Fare Equity Case Study: BART and MARTA

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The Bay Area Rapid Transit Sytem (BART) and Metropolitan Atlanta Regional Transit Authority (MARTA) were two of the earliest heavy rail transit systems built in the modern era of publicly-funded, federally-subsidized urban rail transit construction. Both systems initially opened for service in the 1970s. They are also both named with acronyms that sound like a person's name.

Mallett has developed an accounting method to allocate the total cost of BART and MARTA operations among links and stations within each system.[1] He has also estimated the average fares paid by passengers riding on each link and by passengers boarding and alighting at each station.[2]

[1] Mallett, Z., 2023. Spatial and Temporal Variability of Rail Transit Costs and Cost Effectiveness. Transportation Research Record, 2677(1), pp.1444-1460.

[2] Mallett, Z., 2023. Inequitable Inefficiency: A Case Study of Rail Transit Fare Policies. Working Paper.

BART system characteristics

The BART rail system comprises 131.4 miles of track serving 50 stations in the San Francisco Bay Area of California.

BART charges a distance-based fare structure that charges riders a base fare for trips trips up to six miles long. For trips longer than six miles, there is an additional fare per mile after the first six miles, and lower fare per mile after the first fourteen miles.

Figure 1 shows the network layout with two specific stations and links highlighted.

Table 1 shows some basic data on the lines highlighted in Figure 1 and Table 2 shows some basic data on the stations.

Link	Warm Springs to Fremont	Oakland Center to West Oakland
Length (miles)	4.64	1.59
Annual ridership	2 310 931	37 617 610
Average fare	$2.09	$0.20
Annual cost	$19 465 572	$11 438 535
Median income of proximate residents	$62 710	$27 961

Table 1: Characteristics of BART links of interest

Station	Warm Springs Station	West Oakland Station
Annual ridership	2 310 931	4 583 375
Average fare	$0.70	$0.80
Annual cost	$6 469 690	$3 677 683
Median income of proximate residents	$86 054	$38 576

Table 2: Characteristics of BART stations of interest

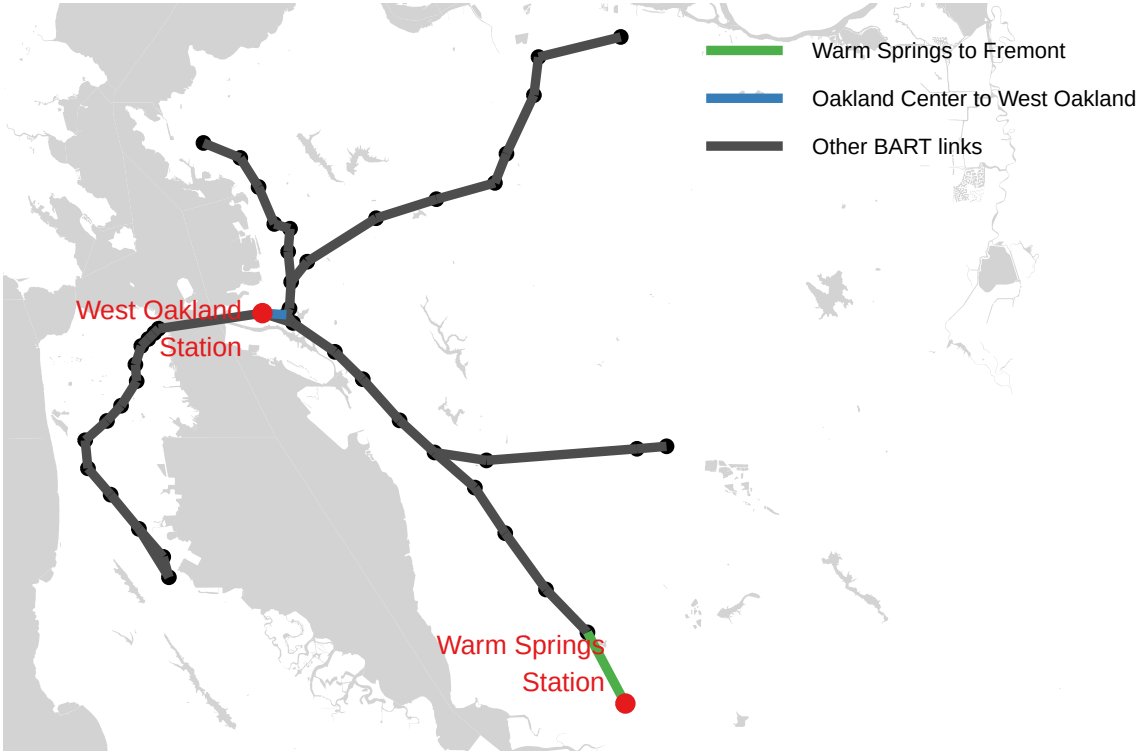

Figure 1: BART system map with locations of links and stations of interest

MARTA system characteristics

The MARTA rail system comprises 48 miles of track serving 38 stations in the Atlanta, Georgia region.

MARTA charges a flat fare of $2.50 per trip, although the average fare on the system overall and for riders on a particular part of the system is generally lower that that due to fare discounts and the use of multi-day transit passes.

Figure 1 shows the network layout with two specific stations and links highlighted.

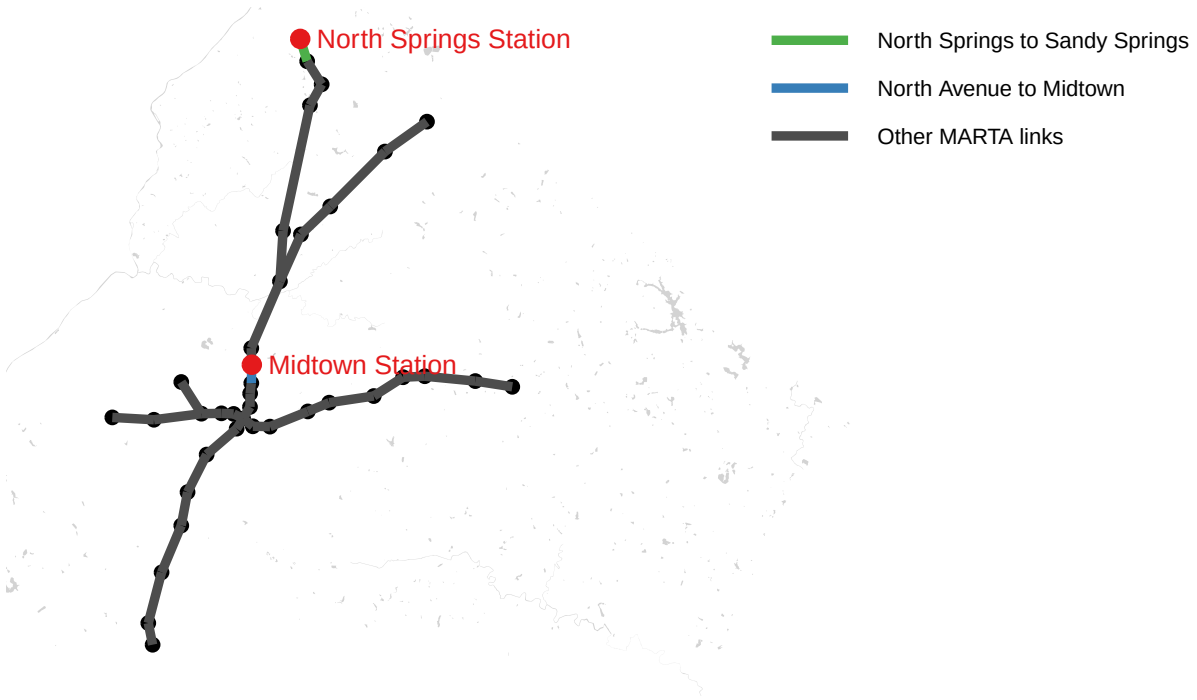

Figure 2: BART system map with locations of links and stations of interest

Table 1 shows some basic data on the lines highlighted in Figure 1 and Table 2 shows some basic data on the stations.

Table 3: Characteristics of BART links of interest

Link	North Springs to Sandy Springs	North Avenue to Midtown
Length (miles)	1.04	0.63
Annual ridership	3 274 598	17 348 957
Average fare	$0.20	$0.05
Annual cost	$2 736 151	$3 364 280
Median income of proximate residents	$69 432	$63 953

Station	Midtown Station	North Springs Station
Annual ridership	3 127 143	3 274 598
Average fare	$0.35	$0.14
Annual cost	$2 696 684	$1 960 150
Median income of proximate residents	$63 953	$69 432

Table 4: Characteristics of BART stations of interest

Questions for discussion

1. For each of the highlighted links on the MARTA system:
    a. What is the average cost per passenger-mile?
    b. What is the average fare collected per passenger-mile?
    c. What is the average subsidy per passenger-mile?
    d. Assuming a person living near each link makes 500 trips on the link each year, what is the average subsidy the person living near each link receives in absolute dollars and as a percentage of the median income for the area where they live?
2. For each of the highlighted links on the BART system:
    a. What is the average cost per passenger-mile?
    b. What is the average fare collected per passenger-mile?
    c. What is the average subsidy per passenger-mile?
    d. Assuming a person living near each link makes 500 trips on the link each year, what is the average subsidy the person living near each link receives in absolute dollars and as a percentage of the median income for the area where they live?
3. What additional data would you want in order to more fully evaluate the equity of transit subsidies in these two regions?