

# **THE INTEGRATION OF HIGH-CAPACITY TRANSPORT MODES INTO LOCAL DEVELOPMENT IN THE AGGLOMERATION OF ABIDJAN: A CASE STUDY OF BUS RAPID TRANSIT (BRT) AND THE METRO.**

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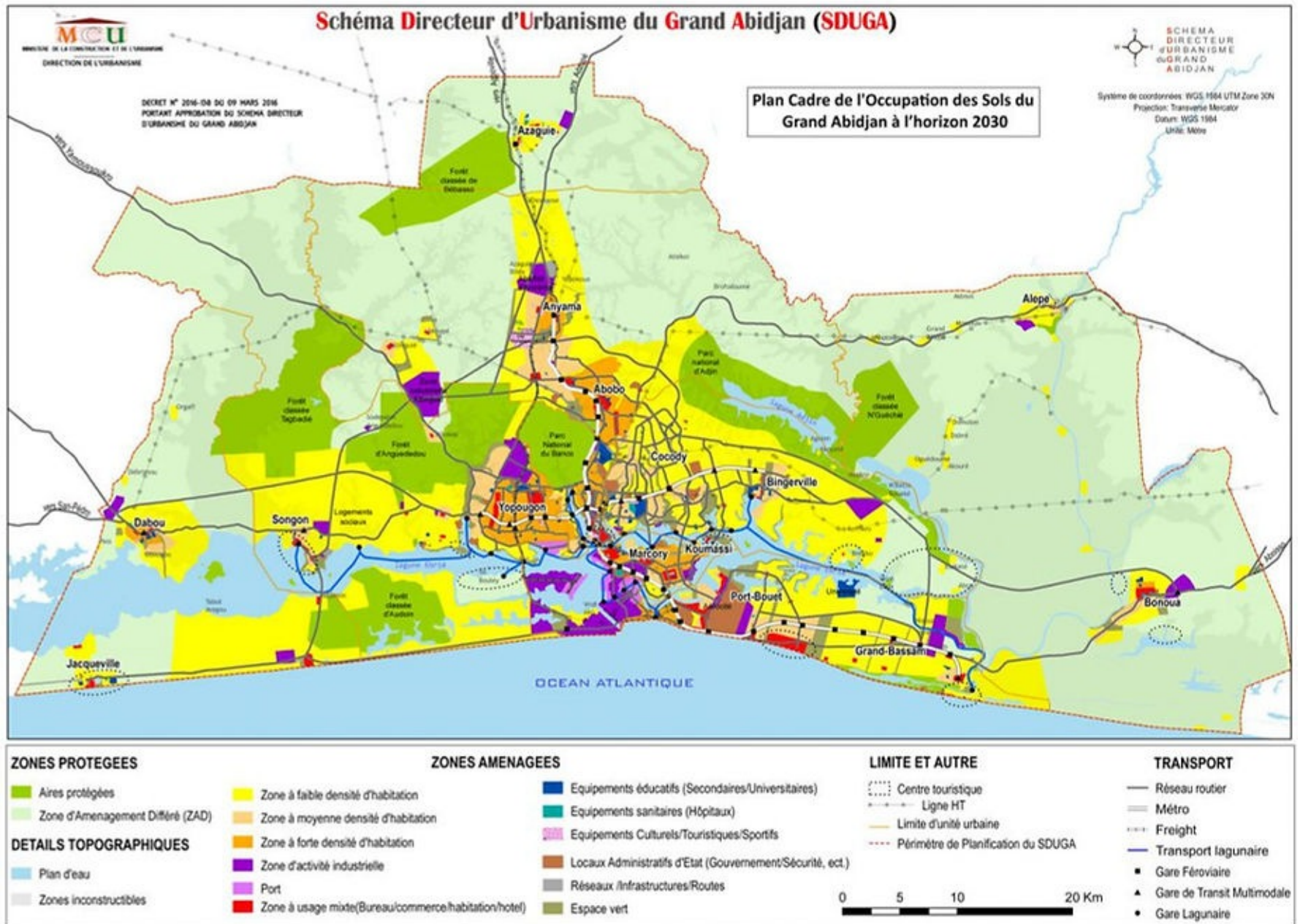


# SUMMA

- The study aims to assess the impact of integrating high-capacity transport systems (BRT and Metro) into Greater Abidjan's local development.
- Key challenges include poor service quality, congestion, and unreliable operations in current transport systems.
- BRT and Metro are expected to improve travel time, reduce congestion, and enhance economic activities by connecting key areas.
- Integration of these systems is crucial for sustainable urban growth and improved local development.



# The Greater Abidjan Urban Master Plan



# PLAN

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# INTRODUCTION



## CONTEXT

- Rapid urbanization and population growth in Abidjan intensify the need for efficient public transport.

Population of the metropolitan area of Abidjan : **5,867,000 people** as of 2024. Reflecting an annual growth rate of approximately **3.18% compared to 2023**

(Source :

<https://worldpopulationreview.com/cities/ivory-coast/Abidjan>)

- Current transport options (SOTRA, Gbaka, taxis) are overwhelmed, leading to unreliable and unsafe conditions.
- High-capacity systems like BRT and Metro are needed to support sustainable urban growth.





# SOTRA – MINI-BUS GBAKA - TAXIS

In the urban agglomeration of Abidjan, a variety of transportation options are available, including SOTRA, minibuses known as GBAKA, and taxis.



## JUSTIFICATION AND UNDERSTANDING OF THE SUBJECT

- BRT and Metro are seen as solutions to Abidjan's mobility challenges.
- These systems reduce travel time, minimize congestion, and encourage a shift from private to public transport.
- The study addresses gaps in understanding their specific impact on local development in African cities.





## PROBLEM STATEMENT

- Abidjan faces severe transport challenges, including congestion, poor service quality, and inadequate infrastructure.
- The integration of BRT and Metro offers a transformative solution to these urban mobility issues.



# PROBLEM STATEMENT



# RESEARCH OBJECTIVES



# RESEARCH OBJECTIVES

## General Objective:

- Demonstrate how BRT and Metro integration can facilitate local development in Abidjan.

## Specific Objectives:

- Assess the current state of public transport and infrastructure. Identify strategic mobility challenges that integration can address.
- Analyze the socioeconomic impacts of high-capacity transport.



# HYPOTHESES

## General Hypothesis:

The integration of high-capacity transport is expected to facilitate local development by enhancing urban mobility and economic productivity.

## Specific Hypotheses:

- The current level of transportation is inadequate to meet the demands of rapid urban expansion. The implementation of effective governance strategies for BRT and metro systems is a prerequisite for the realization of meaningful mobility improvements.
- The achievement of success is contingent upon the quality of the service provided and the extent of public acceptance.





## RESEARCH QUESTION

### **Main Question:**

- How can integrating BRT and Metro impact Greater Abidjan's local development?

### **Sub-questions:**

- What is the current state of transport infrastructure and services?
- What strategic mobility issues are associated with integration?
- How do BRT and Metro affect economic and social dynamics?



# LITERATURE REVIEW



## INTEGRATION MEASURES IN PUBLIC TRANSPORT

- Integration involves creating a seamless public transport system with easy transfers and unified ticketing.

### **Key measures include:**

- Integrated ticketing systems (e.g., smart cards).
- Physical integration of stations and stops.  
Operational coordination of schedules and routes.



# EXISTING STUDIES ON HIGH-CAPACITY TRANSPORT

## Examples:

- Curitiba (Brazil): Reduced travel time and controlled urban sprawl.
- Bogota (Colombia): TransMilenio BRT transformed urban transport.
- Paris (France): Integrated Metro systems managing dense urban populations.
- Insights: Success relies on robust planning, political will, and effective governance.



## DESIGN AND OPERATION OF BRT AND METRO

- **BRT:** Dedicated lanes, off-board fare collection, priority intersections, and frequent service.
- **Metro:** High speed, large capacity, efficient long-distance movement, integrated with other transport modes.





# METHODOLOGY



# RESEARCH DESIGN

- Mixed-methods approach combining quantitative and qualitative research.

## **Data Collection:**

- Surveys with public transport users.
- Interviews with transport officials and urban planners.
- Field observations of transport operations.



## DATA ANALYSIS

The following analytical approaches were utilised:

1. **A quantitative analysis** was conducted to identify trends in transport use and satisfaction through the application of statistical techniques.
2. **A qualitative analysis** was conducted through the thematic analysis of interviews, with the objective of understanding the perspectives of the stakeholders involved.



# RESULTS



# BRT - METRO

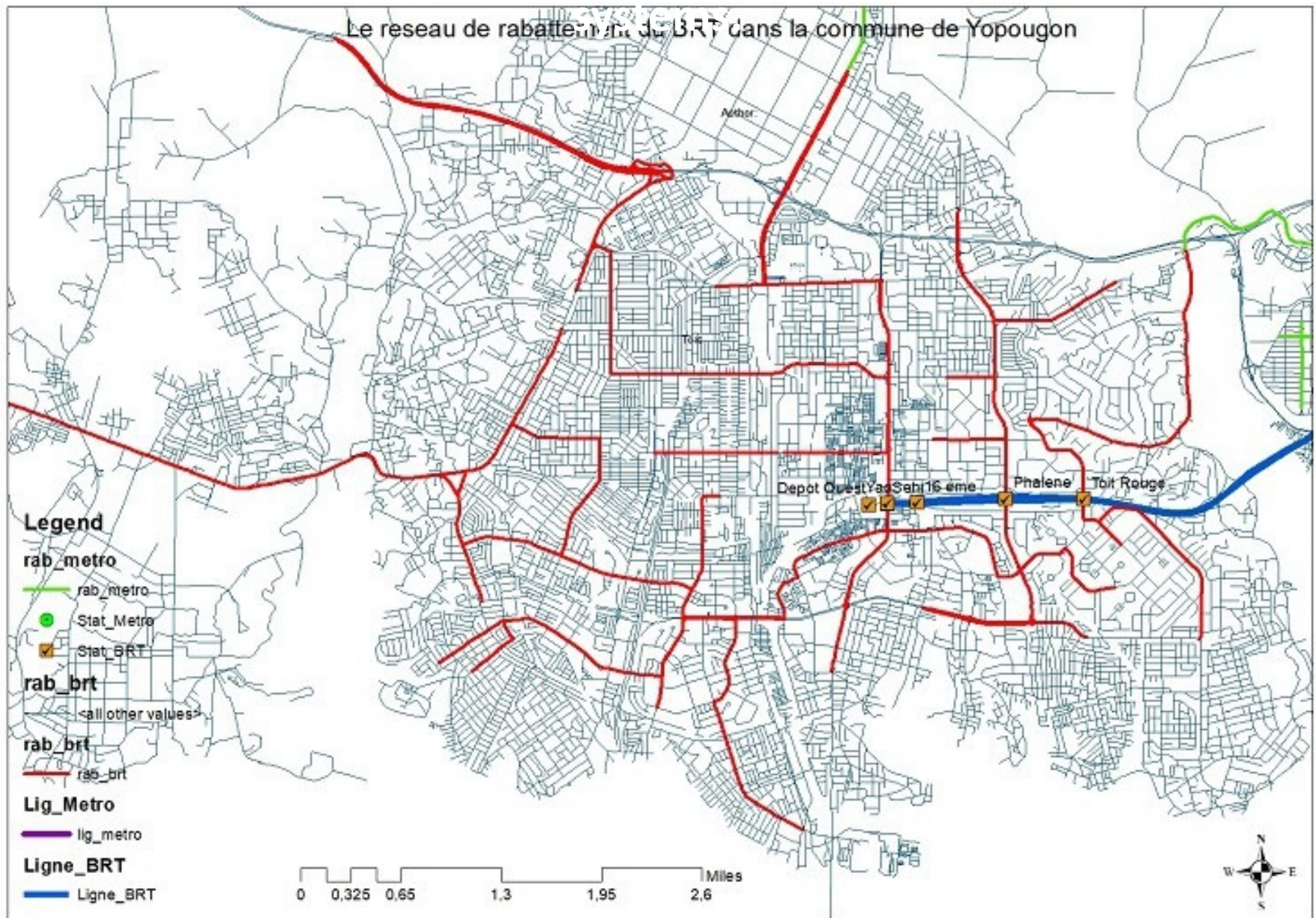




## The principal feeder lines for the METRO and BRT

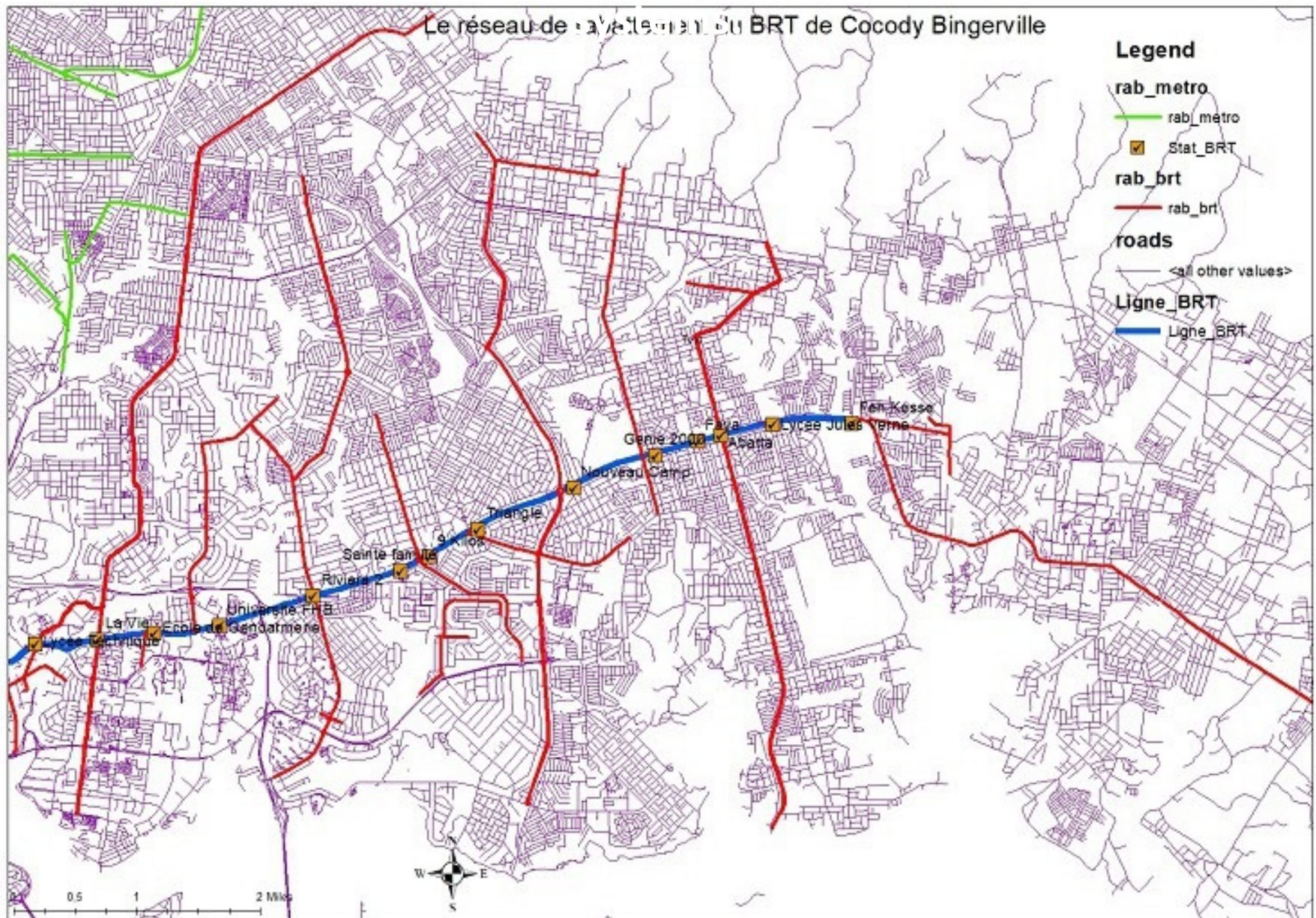


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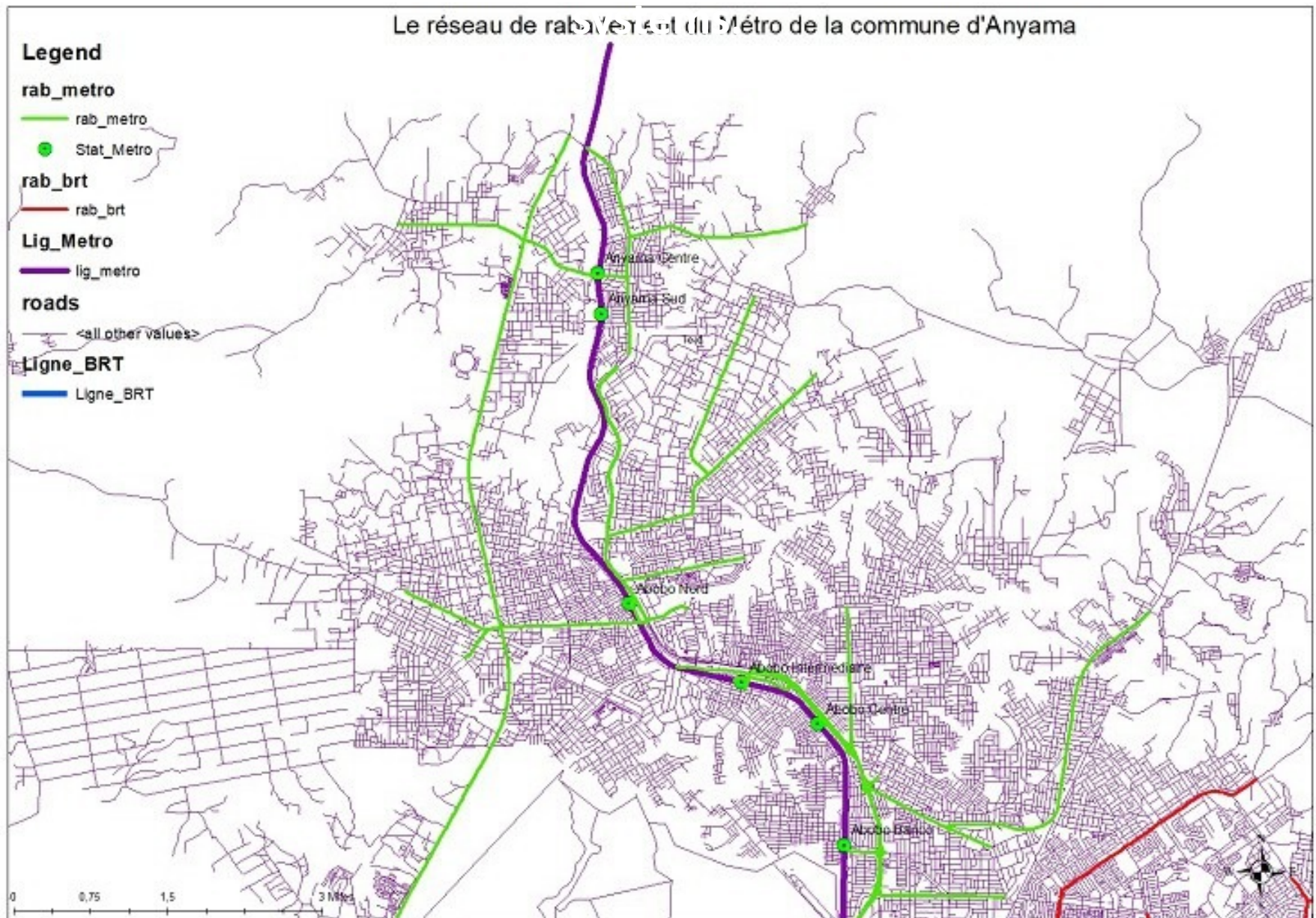


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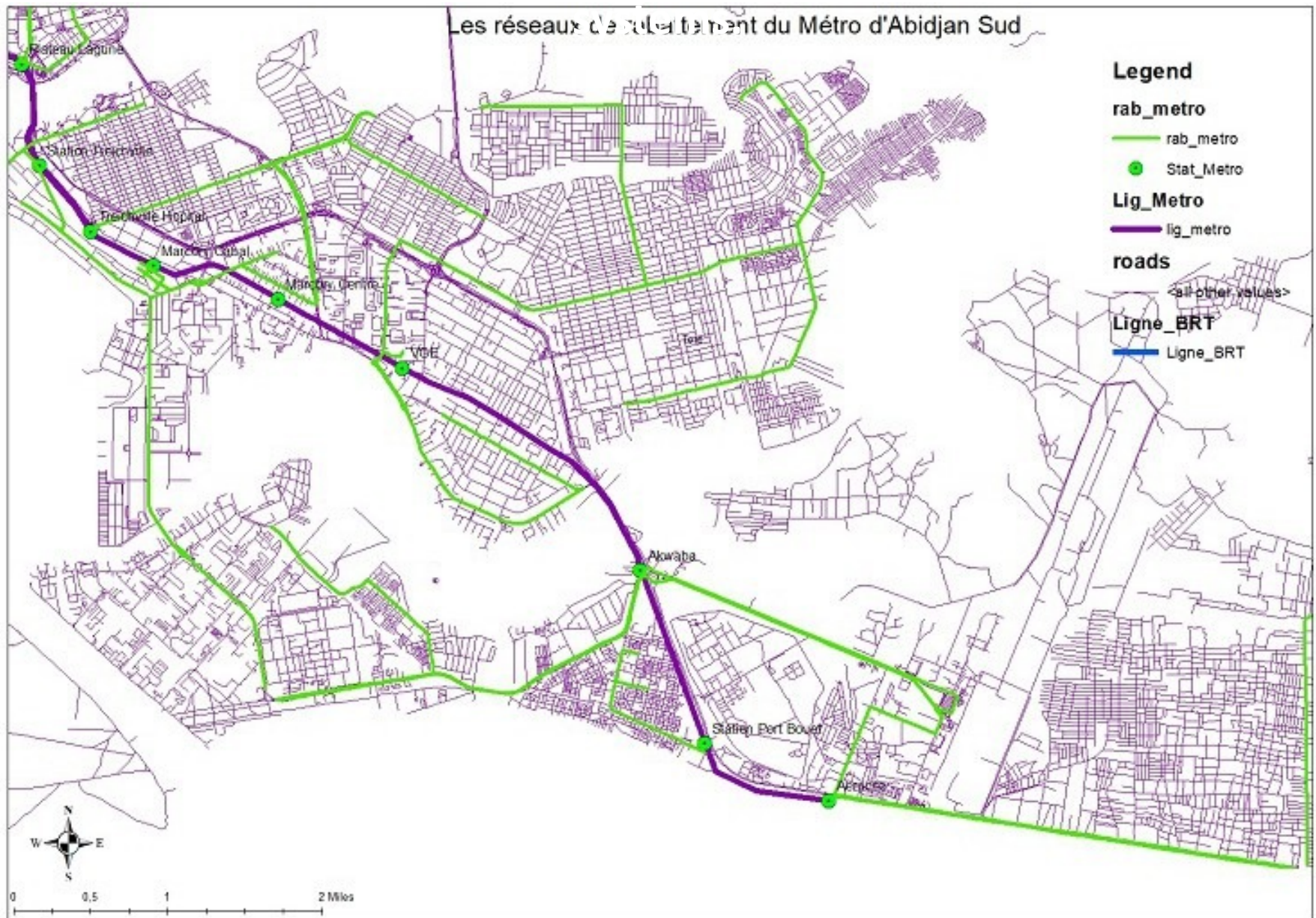








# The principal feeder lines for the METRO and BRT



## SOCIOECONOMIC CHARACTERISTICS OF USERS

- Majority of users are of working age, highlighting reliance on public transport.
- Significant portion earns below the national average, emphasizing the need for affordable transport.



## COMMUTER BEHAVIOR AND TRANSPORT PREFERENCES

- The primary motivations for commuting are work-related, educational, and the desire to access services.
- Peak travel times correspond with traditional work hours.
- Cost, travel time, and safety are the key considerations for users when selecting their mode of transport.





## PREFERENCES FOR BRT AND METRO

- The research findings indicate that users favour Bus Rapid Transit (BRT) and Metro for ***their reliability and speed***, in comparison to the current options available to them.
- The features that are perceived as being of value include ***the presence of dedicated lanes, a reduction in waiting times and an enhanced level of safety***.



## PERFORMANCE METRICS OF BRT

### Key Features:

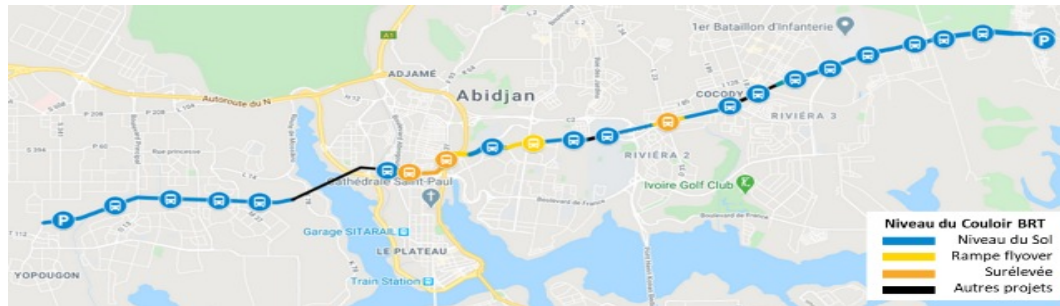
- Dedicated lanes: Ensures faster travel by avoiding regular traffic.
- High-frequency service: Buses every 2.5 minutes during peak hours.
- Corridor: 20 km route from Yopougon to Bingerville with 25 stations.

### Passenger Capacity:

- 340,000 passengers/day projected capacity.
- Ticketing:  
Modern electronic ticketing systems for ease and efficiency.



# BRT



Plus de **100 autobus articulés 100% électriques**, d'une capacité de 150 passagers par bus (environ 300 000 passagers par jour)



**21 stations** (au centre de la chaussée), **2 dépôts** (aux extrémités de la ligne – Yopougon et Bingerville) et **7 pôles d'échanges** avec les autres modes de transport y compris la ligne 1 du Métro



**20 km de voies réservées**, physiquement séparées du trafic normal



**Bus climatisés**



**Paiement préalable** de titre de voyage en station



**Standard : Gold** (fonction des capacités, vitesse, fiabilité et confort envisagés)

## PERFORMANCE METRICS OF METRO

### Route and Coverage:

- 37.4 km from Anyama to Aérocity.
- 20 stations connecting key districts: Abobo, Adjamé, Marcory.

### Capacity and Speed:

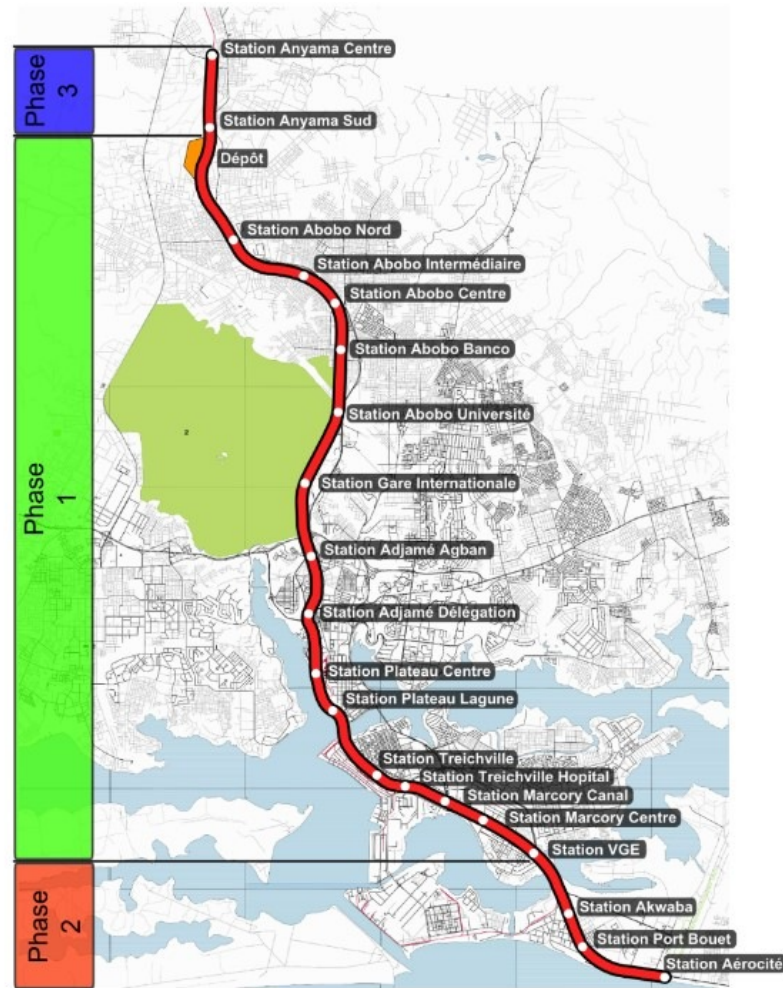
- 500,000 passengers/day.
- Travel speed of up to 80 km/h, reducing travel times significantly (e.g., Anyama to Aérocity in 45 minutes).

### Economic Impact:

- Encourages Transit-Oriented Development (TOD) and economic growth along the metro line.



# METRO



## KEY MOBILITY PATTERNS IN ABIDJAN

The key mobility patterns in Abidjan are characterised by :

- high traffic volumes along major corridors,
- with significant delays during peak hours due to congestion.

*In Abidjan, average road speeds drop to 10-15 km/h during peak hours in congested areas.*

*(Source : World Bank)*



## User Satisfaction with Existing vs Proposed Transport

- The current situation has resulted in a state of dissatisfaction among the public, largely due to delays, overcrowding and safety concerns.
- It is anticipated that the introduction of enhanced features will result in a favourable response to the BRT and Metro services.



## ECONOMIC BENEFITS OF HIGH-CAPACITY TRANSPORT

- The economic benefits of high-capacity transport include job creation. ***The project will create employment opportunities*** in a number of areas, including construction, operation and maintenance.
- The implementation of high-capacity transport solutions has the potential to ***reduce travel costs and congestion***.
- The regeneration of urban areas: The revitalisation of neighbourhoods and the subsequent increase in property values.





## ENVIRONMENTAL BENEFITS

- Significant reductions in greenhouse gas emissions.
- Improved air quality, enhancing public health.



## SOCIAL IMPACTS OF BRT AND METRO

The social impacts of BRT and metro systems can be observed in the enhanced ***accessibility to employment opportunities, educational facilities and healthcare services.***

Furthermore, the improved mobility options for individuals from all socio-economic backgrounds contribute to a ***reduction in socio-economic inequality.***



## CHALLENGES IN IMPLEMENTING BRT AND METRO

- **Funding:** High initial investment and need for sustainable financing.
- **Governance:** Coordination among multiple stakeholders.
- **Public Acceptance:** Ensuring buy-in through awareness and engagement.



# DISCUSSION



## IMPACT ON URBAN MOBILITY

- BRT and Metro reduce travel times significantly along major corridors.
- Improved reliability encourages shifts from private cars to public transport.



## ECONOMIC AND SOCIAL BENEFITS

- Better transport links facilitate business, increase productivity, and boost local economies.
- Improved connectivity integrates peripheral communities into the economic fabric.



## GOVERNANCE AND POLICY ISSUES

- Clear regulatory frameworks are needed for effective operation.
- Emphasizes public-private partnerships and innovative financing models.



# FUNDING

- Exploring alternative funding models like PPPs, subsidies, and user fees





# TECHNOLOGICAL INTEGRATION

- Opportunities for smart technology integration: real-time updates, electronic ticketing.



# PUBLIC ENGAGEMENT

- Involving communities in planning to foster acceptance and support.



# SUSTAINABILITY CONSIDERATIONS

- Aligning transport developments with environmental goals for sustainable urban growth.



# CONCLUSION



## SUMMARY OF KEY FINDINGS

- BRT and Metro offer significant potential to transform Abidjan's urban mobility landscape.
- High-capacity transport supports local development by improving accessibility and reducing congestion.



## IMPLICATIONS FOR ABIDJAN

- Integrated transport can alleviate challenges like traffic congestion and economic inefficiencies.
- Success requires coordinated efforts among government, private sector, and the public.



## RECOMMENDATIONS

- Develop clear policies for the regulation, funding, and expansion of BRT and Metro systems.
- Focus on maintaining high service standards, ensuring reliability, and keeping fares affordable.
- Further research on long-term impacts on urban dynamics and quality of life.

