

Phase 1: Problem Definition and Design Thinking

Problem Definition:

Public transportation analysis is a rigorous and systematic process that involves the thorough evaluation of public transit systems, including buses, trains, subways, trams, and related modes of mass transit. The primary objective of this analysis is to assess the efficiency, effectiveness, and overall performance of these transportation systems within a specific region or urban area. By examining various facets such as ridership patterns, route optimization, infrastructure condition, and conducting cost-benefit analyses, professionals and policymakers aim to derive data-driven insights and recommendations.

These insights are instrumental in making informed decisions and implementing improvements that enhance the quality and accessibility of public transportation services, ultimately benefiting the communities they serve.

Design Thinking :

1. Analysis Objectives:

- Measure service efficiency by analyzing the correlation between the number of boardings and trip durations. Identify routes or time slots where service efficiency can be improved.
- Calculate on-time performance by comparing scheduled stop times with actual arrival times. Develop a performance score for each route and identify trends or specific stops where punctuality issues occur.
- Integrate passenger feedback data with operational data. Identify patterns in feedback that correlate with specific routes or stops. Create sentiment analysis visualizations to understand which aspects of the service need improvement.

2. Data Collection:

- Implement real-time data collection from GPS trackers on vehicles to monitor their locations, passenger counts, and on-time performance.
- Develop mobile apps or web-based surveys for passengers to provide feedback after their trips, allowing for immediate data collection.
- Collect historical data on routes, stops, and passenger counts to establish baseline performance metrics and trends.

3. Visualization Strategy:

- Use IBM Cognos to create interactive maps that display real-time vehicle locations, stop information, and passenger boarding data. Users can track vehicles and boarding trends in real-time.
- Design dashboards that show key performance indicators such as on-time performance scores, passenger feedback sentiment scores, and boardings by route and stop.
- Create temporal heatmaps to visualize patterns of high and low passenger activity throughout the day, allowing for optimized scheduling.

4. Actionable Insights:

- Based on real-time data, suggest dynamic adjustments to schedules to improve on-time performance during peak hours.
- Identify routes or stops with consistently low boardings and explore opportunities for route optimization or consolidation.
- Use sentiment analysis to pinpoint specific aspects of service that passengers are dissatisfied with. Focus on addressing these pain points, such as cleanliness, safety, or accessibility.