

A Study of Traffic Patterns in Mid-sized Towns in the State of Kansas

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Introduction

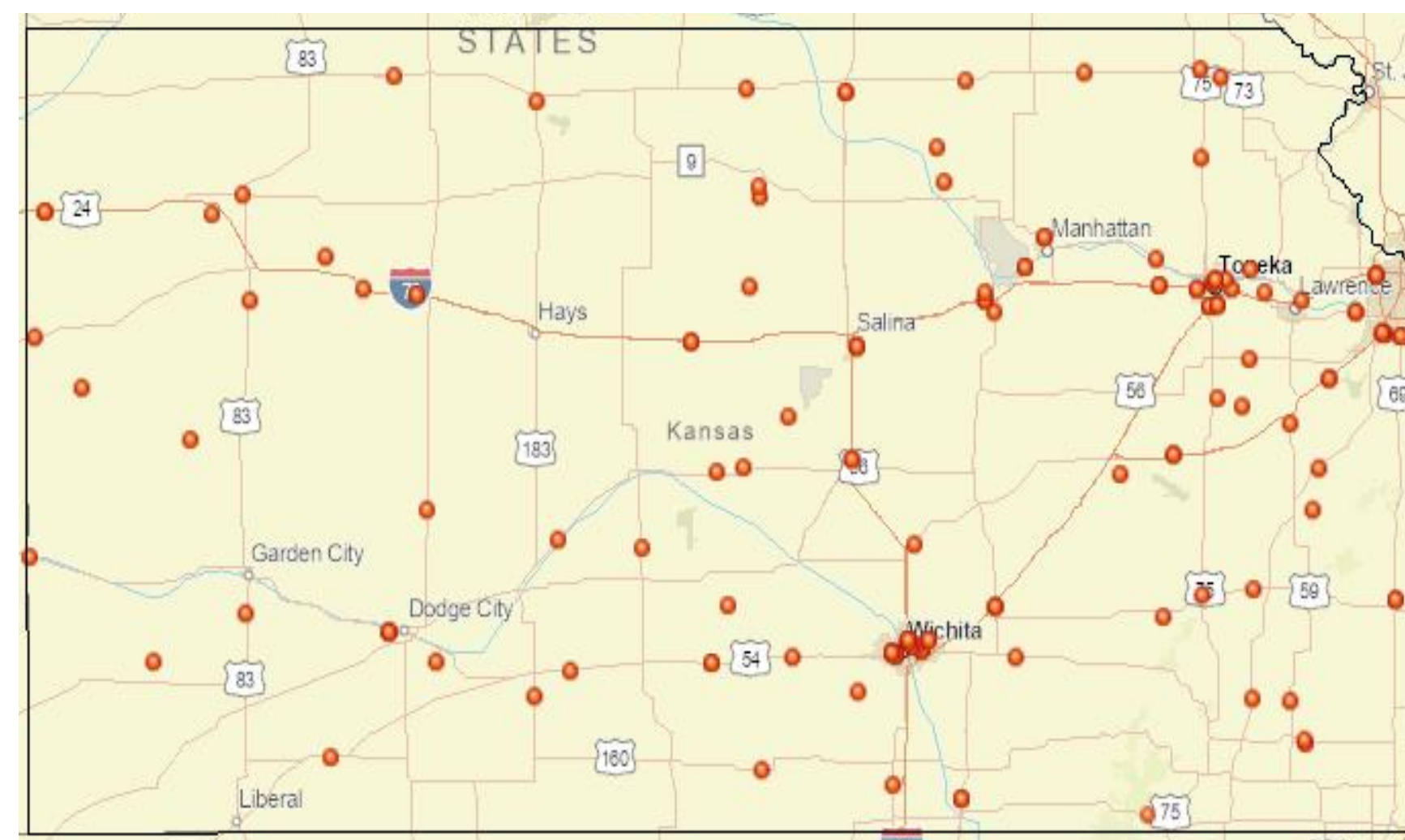
- Understanding traffic patterns helps enhance equity and resilience of transportation infrastructure for years to come.
- We focus on mid-sized towns in the State of Kansas that are not as well represented in similar studies.
- Data analytics tools are used to analyze and compare the traffic pattern in those towns.

Methods

In this study, we identify 10 towns as mid-sized towns with a population size of 10,000 to 30,000.

The Federal highway administration (FHWA) collects hourly traffic counts at different traffic stations across the state.

FHWA data for year the 2022 was used to compare daily traffic volume on weekdays in mid-sized towns.



Map of FHWA traffic stations in Kansas

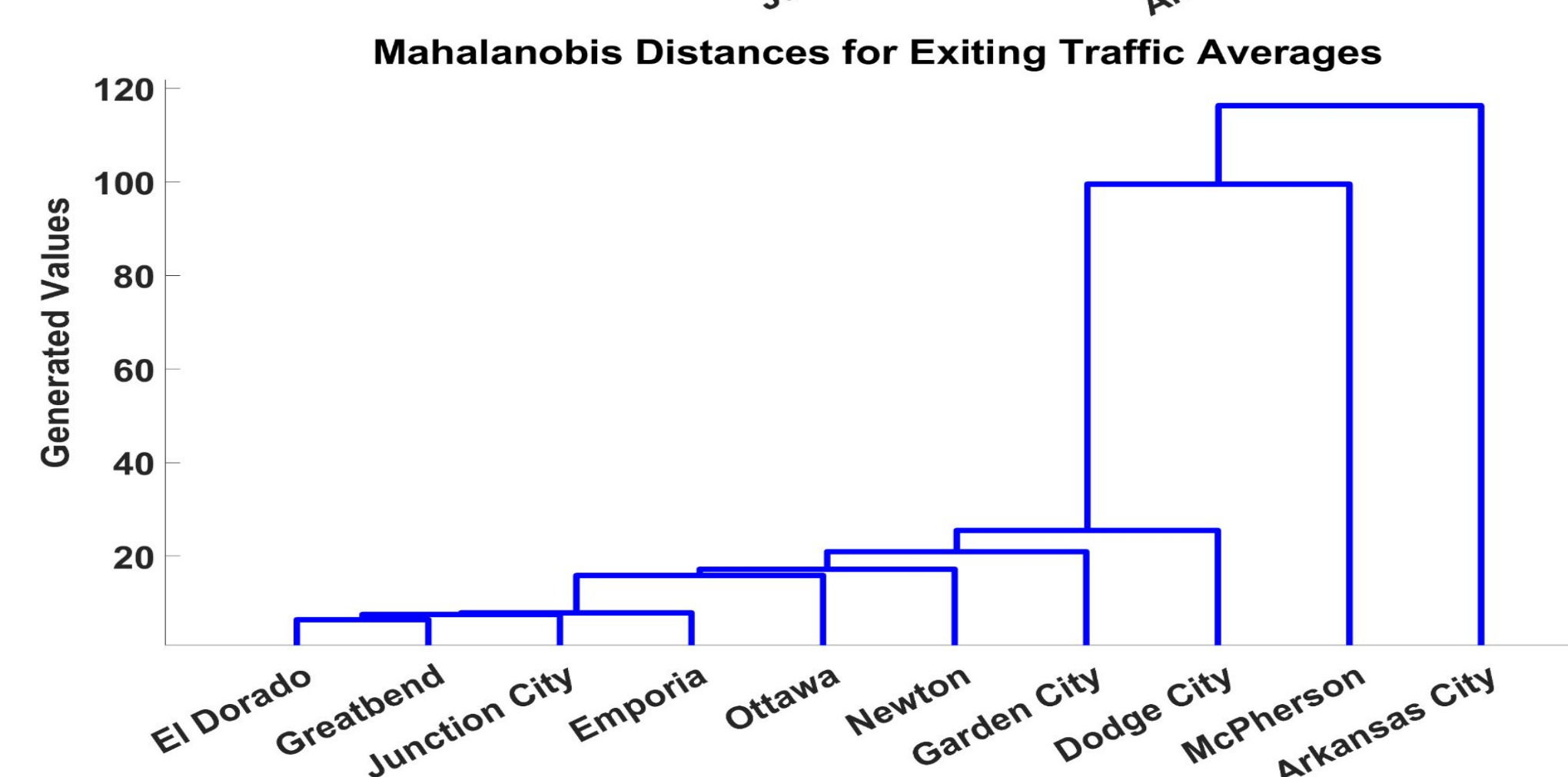
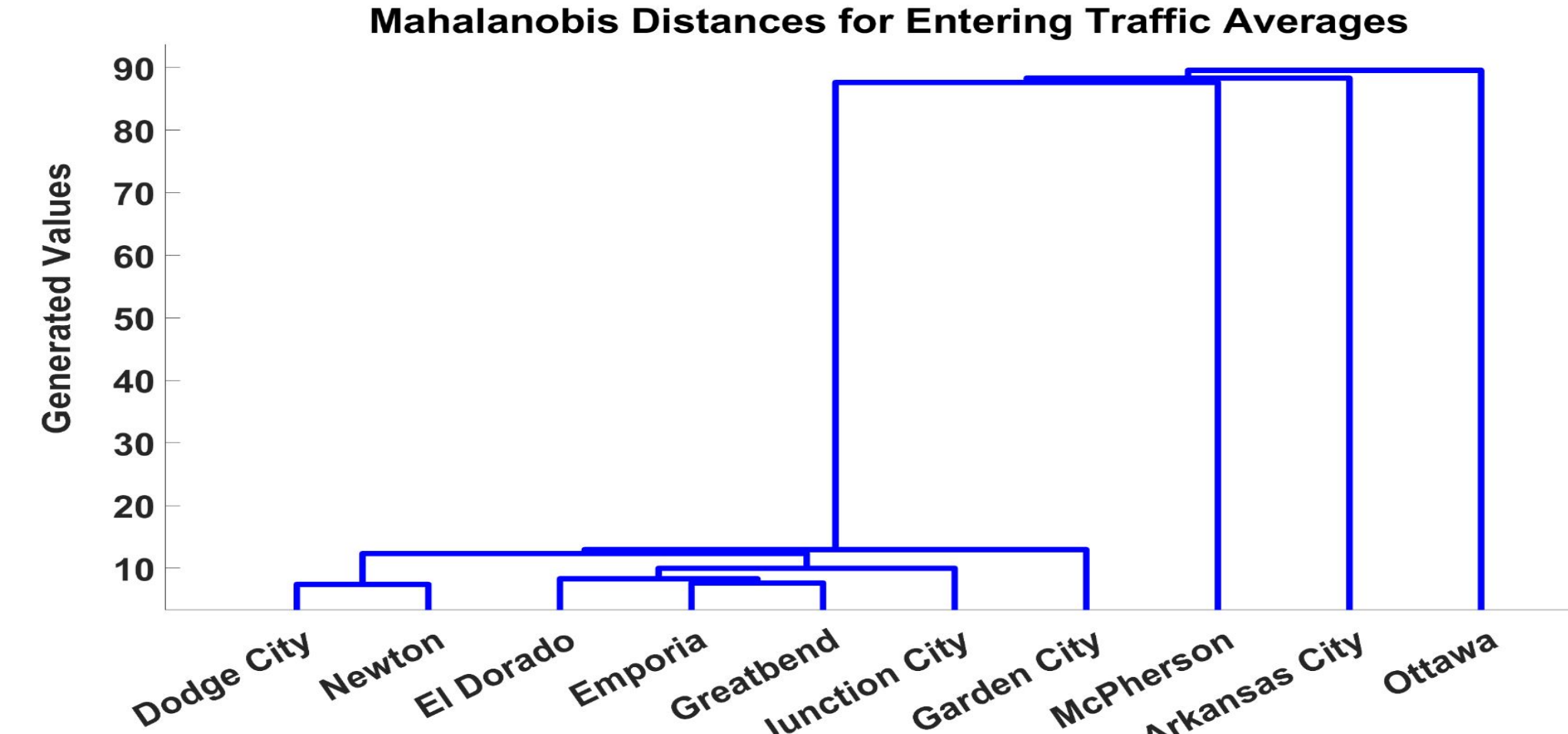
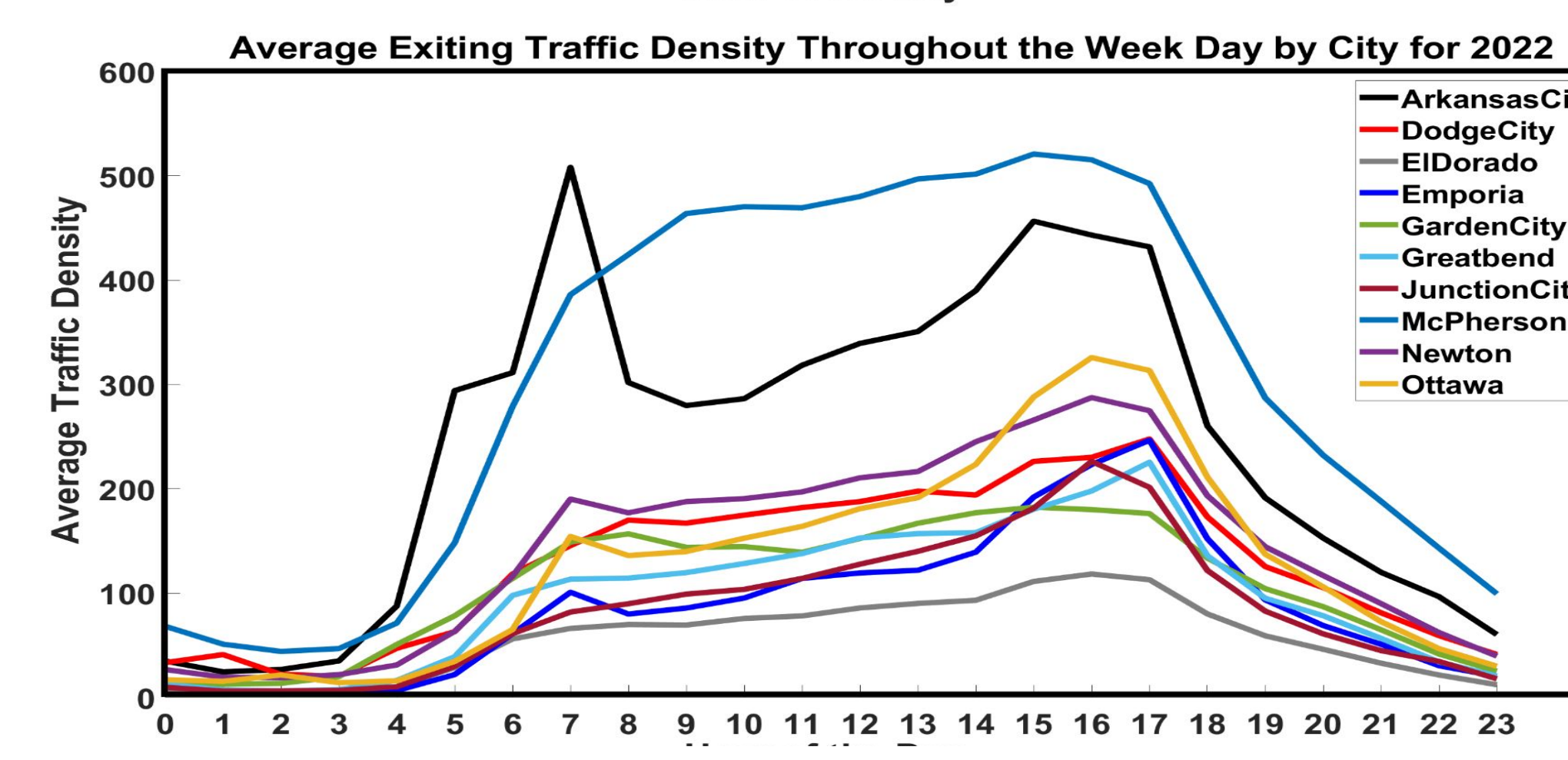
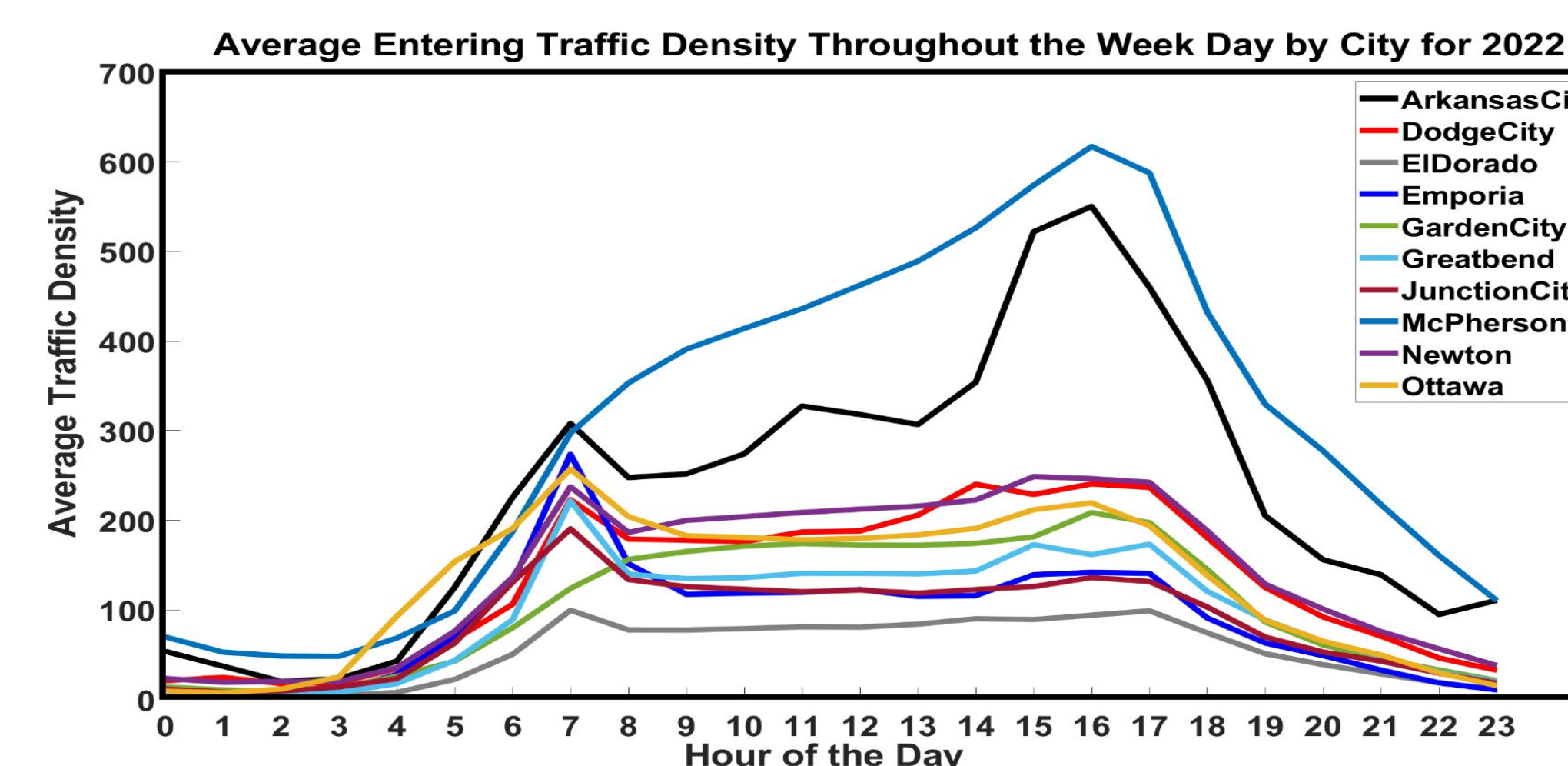
The traffic volume of each weekday forms a time-series data. A dataset consisting of average daily traffic creates a time series for each town considered in the study.

MATLAB was used to analyze the time-series data.

Multivariate analysis of variance MANOVA was used to check if there is significant difference between each city's daily traffic.

Results

Generated P-Values were negligible. Values exceeded ranges beyond practicality.



Discussion

Visual comparisons indicate that each city has unique traffic patterns. However, their shapes follow a distinct pattern mimicking highlights of a commuter's day. MANOVA results show how statistically different each city is from one other.

Arkansas City and McPherson can be identified as cities with high rates of fluctuating traffic, which starkly contrasts with their eight other counterparts. Investigation of these two cities reveals that they share similar industries, notably manufacturing and education. We conjecture that high fluctuation rates are due to manufacturing deliveries and distribution. Additionally, student and faculty commuters may also influence these rates.

Other towns fall within a uniform pattern with varying magnitude. This is caused by the varying population size across those towns.

Future applications of this information could extend to understanding the relationship between socioeconomic factors and traffic density.

Acknowledgements

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