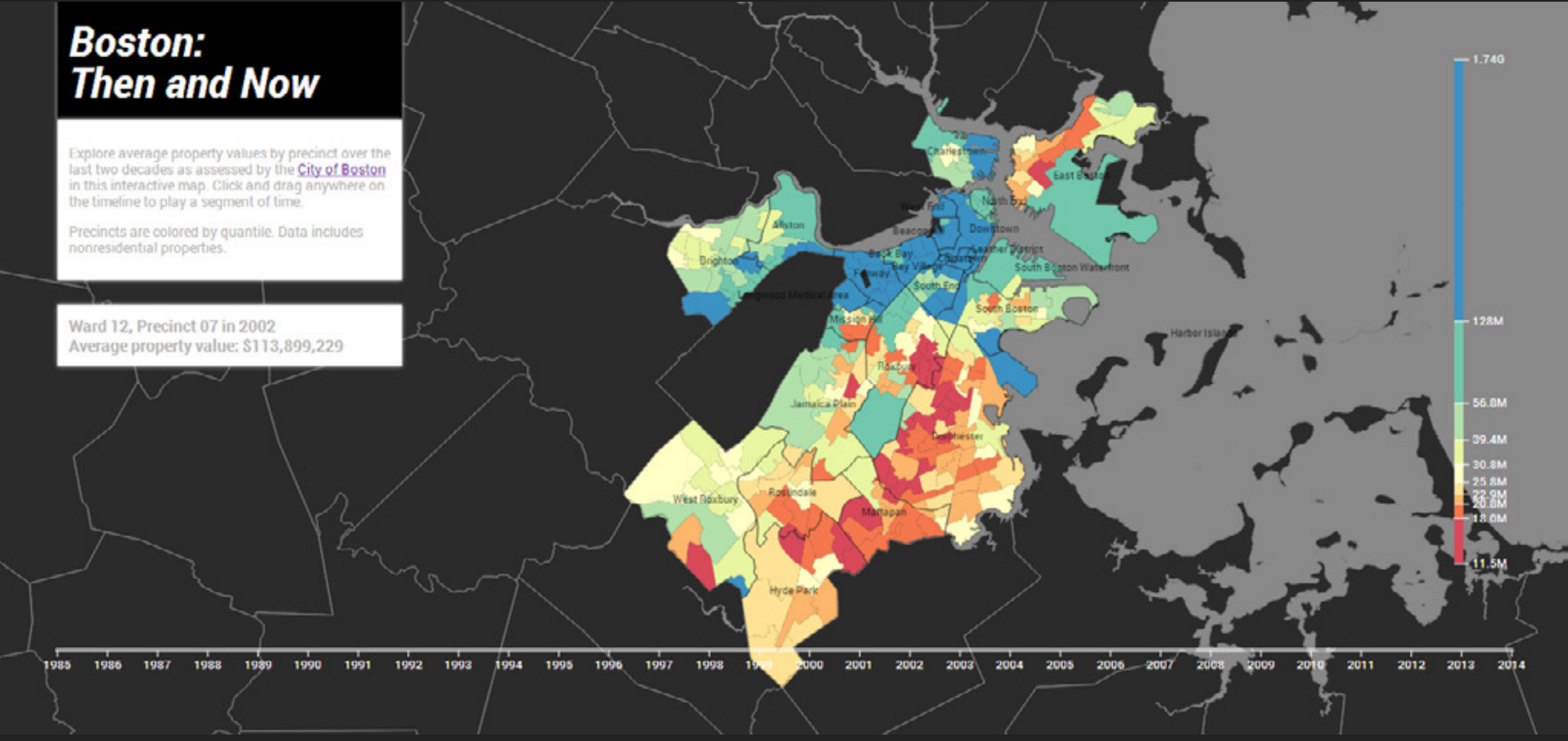



# Boston Then and Now: Gentrification via Property Value

by Alex Chen

# Overview and motivation

By many hard-to-quantify anecdotal or qualitative metrics, many Boston neighborhoods have experienced considerable gentrification in recent years, e.g. Jamaica Plain or South End. In general, gentrification tends to be difficult to quantify—what do we look at? census data on types of households? property values? number of Whole Foods?

And how do we quantify the affective side, of communities who must face being pushed out of affordable housing by college kids and then by yuppies?

This project is not ambitious in the sense of developing new metrics for gentrification—in fact we use the rather simple metric of property value—but we nevertheless hope to capture some broad impressions of gentrification in Boston by visualizing changes in property values over time, particularly in neighborhoods where we are confident that some measure of gentrification exists.

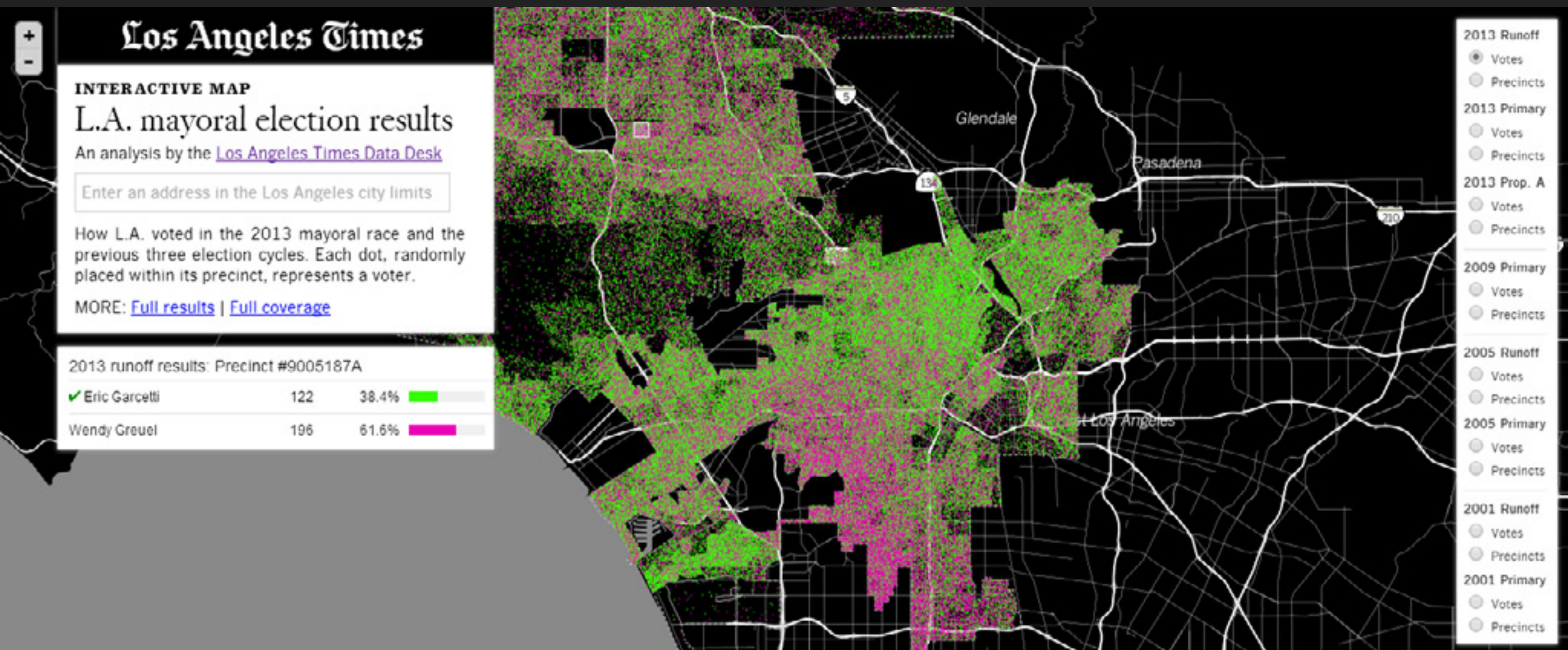
# Related work


This project was inspired by a report by the Asian-American Legal Defense and Education Fund (AALDEF) titled *Chinatown Then and Now*, which investigated gentrification and land use over the last three decades in Chinatowns in Boston, Philly, and New York, documenting the massive changes and challenges these communities faced as local governments let new development gut existing communities.

The AALDEF report used a variety of metrics and gathered its own data to pinpoint what it deemed as significant and harmful trends in Chinatowns, examining everything from rising rents to demographics to types of businesses. I wanted to explore some of the same phenomena within a slightly larger scope, as I had some prior experience talking with residents and community members about gentrification both in Boston's Chinatown and in other neighborhoods, namely South End and Jamaica Plain.

# Related work

This project was also inspired aesthetically by the LA Times Data Desk's osm-silent-la base layer and the below interactive map, built in Leaflet.



# Questions

We began with the following questions in mind:

> "Which Boston neighborhoods have undergone some measure of gentrification in the last two decades?
>
> Is property value alone a good metric for quantifying gentrification?
>
> What's the best technology stack for working with GIS data in D3?"

Quite a few more questions started to crop up in the process of building the visualization, such as "why are we trying to do a GIS project without any GIS experience?" and "oh God why does JS hate me?"

In a more serious vein, we ran into some of the following questions:

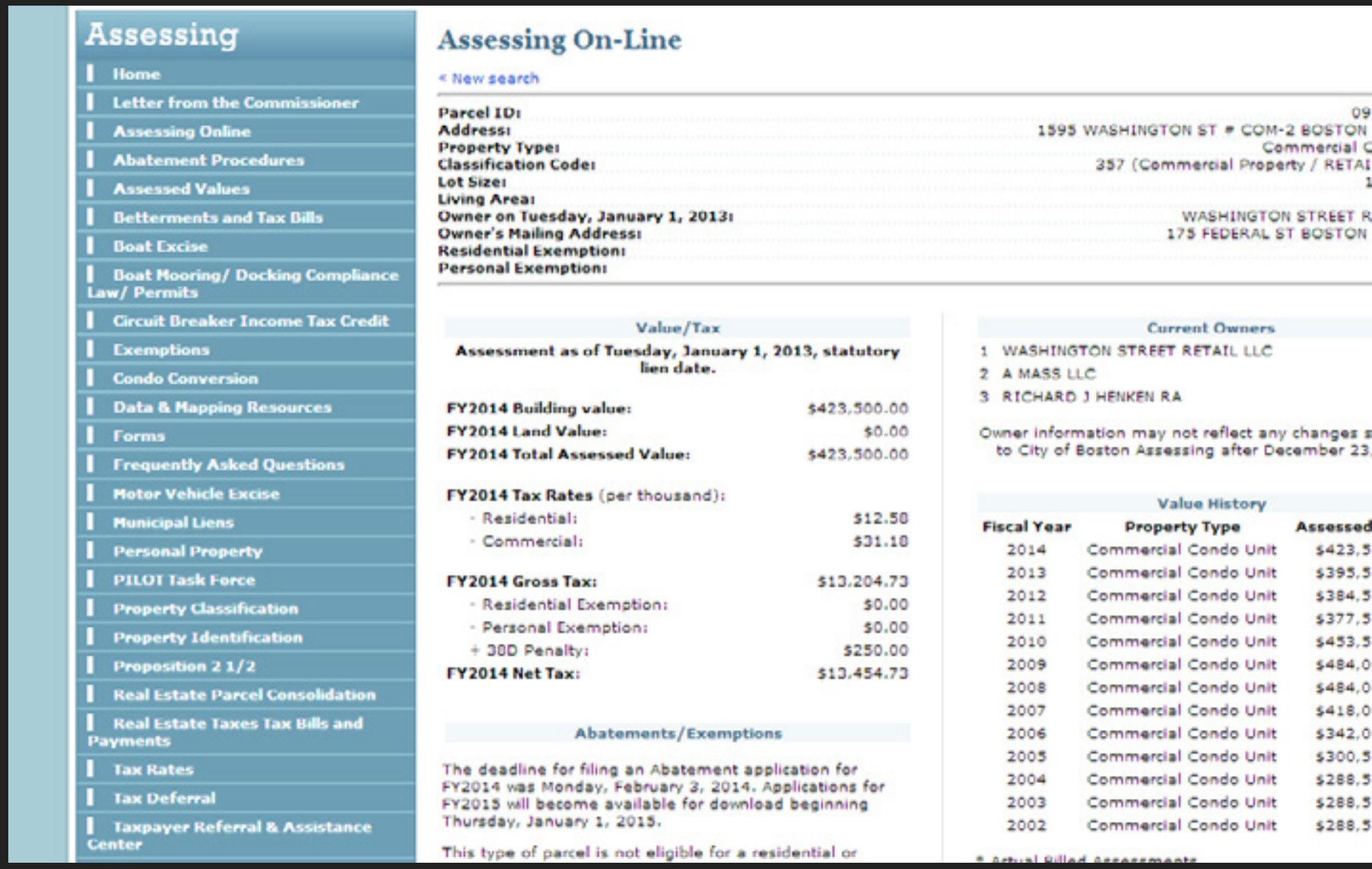
> "How should we store our data dump?
>
> How do we consolidate and aggregate data to reduce the size of the visualization? What bins can we place data points into? Can we make arbitrary yet sensible aggregations of parcels?
>
> How best should we implement interaction with time variance in a user-friendly way?"

The first two more abstract questions of where and how gentrification is happening and of metrics continued to make their presence felt throughout the visualization, but were not engaged with in a significant manner, due to more logistical and technical concerns.

# Data

Property value data was scraped from the City of Boston Assessing On-Line tool in Python by requesting information for each parcel present in the most recent parcel shapefile.

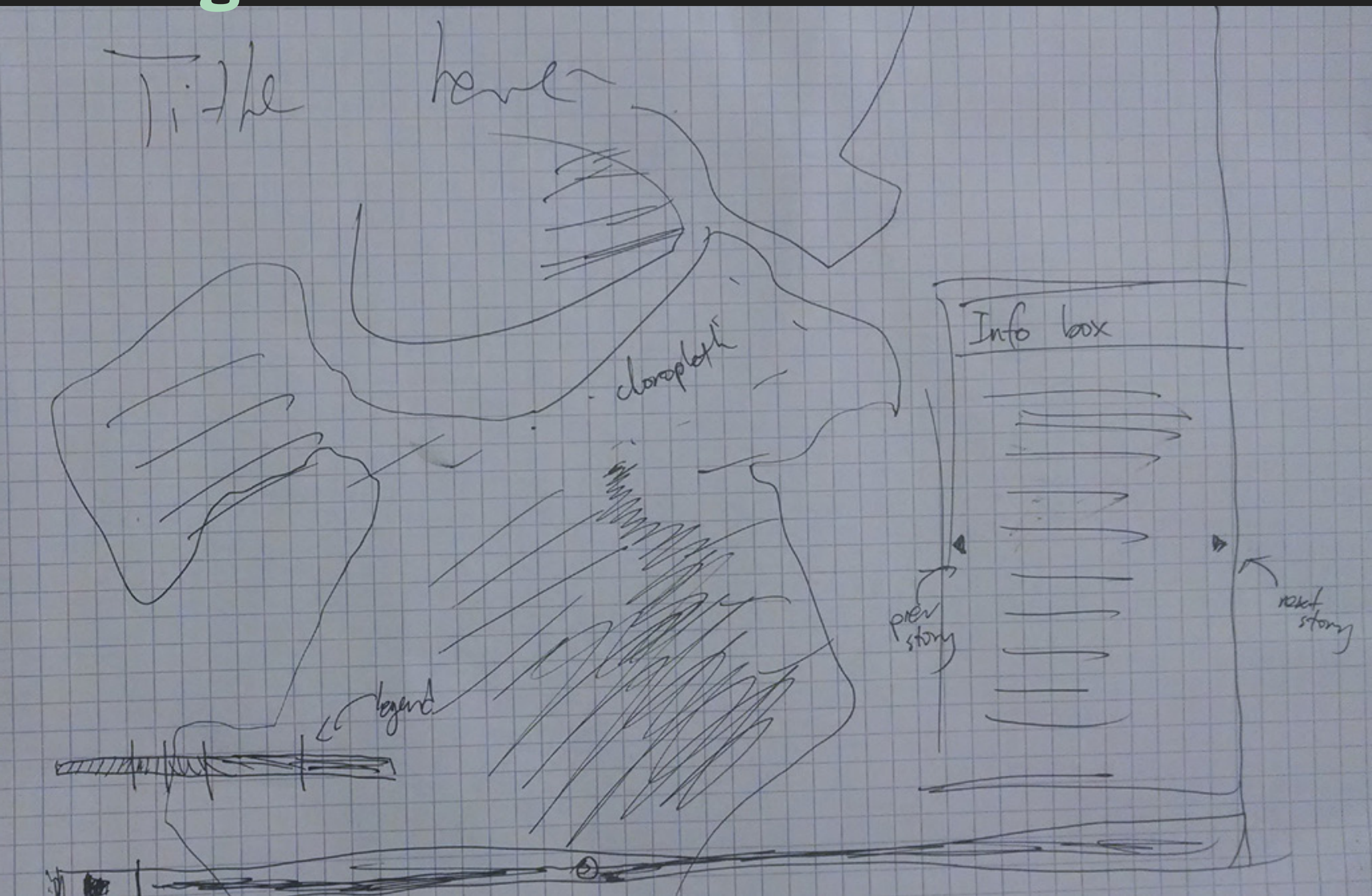
Shapefiles for parcels and wards were provided by the City of Boston's GIS Team and the shapefile for neighborhoods was provided by the Boston Redevelopment Authority.



# Exploratory data analysis

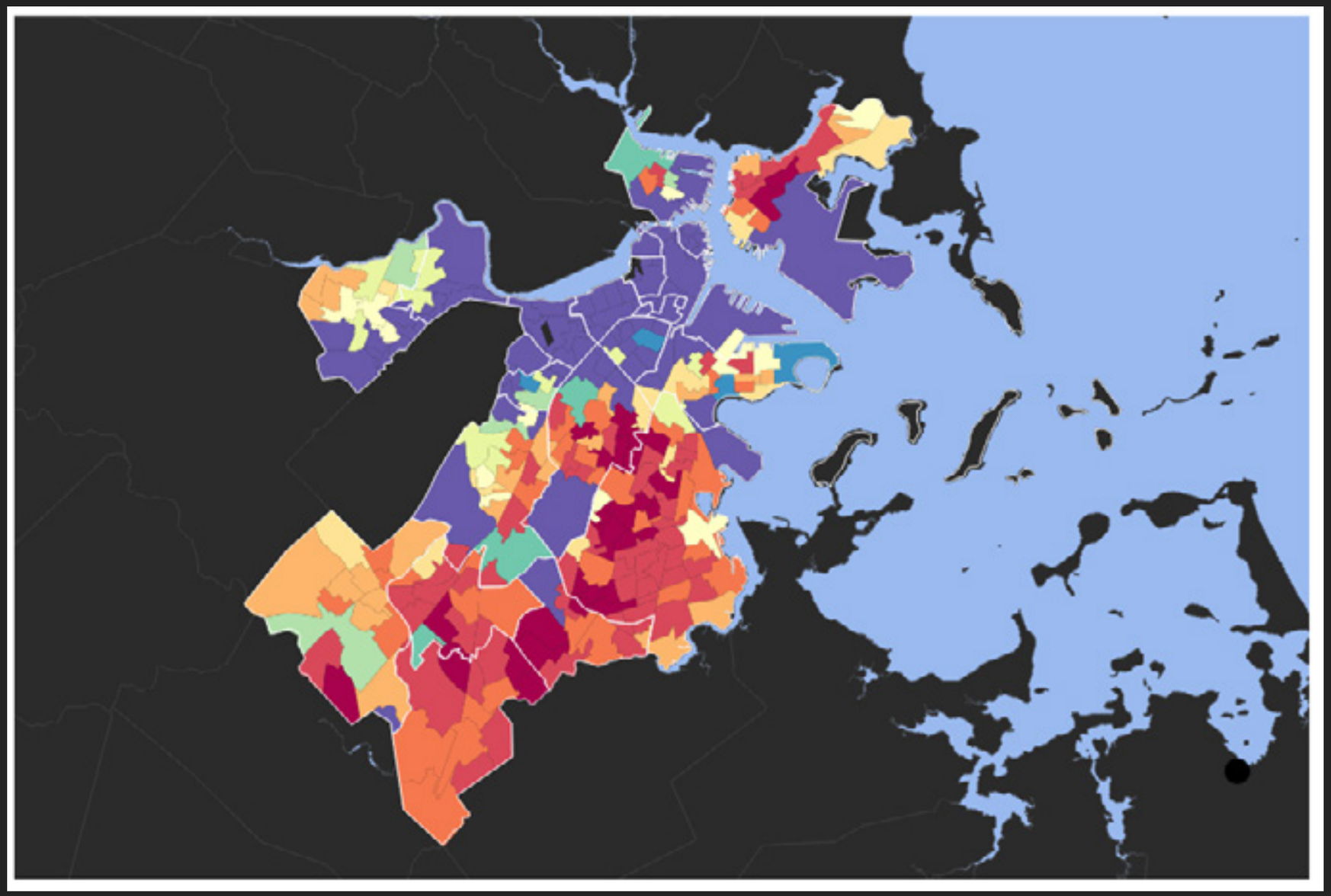
Very little exploratory data analysis was done, given lack of familiarity with GIS tools and general stupidity.

# Design evolution



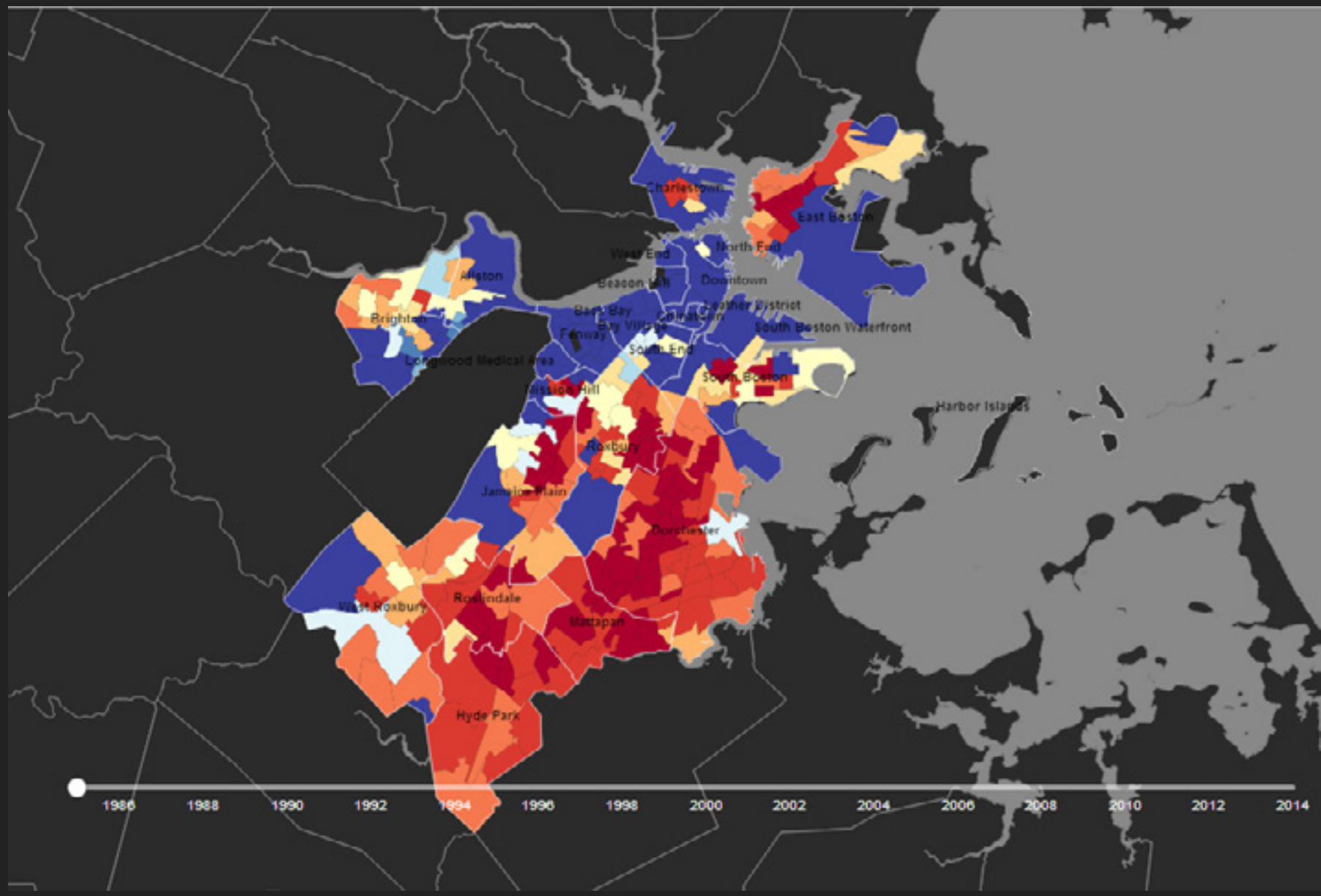
# Design evolution

About the time of the first milestone, the project looked something like this. Interaction was minimal and limited to a handle (implemented as a D3 brush) that was tied to the year. Sliding the handle back and forth allowed one to switch between choropleths for different years. Coloring was implemented (incorrectly) with a quantize scale, which was a very poor choice given the definitely nonlinear distribution of property values.



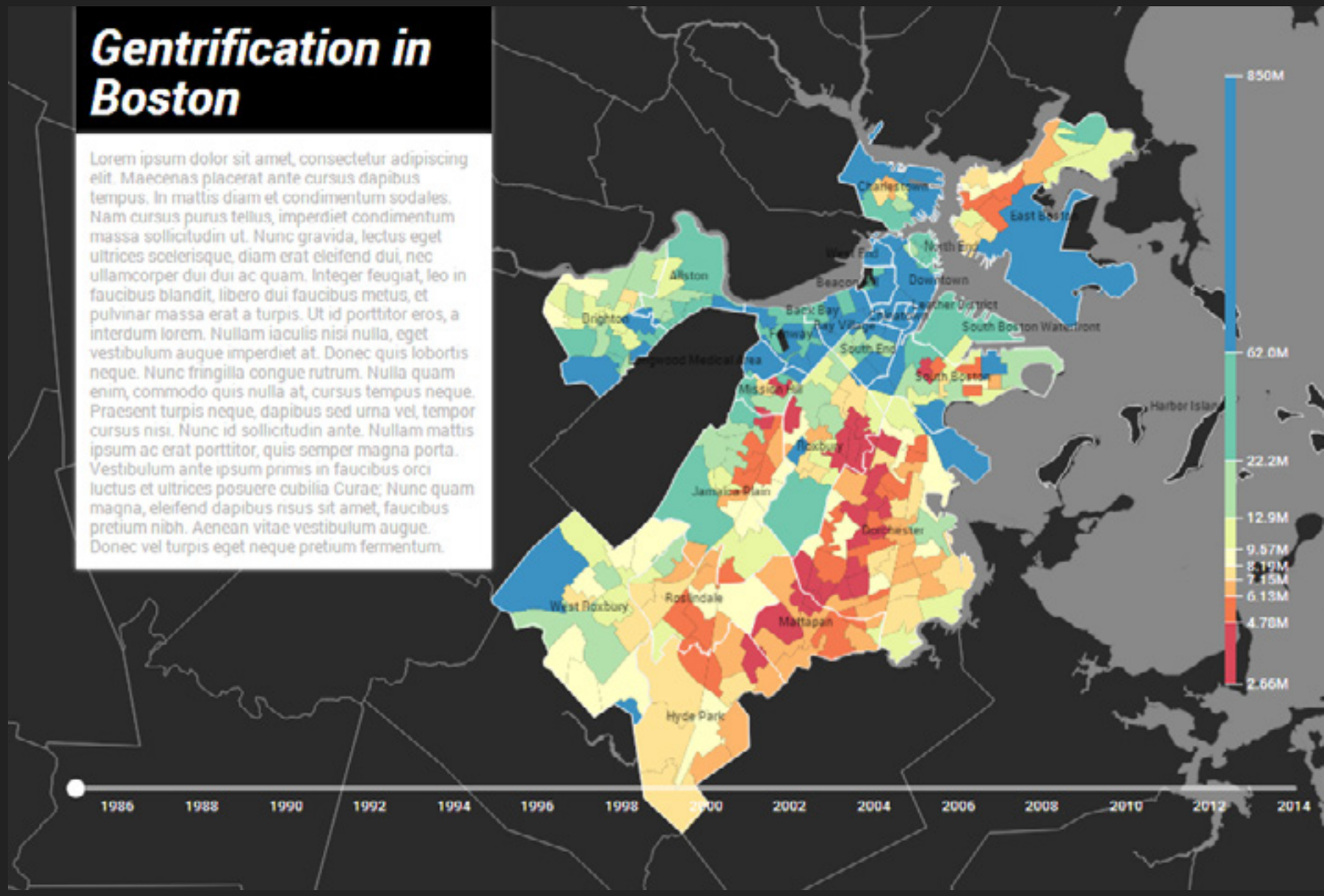
# Design evolution

Some polish. An axis for the slider.

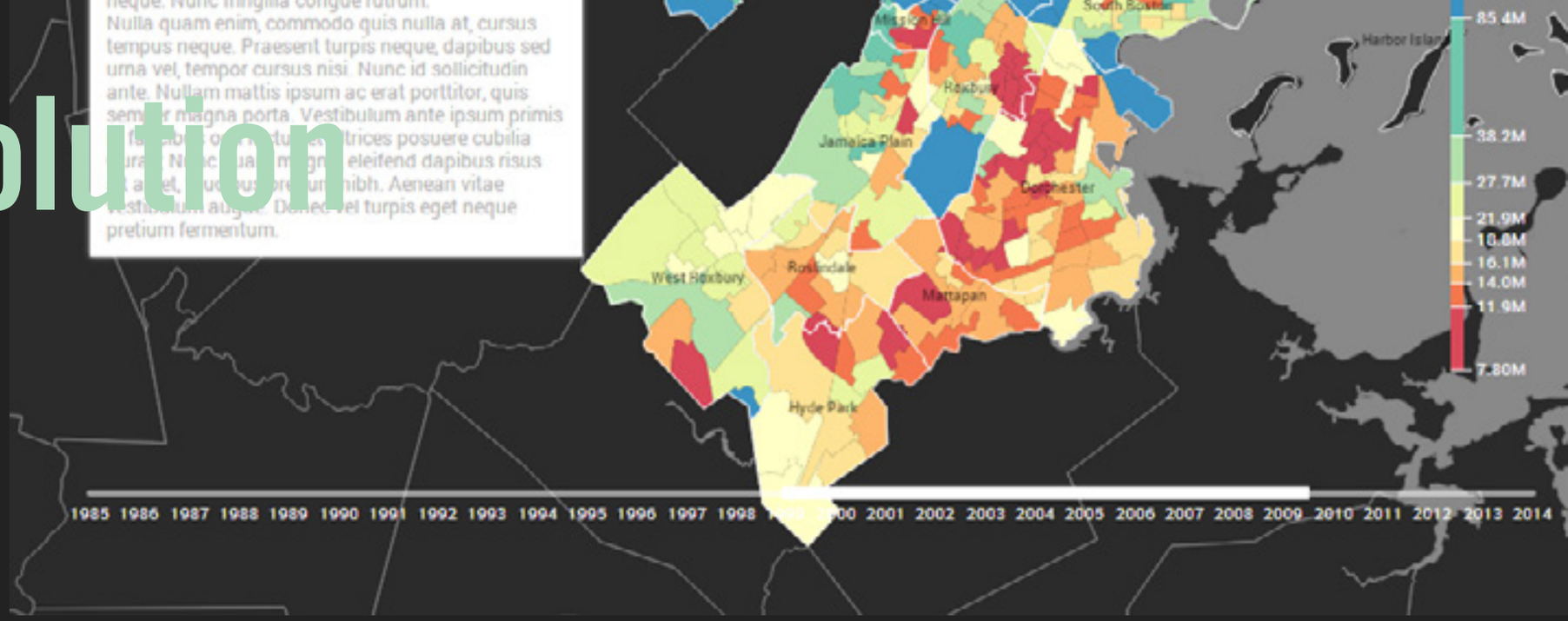


# Design evolution

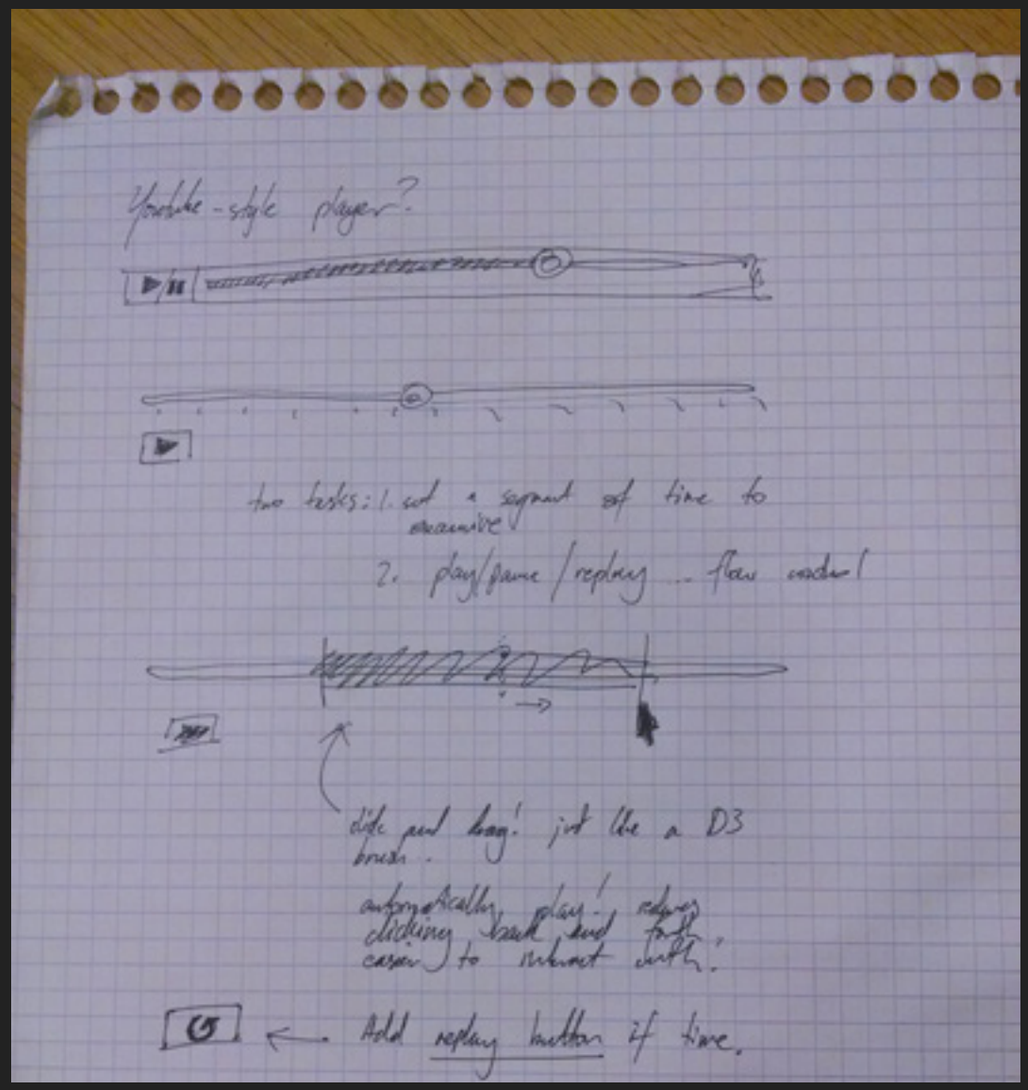
A dynamic legend and some sense of what the final webpage would look like. Realization that the color scale was completely, horrendously wrong; changed to a quantile scale.



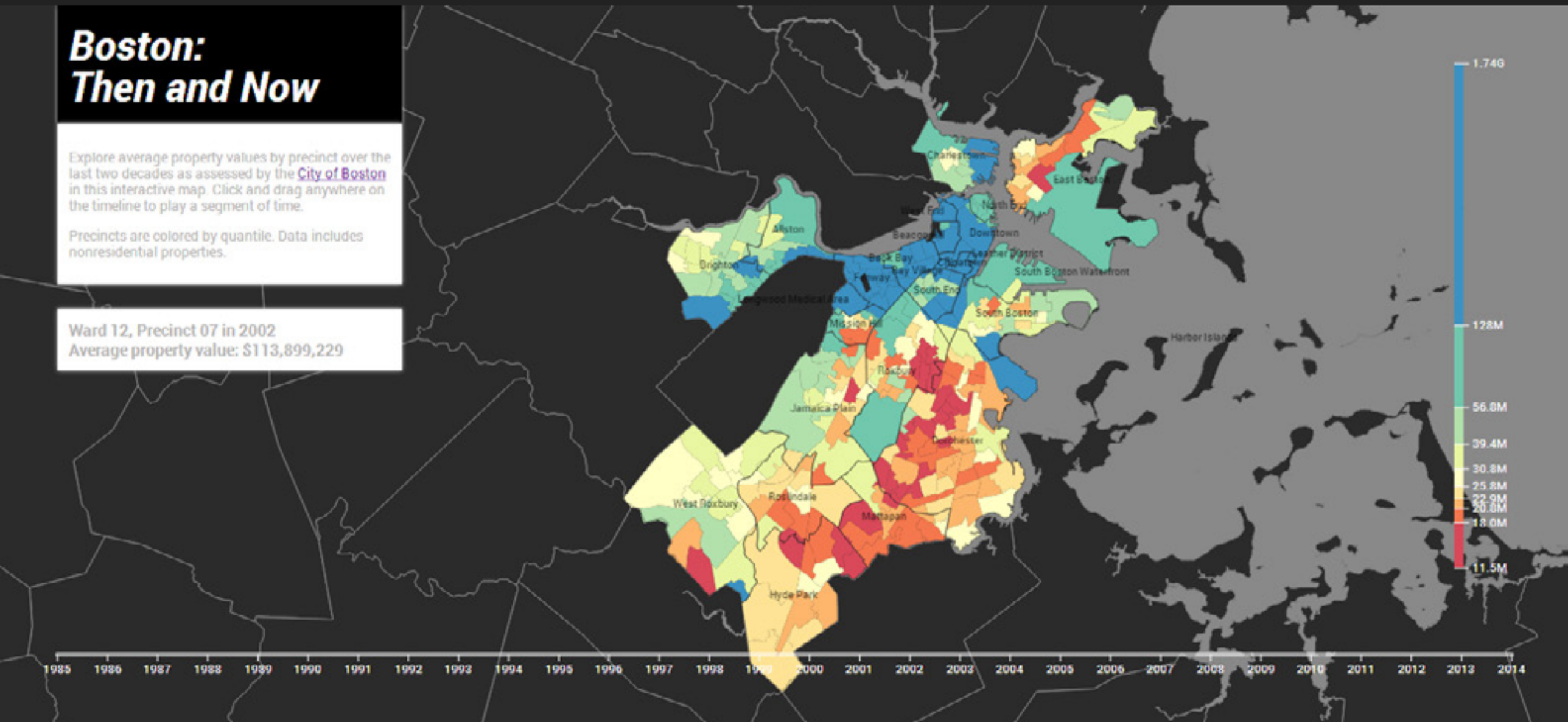
# Design evolution




After considerable brainstorming, the implementation of the click and drag timeline, which allowed one to play selected segments of time with one or two movements instead of dragging a handle wildly back and forth.



# Design evolution



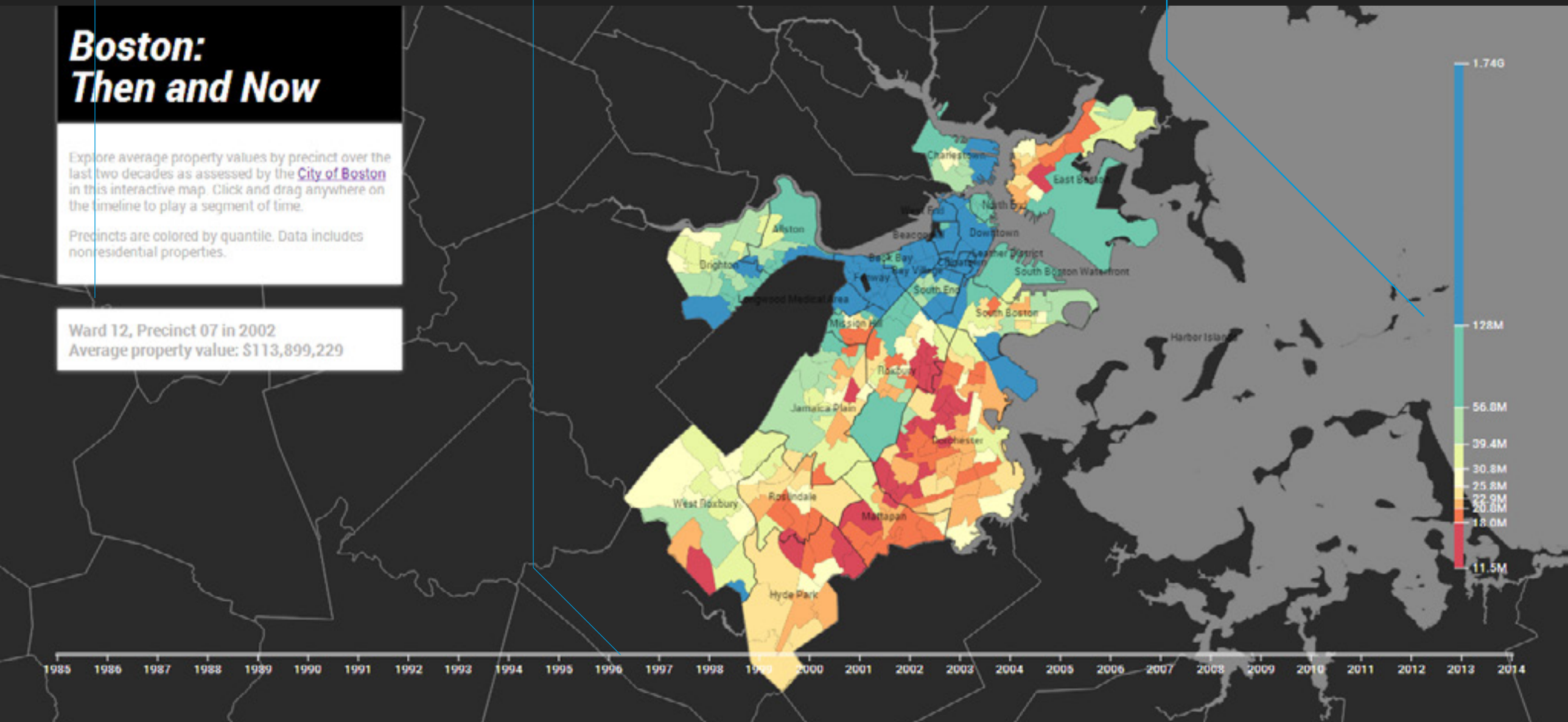
# Implementation

Hovering over a precinct reveals relevant information.

Clicking and dragging on the timeline selects a segment which automatically plays.

Map is zoomable and pannable.

Logarithmic legend shows distribution of values.



# Evaluation

The final visualization does a rather good job of capturing gentrification (as measured by faster rising property value in relation to the rest of the city). Parts of Jamaica Plain are clearly rising in value, most notably the northwest precincts, but several precincts remain close to the the same quantile that they were located in circa 1985.

South End, on the other hand, is relatively blue for all two decades, signifying that either property value is not a good metric or gentrification is not happening (perhaps South End has been gentrifying for a while or is advancing more slowly now).

Mission Hill is a standout in the visualization, with a second 9-quantile precinct in 1985 closing in on the median in 2014.

There are certainly insights to be gleaned from the visualization; unfortunately, without adequate research and time, we were unable to integrate these stories into the visualization. The backbone for such interactivity and storytelling is built, however, and playing certain segments of time for certain neighborhoods would be a cinch.

Further work to be done also includes polishing the responsivity of the design and considering other frameworks to build maps, such as Leaflet, to reduce load time and to use tools more suited to the visualization.