RIDERSHIP PREDICTION FOR EXPANDING METRO NETWORKS

Predicting the **Monthly Ridership** of a newly created/planned metro station in a city's metro network using Graphs and Neural Networks.

Metro Network Used: Chicago's L Network
Newly Expanded Stations: Damen (Green line), Berwyn (Red Line) & Lawrence (Red Line)

Data Sources

1. Chicago Data Portal: Monthly Ridership, Shapefiles for L stations & Bus stops.
2. ACS: Population & Housing Data.
3. Census Bureau: Block Group Shapefiles.

Feature Engineering

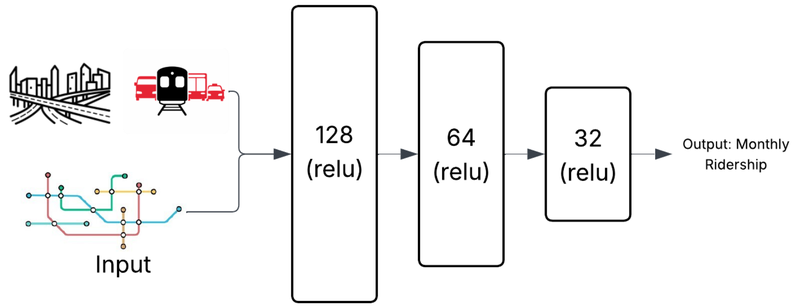
Multimodal Transport
Bus stops & line counts in a radius 500m across each station

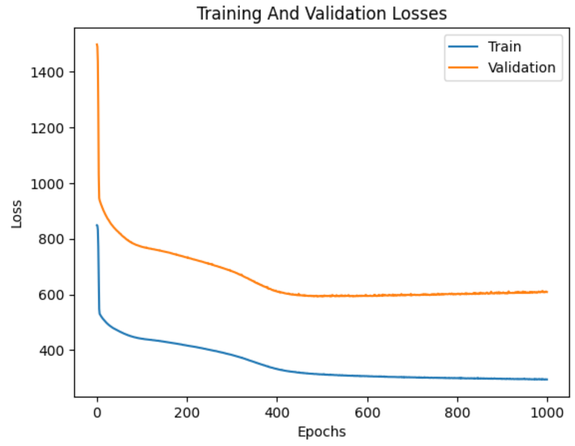
Built Environment
Population Density and Housing Value in a radius 500m across each station

Time-Varied Network Features
Time-Based Centrality & Degree based features for the 'L Network'

Model Training

MLP trained to predict monthly ridership for a station based on these features

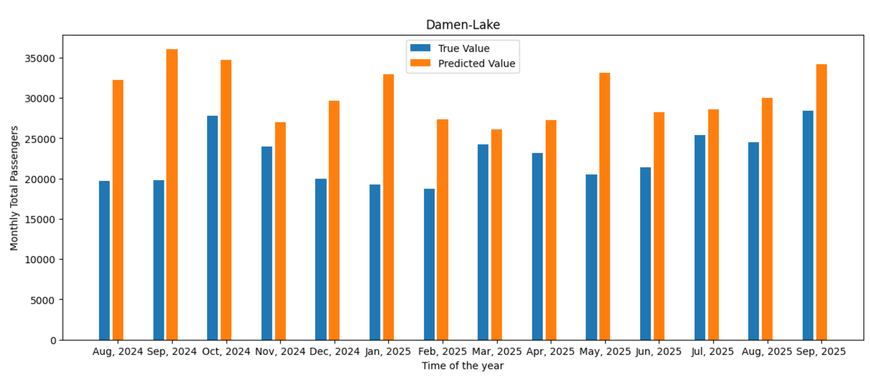




Prediction Results

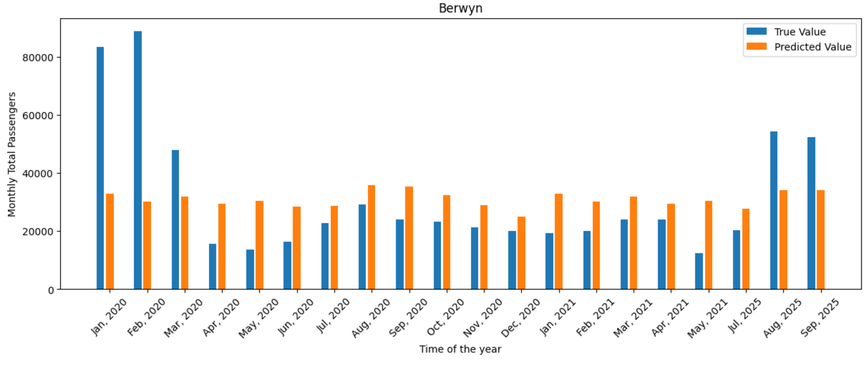
Damen-Lake (Green Line)

Opened: Aug 2024



Berwyn (Red Line)

Active till May 2021, Rebuilt and Reopened in Aug 2025



Lawrence (Red Line)

Active till May 2021, Rebuilt and Reopened in Aug 2025