Metroville Urban Rail Expansion Project Plan

* KPI Development

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**Introduction**

This Project Plan should focus on the fundamentals of KPI development rather than requiring an in-depth understanding of rail infrastructure. The primary goal is to create effective and meaningful KPIs that align with the project’s objectives, despite not being a rail industry expert. The notes imply a strength of a KPI lies in its ability to measure success toward specific goals, not in the complexity of its design.

**Metroville Overview:**

* **Location:** Temperate climate zone, urban and suburban mix.
* **Topography:** Features include a river, several hills, and a dense city center.
* **Population:** 2.5 million, with a 2% annual growth rate.
* **Economic Activities:** Service industries, technology sectors, and manufacturing.
* **Current Rail System:** Two main lines, with issues of overcrowding and limited southern/eastern suburbs access.
* **Environmental Goals:** Improve air quality and increase green spaces.

**Project Goals:**

* **Expand Connectivity:** Extend the rail network to underserved areas, considering Metroville's topography and demographic growth.
* **Enhance Efficiency:** Address peak hour overcrowding and integrate new lines with existing systems.
* **Promote Sustainability:** Align with the city's environmental goals, reducing carbon emissions and increasing the use of renewable energy.

# Technical Feasibility KPIs

## KPI 1:

KPI Name: Track Installation Progress

Definition (What it measures): This KPI measures the progress of rail track installation, focusing on how much rail track is installed over a specific period. This is crucial in areas with complex geography (terrains), such as the hills and river crossings.

Measurement Method (How data will be gathered and calculated): Data will be collected from construction reports, satellite mapping tools, site inspections, and project management tools. The total length of installed track will be recorded monthly and compared against planned milestones, considering complex geographic areas hills and river crossings.

* If using Python, track progress using data stored in CSV files or databases. Use Pandas to calculate the total length of installed track and compare it to the planned installation progress.
* If using SQL, set up a database to log construction milestones and progress percentages, which can be queried periodically to assess the project's progress.

Rationale (Why this KPI is important): Given Metroville’s topography of the hills and river crossings, monitoring track installation progress is crucial for identifying potential delays due to construction difficulties. It ensures that the project timeline stays on track, with the necessary adjustments made for these geographical obstacles.

## KPI 2:

KPI Name: Electrification Completion Rate

Definition (What it measures): This KPI tracks the progress of rail electrification, focusing on the installation of electrical systems to power trains, which is necessary in areas or terrain where electrification is quite difficult like in hilly areas and river crossings.

Measurement Method (How data will be gathered and calculated): Data will be collected from engineering teams and installation reports. The completion percentage of electrification across various segments will be measured periodically either weekly, or monthly, focusing on areas/terrain that are difficult to implement the rail electrification.

* This can be made through Python to track progress using data stored in CSV files, regular databases, using Pandas, using Excel/Sheets, or SQL databases.

Rationale (Why this KPI is important): Metroville’s environmental goals include increasing the use of renewable energy, and electrification must be completed. By monitoring electrification progress, including the city’s difficult area/terrain, ensures that the project contributes to sustainability goals and maintains efficiency.

# Environmental Sustainability KPIs

## KPI 1:

KPI Name: Carbon Emissions Reduction

Definition (What it measures): This KPI tracks the reduction in carbon emissions resulting from the transition to an expanded rail network using electric trains, which is one of the air quality goals that Motorville needs to improve.

Measurement Method (How data will be gathered and calculated): Emissions data will be collected from energy usage reports and the rail system’s carbon audit. Carbon reduction will be estimated based on energy consumption reduction due to the shift to electrification and increased renewable energy use in the system.

* If using Python (Pandas), it can track and calculate energy consumption across time, comparing pre- and post-electrification emissions.
* If using SQL, it can be used to store and retrieve energy consumption data, with periodic reporting generated through SQL queries.

Rationale (Why this KPI is important): Metroville has a strong environmental focus, aiming to improve air quality. This KPI ensures the rail expansion project is contributing to carbon reduction, meeting environmental goals, and improving air quality, which is essential to the city’s long-term sustainability.

## KPI 2:

KPI Name: Green Space Enhancement

Definition (What it measures): This KPI tracks the increase in green spaces within Metroville, focusing on any landscaping or public green areas that are developed along the new rail lines and considering areas that were previously underserved by parks.

Measurement Method (How data will be gathered and calculated): The area of land transformed into green spaces such as the parks or tree planting along rail corridors, will be recorded. Additional measurements include surveys, urban planning maps, and land-use data will be used to track and calculate the enhancement of green spaces.

* If using Python (Pandas), it can track and calculate energy consumption across time, comparing pre- and post-electrification emissions.
* If using SQL, it can be used to store and retrieve energy consumption data, with periodic reporting generated through SQL queries.

Rationale (Why this KPI is important): Metroville’s environmental goals include increasing green spaces, which also help with air quality and residents’ well-being. This KPI ensures that the rail expansion contributes to improving the city's landscape, promoting sustainability and enhancing public health.

# Community Acceptance KPIs

## KPI 1:

KPI Name: Public Engagement & Customer Satisfaction

Definition (What it measures): This KPI tracks the level of public engagement and customer satisfaction with the Metroville’s rail expansion, focusing on how well the project addresses the needs of the diverse communities across the urban and suburban areas, particularly those in underserved southern and eastern suburbs. It should also create a community where the customer will be apart of the goals to keep them engaged and active.

Measurement Method (How data will be gathered and calculated): All these data will be collected through public surveys, town hall meetings, and online platforms where residents can submit feedback. The feedback offers metrics such as engagement rates, satisfaction levels, and qualitative feedback that will be analyzed to gauge public sentiment. There could be also usage of third parties with AI and other privacy concerns to make sure these surveys can help bring better acceptance feedback.

* If using Python (Pandas), it can be used for more advanced tracking, where the data can be processed to perform sentiment analysis on open-ended responses or calculating engagement metrics like response rates and satisfaction levels.
* If using SQL, it can be used to store feedback responses in a database, with queries run to analyze trends in public sentiment.

Rationale (Why this KPI is important): With Metroville’s diverse population and the goal of improving accessibility for underserved communities, tracking public engagement ensures that the project aligns with residents’ needs, fosters support, and addresses potential concerns early. Third part usages and the AI can enhance digital features such as discounts, events, and other engagement for the residents to feel more connected to the community. Implementing Privacy polices and concerns would reassure residents of how Metroville handles user data and personal information.

## KPI 2:

KPI Name: Improved Access and Service Quality

Definition (What it measures): This KPI tracks the improvement in transportation accessibility for residents in underserved areas such as the southern and eastern suburbs, focusing on how the expanded rail network improves commute times, reliability, and overall service quality.

Measurement Method (How data will be gathered and calculated): Ridership statistics and surveys will measure commuter satisfaction in newly served areas. Key metrics include changes in commute times, the number of new passengers from underserved areas, and the reduction in overcrowding during peak hours.

* This can be made through Python to track progress using data stored in CSV files, regular databases, using Pandas, using Excel/Sheets, or SQL databases.

Rationale (Why this KPI is important): A key goal of the rail expansion is to increase connectivity to underserved areas. By tracking service improvements and increased access to public transportation, this KPI ensures that the project is effectively meeting the needs of Metroville’s growing population and providing equitable service across both urban and suburban zones.

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