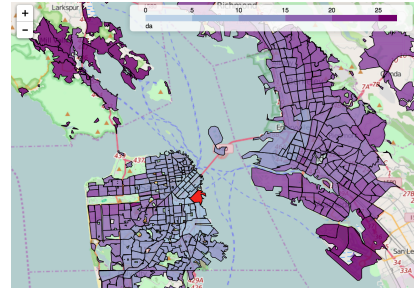


CE 88
Homework 5

In this homework, you will explore environmental impact of a typical event held at AT&T Park stadium, such as the recent Metallica [concert](#) on Saturday Feb 6th 2016, the Super Bowl weekend. You are to use the data sources from the Mini-labs 4 and 5, under the simplifying assumptions described below.



Network. Given the significant flow of people to the venue, we will assume that traffic conditions and travel times are similar to AM peak traffic. All Lyft/Uber/Taxi drivers are old Metallica fans and are taking a day off. No other modes besides driving and regular walk-to-transit are available to reach the venue. Those who prefer driving to the venue carpool with a neighbor, and the average vehicle occupancy is 2 persons (therefore use the 'shared ride (2 people)' travel times). Regarding driving vs. transit, all the factors except travel time (such as parking fees, transit fares, crowdedness, etc.) are balancing out so that **travel time** can be considered as **the only factor** in travel mode choice. As parking at the venue is limited, it is known that queuing at the lot or searching for parking in the neighborhood adds **extra 25 minutes** of travel to the driving time. Assume that decisions are deterministic: people always choose the mode that provides shortest travel time. If you have completed HW4 by now, you know the modal split and are good to go!

Population. Ticket sales show that 20 out of every 1000 people age 20-44 and 5 out of every 1000 people age 45-64 have tickets to the event. There is no reason to believe that the distribution of home locations of attendees is any different from that of the general population (distance decay effect is negligible within the Bay Area, and fans do not tend to settle nearby other fans), nor that income levels have a significant impact on ticket sales (experience is priceless for true fans). Following the Mini-labs, you can only consider SF, Oakland, Berkeley, and Marin areas in your estimates below.

Problem 1 (5 points). Estimate the total number of concert attendees.

Problem 2 (5 points). Estimate the impact of the concert on the area in terms of the total private vehicle-miles travelled (VMT). Remember that the average occupancy is 2 persons/vehicle and don't forget to account for the modal split

Your submission must be both a PDF file with your answers and the code you generated to compute the answers.