London School of Economics

Data Analytics Career Accelerator

Thoughtworks Employer Project

Word Count: 1000

Date: Mon, 06/May/2024

Context

In 2018, the Mayor of London launched the Transport Strategy to transform urban mobility and reduce car dependence. Targeting 80% of all trips by 2041 to be via walking, cycling, or public transport, the strategy includes expanding cycling infrastructure, improving street environments, and making cycling accessible for all groups. This analysis evaluates progress towards these goals, assessing the impact of infrastructure improvements on cycling behaviour and the effectiveness of cycle hire schemes, and identifying key demographics for increased cycling participation.

Problem Statement

How can the 2018 London Transport Strategy be optimised, specifically with regards to cycling, to meet the 2041 goal of 80%? What progress has been achieved, and what are the key barriers hindering greater cycling uptake? This analysis seeks to identify actionable recommendations for the Mayor's office to enhance infrastructure, policies, and community engagement efforts to effectively target diverse demographic groups and achieve the set targets.

Key Stakeholders

- **Government and Regulatory Bodies:** Mayor of London, Political Parties of London Assembly, Mayor's Office for Policing and Crime, Government
- **Transport Authorities and Professionals:** Transport for London (TfL), London Fire Commissioner
- **Community and Public Representatives:** Cyclist Associations, Taxi drivers, Traffic participants

Project Scope

Objective: To evaluate the progress of cycling initiatives within London’s transport strategy, providing insights and strategic recommendations to align with the city's transportation and environmental goals.

Project Plan

The project will proceed through phases of data collection, analysis, and reporting. Each phase is structured to align with project objectives, with key decisions focused on role allocation, communication, and adherence to timelines.

Areas of focus and objectives for assessing and improving cycling infrastructure and promotion efforts in London:

Project	Analysis
Cycle network Expansion	Monitor annual additions to cycle lanes and assess new paths' accessibility in residential and commercial zones. Analyse usage patterns by time and weather conditions, and evaluate cyclist volume on Cycle Superhighways and Quietways. Examine changes in accident rates following infrastructure enhancements.
Improving Street Environments	Measure changes in redesigned roads, including traffic volume, speed, and air quality. *[Satisfaction surveys will be needed in the future, however, they go beyond the scope of this assignment.]*
Safety Initiatives	Analyse accident data to pinpoint high-risk areas and evaluate safety improvements. Investigate how bike theft impacts cycling demand and propose strategies to mitigate this effect.
Cycle Parking	Analyse the occupancy rates of parking locations relative to public transport stations (+shopping areas, and offices).
Bike sharing programme	Analyse the usage patterns of cycle hire bikes compared to private cycles, identify popular routes or locations, and suggest targeted marketing campaigns.
Demographic aspects of cycling	Identify the reasons behind the significantly lower cycling uptake for women. Barriers to cycling of different age and minority groups. What measures (infrastructure, safety) can improve cycling uptake.
Case study	Integrating insights from New York and Sydney datasets into the analysis of London cycling data, gain a broader understanding of urban cycling dynamics and leverage cross-city comparisons.

Data Limitations. Availability and quality of data could constrain the accuracy and comprehensiveness of the analysis. For instance, incomplete or outdated data may limit the ability to assess certain aspects of cycling behaviour or infrastructure effectiveness.

Team roles and ways of working

Project manager.

Oversees project planning, execution, and delivery, coordinating activities, managing resources and timelines. Serves as the primary contact for stakeholders, ensuring effective communication and progress monitoring. Identifies risks and implements strategies to maintain project alignment.

Data Analyst

Collects, cleans, and analyses data related to cycling infrastructure, usage patterns, accidents, and other relevant factors. Conducts statistical analysis to identify trends, patterns, and correlations. Prepares reports, programming code and visualisations to communicate findings effectively to team members and stakeholders. Works closely with other team members to provide data-driven insights for decision-making.

Project allocations:

- **Mathieu and Fernanda –** Cycle Network Expansion
- **Alina –** Improving Street Environments & Cycle Parking
- **Fernanda –** Safety Initiatives
- **Zora –** Bike Sharing Programme
- **John –** Case Study (NYC and Sydney)
- **Judit –** Demographics

Operation Team Roles

- **Report Coordinator [Alina & Fernanda]:** Manages the report creation, ensuring coherence and accuracy. Facilitates collaboration among team members for draft reviews and integration of their project contributions.
- **Jupyter Administrator [Mathieu & John]:** Manages the initial setup of Jupyter Notebooks with cleaned data, ensuring version control and PEP8 compliance. Coordinates task-specific notebooks and integrates them into a comprehensive project notebook.
- **Presentation Manager [Zora & Judit]:** Oversees the development of presentations, ensuring they align with project objectives. Team members prepare individual slides based on their tasks, which are then consolidated into a unified presentation.

Communication plan/channels

- **Document Sharing & Collaboration:** Utilise a shared Google Drive for joint document ownership and a repository of resources. Use Lumin for collaborative document submissions.

- **Communication Tools:** WhatsApp for initial contacts, scheduling, and notifications. Zoom/Google Meets for bi-weekly meetings every Monday and Thursday at midday, with shared calendars and recorded meeting minutes.

- **Task Management:** Coding reports and syntax notes ensure cohesion, reproducibility, and serve as safety measures. The weekly leader chairs the meetings, concluding with defined action points for clarity and follow-up.

Timeline/Roadmap

Analytical Approach

- **Data Collection:** Employ web scraping with tools such as BeautifulSoup and API calls, to gather and validate essential datasets for accuracy.

- **Data Cleaning:** Use Python (Pandas, NumPy) to ensure dataset consistency, with team audits to oversee the cleaning processes.

- **Data Analysis:** Apply statistical methods and visualisation tools (Python's Matplotlib and Seaborn, R, Tableau) to analyse trends and patterns.

- **Presenting Findings:** Conduct regular team meetings to review progress and align with project objectives, culminating in the presentation of findings to stakeholders.

Project Roadblocks

- Anticipate potential challenges such as dirty data, data access limitations, uneven team skill sets, team member unavailability and communication gaps.
- Implement proactive measures including data cleaning plans, early data access requests, team roles assessment, clear communication channels, phased approach with defined deliverables, and regular reviews and risk assessments.

[see Appendix for details]

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Appendix

Roadblocks

Anticipate. Prevent. Overcome.

Data Issues

- **Dirty Data:** Missing values, inconsistencies, and errors can plague datasets.
- **Data Access:** Permissions or limitations on obtaining the data you need can stall progress.

Team Dynamics

- **Uneven Skill Sets:** Team members with varying experience levels can lead to imbalances in workload.
- **Communication Gaps:** Unclear roles or communication breakdowns can cause confusion and delays.

Project Management

- **Scope Creep:** Project goals expanding beyond initial plans can lead to missed deadlines.
- **Unrealistic Expectations:** Unforeseen technical hurdles or data limitations can derail initial expectations.

Be proactive

- **Data Cleaning Plan:** Schedule time for data exploration and cleaning early on. Define data quality checks and assign ownership.
- **Data Access Requests:** Anticipate data needs and request access well in advance. Explore alternative datasets as backups.
- **Team Roles & Skills Assessment:** Evaluate team strengths and weaknesses. Assign tasks that leverage each member's expertise.
- **Communication Plan:** Set clear communication channels (meetings, shared documents) and expectations for updates and feedback.
- **Phased Approach & Defined Deliverables:** Break down the project into phases with clear milestones and deliverables.

Regular Reviews & Risk Assessment

Schedule regular check-ins to assess progress and identify potential roadblocks. Adjust timelines or project scope as needed.

Detailed Roadmap

Phase	Description	Timeline
Initiation	Ensure all team members are clear on their responsibilities. Establish robust communication channels and defined roles to facilitate understanding and accountability throughout the project lifecycle.	**April 26 - May 7**
Planning	Develop a detailed project plan outlining tasks, timelines, and resource allocations. Data collection to ensure we have the necessary information for analysis. Implement risk management strategies to proactively address potential obstacles.	**April 26 - May 7**
Execution	Data collection, data cleaning, web scraping. Explore the data on cycling infrastructure, usage patterns, and other metrics to identify the area of recommendation.	**May 1 - May 19**
Monitoring & Synchronisation	Present the team members key findings of the analysis. Determine areas for further analysis. Organise findings in a sequence that makes sense. Compile findings into a comprehensive report and presentation.	**May 20 - May 26**
Closure	Prepare and present a five-to-ten-minute data-informed recommendation to the employer partner based on findings. Practice presenting in a group to ensure each group member understands their role. Present directly to the employer partner.	**May 27 - June 10**