

Executive Summary — Mobility Data

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Mobility Data — Executive Summary

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What I Built

Three transportation analytics systems using real transit, safety, and aviation data.

Project	Domain	Data Source	Key Result
WMATA Ridership	Transit optimization	DC GIS MapServer: 98 stations, 138 snapshots, 77 weekly records	Station-level ridership patterns + peak hour identification
NHTSA Safety	Traffic safety analysis	NHTSA FARS: 196,373 total records (39K accidents + 96K persons + 61K vehicles)	State-level fatality trends + vehicle type risk profiles
BTS Flight Delays	Aviation performance	USDOT TranStats: 547,271 flight records (January 2024)	Airline delay comparison + route performance metrics

Why This Matters

For Transit Agencies: WMATA ridership analysis identifies which 98 stations have the highest traffic density. Same approach applies to bus route optimization and fleet scheduling.

For Insurance / Safety: NHTSA FARS analysis provides state-level risk profiles. Useful for underwriting, policy pricing, and safety intervention targeting.

For Airlines / Logistics: BTS delay analysis benchmarks airline performance. The 547K-record dataset covers every major carrier — applicable to supply chain and route planning.

Key Numbers

- **196,373 total safety records** (accidents, persons, vehicles)
 - **547,271 flight records** for January 2024
 - **98 WMATA stations** with ridership snapshots
 - **Top 10 states** by fatalities identified with per-capita adjustment
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Tech Stack

Python · Pandas · Plotly · REST APIs · GIS/MapServer · Statistical Analysis

Verification

All data from live government APIs. WMATA via DC GIS REST endpoint. NHTSA via official FARS bulk download. BTS via USDOT TranStats. No synthetic traffic data.

Live Code: github.com/gosidehustlesisi/sierra-mobility-data

Interactive Portfolio: gosidehustlesisi.github.io/sierra-applied-ml/

“Transportation data is everywhere — toll tags, GPS traces, flight records. The question is whether you can turn it into decisions.”