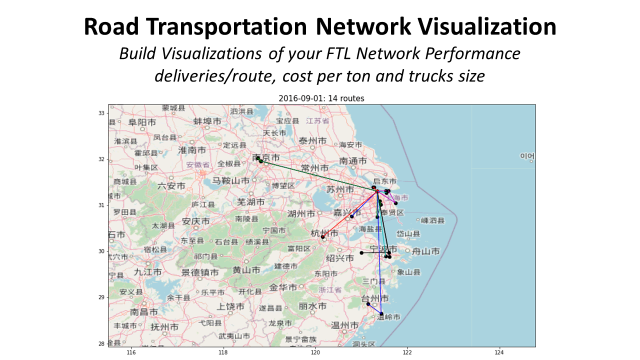
**PROJECT TITLE: PUBLIC TRANSPORT ANALYSIS**

**PHASE 5: Project Documentation &Submission**

**INTRODUCTION :**

Public transport analysis is a critical evaluation of transportation systems that serve the general public. It involves assessing various aspects of public transportation, including buses, trains, trams, subways, and other modes of communal mobility. The analysis can encompass a range of factors such as efficiency, accessibility, affordability, safety, environmental impact, and social equity. Researchers and policymakers often conduct these analyses to make informed decisions about improving public transport services, addressing congestion, reducing emissions, and enhancing urban planning. Understanding the strengths and weaknesses of public transportation systems is crucial for creating sustainable and efficient transportation networks that benefit communities and regions.



**Dataset link:(** **https://www.kaggle.com/datasets/rednivrug/unisys?select=20140711.CSV)**

**TripID**  **RouteID** **StopID StopName WeekBeginnumberofboarding**

23631 100 14156 181 CrossRd6/30/20130:00 1

23631 100 14144 177Cross Rd6/0/20130:00 1

23632 100 14132 175CrossRd6/30/2010:00 1

23633 100 12266 ZoneAArndaleInterchange6/30/201 0:00 2

23634 100 14132 175Cross Rd6/30/2013 0:00 1

23634 100 13335 9AHolbrooksRd6/30/2013 0:00 1

23634 100 13878 9MarionRd6/30/2013 0:00 1

23634 100 13045 206HolbrooksRd6/30/2013 0:00 1

23635 100 13335 9AHolbrooksRd6/30/2013 0:00 1

**Project objectives :**

1. **Efficency**

the system's ability to move people from one place to another in a timely manner.

1. **Accessibility:**

Evaluating how well the system serves different communities and populations, ensuring equitable access.

1. **Cost-effectiveness**:

Determining if the system provides value for money in terms of its operations and subsidies.

1. **Environmental Impact:**

Studying the system's effects on the environment, including emissions and sustainability.

1. **Safety:**

Ensuring the safety of passengers and pedestrians in the transport system.

1. **Infrastructure Planning:**

Identifying the need for expansion, maintenance, or improvements in the transport network.

1. **User Satisfaction:**

Measuring passenger experience and addressing their needs and concerns.

1. **Integration:**

Analyzing how different modes of public transport (bus, train, metro, etc.) work together to provide a seamless journey.

1. **Economic Benefits:**

Examining the economic impacts of public transportation on a region, such as job creation and increased property values.

**DESIGN THINKING PROCESS:**

**1.Empathize:**

- Understand the needs and pain points of public transport users.

- Conduct surveys, interviews, and observations to gather insights from passengers.

- Consider diverse user groups and their specific requirements (e.g., commuters, tourists, people with disabilities).

**2. Define:**

- Clearly define the problem or challenges faced by the public transport system.

- Create user personas and identify key issues that need to be addressed.

- Set specific goals and objectives for the analysis.

**3. Ideate:**

- Brainstorm potential solutions and improvements.

- Encourage creative thinking and generate a wide range of ideas.

- Consider both incremental changes and radical innovations.

**4. Prototype:**

- Develop tangible representations of potential solutions.

- Create prototypes of new features, services, or infrastructure changes.

- Test these prototypes with a small group of users to gather feedback.

**5. Test:**

- Collect feedback on the prototypes from users.

- Analyze the feedback to refine and improve the proposed solutions.

- Identify strengths and weaknesses in the design.

6**. Implement:**

- Based on the feedback and analysis, select the most viable solutions.

- Develop an implementation plan, considering budget, resources, and timeline.

- Collaborate with relevant stakeholders, such as transportation authorities and urban planners.

**7. Evaluate:**

- Continuously monitor the impact of the implemented changes.

- Collect data on passenger satisfaction, ridership, and other relevant metrics.

- Adjust and iterate based on ongoing feedback and data.

**8. Repeat:**

- Design thinking is an iterative process, so be prepared to revisit and refine the public transport system as needed.

- Stay open to new ideas and adapt to changing user needs and technological advancements.

**DEVELOPMENT PHASES :**

**1.Market Research:** Study the demographics and travel patterns of the area to understand the potential demand for public transport.

**2. Route Planning:** Determine the most effective routes based on population density, key destinations, and traffic patterns.

**3. Cost Estimation**: Calculate the budget required for infrastructure, vehicles, and operational expenses.

**4. Environmental Impact Assessment:** Evaluate the project's environmental effects and plan for sustainability.

**5. Infrastructure Design**: Develop plans for bus stops, train stations, and other necessary infrastructure.

**6. Technology Integration**: Consider implementing modern technologies like real-time tracking, electronic fare systems, and automated scheduling.

**7. Regulatory Compliance:** Ensure adherence to local and national transportation regulations.

**8. Funding and Financing:** Explore funding options, which may include government grants, public-private partnerships, or loans.

**9. Stakeholder Engagement**: Involve the community, local authorities, and potential investors in the planning process.

**10. Risk Assessment**: Identify and mitigate potential risks, such as construction delays, budget overruns, or changes in ridership.

**11. Timeline and Milestones:** Create a project schedule with clear milestones for tracking progress.

**12. Public Relations:** Communicate the project's benefits and progress to the public and address concerns.

**13. Safety and Security**: Develop plans for passenger safety and security.

**14.Operations** **and Maintenance**: Plan for ongoing operation and maintenance of the transport system.

**15. Performance Metrics**: Establish key performance indicators to assess the success of the system

**DATA COLLECTION PROCESS:**

**1. Define Objectives**: Determine the specific objectives of the analysis, such as improving efficiency, reducing congestion, or enhancing user experience.

**2. Data Sources:** Identify the sources of data, which may include:

- GPS and Telematics Data: Gather data from buses, trains, or other vehicles equipped with GPS and telematics systems to track their movements and performance.

- Ticketing and Fare Data: Collect data on ticket sales, fare collection, and passenger boarding/alighting information.

- Surveys: Conduct passenger surveys to gather information on user preferences, demographics, and satisfaction.

- Traffic and Weather Data: Incorporate external data sources such as traffic conditions and weather to understand their impact on public transport.

3. **Data Collection Methods:**

- Automated Data Collection: Utilize automated systems to collect real-time data, such as GPS tracking, automatic passenger counters, and electronic ticketing systems.

- Manual Data Collection: Conduct manual observations, surveys, and manual ticket validation when automated data is unavailable or incomplete.

4**. Data Storage**: Store the collected data in a secure and structured database or data management system.

5**. Data Cleaning:** Clean and preprocess the data to remove errors, inconsistencies, and outliers.

6**. Data Analysis**: Analyze the data using various techniques, such as:

- Descriptive Analytics: Summarize the data to gain insights into system performance and passenger behavior.

- Predictive Analytics: Use historical data to make predictions, such as demand forecasting or schedule optimization.

- Prescriptive Analytics: Suggest improvements and strategies based on analysis results.

7**. Visualization**: create visual representations of the data, such as charts and maps, to aid in understanding and decision-making.

8. **Feedback Loop**: Use the analysis results to make informed decisions and improvements in public transport operations.

**9. Privacy and Security: Ensure** that passenger data is handled in compliance with privacy regulations and security protocols.

1. **Continuous Monitoring**: Implement ongoing data collection and analysis to adapt to changing circumstances and improve public transport services.

**DATA VISUALIZATION USING IBM COGNOS :**

1. **Data Integration:**

- Collect and integrate data from various sources, such as ticketing systems, GPS tracking, maintenance logs, and passenger surveys.

- Store the data in a data warehouse or suitable data source that Cognos can access.

**2. Create Data Models:**

- Use Cognos Framework Manager to create data models and define relationships between data tables. This helps in organizing and structuring your data for analysis.

**3. Design Reports and Dashboards:**

- Use Cognos Report Studio or Cognos Analytics to design interactive reports and dashboards.

- Customize reports to display key performance indicators (KPIs), such as ridership, on-time performance, and revenue.

**4. Geographic Data Visualization:**

- If you have location data, use Cognos' mapping capabilities to create geographic visualizations. This can help analyze routes, stops, and congestion areas.

**5. Time-Series Analysis:**

- Utilize Cognos to analyze historical data and trends over time, allowing you to identify peak hours, seasonality, and long-term performance.

**6. Predictive Analytics:**

- Incorporate predictive analytics if you want to forecast demand, schedule maintenance, or optimize routes.

**7. Data Filters and Parameters:**

- Implement filters and parameters to allow users to interact with the data, enabling them to focus on specific aspects of public transport analysis.

**8. Share Insights**:

- Publish reports and dashboards to the Cognos portal or other distribution methods, so stakeholders can access and explore the data.

**9. Collaboration:**

- Enable collaboration features for team discussions and annotations on specific data points.

**10. Mobile Accessibility:**

- Ensure that reports and dashboards are accessible on mobile devices for on-the-go analysis.

**11. Real-time Monitoring:**

- Consider integrating real-time data streams to monitor the current status of public transport systems.

**12. Maintenance and Optimization:**

- Continuously monitor the performance of your reports and dashboards, and optimize them as needed.

**PYTHON CODE:**

import pandas as pd

import matplotlib.pyplot as plt

import seaborn as sns

# Sample public transport data

data = {

'Date': ['2023-01-01', '2023-01-02', '2023-01-03', '2023-01-04'],

'Ridership': [1200, 1400, 1600, 1800],

'Revenue': [6000, 7000, 8000, 9000]

}

# Create a DataFrame

df = pd.DataFrame(data)

# Line plot of daily ridership

plt.figure(figsize=(10, 5))

sns.lineplot(data=df, x='Date', y='Ridership')

plt.title('Daily Ridership Over Time')

plt.xlabel('Date')

plt.ylabel('Ridership')

plt.xticks(rotation=45)

plt.show()

# Bar plot of daily revenue

plt.figure(figsize=(10, 5))

sns.barplot(data=df, x='Date', y='Revenue', palette='Blues')

plt.title('Daily Revenue Over Time')

plt.xlabel('Date')

plt.ylabel('Revenue')

plt.xticks(rotation=45)

plt.show()

**Output:** 