TOPIC

PUBLIC TRANSPORTATION EFFICIENCY ANALYSIS

AIM :

To Public Transportation Efficiency Analysis typically involves evaluating various aspects of a public transportation system to assess its effectiveness and identify areas for improvement.

Define Objectives and Scope:

Determine the specific goals of your analysis. What aspects of public transportation efficiency are you interested in? Examples include ridership, on-time performance, cost-effectiveness, or environmental impact

Objectives and Scope

Data Collection:

Gather relevant data from various sources. This can include ridership numbers, schedules, routes, maintenance records, financial data, and more. Government agencies, transportation companies, and open data platforms can be valuable sources

Data Collection method

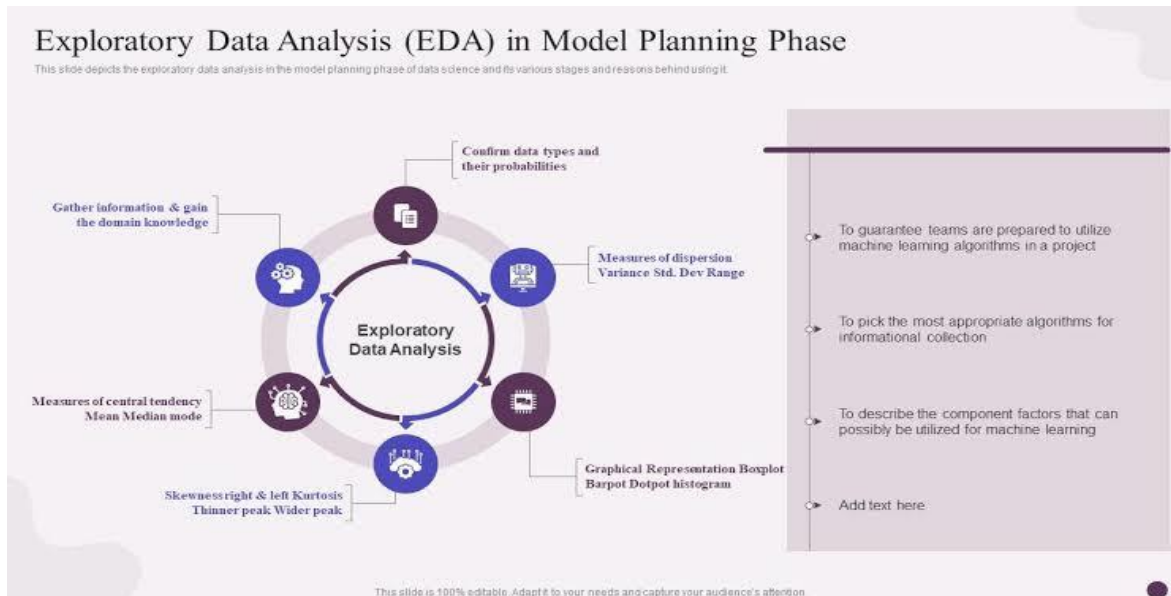**Data Cleaning and Preprocessing :**

      Clean and preprocess the data to ensure accuracy and consistency. This involves handling missing data, removing duplicates, and standardizing format .

Data cleaning

Exploratory Data Analysis (EDA):

  Explore the data to gain insights. Create visualizations and summary statistics to understand trends, patterns, and outliers

Exploratory Data Analysis (EDA)

Key Performance Indicators (KPIs):

   Define KPIs to measure efficiency. These can include:

Ridership Metrics:

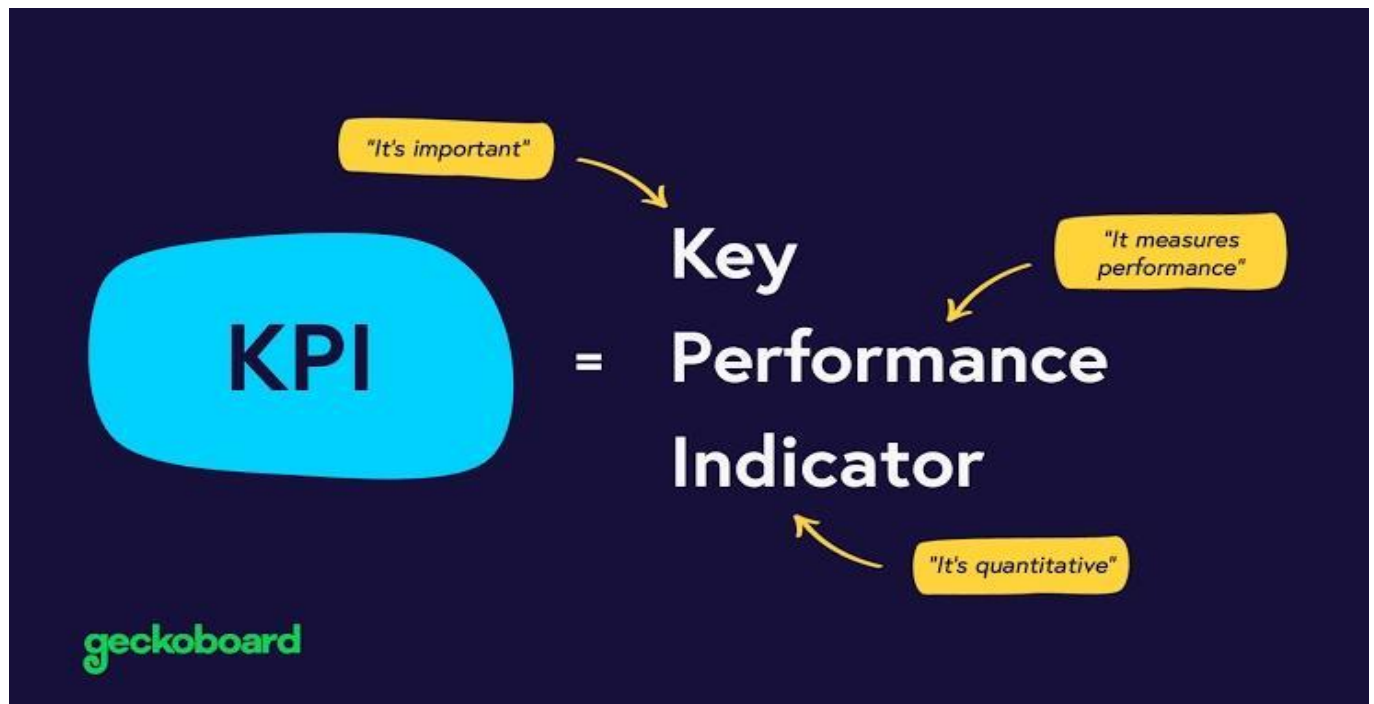**Total ridership, ridership per route, seasonality.**

Operational Metrics:

On-time performance, vehicle utilization, maintenance costs.

Financial Metrics: Revenue, subsidy per passenger, cost per mile.

Environmental Metrics:

Emissions reduction, energy efficiency.

**Key Performance Indicators**

Comparative Analysis :

Compare the performance of different routes, modes, or time periods within the transportation system. Identify factors contributing to variations in efficiency.

Cost-Benefit Analysis:

Evaluate the costs of running the transportation system against its benefits. Consider both direct costs (e.g., operations, maintenance) and indirect benefits (e.g., reduced congestion, environmental impact).

Cost-Benefit Analysis
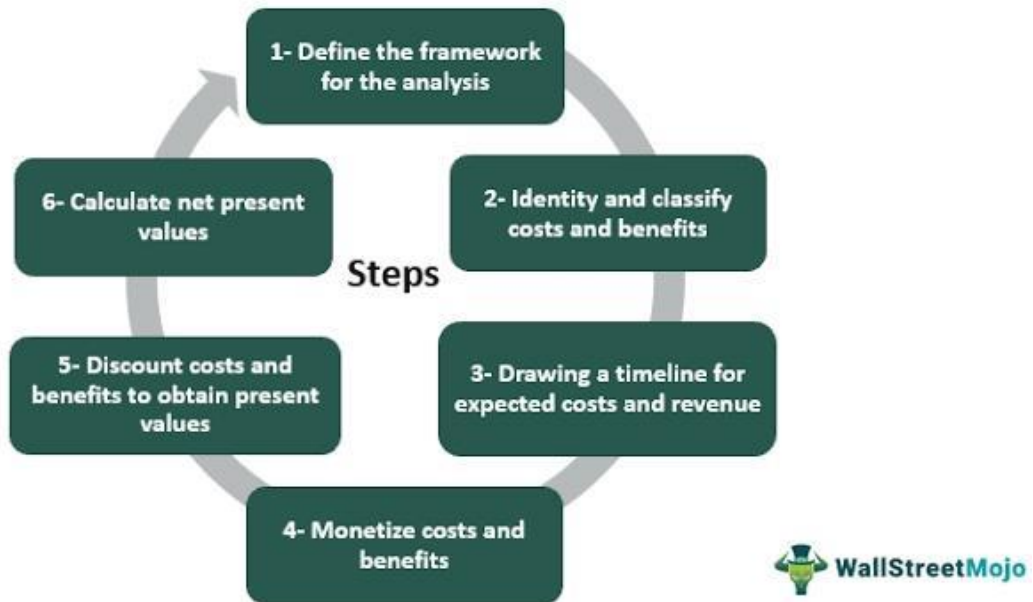
Cost-Benefit Analysis

Predictive Modeling (Optional):

If you have historical data, build predictive models to forecast ridership, revenue, or other key metrics. This can help in scenario planning and future projections.
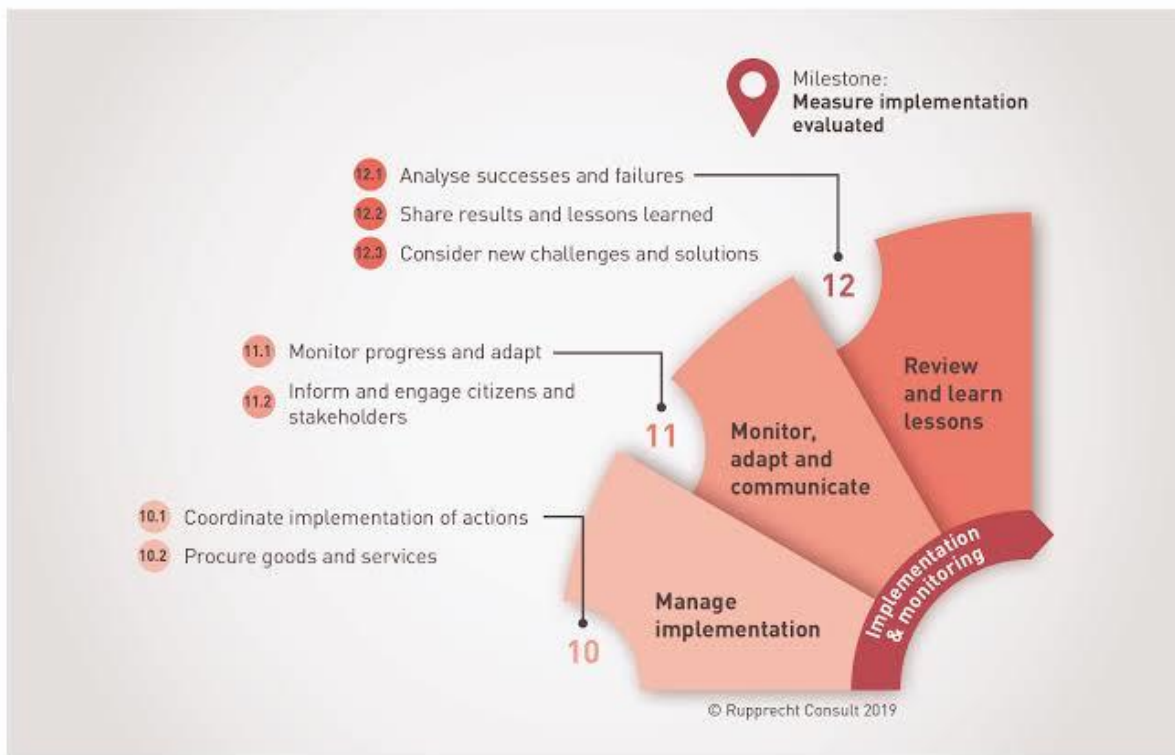
Recommendations:

Based on your analysis, provide actionable recommendations to improve efficiency. These could involve route optimizations, schedule adjustments, fare changes, or infrastructure upgrades.

Visualization and Reporting:

Present your findings using clear visualizations, charts, and a comprehensive report. Make the information accessible to stakeholders, which may include government agencies, transportation companies, or the public.

Implementation and Monitoring:

If your recommendations are adopted, monitor the implementation of changes and track their impact over time. Continuously measure KPIs to ensure improvements are sustained.

Milestone:
Measure implementation evaluated

12.1 Analyse successes and failures
12.2 Share results and lessons learned
12.3 Consider new challenges and solutions

12

Review and learn lessons

11.1 Monitor progress and adapt
11.2 Inform and engage citizens and stakeholders

11 Monitor, adapt and communicate

10.1 Coordinate implementation of actions
10.2 Procure goods and services

Manage implementation
10

Implementation & monitoring

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Feedback and Iteration:

Gather feedback from stakeholders and the public to refine your analysis and recommendations. Transportation systems are dynamic, so ongoing analysis and adjustment may be necessary.
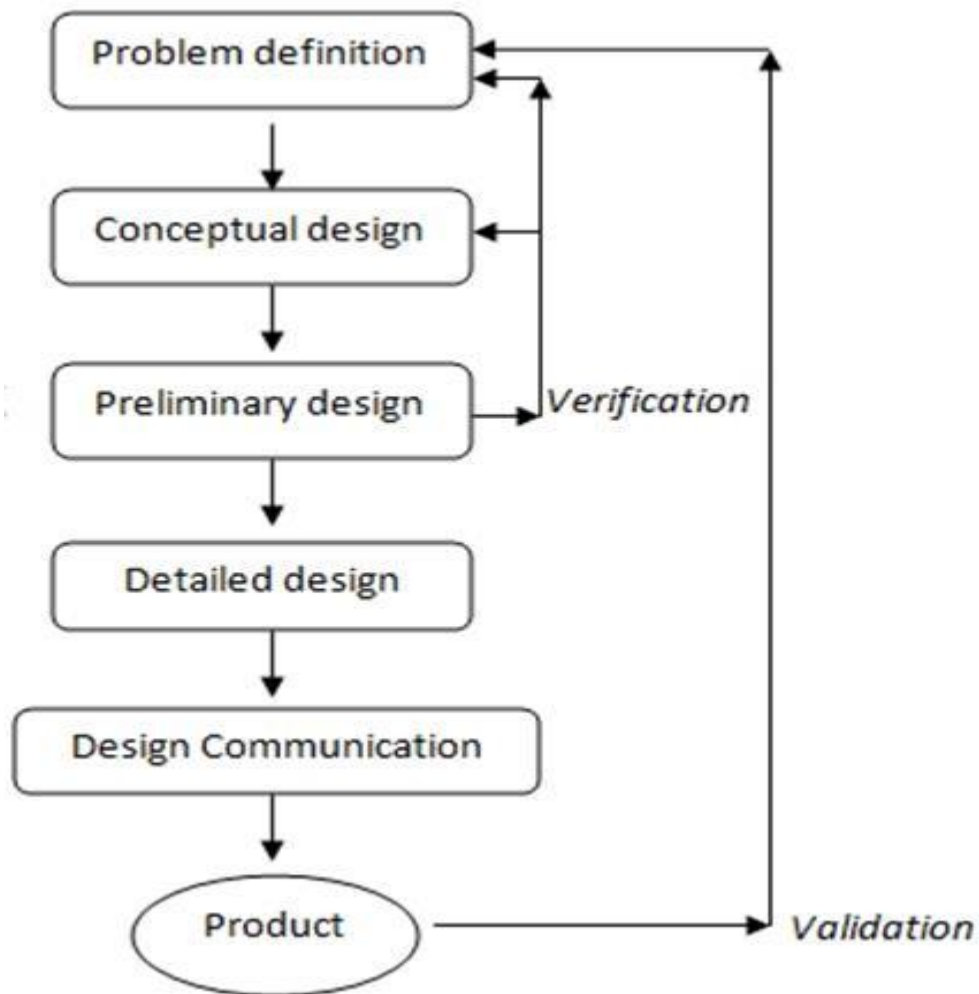
Feedback and Iteration

Keep in mind that public transportation efficiency analysis can be complex and may require expertise in data analysis, transportation planning, and economics. Utilizing software like Python with libraries

such as pandas, matplotlib, and seaborn can help in data analysis and visualization. Additionally, collaborating with experts in the field or local transportation authorities can provide valuable insights and data access.

Public Transportation Efficiency Analysis short diagram: