Abstract:

The "Analyzing Transportation Trends Post-COVID" project aims to provide insights into how the COVID-19 pandemic and related restrictions have influenced transportation patterns in the United Kingdom. Utilizing a dataset containing daily transportation data, we explore fluctuations, the impact of holidays, and the overall trends. The project also investigates specific transportation modes, including light commercial vehicles, heavy goods vehicles, public transport, and the London Tube. We then discuss the transition to monthly averages to provide clearer visualizations and insights. In addition, we propose enhancements for the dashboard's utility and future analyses, including predictive modeling, geographical integration, assessing environmental impact, and understanding economic implications. The project ultimately highlights the importance of data-driven decision-making in transportation planning.

Introduction:

Transportation is a vital aspect of modern society, influencing economic activities, daily life, and environmental sustainability. Understanding how transportation patterns evolve is crucial for policy-makers, urban planners, and businesses. This project explores transportation trends in the United Kingdom, particularly in the post-COVID era. We utilize a comprehensive dataset and visualization tools like Tableau to analyze daily transportation data and draw meaningful insights.

Data Source and Tools:

Data Source: Government-provided dataset on transportation usage.

Analysis Tools: Tableau for data visualization and Python for data preprocessing.

Data Collection and Preprocessing:

The first step in our analysis involved data collection and preprocessing. The raw dataset contained daily records of transportation usage, including various modes such as buses, trains, and personal vehicles. Data preprocessing tasks included data cleaning, handling missing values, and formatting dates.

Exploratory Data Analysis:

Sheet 1: Understanding the Trends

Our initial exploration focused on understanding the daily trends in transportation usage. The following key observations were made:

Daily Trends Analysis:

Figure 2 provides a visual representation of the daily fluctuations in transportation usage. These fluctuations can be attributed to various factors, including commuting patterns, special events, and the influence of holidays. Notably, daily peaks and troughs are visible, indicating distinct usage patterns.

Impact of Bank Holidays:

We observed a significant impact of bank holidays on transportation choices. Figure 3 showcases the reduction in vehicle usage during or near bank holidays, represented by vertical lines. These periods typically see a decrease in transportation activity as people take breaks from their daily routines.

London Tube Outlier:

On December 25th, 2022, Christmas Day, a striking anomaly occurred—the London Tube experienced a substantial increase in usage that surpassed all other transportation modes. Figure 4 highlights this unique data point, which prompted further investigation into its causes.

Transition to Monthly Averages:

To simplify the analysis and provide clearer visualizations, we transitioned to using monthly averages. Monthly averages offer a more comprehensive view of transportation trends, minimizing the influence of daily fluctuations. This clarity aids in the comprehension of the overall trends. Figure 5 illustrates the upward trend observed in monthly averages.

Sheet 2: Private vs. Public Habits

The second sheet of our analysis focuses on comparing private and public transportation habits during weekdays and weekends on a monthly basis.

Comparison of Private and Public Transportation:

We observed significant differences in transportation habits between weekdays and weekends, with approximately a 0.2 difference in median values each month.

Transportation usage follows distinct patterns throughout the year, peaking around March to June and gradually decreasing until December and January of the following year.

Private vehicle usage on weekdays showed a slight underperformance when compared to benchmark data, which considered only February usage. This decrease may be attributed to the growing adoption of hybrid work modes and factors like comfort and convenience.

Effect of COVID-19:

The analysis highlighted the significant impact of COVID-19 on transportation patterns, with noticeable differences between pre-COVID and post-COVID trends.

Commercial Use Vans:

Commercial use vans consistently surpassed the baseline, suggesting policy adjustments could support economic recovery.

The positive performance of commercial use vans can be seen as an indicator of economic recovery, especially in industries rely on these vehicles for transportation and logistics. Supporting and sustaining this trend can contribute to overall economic growth.

Dashboard Enhancements and Future Analysis:

Predictive Modeling:

One potential enhancement for our dashboard is the implementation of predictive modeling. Predictive models can forecast future transportation trends by analyzing historical data patterns and incorporating variables such as economic indicators and public health measures. This can assist planners and policymakers in making proactive decisions and allocating resources efficiently.

Geographical Integration:

Integrating geographical data into our dashboard could provide regional insights, allowing for a more granular analysis of transportation behavior variations. This geographical analysis can reveal spatial patterns and assist in targeted interventions and location-specific planning.

Environmental Impact:

Exploring the environmental impact of changing transportation patterns is another avenue for future analysis. We can investigate differences in emissions and air quality associated with shifts in vehicle usage. Understanding these environmental implications is crucial for sustainable transportation planning.

Economic Implications:

Beyond policy decisions, understanding the economic implications of transportation trends on various sectors is vital. How do these changes affect industries such as logistics, retail, and public transit providers? Conducting economic impact assessments can inform decisions that support economic recovery and long-term growth.

Conclusion:

In conclusion, our analysis of transportation trends post-COVID reveals an upward trajectory in transportation usage. We observed the impact of holidays, the London Tube outlier, and the importance of transitioning to monthly averages for clearer visualizations. Our project highlights the significance of data-driven decision-making in transportation planning and suggests future enhancements to our dashboard for more comprehensive analyses.

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