

Determination of Tren Urbano Ridership Demand Based on Social, Economic and Transportation Indicators



TREN URBANO

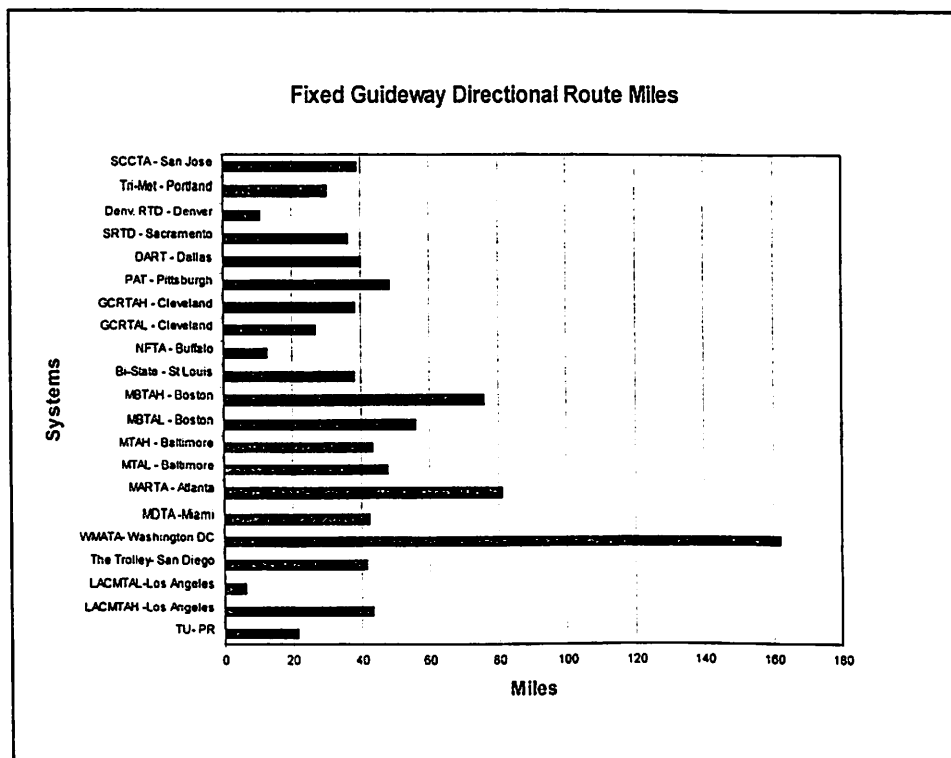
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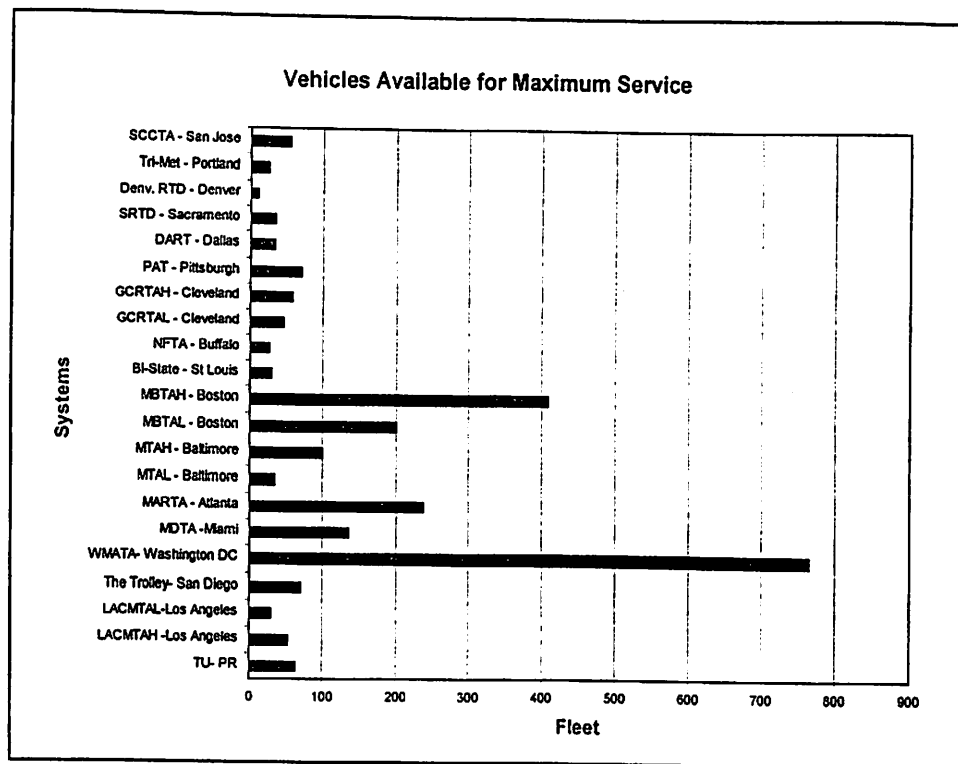
Objectives

- To obtain a model to predict the ridership demand for Tren Urbano using data from similar rail transit systems.

Research Plan

- Literature Review
- Collection of Data
 - Social, Economic and Population Indicators
 - Census (1990)
 - System Indicators
 - National Transit Database (NDT), FTA
 - Transportation Indicators
- Cluster Analysis
 - k-means
 - Variables:
 - # lines, fixed guideway, mode, fleet, #stations
- Linear Regression



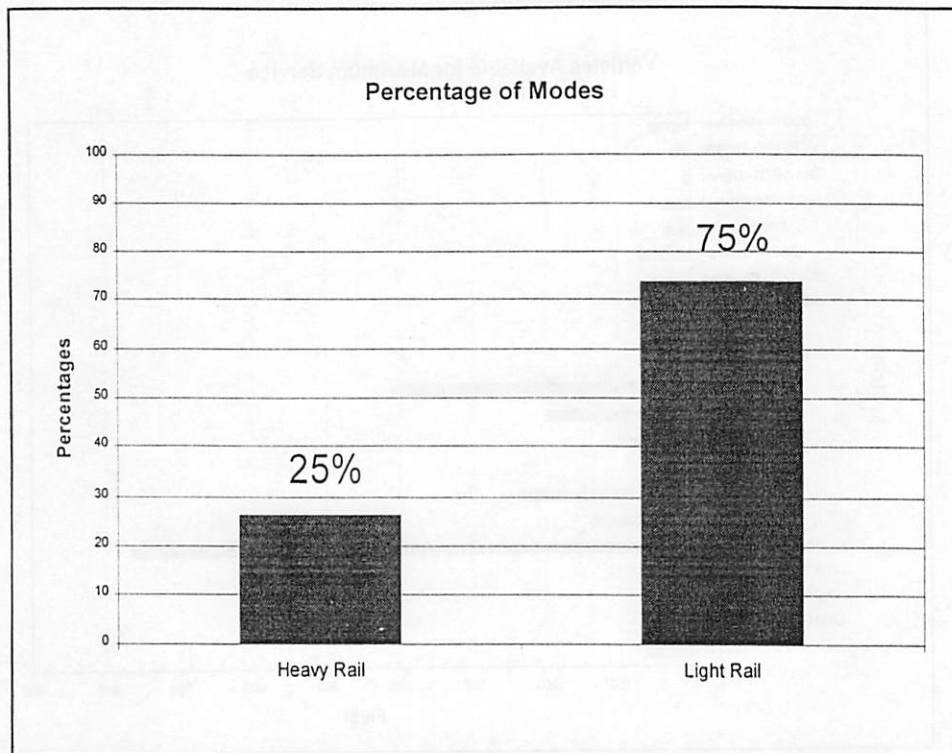


Results of Cluster Analysis

Excluded Systems:

- WMATA, Washington D.C.
- MARTA, Atlanta
- MBTA (LR), Boston
- MBTA (HR), Boston

16 systems in the TU cluster



The Model

- Linear Regression
- Stepwise method
- Variables used:
 - mode, guideway, fleet, # stations
 - headway, area, pop density, % pop growth
 - % hispanic origin, crime rate, Index of education
 - income, congestion index, AADT
 - % public transportation, total highway mileage

Results

$$Y = 175.144 (\text{FLEET}) + 1.313 (\text{CR}) + 4868.99$$

Summary of the Model

R ²	0.61
Standard Error	6983.74
Mean Absolute Error	4509.99
F	10.177
Sig	0.002

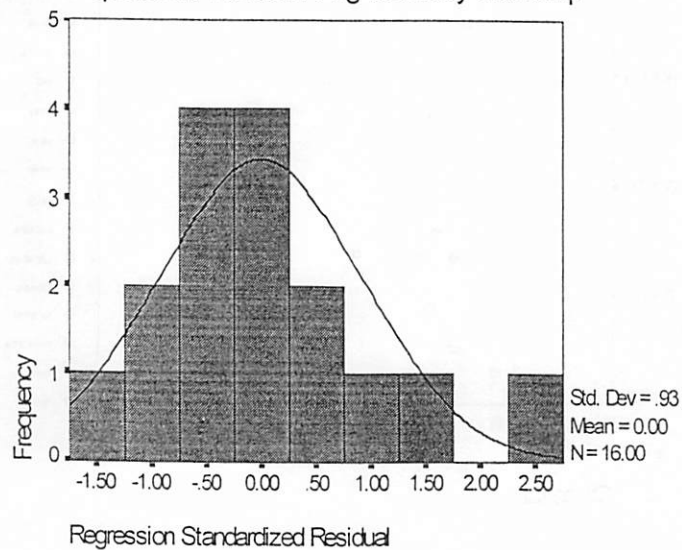
Coefficients

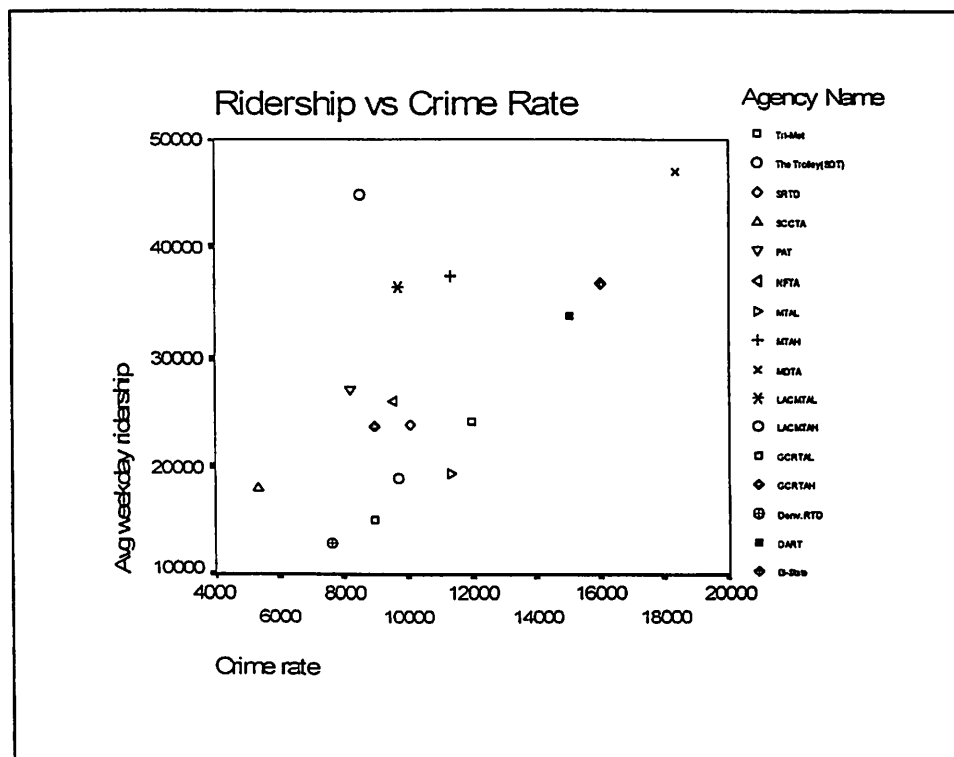
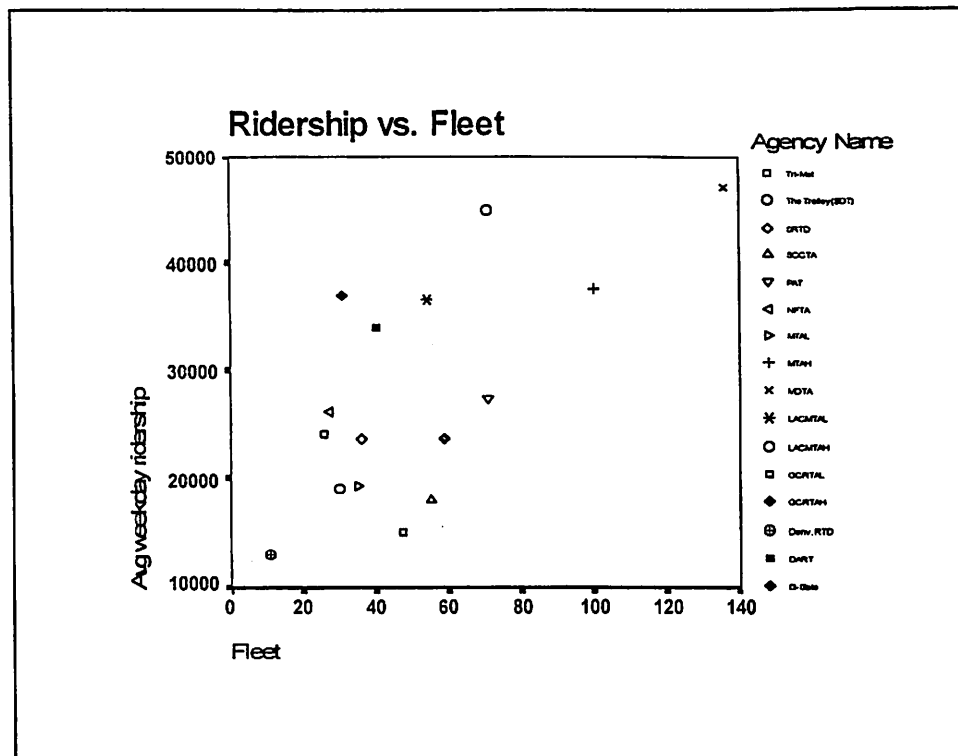
	B	Std. Error	t	Sig.
(Constant)	4868.999	6111.512	0.797	0.440
Fleet	175.144	61.259	2.859	0.013
Crime Rate (CR)	1.313	0.575	2.285	0.04

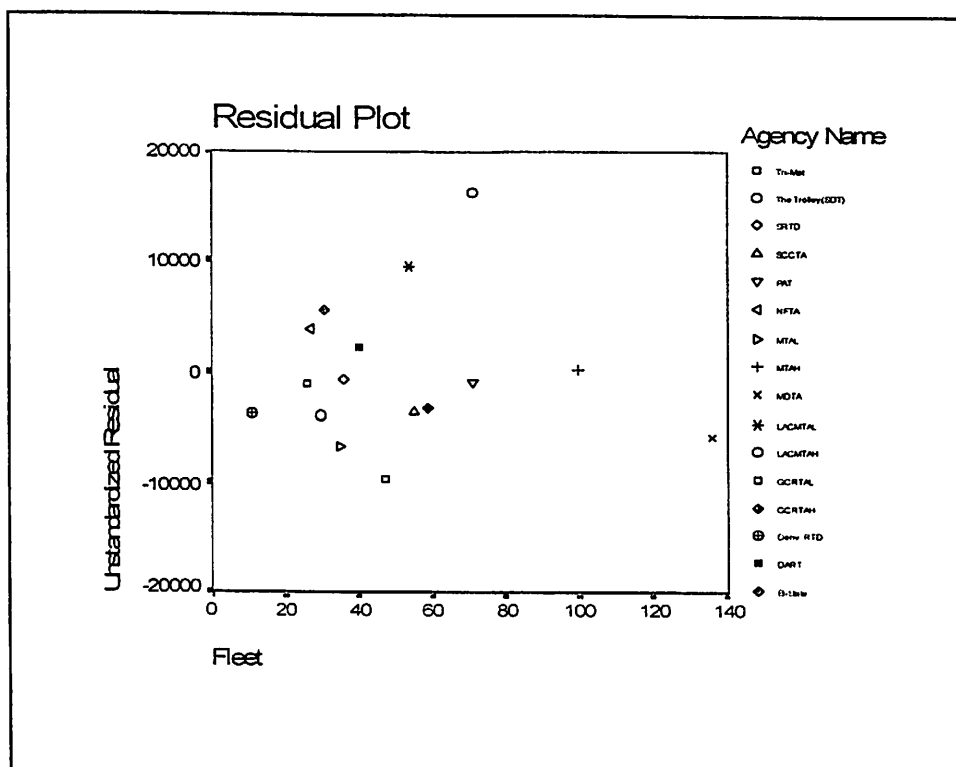
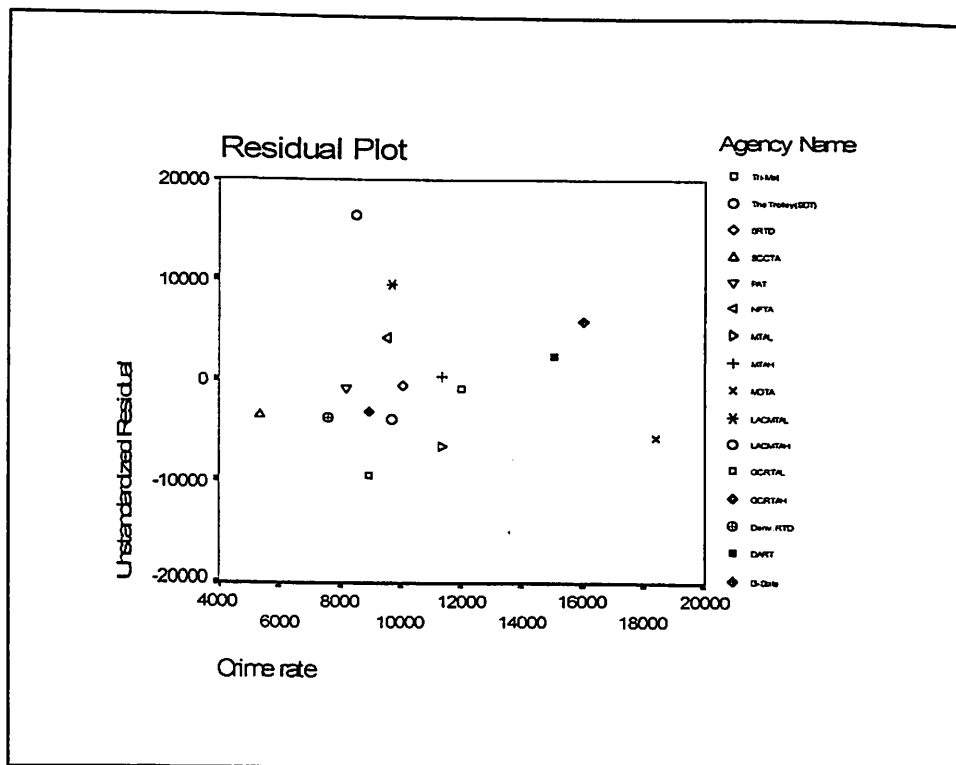
Predicted average weekday ridership for TU = 25,548

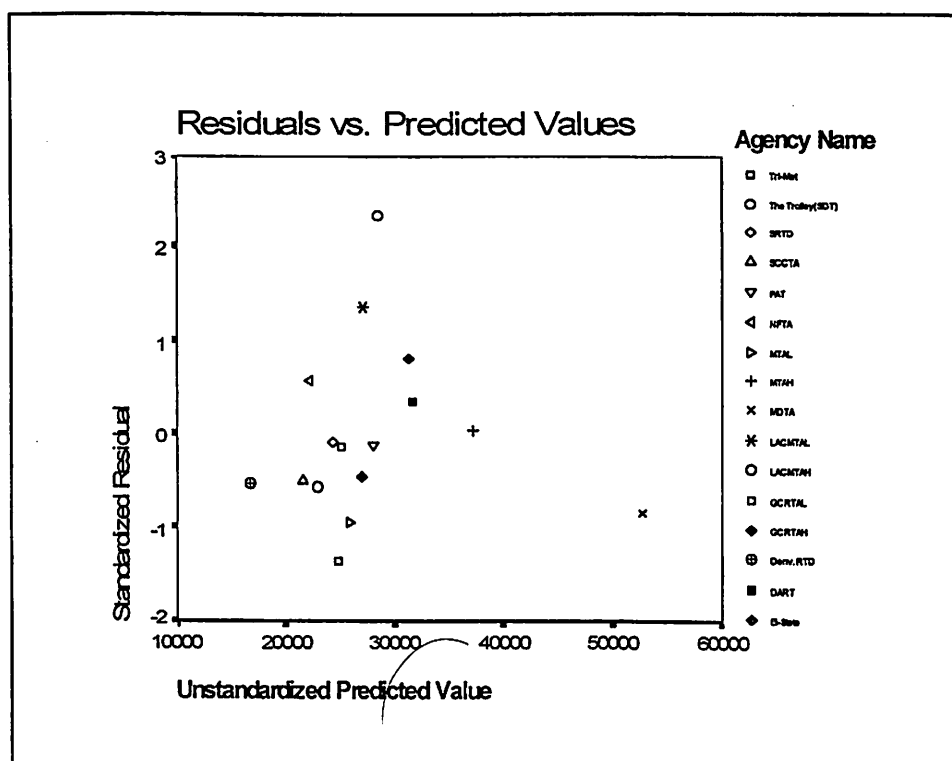
Histogram of Standardized Residuals

Dependent Variable: Avg weekday ridership









Preliminary Conclusions

- ☛ In our model fleet is more significant to predict ridership demand than crime rate.
- ☛ A satisfactory fit has been achieved.

Future Work

- ☛ Study of the SDT and MDTA systems
- ☛ Addition / Removal of Variables
- ☛ Addition of NJ Transit and other systems
- ☛ Study of CR significance