

Interpreting Metrorail Total Ridership Data

The total ridership data posted to the WMATA website provides information on how many trips were tapped (transaction records) and non-tap (faregate sensors) on Metrorail. This data is presented here for analysis purposes but may diverge from official reports Metro maintains for accounting and revenue purposes, and for submission to the Federal Transit Administration and other oversight bodies.

How the Data is Recorded

In August 2021, Metro began replacing faregates throughout the Metrorail system. The new faregates have an array of sensors in them that infer passenger behavior based on how sensors are set off when customers interact with them. It is from these sensors that Metro collects data on non-tap trips.

Extent of the Data

Faregate installation was completed in late December 2022. Therefore, complete systemwide data on non-tap trips is only available starting in January 2023.

Data Definitions

- Total ridership: the sum of tap and non-tap entries on Metrorail
- Tap ridership: the sum of paid entries on Metrorail recorded by SmarTrip transactions.
- Non-tap ridership: the sum of unpaid entries on Metrorail recorded by the faregate sensors
- Percent non-tap ridership: the share of non-tap entries on Metrorail. Calculated as non-tap ridership/total ridership.

Data Quality

The tap ridership data reported in these spreadsheets has passed a set of business rules to qualify as ridership data. Unsuccessful transactions are typically not included in these counts, for example.

In addition, the non-tap ridership data has also passed a set of rules that ensures the sensors are reporting behavior correctly. This sensor logic has been refined over time and can change in the future.

It's important to note that, Metro's fare system is composed of hundreds of devices, communication lines, and backend support systems that function in a complex operating environment every day. Data generated by the system can be impacted by unexpected real-world events, such as:

1. Equipment failures
2. Incomplete rail data if faregates are ever opened to alleviate extreme crowding during special events

In addition, external factors influence the data as well, such as extreme weather like snow days, or station closures for capital maintenance.

If you have any questions, please reach out to planning_ridership@wmata.com.

Data Dictionary

Systemwide Daily Totals

1. Ridership Service Date

8/21/2023

- 1.1. The date of service. Metro service days are defined as 4:00 AM to 3:59 AM the following day for rail ridership. This means that ridership after midnight is categorized to the prior day.
2. **Total Ridership**
 - 2.1. The sum of tap and non-tap entries on Metrorail systemwide.
 - 2.2. Defined as: $\text{Sum}(\text{Tap Ridership}) + \text{Sum}(\text{Non-tap Ridership})$
3. **Tap Ridership**
 - 3.1. The sum of paid entries on Metrorail recorded by SmarTrip transactions.
4. **Non-Tap Ridership**
 - 4.1. The sum of unpaid entries on Metrorail systemwide as recorded by the faregate sensors.
5. **Percentage Non-tap Ridership**
 - 5.1. The share of non-tap ridership on Metrorail systemwide for that service date.
 - 5.2. Defined as: $\text{Sum}(\text{Non-tap Ridership}) / \text{Sum}(\text{Total Ridership})$

Systemwide Averages per Month and Service Type

1. **Month**
 - 1.1. The calendar year and month.
2. **Service Type**
 - 2.1. The type of rail schedule Metro planned to run on that day of service.
3. **Average Total Ridership**
 - 3.1. The average total entries per service type during that calendar year and month.
4. **Average Tap Ridership**
 - 4.1. The average number of paid entries on Metrorail systemwide as recorded by SmarTrip transactions for that service type and calendar year and month.
5. **Average Non-tap Ridership**
 - 5.1. The average number of unpaid entries on Metrorail systemwide as recorded by the faregate sensors for that service type and calendar year and month.
6. **Average Percentage Non-tap Ridership**
 - 6.1. The share of non-tap ridership on Metrorail.
 - 6.2. Defined as: $\text{Sum}(\text{Average non-tap ridership}) / \text{Sum}(\text{Average total ridership})$

Station Averages per Month and Service Type

1. **Station Name**
 - 1.1. The rail station where customers entered. Where stations have multiple entrances, all entrances are summed together.
2. **Month**
 - 2.1. The calendar year and month.
3. **Service Type**
 - 3.1. The type of rail schedule Metro planned to run on that day of service.
4. **Average Total Ridership**
 - 4.1. The average total entries per service type during that calendar year and month.
5. **Average Tap Ridership**
 - 5.1. The average number of paid entries on Metrorail as recorded by SmarTrip transactions for that service type and calendar year and month.
6. **Average Non-tap Ridership**

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6.1. The average number of unpaid entries on Metrorail as recorded by the faregate sensors for that service type and calendar year and month.

7. **Average Percentage Non-tap Ridership**

7.1. The share of non-tap ridership on Metrorail.

7.2. Defined as: $\text{Sum}(\text{Average non-tap ridership}) / \text{Sum}(\text{Average total ridership})$