

Data Visualization as a Tool for Equity

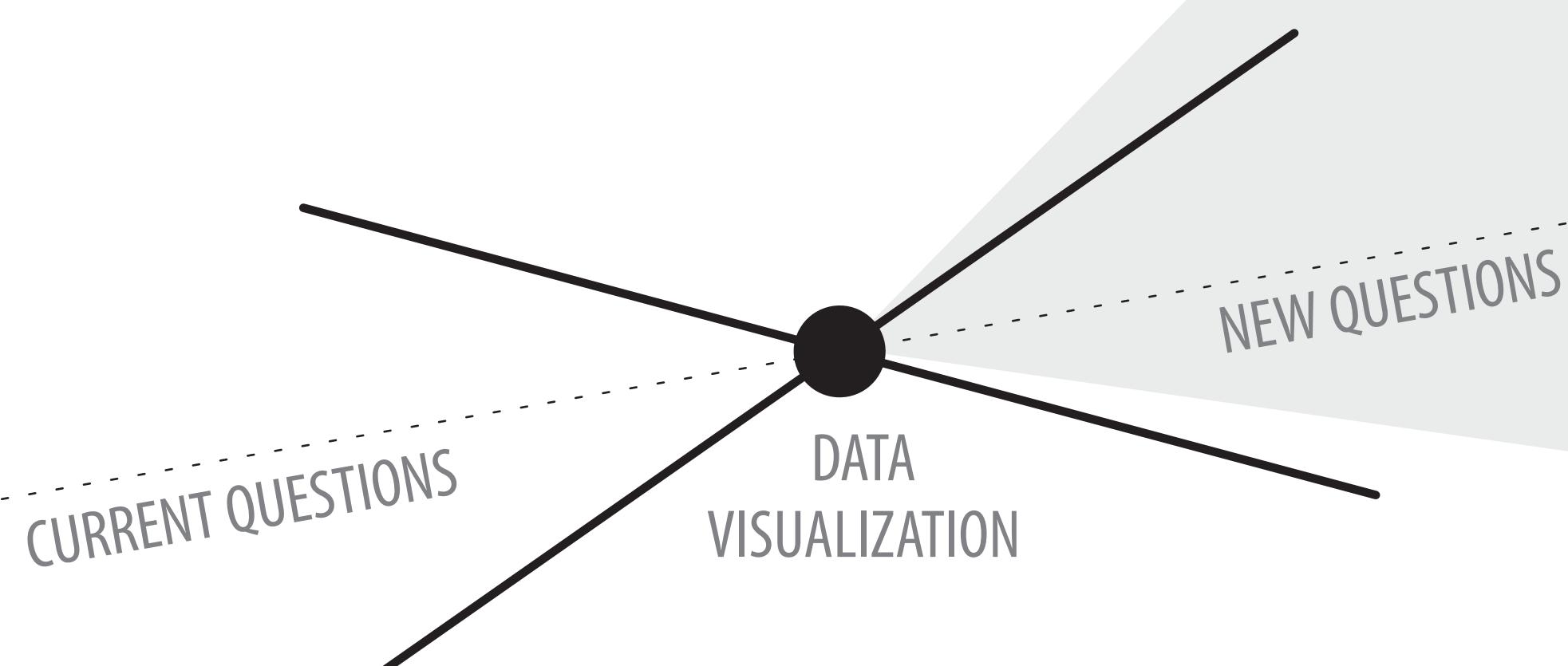
The power and pitfalls of visualization in transit planning

"Transit Quality & Equity" was created as a response to Urban Data Challenge, an international open data competition that aimed to explore urban data sets through data visualization. The project grabbed attention for being "political" and eventually won second prize in the challenge.

This experience led me to thinking about the roles that data visualization can play in city planning, particularly when seen from the lens of equity. I'm using the project as a case study to explore such roles.

Big Data, Small Insight?

Analysis of massive data sets may reveal new insights that were unseen before. However, the belief that quantitative big data represents the whole truth (**data fundamentalism**¹) is dangerous. Data is ultimately not objective, as it may reflect bias in its collection or interpretation.



A Tool, not a Solution

Proper data science and processing can help give tremendous insights, but translating the raw data into something meaningful can be challenging without the proper tools.

Data visualization can be viewed as one tool that helps viewers understand and explore large amounts of information. They aren't an end in themselves, however. Although data visualizations may be used to address existing questions or problems, they may also raise new questions and problematize current tools/practices.

Case Study

Transit Quality & Equity in San Francisco

The visualization shows that in many cases, there's an inverse relationship between level of service and poverty level, i.e. areas with higher poverty level have less transit service. In addition, lower-income areas are frequently neighborhoods of color as well, which suggests the racialized nature of transit service (see tracts 231.02, 231.03, and 234 for example).

However, it's not always the case. Tract 332.01, for instance, has a relatively high poverty level and low transit density, and the majority of residents is white. Tract 118 and 611, on the other hand, are neighborhoods of color with high poverty level as well as high transit density.

Numbers don't always speak for themselves. While the project helped bring equity issues to the forefront, the resulting insight is incomplete. Data visualization can be used to promote equity, but it simply cannot do so by itself. This case study underscores the need for additional qualitative data to create a more representative overall picture.

Racially Just Criteria

Planning tools & policies may not be inherently racist. However, data visualizations can illuminate how **these artifacts are racialized**, posing new questions to planners and policymakers that compel them to consider planning from the lens of equity.



People's lived experience may not be reflected in data and numbers²

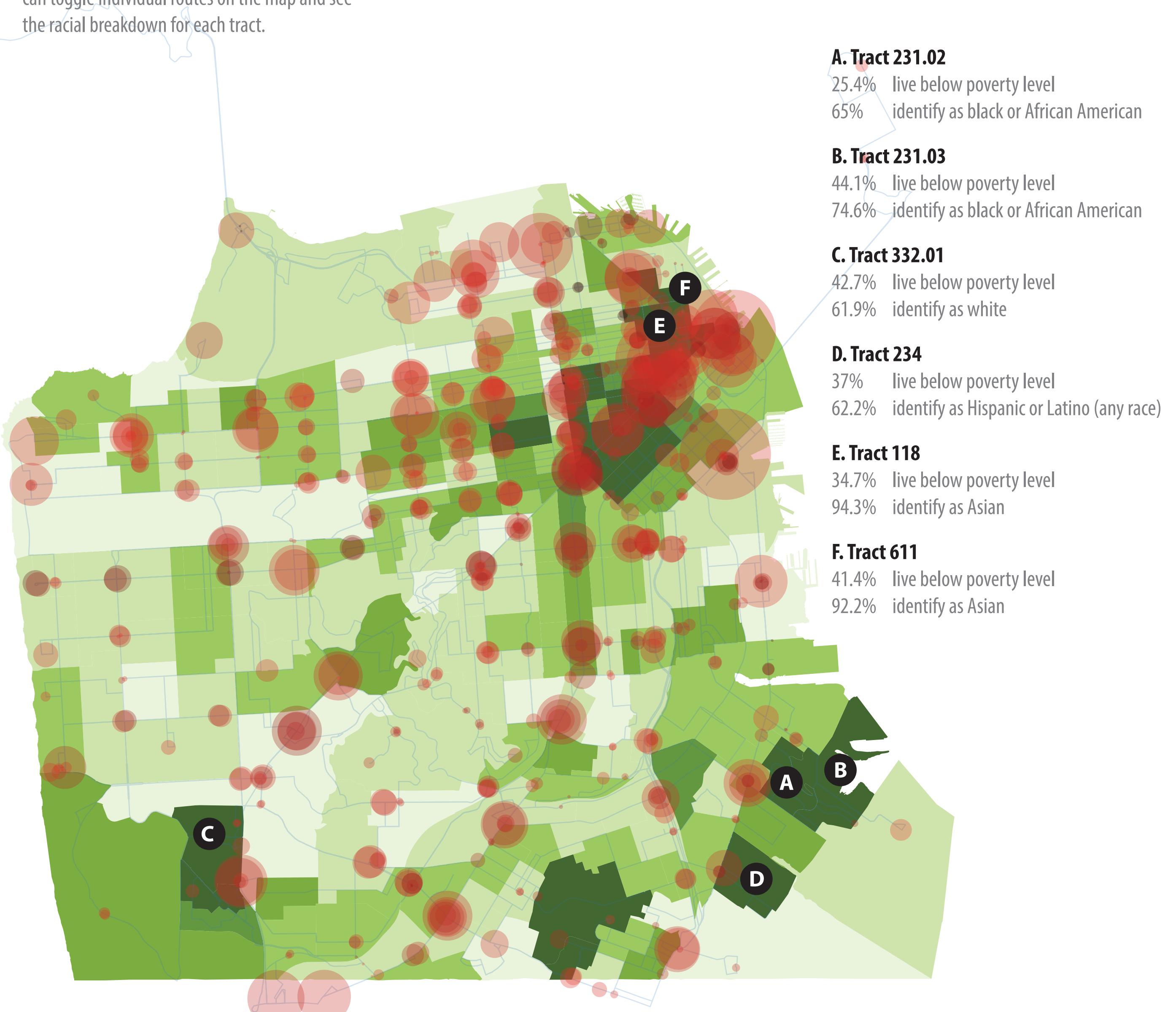
Fighting Data with Data

Issues with "data fundamentalism" was one reason that led me to create "Transit Quality & Equity". In this project, I introduced another data set (poverty level and racial breakdown) into the primary transit data. By combining the two, I intended to highlight possible equity issues that might have been overlooked otherwise and, in the process, ask the question: **can data visualization be used as a tool for equity?**

Methodology
The economic & race data are obtained from the US Census. The transit data is obtained from MUNI and it contains public transportation data from October 1–October 7, 2012. It was processed further to represent quantity and quality of transit throughout the city.
Access to transit stops can be seen by the density of dots around a neighborhood. The size of the dots represent service frequency, and the varying shades of the dots represent the average delay for each stop. In the interactive version, the user can toggle individual routes on the map and see the racial breakdown for each tract.

Legend
● TRANSIT STOP
● LESS FREQUENT SERVICE
● MORE FREQUENT SERVICE
— SHORTER DELAY
— LONGER DELAY

POVERTY LEVEL
■ <= 5% OF RESIDENTS
■ 5.01 - 10% OF RESIDENTS
■ 10.01 - 15% OF RESIDENTS
■ 15.01 - 20% OF RESIDENTS
■ 20.01 - 25% OF RESIDENTS
■ > 25% OF RESIDENTS



1. Crawford, Kate. "The Hidden Biases in Big Data". http://blogs.hbr.org/cs/2013/04/the_hidden_biases_in_big_data.html.

2. From left to right:
 Wiles, Tay. "Free Muni Program for Youth Kicks Off". <http://missionlocal.org/2013/02/free-muni-program-for-youth-kicks-off/>
 Menon, Mallika. "Muni Jobs Training Failed for Many of the Temporary Workers". <http://missionlocal.org/2010/11/muni-training-jobs-training-failed-for-many-trainees/>
 LightRailNow!. "Denver, Sacramento, San Francisco: Light Rail Continues Vigorous Growth". http://www.lightrailnow.org/news/n_lrt_2007-03a.htm