLabs mobile device data, Open Street Map



# Art changes public space

**A close look at the changes in activity patterns between the week during installation and the following normal week shows a clear increase and shift in plaza activity, particularly near the installations themselves.**

The Public Trust installation in Kendall Square, an area near two public transit stops with significant commuter activity, had significantly more overall viewer density based upon a calculation of pedestrian density per acre during the hours of the Public Trust installation. Visitor density was just slightly the lowest in Copley Square, possibly because the plaza and public space around the Public Trust installation are the largest in scale when compared to the other two locations.

Because the Dudley Square location is the most compact and

least used during non-installation days, the impact of Public Trust is most clear and significant in this location.

The maps below show that all locations saw an increase in plaza activity in viewing areas directly abutting the Public Trust installation. Again, the most clear impact correlation is shown in the Dudley Square plaza, where normal urban activity is the lowest. While the impact of Public Trust is clear across locations, there is more noise in the data around Kendall and Copley Squares, which see naturally high volumes of traffic.

Dudley Square  
Plaza area: 0.2 acres

1,000

Kendall Square  
Plaza area: 0.55 acres

4,000

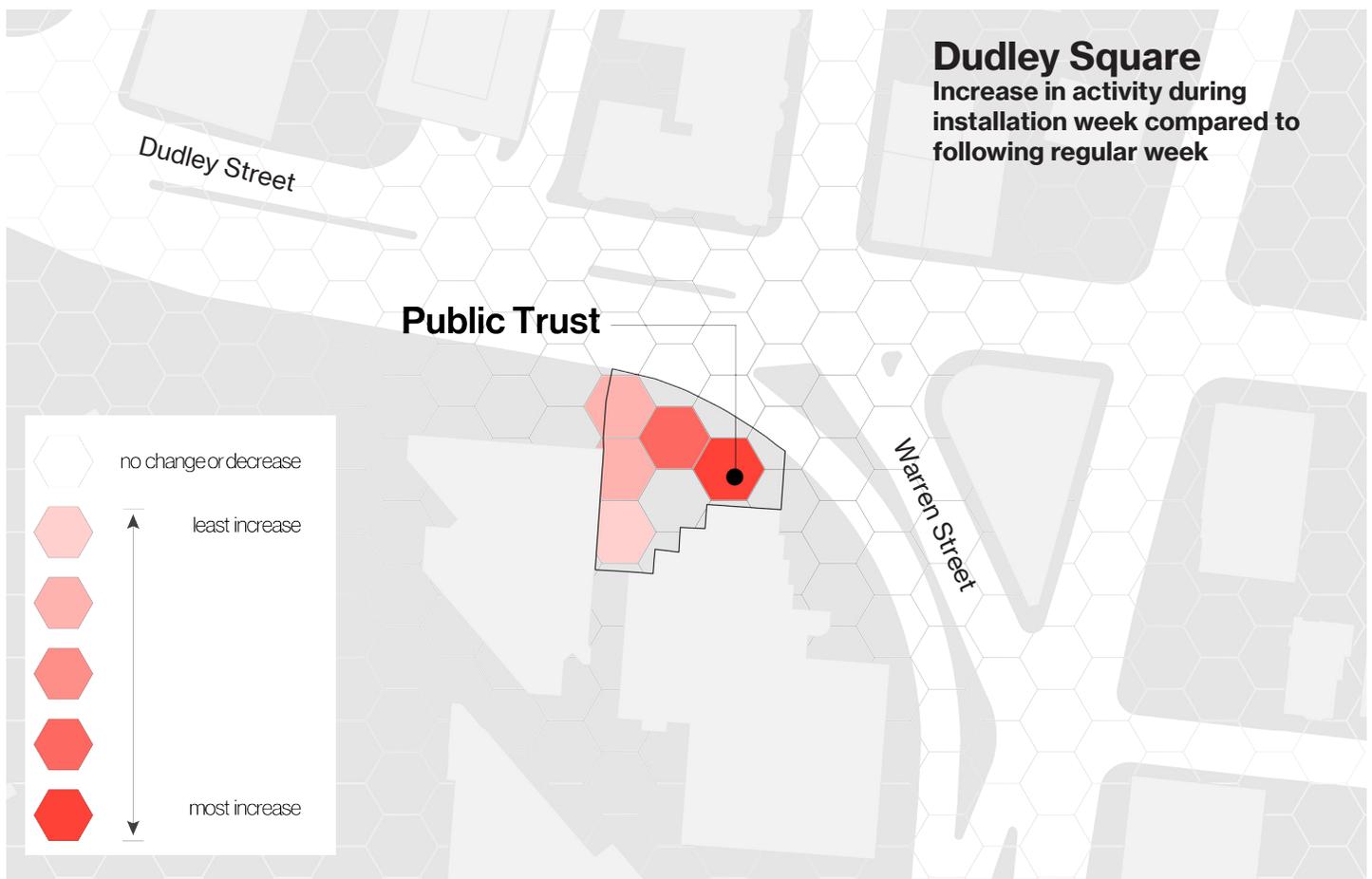
Copley Square  
Plaza area: 3.3 acres

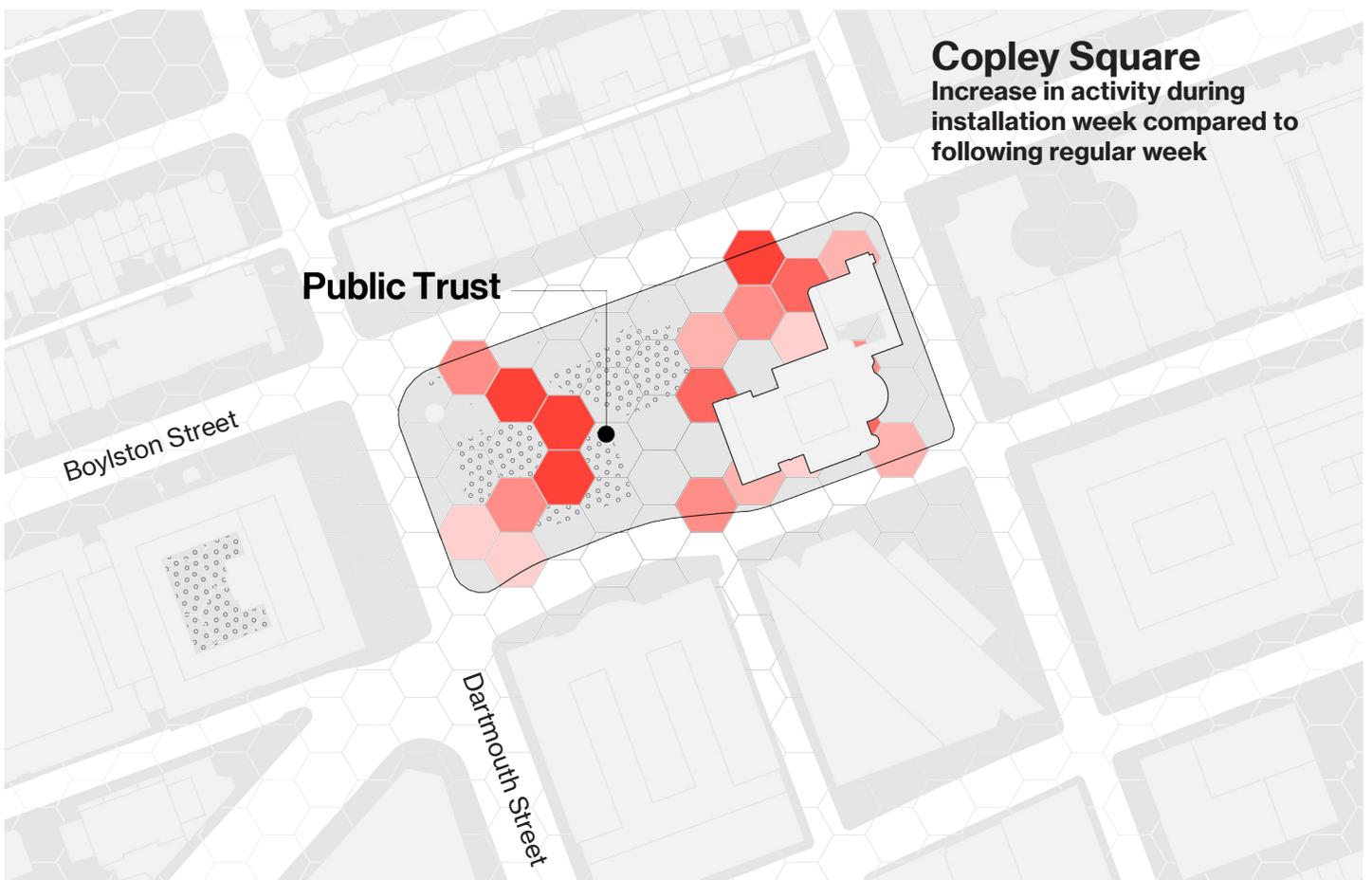
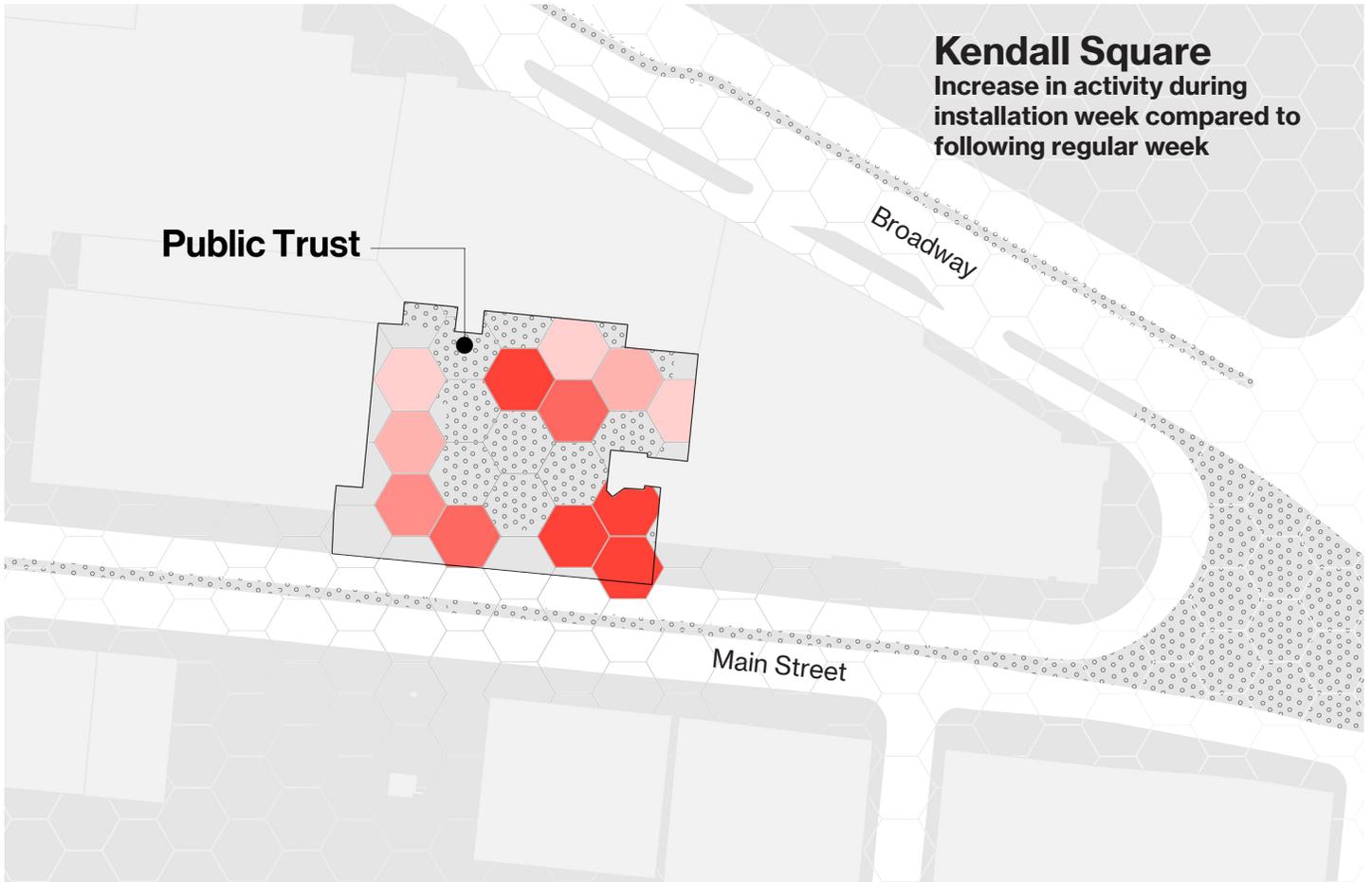
900

### Visitor Density by Location

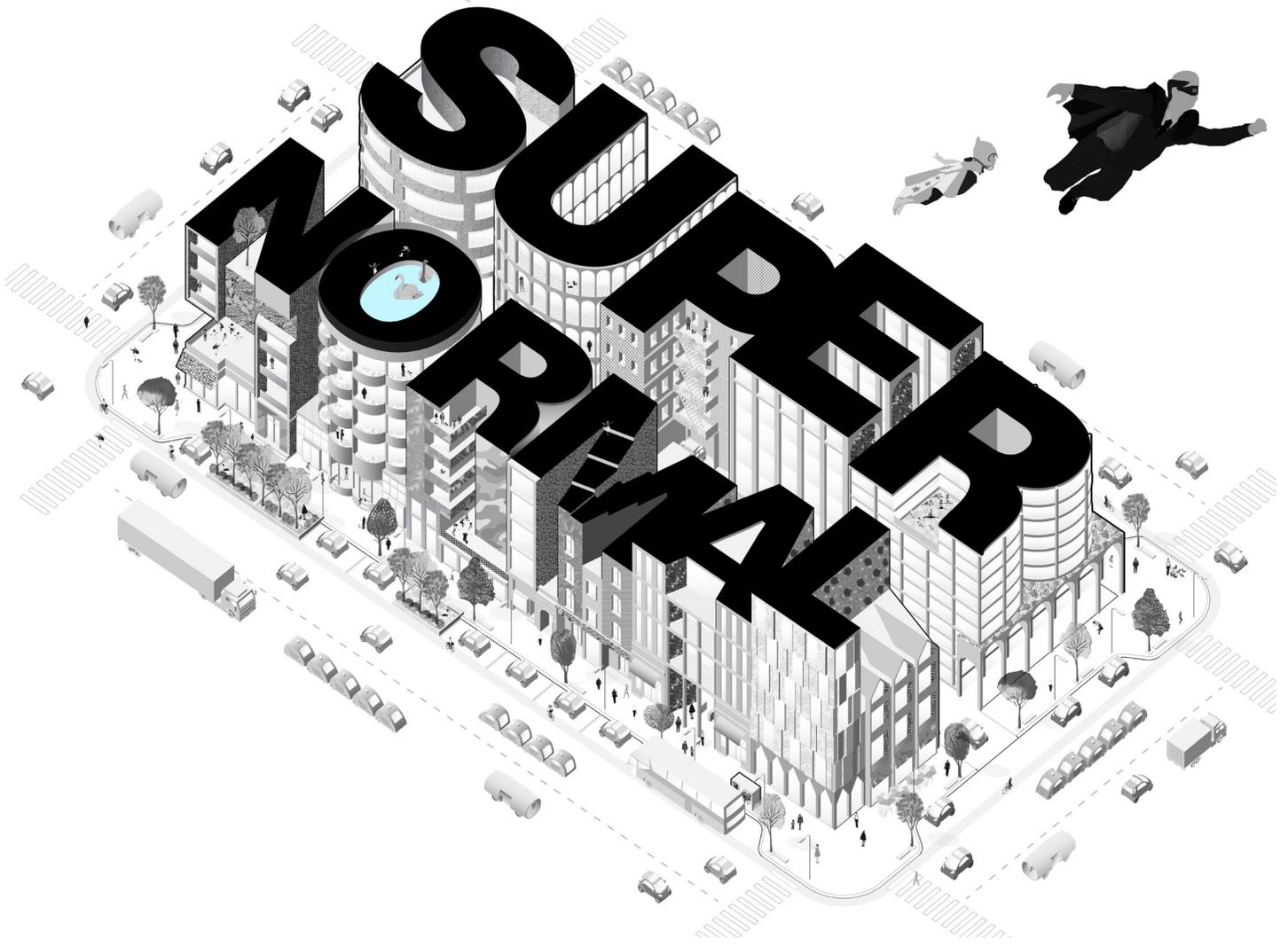
A comparison of visitor density by the number of impressions recorded per acre over the week-long installations during open hours.

Data Sources: City of Boston open GIS data, CraveLabs mobile device data









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