#### Philadelphia Household Travel Survey US Transit Data and Metrics

University of Pennsylvania Erick Guerra

**Purpose:**

The purpose of this assignment is to learn to work with the National Transit Database and to develop an understanding of some of the key metrics used to evaluate transit system performance. I am providing a variety of labs and the data to complete the assignment on Canvas. Please disregard online links to the data which are no longer available.

1. Estimate the average of the following indicators for the nation’s light rail, heavy rail, commuter rail, and bus systems in 2019 (be careful to exclude systems that do not operate the modes in question or that report zero PMT):
   1. Passenger miles (PMT) per unlinked passenger trip (UPT)
   2. Passenger miles per directional route mile (DRM)
   3. Fare revenue per passenger mile (note that this is an estimate of how much people pay for each mile of service)
   4. Fare recovery ratio (total fare revenue divided by total operating costs.
   5. Average speed (vehicle revenue miles divided by vehicle revenue hours). (Rail modes only.)
2. Calculate the fare recovery ratio for all nation’s light rail, heavy rail, commuter rail, and bus systems in 201\9 (i.e., the average for the mode instead of the average fare recovery ratio of the different transit agencies.) Compare this figure to the fare recovery ratios estimated in question 1 (average by agency). Discuss any differences. (See note at bottom to understand difference between 1 and 2.)
3. The Los Angeles Metropolitan Area has multiple providers of public transportation. Plot the fare recovery ratio for the Los Angeles MTA (TRS ID 90154) and the Southern California Regional Rail Authority (TRS ID 90151) for light rail, heavy rail, commuter rail, and bus from 2002 to 2021. There should be a separate line for each mode displayed on one graph. Note that there are two bus services for the MTA. One is directly operated (Service == “DO”); the other is privately provided (Service == “PT”). Plot each separately. (Hint: LA$Mode[LA$Mode == "MB" & LA$Service == "PT"] <- "MB\_PT")

Note: Here are the calculations for fare recovery ratio for questions 1 and 2 with the following imaginary 3 heavy rail systems.

|  |  |  |  |
| --- | --- | --- | --- |
| System | Fares | Opex | FRR |
| A | 5 | 10 | 1/2 |
| B | 100 | 500 | 1/5 |
| C | 1000 | 3000 | 1/3 |

The answer to question 1 would be (1/2+1/5+1/3) / 3

The answer to question 2 would be (5+100+1000) / (10+500+3000)