Traffic Prediction Plotting/Decision Support Tool

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Traffic Prediction Plotting

Introduction

- **Traffic Congestion** presents one of the biggest challenges to modern cities
  - Productivity loss, air pollution, and more can all be attributed to traffic congestion
- **Traffic Prediction** systems can improve city/road planning and user interface is critical for understanding trends and ease of use

Purpose/Aim

- Create a data dashboard with synchronized charts displaying:
  - Historical traffic speed
  - Historical traffic volume
  - Historical Road occupancy
  - Future traffic predictions

Methods:

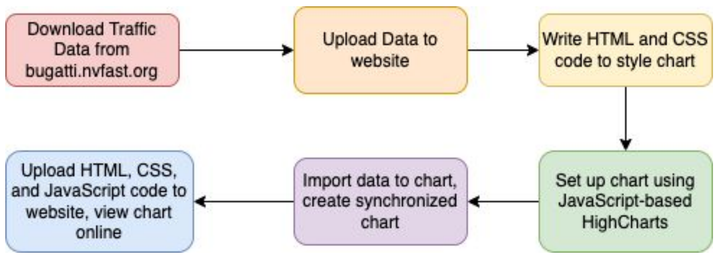

Fig.1 Methods Flowchart.
Illustrates the process of making a synchronized traffic chart from downloaded data

- Plotting libraries include:
  - Highcharts, a JavaScript-based plotting library
  - MatPlotLib, a Python-based plotting library
    - MatPlotLib is not well-suited for web development
  - This project used HighCharts synchronized charts for reasons including:
    - Highcharts has the ability to synchronize charts (speed, volume, and occupancy shown on separate charts with a synchronized x-axis)
    - Highcharts provides a professional-looking, visually appealing charting framework suitable for web development

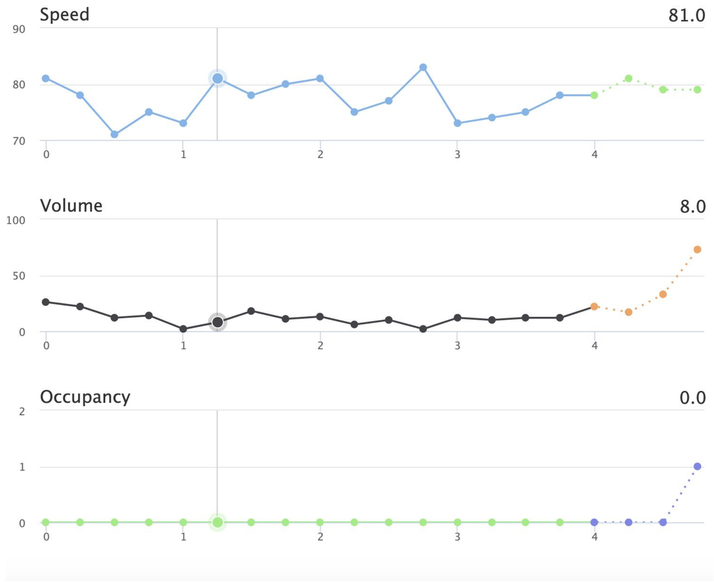

Fig 2. Website Chart. Illustrates how speed (mi/hr), volume (vehicles/15 min), and occupancy (roadway percentage occupied) charts can be synchronized, with historical data represented by a solid line and predictions shown as a dotted line

Results:

- Successfully created synchronized charts displaying:
  - Historical speed, volume, and occupancy data
  - Easily distinguishable traffic predictions

Discussion, Conclusions:

- Creating these synchronized charts represents an important step in improving the user interface and utility of traffic prediction sensors on 1-15 in Las Vegas
- Short-term trends are easily visualized, allowing city/road planning professionals to make real-time decisions to alleviate congestion based on traffic trends

Future Research:

- Future research includes:
  - Creating synchronized charts that auto-update
    - importing traffic data in real-time and automatically updating the plots
  - Expanding the traffic prediction plots to areas beyond the I-15 corridor in Las Vegas

Decision Support Tool

Introduction:

- Access to **active transportation** is crucial for improving public health outcomes
- The Decision Support Tool aims to give decision-makers a quantitative measure of current levels of active transport and suggestions for infrastructure improvements such as traffic calming measures, sidewalks, and bike lanes
  - The DST was created by the UNLV School of Public Health for use in the Las Vegas Metro area

Purpose/Aim:

- Expand the Decision Support Tool to jurisdictions beyond the Las Vegas Metropolitan Area including:
  - Reno/Washoe County
  - Arizona
  - Utah

Methods:

- Searched GIS databases for jurisdictions throughout the region to find GIS information on locations of schools, parks, bike lanes, and more
- Conducted Public Records Requests for several states to access Historical Crash Data
- Created GIS Mapping Applications with the Crash Data
- Wrote instructions for different data sources, added new jurisdictions to existing code base of the online DST

Results:

- Expanded the DST to 16 additional jurisdictions outside of Nevada, encompassing all major metro areas in Arizona, Nevada, and Utah

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