Final Presentation

Transit and Mobility

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Key Factors for Successful PPP Project Implementation

Delivery Method

Structuring the Project for Success

Social impact

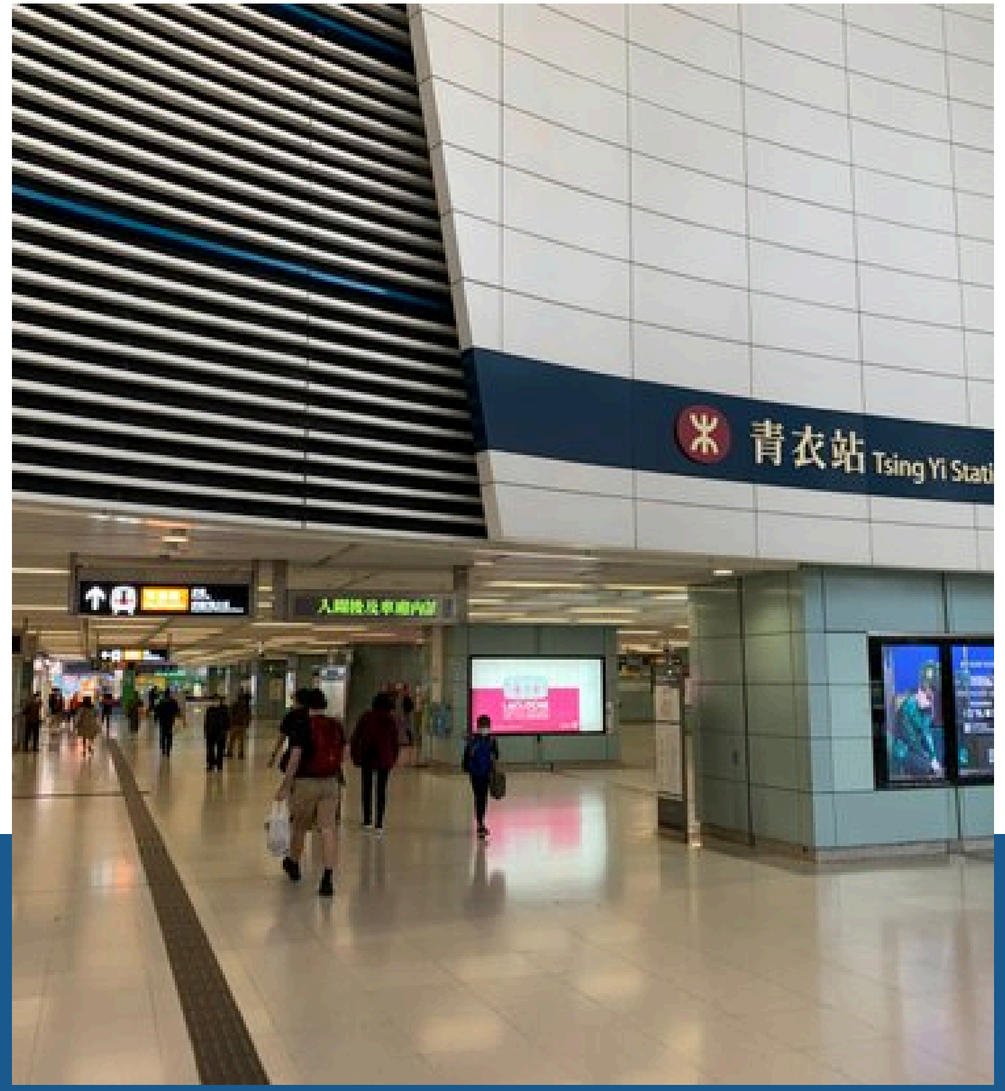
Enhancing Community and Environmental Well-being

Financial Viability

Ensuring Economic Feasibility and Value

Challenges

Identifying and Mitigating Risks



Research Proposal

With the ever-increasing challenge in expanding and operating a profitable metro in New York City, we want to look whether different P3 projects for construction and operations can work for NYC.

We will look at 3 different P3 mass transit around the world, look at how they started, what made them successful, and what we can learn to incorporate into NYC

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Case Studies

Transit and Mobility

We will look at 3 different P3 projects around the world, stating its success and challenges, and comparing it with New York City

Hong Kong

The Mass Transit Railway (MTR) Case Study of Tung Chung and Airport Express Line at Tsing Yi Station

Bogotá

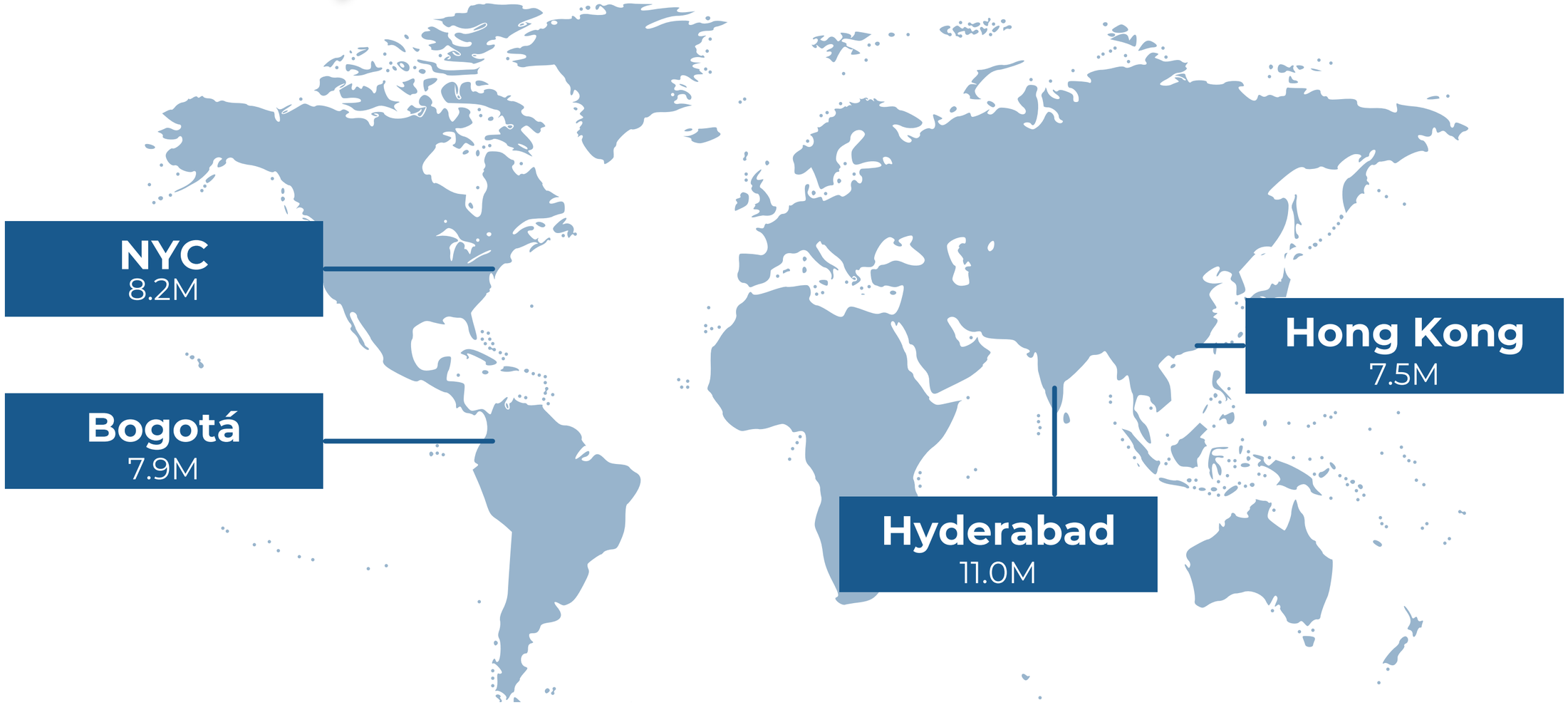
Bogotá´s first Metro Line 23km long with a total of 16 stations that serve a population of 2 million people

Hyderabad

One of the largest PPP in the world, in the Metro rail sector, with a total network of 72Km

Locations

Transit and Mobility



Case 1
Hong Kong

A “Rail + Property” P3 Model, a Joint Real-Estate and Transit Oriented Development

(Courtesy of @RailShooter on IG)

MTR - A Short Background

(Courtesy of MTR Hong Kong)

- 99 Heavy Rail Stations and 68 Light Rail Stations
- On average 4.6 million passengers per day (2023)
- 25% privately owned, with a profit driven mindset
- Not only develops rail operations but also real estate
- MTR does not receive a significant portion of profits through rail operations, but instead from property management and rental, as well as station commercial businesses
- MTR earned $770 Million US Dollars in Net Profit for Q1 and Q2 2024

What is the “Rail plus Property” Model?

- The rail operator works with private real estate companies to develop residential and commercial spaces when building a completely new or redeveloping a station, then renting or selling them for profit
- Requires MTR to bear long term risks in property market fluctuation and initial project financing for rail operations
- Possible due to:
  - Limited alternatives from dense and limited real estate in Hong Kong
  - Optimistic expectations of real estate market (property prices from 2014 are 15 times higher than 1980, although prices has stagnated due to political and social issues as well as COVID comparing 2024 and 2014)

How is “Rail plus Property” Done?

1. Government provides MTR “land development rights” and sells the land at a premium related to its market value

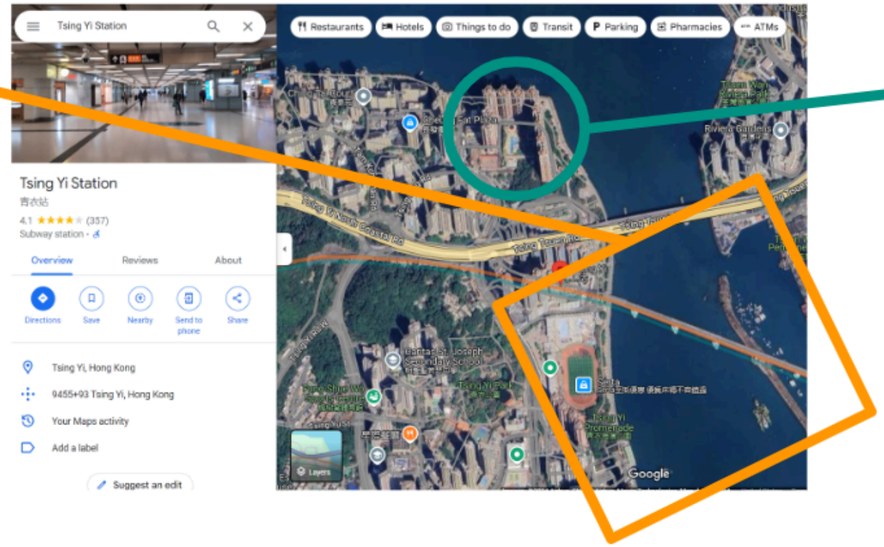
2. MTR builds the new rail line and station, partners with private developers through a competitive bid process

3. MTR either receives a share of profits that developers make, i.e. through percentage of total development profits or fixed lump sum, collects rent through commercial properties built on site and in station, as well as collecting dividends on stock ownsership

Note

Significant political will and assistance in acquiring land development rights made this possible!

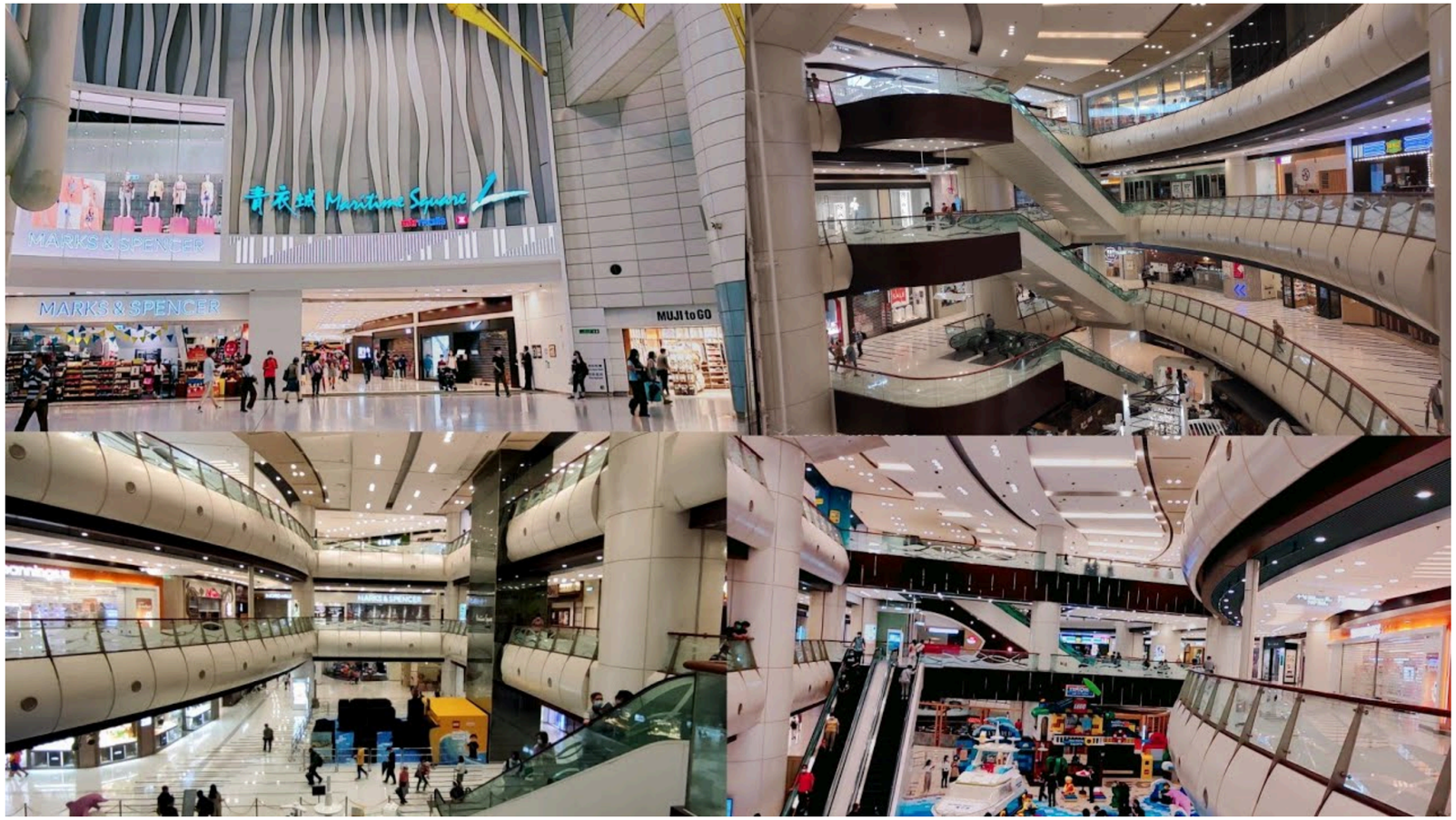
A Visible Example - Tsing Yi Station



- Red Dot is Tsing Yi Station

(Courtesy of Google Maps, 28HSE and HK Memory)

A Visible Example - Tsing Yi Station



(Courtesy of @melony085 on YouTube)

How Can We Replicate the R+P Model in NYC Metro Area?

1. Identify an **express station** with **adequate public land** and **political will** to allow special zoning laws for denser and taller buildings

2. Sell the land to MTA/ NJ Transit, conduct a competitive bid with the private sector to build residential buildings and commercial real estates

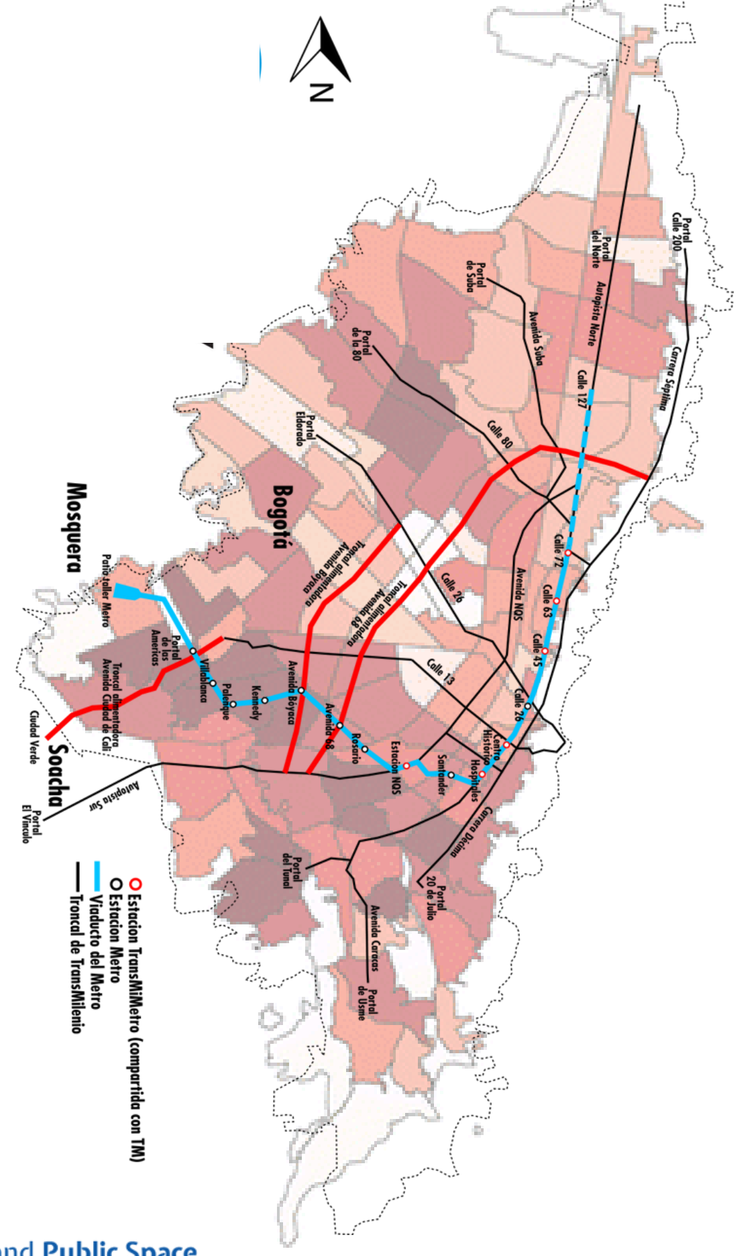
3. Work with local government and housing authority to build low income/ affordable housing **to overcome political risks**

Presented By : Camilo Ferreira

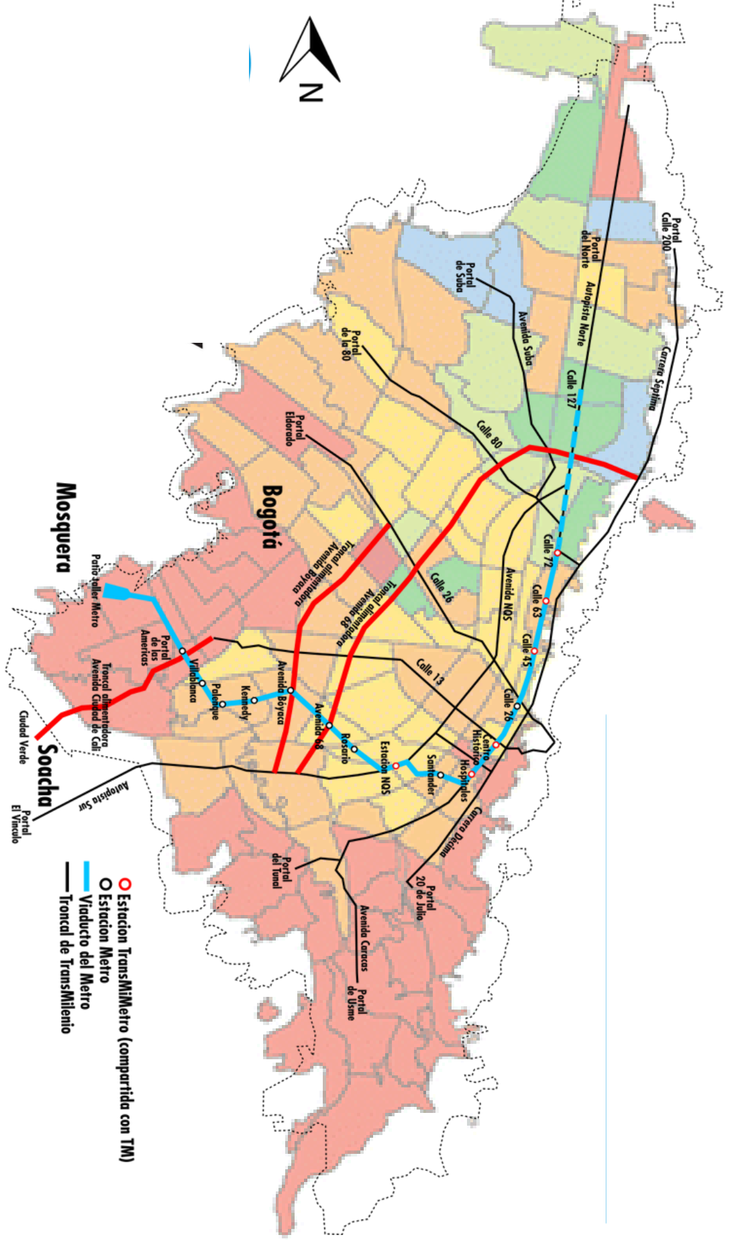
Case Study 2 Bogotá

- 16 stations **24km** (14mi)
- Trains run at a frequency of every 90 seconds.
- **1 million** passengers per day.
- maximum speed of 80 km/h, with an average operational speed of 43 km/h.
- **US$4 billion** Design Built Operate Mantain Transfer Delivery method

Courtesy of Alcaldia Metro de Bogota



< 1000
1000 - 2500
2500 –5000
5000 – 10000
10000 – 15000
15000 – 20000
20000 – 30000
> 30000



Low (1-2)
Low and medium
Medium (3-4)
Medium and high
High (5-6)
Mixed

COLUMBIA | CBIPS
Center for Buildings, Infrastructure and Public Space

Population density (inhabitants/sq. km)

Socioeconomic strata (prevailing group)

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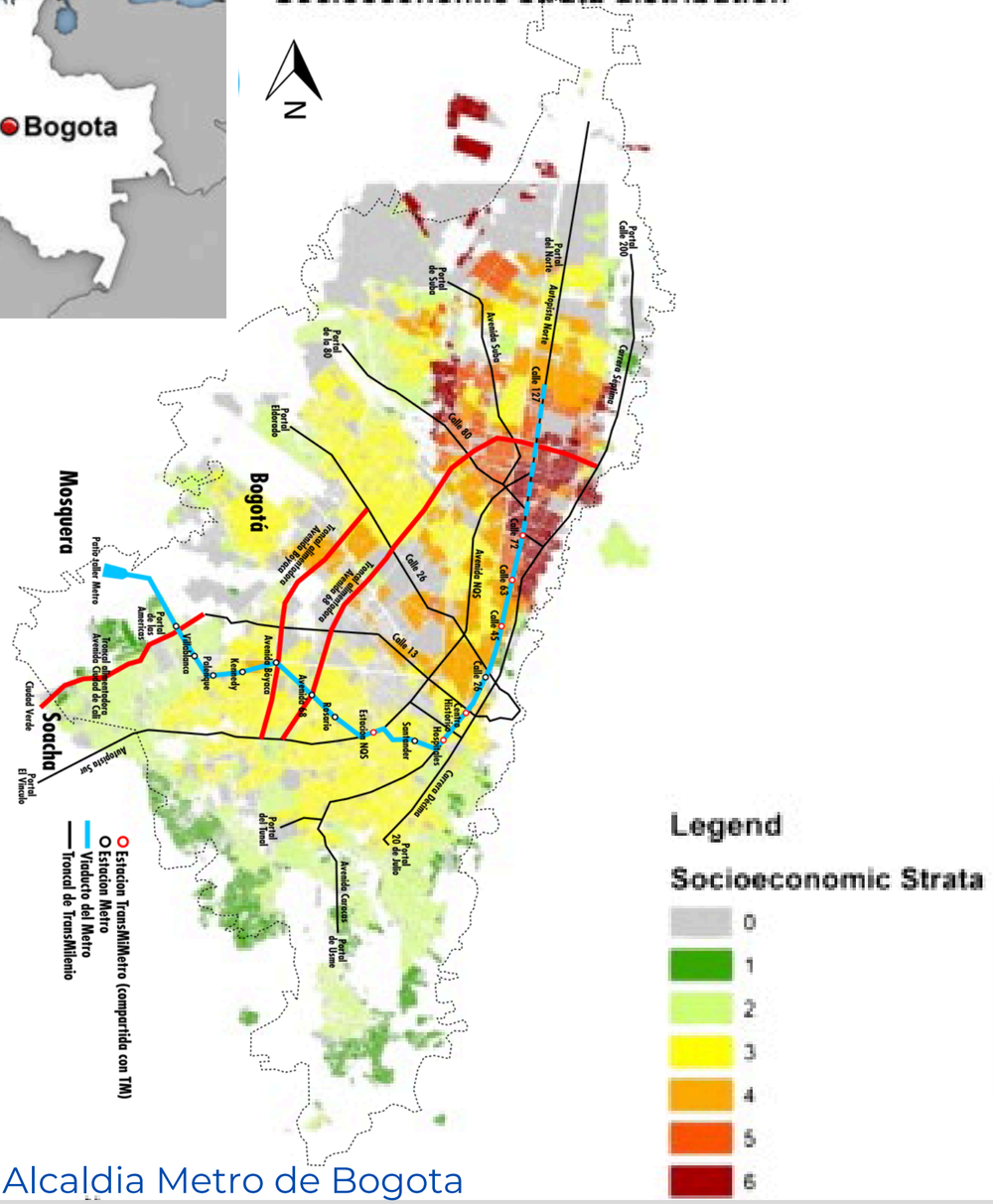
Socioeconomic strata distribution

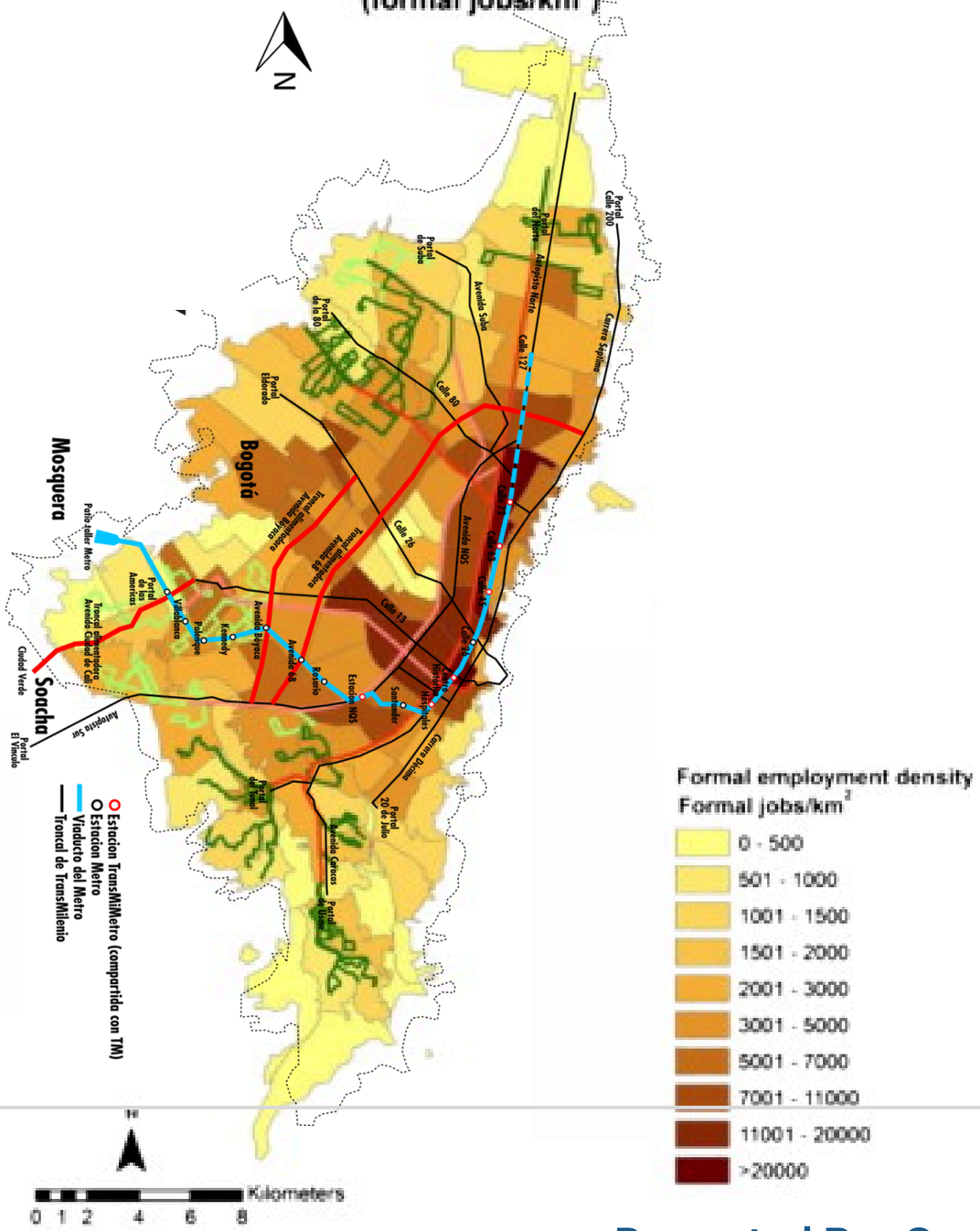


Legend

Socioeconomic Strata

- 0
- 1
- 2
- 3
- 4
- 5
- 6

Formal employment density 2005 (formal jobs/km²)



Formal employment density

Formal jobs/km²

- 0 - 500
- 501 - 1000
- 1001 - 1500
- 1501 - 2000
- 2001 - 3000
- 3001 - 5000
- 5001 - 7000
- 7001 - 11000
- 11001 - 20000
- >20000

From Alcaldia Metro de Bogota

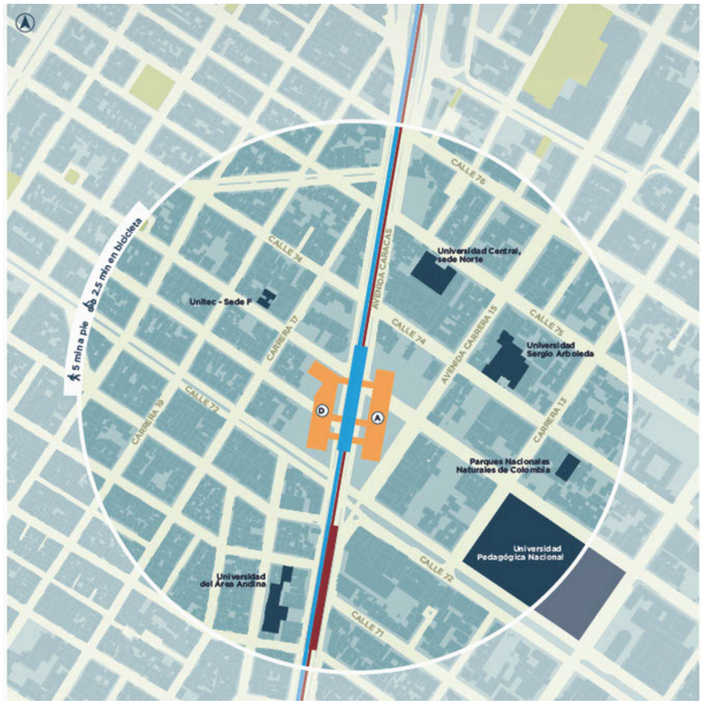
Presented By : Camilo Ferreira

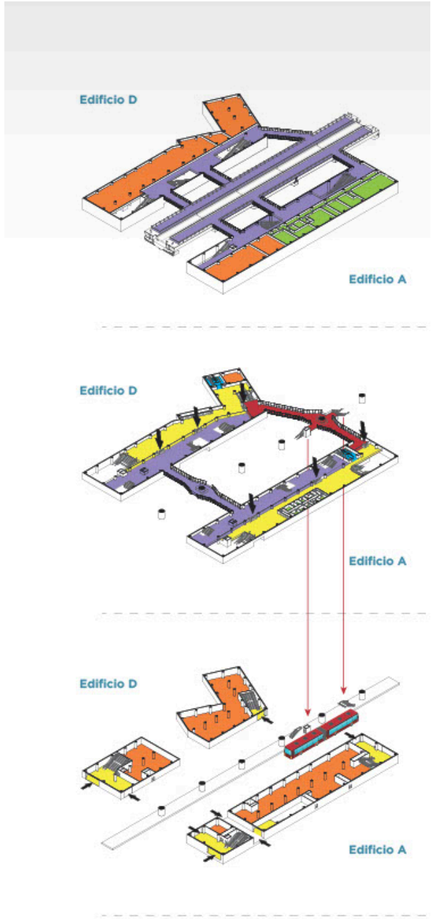
Challenges

- Integration with other systems
- Today Bogota relies on the BRT Transportation System with 2.4 million passengers a day
- Contractual relation with stakeholders

Bogotá Takeaways

Taken from Metro de Bogota





- Optimized station layout to enhance passenger flow and urban accessibility.
- Integration of commercial spaces to improve user experience and generate revenue.
- Non-fare revenue projected to increase by 15-20%.
- Stations designed as urban hubs to support local businesses and connect transport networks.
- Focus on sustainability through walkability and mixed-use development.

Relevance with NYC

1. **Integrated systems. BRT and subway**

2. Developing partnerships with private companies to transform urban spaces surrounding transit stations can create significant financial and social benefits for public entities.

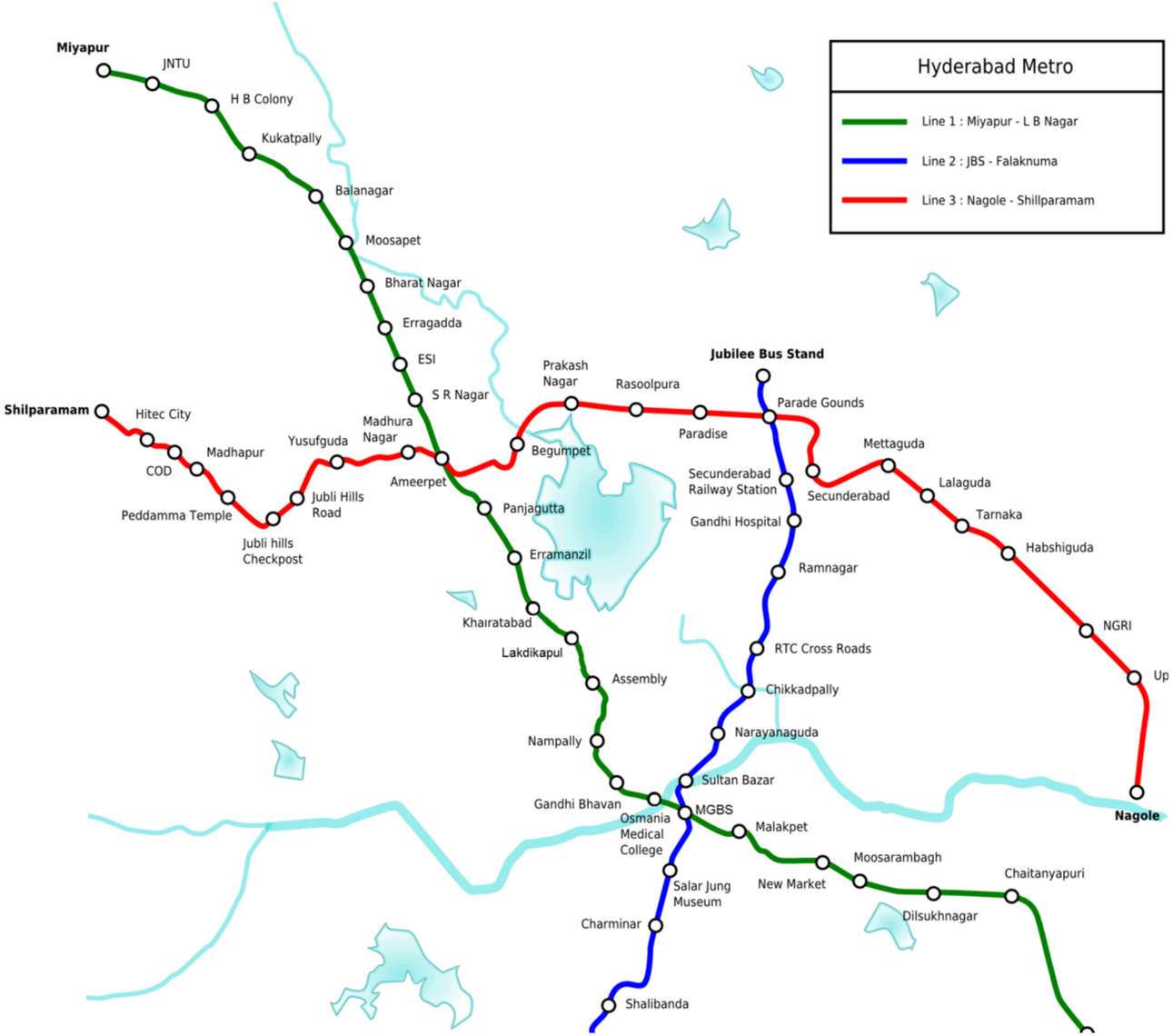
3. Decentralizing job hubs within the city

Case Study 3
Hyderabad

HYDERABAD METRO RAIL

SOURCE: ET GOVERNEMENT, 2023

- **Route Coverage** : Covers 69.2 km across three corridors, making its India's second-largest metro network after Delhi.
- Partnership between **L&T Metro Rail Hyderabad Limited (L&TMRHL)** and **the Government of Telangana.**
- **Hyderabad Metro is the world's largest elevated Metro Rail system based on Design Build Finance Operate Transfer basis**
- **The lines are arranged in a secant model**
- **Cost:** Approx. **$2.3billion**.



HYDERABAD METRO NETWORK MAP

SOURCE: WIKIPEDIA, 2010

Unlike a traditional grid system where lines mostly cross at right angles, a secant model features lines that intersect at various angles, allowing for better coverage of a city's geography

Hyderabad Metro being a prominent example of this design where multiple lines intersect at oblique angles, maximizing accessibility and minimizing travel time between different areas.

Timeline

TIMELINE OF THE PROJECT
SOURCE: CREATED BY YUGNAHDAR, 2024

METRO STATION UNDER CONSTRUCTION
SOURCE: L&T METRO RAIL , 2014

KHAIRATHABAD METRO STATION
SOURCE: WIKIPEDIA , 2021

Hyderabad Metro Rail Innovative Project Delivery

1. **Public-Private Partnership (PPP) Model:**

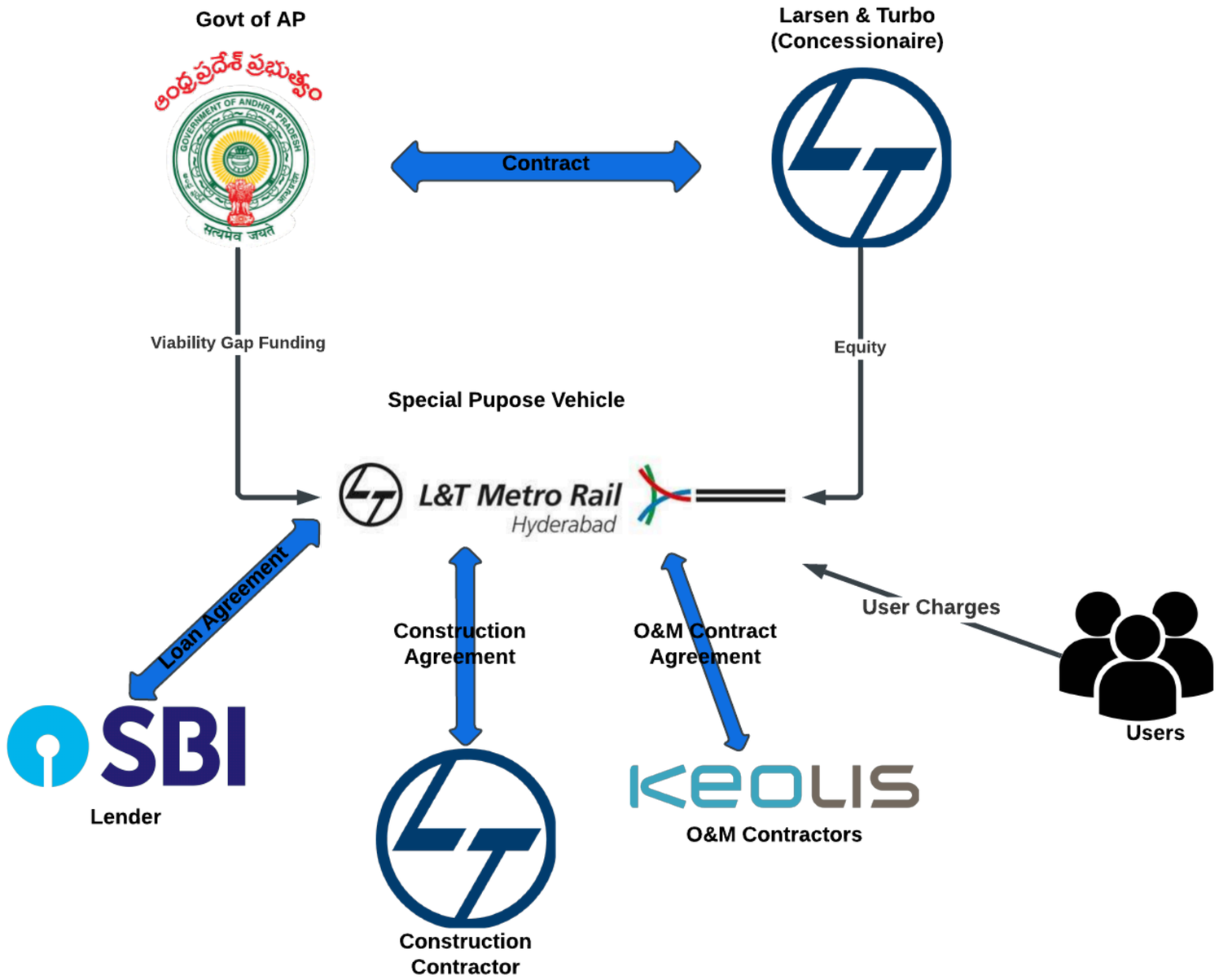
- Design Build Finance Operate Transfer (DBFOT).
- Concession agreement for 30 years, extendable by 25 years.
- The private sector (Larsen & Toubro) is given the right to develop land for revenue generation (Transit Oriented Development).

2. **Viability Gap Funding (VGF):**

- National and state governments provided 10% of the project cost as a capital grant.
- Equity by the Government of Andhra Pradesh and private stakeholders.

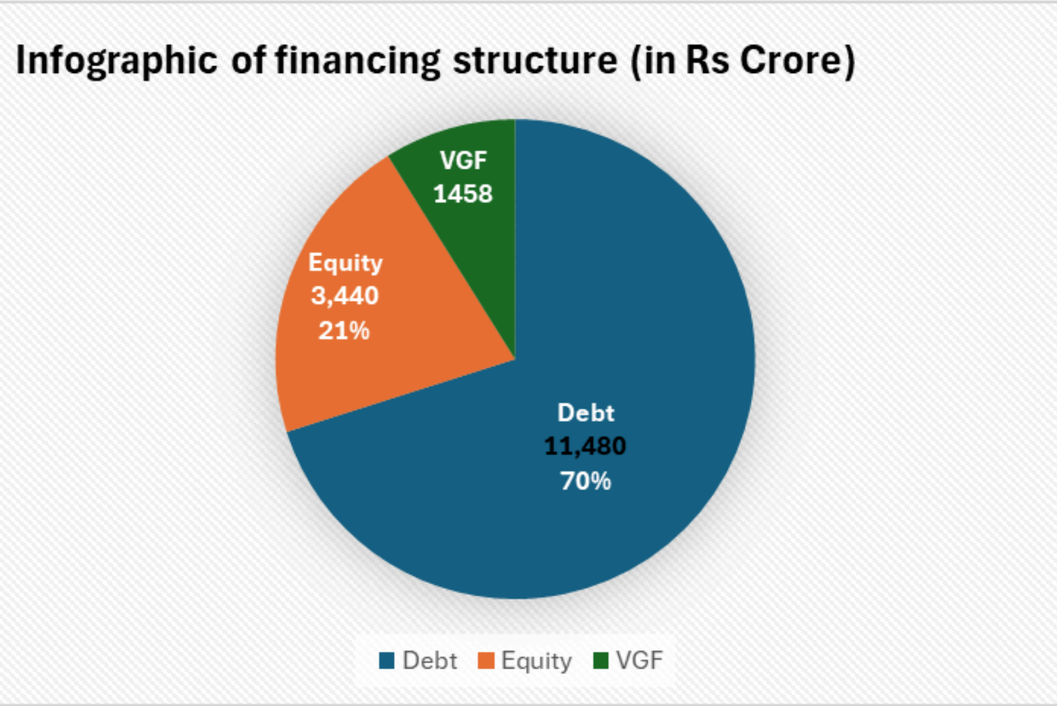
3. **Performance Standards:**

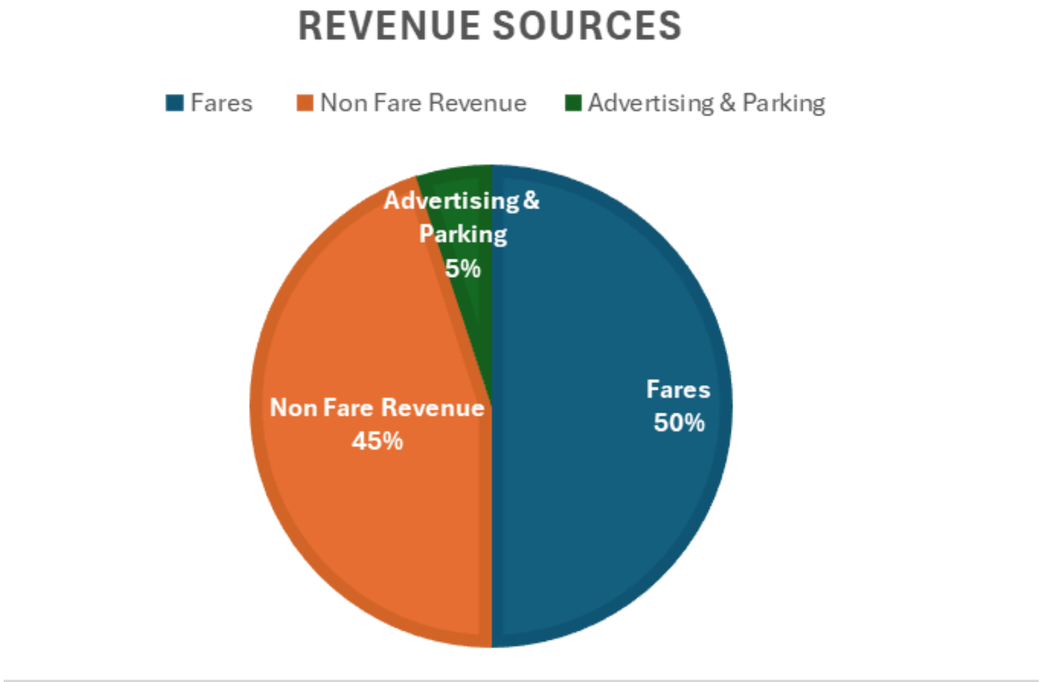
- Output-based specifications allowed private innovation.
- Mandatory compliance with the Manual of Specifications and Standards (MSS).



ORGANIZATIONAL CHART OF STAKEHOLDERS IN THE HYDERABAD METRO RAIL PPP MODEL
SOURCE: CREATED BY YUGNAHDAR, 2024

Sustainable Financing and Revenue Generation





Challenges Overcame:

- Avoided soft loans to encourage wider participation.
- INR3000 crore cost overrun due to land acquisition delays.

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Hyderabad Urban Landscape Transfromation

1. **Improved Mobility:**
- Daily ridership grew to 475,000 by 2020.
- Reduced road congestion and pollution.

2. **Inclusivity:**
- Accessible design for elderly, disabled, women, and economically disadvantaged.
- Public engagement through outreach programs (e.g., poems, songs).

3. **Cultural and Community Sensitivity:**
- Managed 20 religious structures without conflict.
- Altered project alignments to respect community concerns.

4. **Urban Development:**
- Transit-oriented developments around stations.
- Aesthetic and energy-efficient depot and station designs.

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Challenges with Current PPP Models

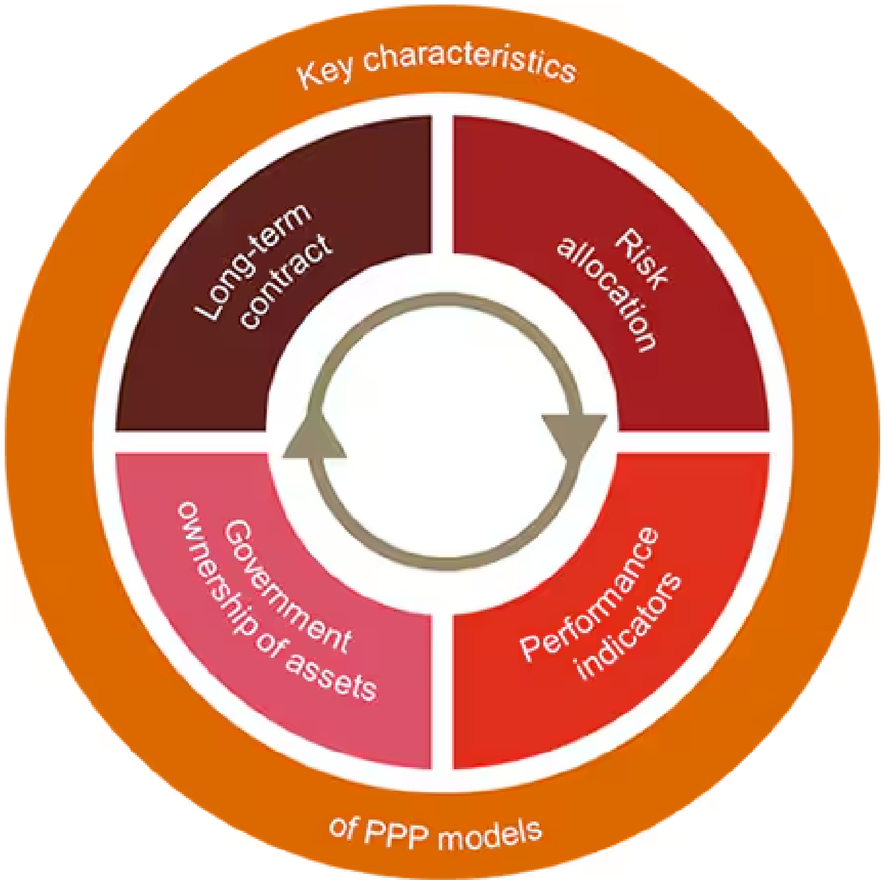
- **Distrust:** Historical issues in accountability lead to a lack of confidence between partners.
- **Misaligned Objectives:** Public goals like sustainability may conflict with private-sector priorities like profitability.
- **Focus on Lowest Bids:** Prioritizing cost over value creates projects with higher risks of failure or inefficiency.
- **Risk Mismanagement:** Public entities often bear the brunt of risks due to incomplete agreements.

Framework for Smarter PPPs

- Shift from a transactional mindset to one of collaboration and mutual benefit.

Components:

1. Mutual Value Creation: Both sectors must see value that extends beyond monetary returns, focusing on societal impact.
2. Balanced Risk Allocation: Risks should be shared based on which entity is better positioned to manage them effectively.
3. Performance-Based Models: Payments should be tied to the achievement of measurable outcomes (e.g., infrastructure quality, delivery timelines).



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Recommendations for the Future

Build Trust:

- Engage in open dialogue and clear frameworks to reduce skepticism.
- Promote co-investment to ensure both parties are equally committed.

Focus on Lifecycle Value:

- Move beyond short-term cost savings to evaluate the full lifecycle costs of infrastructure projects

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Use Data-Driven Approaches:

- Leverage technology and analytics to monitor progress and inform decisions.

Implement Adaptive Contracts:

- Use flexible agreements that can evolve with project changes or external circumstances.

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THANK YOU!