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Allocative efficiency in times of scarcity: a multi-criteria prioritization of mobility projects in the Metropolitan Region of Rio de Janeiro under the Lens of public security and the Fiscal Recovery Regime

Eficiência alocativa em tempos de escassez: uma priorização multicritério de projetos de mobilidade na Região Metropolitana do Rio de Janeiro sob a ótica da segurança pública e do Regime de Recuperação Fiscal

Eficiencia alocativa en tiempos de escasez: una priorización multicriterio de proyectos de movilidad en la Región Metropolitana de Río de Janeiro bajo la óptica de la seguridad pública y del Régimen de Recuperación Fiscal

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Volume
14

Issue
1

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Submitted *28 Nov 2025*

Accepted *13 Jan 2026*

Published *26 Feb 2026*

Citation
PERES, W. R.; LEITÃO FILHO, J. C. S.; CUNHA FILHO, J. F. Allocative efficiency in times of scarcity: a multi-criteria prioritization of mobility projects in the Metropolitan Region of Rio de Janeiro under the Lens of public security and the Fiscal Recovery Regime. ***Coleção Estudos Cariocas,*** *v. 14, n. 1, 2026.*
DOI: 10.71256/19847203.14.1.204.2026.

The article was originally submitted in PORTUGUESE. Translations into other languages were reviewed and validated by the authors and the editorial team. Nevertheless, for the most accurate representation of the subject matter, readers are encouraged to consult the article in its original language.

Abstract

This article analyzes public transport investment priorities in the Rio de Janeiro Metropolitan Region under the constraints of the Fiscal Recovery Regime and the impacts of urban violence on system operations. A portfolio of 15 strategic projects (R$ 68.4 billion) is assessed using Multicriteria Decision Analysis through the Weighted Sum Model, incorporating Operational Security Costs as a key feasibility variable. Results indicate the predominance of urban rail rehabilitation and BRT/LRT expansion over new metro lines, highlighting that allocative efficiency depends on recovering existing assets integrated with public security policies.

Keywords: urban mobility, fiscal constraints, project prioritization, public security, multicriteria analysis, Rio de Janeiro

Resumo

Este artigo analisa as prioridades de investimento em transporte público na Região Metropolitana do Rio de Janeiro, diante das restrições do Regime de Recuperação Fiscal e dos impactos da violência urbana sobre a operação dos sistemas. Examina-se um portfólio de 15 projetos estruturantes (R$ 68,4 bilhões), utilizando Análise Multicritério de Apoio à Decisão pelo Weighted Sum Model, com a inclusão do Custo Operacional de Segurança como variável de viabilidade. Os resultados apontam a requalificação dos trens urbanos e a expansão de BRT/VLT como mais eficientes que novas linhas de metrô, ressaltando a necessidade de recuperação de ativos existentes integrados a políticas de segurança pública.

Palavras-chave: mobilidade urbana, restrições fiscais, priorização de projetos, segurança pública, análise multicritério, Rio de Janeiro

Resumen

Este artículo analiza las prioridades de inversión en el transporte público de la Región Metropolitana de Río de Janeiro, considerando las restricciones del Régimen de Recuperación Fiscal y los efectos de la violencia urbana en la operación de los sistemas. Se evalúa un portafolio de 15 proyectos estructurantes (R$ 68,4 mil millones) mediante Análisis Multicriterio de Apoyo a la Decisión con el Weighted Sum Model, incorporando el Costo Operativo de Seguridad como variable clave. Los resultados destacan la rehabilitación ferroviaria y la expansión de BRT/VLT frente a nuevas líneas de metro, enfatizando la integración con políticas de seguridad pública.

Palabras clave: movilidad urbana, restricciones fiscales, priorización de proyectos, seguridad pública, análisis multicriterio, Río de Janeiro

1 Introduction

The Rio de Janeiro Metropolitan Region (RMRJ) is a complex urban agglomeration composed of 22 municipalities, including the state capital, and home to approximately 12 million inhabitants. It is currently facing a decisive moment in its socioeconomic development trajectory. Urban mobility—historically recognized as the backbone of economic and social integration in any metropolis—has encountered difficulties in some systems, such as the railway network, characterized by a “silent collapse.”

Chronic congestion, the rapid deterioration of some mass transit services, high fares, and a public security crisis that has ceased to be episodic and has become structural directly affect system operations. Estimates by the National Confederation of Transport (CNT, 2024) indicate that congestion in major Brazilian metropolises generates annual losses on the order of R$98 billion, resulting from wasted fuel, lost productive hours, and environmental costs. In Rio de Janeiro, this impact is aggravated by a complex geography—compressed between the Tijuca Massif, Guanabara Bay, and the Atlantic Ocean—and by a history of administrative discontinuities.

For a proper understanding of the challenges involved, it is essential to clarify the institutional complexity governing mobility in the region. The management of transportation systems in the RMRJ is fragmented among different levels of government, creating additional barriers to integration. The State of Rio de Janeiro holds constitutional authority over high-capacity systems that cross municipal boundaries, such as the Metro (although its current network is restricted to the Municipality of Rio de Janeiro), the Urban Trains (SuperVia), and waterborne transport (Barcas), as well as the regulation of intermunicipal bus lines through the Department of Road Transport (DETRO-RJ) and the regulatory agency AGETRANSP for other modes. In addition, the management of local transport and land-use planning falls under municipal authority. In the capital, the Municipality of Rio de Janeiro administers the BRT system (via Mobi-Rio), the VLT, and the bus network. This administrative fragmentation poses challenges for integration, particularly in the fare system, as projects encounter “islands” of political and budgetary autonomy. Consequently, prioritization analysis must go beyond technical feasibility and incorporate an evaluation of the institutional robustness of each managing authority.

Metropolitan peripheries—notably the Baixada Fluminense, the eastern side of Guanabara Bay, and the North and West Zones of the capital—suffer disproportionately, with average home-to-work commuting times frequently exceeding two hours, constituting one of the worst mobility conditions in the Southern Hemisphere. In this context, the mobility team of the Instituto Rio Metrópole (IRM), supported by data analysis tools and traffic simulations, examined the updated BNDES Project Portfolio (2025). This portfolio, ambitious in its technical conception, proposes the implementation of 94 km of new metro lines and 107 km of VLT/BRT systems, requiring a total investment of R$68.4 billion, in addition to the rehabilitation of the urban rail system.

However, the feasibility of fully implementing this plan collides with the harsh fiscal reality of the State of Rio de Janeiro. The central objective of this article is to propose a rational prioritization rule for these investments. It advances the hypothesis that, under severe budgetary constraints imposed by the Fiscal Recovery Regime (RRF), the “best engineering solution” (often associated with heavy underground metro systems) is not always the “best economic and social solution.” The analysis seeks to identify which interventions offer the greatest return in terms of passengers transported and social equity per monetary unit invested (allocative efficiency), incorporating the cost of urban violence into the equation of financial feasibility.

2 Theoretical and contextual foundation

2.1 Austerity Urbanism and the Fiscal Recovery Regime

The concept of “austerity urbanism” (Peck, 2012) describes a scenario in which urban planning becomes entirely subordinated to the logic of debt management and expenditure cuts. The State of Rio de Janeiro has operated under the Fiscal Recovery Regime (RRF) since 2017, with extensions that prolong its effects until at least 2030. Adherence to this regime, regulated by Complementary Law 159/2017 and supervised by the National Treasury, imposes a strict spending cap and conditions the suspension of debt servicing on the implementation of structural reforms and the sale of assets.

For the correct interpretation of the restrictions imposed by the RRF in this study, it is essential to define the categories of public expenditure used: CAPEX (Capital Expenditure) and OPEX (Operational Expenditure). CAPEX refers to investments in the formation of long-term physical assets, such as the construction of tunnels, stations, viaducts, and the acquisition of rolling stock (rail vehicles and buses). Under the RRF, the State’s capacity to undertake CAPEX with treasury resources is practically null, depending instead on external credit operations or concessions. OPEX, in turn, encompasses the recurring costs required to maintain services in operation, including energy or fuel, personnel, maintenance, traffic control systems, and asset security. The analysis proposed in this article emphasizes that, in areas of conflict, security-related OPEX can render a project unviable even when its CAPEX initially appears acceptable, transforming “operational cost” into a continuous fiscal liability for the State.

According to the FIRJAN Fiscal Management Index (IFGF, 2025), the financial health of many municipalities in the state of Rio de Janeiro is also alarming: 36% are in a difficult or critical fiscal situation. The consolidated state public debt surpassed R$200 billion in October 2025. This liability drastically limits the State Treasury’s ability to provide non-repayable funding (resources from the fiscal budget) for long-term infrastructure projects with slow maturation, and even to contract loans that generate future debt, such as those required for expanding metro networks.

In this context, any mobility project that relies heavily on continuous operational subsidies or massive state investment for its construction begins with a high risk of discontinuity. Even if a concession agenda is considered, the scale of the resources required to implement some projects in the portfolio will still require a portion of counterpart funding from the State Treasury. Prioritization, therefore, is not merely a technical tool but a necessity for the survival of public planning.

2.2 The Crisis of Structuring Transport Modes: A History of Degradation

The diagnosis presented in the Urban Transport Master Plan (PDTU, 2015) and in the recent PlanMob (2023), developed by IRM, reveals an excessive dependence on road transport, which accounts for about 80% of motorized trips in the RMRJ. This dependence overloads the road network and generates profound negative externalities.

2.2.1 The Implosion of the Railway System (SuperVia)

The urban rail system under the jurisdiction of the State of Rio de Janeiro, operated by the concessionaire SuperVia, is the most emblematic case of the crisis. Historically, Rio’s railway network transported more than 1 million passengers per day in the 1980s. After the concession process in 1998, there was a period of recovery in investment and demand, reaching around 600,000 passengers per day in the mid-2010s.

However, the economic crisis after 2016, the COVID-19 pandemic, and the expansion of territorial control by armed groups led the concessionaire to enter

judicial reorganization in 2021. Currently, the system operates at a level of approximately 300,000 passengers per day—similar to the volume transported in the 1930s—representing enormous underutilization of an installed infrastructure capable of far greater capacity. The recent creation of the Railway UPI[1] and judicial approvals aim to halt the financial bleeding, but the physical infrastructure (tracks, signaling, overhead lines, and stations) suffers from obsolescence and predatory vandalism.

2.2.2 The BRT Cycle: From the Olympic Model to Intervention

The BRT (Bus Rapid Transit) system implemented by the Municipality of Rio de Janeiro, launched as the crown jewel of the Olympic legacy (2010–2016), experienced a rapid collapse. The original model, based on consortia of private bus companies responsible for fleet and operations, failed to guarantee maintenance and service quality. Vandalized stations, a deteriorated fleet, and irregular intervals led to a loss of demand, many of these problems linked to the urban violence present in large parts of the areas where the BRT operates.

The intervention of the Municipality of Rio de Janeiro (2021–2024), through the public company Mobi-Rio, promoted a “re-statization of operations,” characterized by the direct acquisition of fleet and the rehabilitation of infrastructure. Although it demonstrated the feasibility of recovering the system, the move imposed a high financial burden. The sustainability of this model requires a strong state presence to mitigate chronic problems such as asset vandalism, insecurity, and fare evasion, which in critical periods exceeded 20% of users.

2.2.3 The Silent Crisis of the Urban Bus Network

It is imperative to add to the diagnosis the critical situation of the urban bus system (municipal and intermunicipal), which, although not the focus of major fixed infrastructure projects, transports the majority of the population in the RMRJ and acts as a vital feeder to mass transit systems. Data from the Federation of Passenger Transport Companies of the State of Rio de Janeiro (Fetranspor), now called SEMOVE, indicate a drop of more than 44% in the number of paying passengers over the last decade, drastically aggravated by the COVID-19 pandemic, when the system lost more than 10 million passengers in a single year.

This mode faces severe integration failures: physical integration is precarious outside BRT terminals; temporal integration through the Intermunicipal Single Ticket (BUI) has faced income ceiling restrictions and fare increases; and the recent coexistence of the Jaé (municipal) and Riocard (state) ticketing systems has generated uncertainty regarding full interoperability. In addition, the bus network suffers unfair competition from informal van transport (often controlled by militias), which drains demand from profitable regular routes and deepens the economic-financial imbalance of legal concessionaires. Moreover, there is also competition between bus routes that run parallel to the corridors of rail-based systems.

2.3 The Hidden Variable: Violence and Territorial Control

Violence in the RMRJ is not a random externality, like a natural disaster; it is a direct and predictable cost. The phenomenon of armed territorial control—whether by drug trafficking organizations or militias—imposes physical barriers to transport operations.

[1]The Isolated Productive Unit (UPI) for Railways constitutes a legal and financial instrument established within the judicial reorganization process of the current concessionaire (SuperVia), based on Law No. 11,101/2005. Its primary function is to segregate the operational assets and exploitation rights of the railway network from the multibillion-real liabilities of the distressed company, allowing the operation to be transferred or auctioned without the new investor inheriting the previous debts. This form of “asset shielding” is a strategic mechanism to provide legal certainty for both the State and the private sector, enabling the continuity of service and attracting the investments necessary for the rehabilitation of the railway system in the Metropolitan Region of Rio de Janeiro.

- Infrastructure theft: SuperVia reports kilometers of signaling and power cables stolen monthly, causing interruptions that degrade service reliability.
- Operational threats: Drivers and train operators frequently refuse to operate on certain segments after specific hours due to fear of shootings or the seizure of vehicles to be used as barricades.
- “Hardening” costs: Stations in conflict areas require vandalism-resistant materials (which increases CAPEX) and reinforced public security (which inflates OPEX).

Ignoring this variable in traditional economic feasibility studies (EVTEA) has led to serious errors in demand and cost projections.

3 Methodology

To rank the portfolio of 15 projects selected for the Rio de Janeiro Metropolitan Region (RMRJ) by the Banco Nacional de Desenvolvimento Econômico e Social (BNDES) in the “National Urban Mobility Study” (BNDES, 2025) and address the problem of resource scarcity, a Multi-Criteria Decision Analysis (MCDA) approach was adopted, specifically the Weighted Sum Model (WSM).

3.1 The weighted sum model

The WSM is the most widely used method in single-dimension decision analyses. The choice of this method is justified by its transparency and ease of communication with public managers (“decision makers”), unlike more complex methods (such as AHP or TOPSIS)[2] that may function as “black boxes.”

The final score S_i of each project i is calculated using the formula:

$$S_i = \sum_{j=1}^{n} \omega_{ij} \cdot a_{ij} \quad (1)$$

Where:
w_j is the weight assigned to criterion j ($\sum w_j = 1$).
a_{ij} is the normalized value of project i under criterion j.

3.2 Data normalization and sources

Since the criteria have different units (Brazilian reais, number of passengers, kilometers), the Min–Max normalization method was used to transform all values onto a dimensionless scale between 0 and 1.

For the construction of the indicators, the primary data sources were the National Urban Mobility Study (BNDES, 2025) for CAPEX variables, project length, and projected demand; operational reports from AGETRANSP and SuperVia for reliability data and current costs; and spatial cross-analysis in a GIS (Geographic Information System) environment between project alignments and crime-density maps for the security variable.

This methodological procedure made it possible to spatialize risk, assigning penalties to sections of projects that pass through critical areas, thereby going beyond purely financial analysis.

[2] AHP (Analytic Hierarchy Process): A method that decomposes the decision problem into a hierarchical structure (goal, criteria, and alternatives) and uses pairwise comparisons (one against another) to mathematically determine the weight and priority of each element. TOPSIS (Technique for Order Preference by Similarity to Ideal Solution): A technique that evaluates and ranks alternatives based on geometric distance: the best option is the one that is simultaneously closest to the “positive ideal solution” (the best possible value across all criteria) and farthest from the “negative ideal solution” (the worst possible scenario).

3.3 Definition of the “operational security cost” variable and the armed groups map

The innovation of this study lies in the explicit inclusion of the “Annual Security Cost” criterion. This variable was constructed by crossing the georeferenced alignment of each project with the database of the “Historical Map of Armed Groups in Rio de Janeiro,” developed through a partnership between the Grupo de Estudos dos Novos Ilegalismos da Universidade Federal Fluminense (GENI/UFF) and the Instituto Fogo Cruzado.

The methodology of this map does not rely solely on official crime statistics; rather, it uses triangulation of data from hundreds of thousands of anonymous reports to the Disque-Denúncia hotline, records of police operations, and media monitoring. The indicator defines “territorial control” when an armed group exercises continuous dominance over the social and economic routines of a given area.

For the mobility analysis, project segments intersecting these areas of armed control (militias or drug-trafficking groups) were classified as “High-Risk” zones. An additional OPEX was then estimated to account for station fortification, reinforced private security, and replacement of vandalized assets.

The precariousness and operational instability of high- and medium-capacity transport systems in the Rio de Janeiro Metropolitan Region are inseparable from the dynamics of territorial control exercised by armed groups. According to the Armed Groups Map (Instituto Fogo Cruzado; GENI/UFF, 2024), approximately 18.1% of the urbanized area and 34.9% of the metropolitan population — about 4 million people — live under the control or influence of drug-trafficking factions and militias.

The main BRT corridors (TransCarioca, TransOeste, and TransBrasil) cross extensive conflict zones and consolidated territories under the dominance of these groups. However, it is on the rail branches operated by SuperVia that operational costs become critical due to frequent service interruptions and imminent risks to passengers and staff.

This territorial reality imposes “Operational Security Cost” as a determining variable, where public transport ceases to be merely a mobility vector and becomes hostage to the fragmentation of state sovereignty in the suburbs and the Baixada Fluminense.

- “Green” Areas (Low Risk): Standard property-surveillance costs (example: metro Lines 1 and 4).
- “Red” Areas (High Risk/Conflict): Inclusion of costs for armoring, tactical public-security teams, accelerated replacement of vandalized assets, and revenue loss due to service interruptions (example: railway branches operated by SuperVia).

Estimated values ranged from R$1.5 million/year (projects in consolidated areas such as the Zona Sul, Rio de Janeiro) to R$17.5 million/year (requalification of the railway network crossing dozens of conflict-affected communities across all operating branches).

3.4 Weight and criteria matrix

The weights (Table 1) were calibrated to reflect the reality of the crisis and the literature on transport planning in contexts of scarcity. Assigning 48.9% to the global weight of the “Demand” dimension is based on the premise of maximizing social welfare: in a scenario of finite resources, the ethical priority is to benefit the greatest absolute number of people (patronage/ridership), as advocated by authors such as Jarrett Walker (2012) and Robert Cervero (1998).

The Operational Security criterion received a weight of 10%, acting as a penalization or “veto” factor. Although this may appear to be a relatively small percentage, its function in the model is to downgrade projects that, despite high demand, present

risks of frequent service interruptions (as occurs with the trains operated by SuperVia), which would destroy reliability and consequently reduce long-term demand.

The Financial criterion (15.6%) and Implementation Risk (20.1%) complete the matrix, penalizing projects with high civil-engineering complexity (such as tunnels), which historically lead to budget overruns and schedule delays.

Table 1: Detailed matrix of criteria and weights

Dimension	Criterion	Description	Weight (wj)
Demand (Social)	Population Served	Population within the direct area of influence (500 m–1 km).	0.081
	Boardings/Day	Projected absolute demand.	0.198
	Usage Index	Relative boardings (Passengers / Resident population within the project's catchment area).	0.210
Financial	Unit Cost	Implementation cost per km (CAPEX/km).	0.081
	Social Cost	Total investment per capita (CAPEX/inhabitant).	0.075
Risk	Complexity	Need for land expropriations and geotechnical interventions.	0.141
	Maturation	Time until full operation (time horizon).	0.060
Operational	Security Cost	Estimated additional OPEX for security.	0.100
Strategic	Competition	Degree of overlap with existing transport modes.	0.054
TOTAL			**1.000**

Source: The authors (2025)

4 Analysis of Results

The application of the matrix generated a ranking, allowing the 15 projects highlighted by BNDES for the Rio de Janeiro Metropolitan Region, and included in the National Urban Mobility Study (ENMU), to be grouped into three priority clusters.

To provide context for readers unfamiliar with the geography of the Rio Metropolitan Region (RMRJ), the priority corridors are distributed as follows:

- The TransOeste Corridor connects Barra da Tijuca (coastal area) to the working-class neighborhoods of Santa Cruz and Campo Grande in the far west;
- The Railway Network radiates from downtown Rio (Central do Brasil) to the North and West (Baixada Fluminense and West Zone), covering the areas with

the highest population density;
- Metro projects are predominantly concentrated in the South Zone and in underwater connections to Niterói, areas with higher income levels and real estate costs.

The results of the analysis were grouped into clusters as presented in the following sections.

4.1 Cluster 1: Optimization and High Efficiency (1st to 5th place)

This group consists of projects that make use of existing corridors or require surface-level interventions.

- BRT – VLT TransOeste: The top-ranked project. Despite requiring significant investment (R$106 million/km if converted to light rail or heavily upgraded), it has the highest relative demand in the system. It is the only mass transit connection for a rapidly growing population area.
- Urban Train Rehabilitation: Ranked second, revealing the latent potential of SuperVia. The estimated rehabilitation cost (R$13 million/km for signaling and track) is minimal compared to building new lines. Its penalty was almost entirely due to the “Safety” criterion (R$17.5 million/year). Without this additional cost, it would rank first overall. However, it is worth noting that in 2010, Addendum No. 8 was signed between the State and the SuperVia concessionaire, allocating R$2.4 billion (2010 values) to invest in 270 km of track, which proved insufficient for full rehabilitation. Updated to 2025 values using IPCA and IGPM averages, this would amount to approximately R$22.9 million/km—almost double the ENMU estimate.
- BRT – VLT Transcarioca, BRT TransBaixada, and VLT São Cristóvão: These follow the logic of connecting already dense centers with medium-cost infrastructure.

4.2 Cluster 2: Intermediate Projects (6th to 10th place)

This group includes BRT expansions in lower-density areas (Campo Grande–Magarça) and urban connection light rail systems (VLT Centro Niterói–Charitas). These are valid projects, but with lower urgency or less immediate social return compared to the first group.

Metro Line 3 (Praça XV – São Gonçalo) appears here in 9th position. Despite being a long-standing aspiration of São Gonçalo’s population, its high implementation cost and construction complexity (underwater tunnel or elevated bridge across the bay) reduce its short-term feasibility.

4.3 Cluster 3: Projects with Low Immediate Return (11th to 15th place)

This cluster is dominated by heavy underground metro expansions.

- Metro Line 2 – Praça XV (14th place): With a cost close to R$1 billion/km, this project represents the opposite of allocative efficiency in times of crisis. Although technically desirable to relieve Carioca station and allow operation with 8-car trains—thus increasing Line 2 capacity—the required investment could finance the full rehabilitation of the metropolitan train and BRT systems. It is important to note that the demand figures presented in the study refer only to the additional demand generated by this segment, which explains the outcome of the analysis.
- Gávea Metro (15th place): The halted construction of Gávea station represents a legal and financial liability, but its completion and expansion toward Tijuca (Uruguai) or downtown appear financially unfeasible within the fiscal recovery regime (RRF). The works to drain water and complete part of the station merely reduce the risk of structural collapse of the unfinished infrastructure and provide very limited mobility benefits, as the station would only connect to São

Conrado. Without completing the tunnel toward Leblon (Antero de Quental)—which still requires 1.2 km of excavation and is not included in the current scope—the systemic benefit remains limited, forcing users from downtown or the North Zone to make an additional transfer at São Conrado to reach Gávea.

Table 2 provides a summary of the project ranking.

Tabela 2: Ranking outline

Ranking	Project	Final Score	Cost/km (R$ mi)	Implementation CAPEX	Security Cost (R$ million/year)	OPEX
1	BRT - VLT TransOeste	0.6290	106.0	High	3.5	Low
2	Urban Train Rehabilitation	0.6239	13.0	Low	17.5	Critical
3	BRT - VLT Transcarioca	0.6105	140.2	High	3.5	Low
4	BRT Campo Grande - Magarça	0.5777	60.2	Medium	1.5	Low
5	VLT São Cristóvão	0.5632	107.3	Medium	1.5	Low
6	BRT Jardim Oceânico - Taquara	0.5535	70.7	Medium	2.5	Medium
7	BRT TransBaixada	0.4762	51.8	Low	1.5	Low
8	BRT Deodoro - Santa Cruz	0.4632	54.5	Low	3.5	Medium
9	Metro Praça XV - São Gonçalo (L3)	0.4181	634.8	Very High	10.5	High
10	VLT Centro de Niterói - Charitas	0.3983	103.8	Medium	2.5	Low
11	Metro Centro - Deodoro	0.3578	372.6	High	9.0	High
12	Metro Alvorada - Cocotá	0.3574	366.1	High	4.5	Medium
13	VLT Gávea - Botafogo	0.3470	104.9	Medium	2.5	Low
14	Metro L2 - Praça XV	0.3369	970.6	Very High	10.5	High
15	Metro Gávea - Del Castilho	0.2594	793.8	Very High	9.0	High

Source: The authors (2025)

5 Discussion and case studies

5.1 The “SuperVia paradox”: engineering versus public security

The analysis of the results raises a central question: why is the railway system—which is the cheapest and highest-capacity mode—collapsing? The answer lies in issues related to public security. The modeling showed that SuperVia’s “Security Cost” is 5 to 10 times higher than that of other modes. However, this cost is often treated as a “concessionaire problem.”

International case studies reinforce the need to integrate transport and security in conflict-affected territories. The experience of Medellín (Colombia) with the Metrocable system is paradigmatic: the project’s success did not come solely from installing cable cars in the comunas, but from the strong presence of the State through the Integrated Urban Projects (PUI), which ensured surrounding security and infrastructure integrity, transforming stations into hubs of citizenship rather than mere transit points. Unlike Rio, where stations are “fortified” against their surroundings, in Medellín transport became a driver of territorial recovery.

In Rio, the “privatization” of security (requiring the concessionaire to combat vandalism, cable theft, and regain access control in stations under the influence of criminal groups) has proven ineffective. The cost of R$17.5 million/year, which penalized the project in the ranking, is in fact a high-return investment. Assuming this responsibility by the State, through an effective Railway Police Battalion, would reduce project costs and increase its attractiveness and fare revenue. Although such a measure would burden public finances, it represents a necessary prioritization for society, especially for those most dependent on access to employment, education, and leisure opportunities.

5.2 The “Safe BRT” model as a benchmark

The “Safe BRT” program, implemented by the Rio City Hall, offers a positive counterexample. By dedicating public security agents (Military Police and Municipal Guard in additional shifts) specifically to patrol stations and buses, the program managed to drastically reduce vandalism and fare evasion. This model validates the premise that security is a production input in transport systems. The improved ranking of BRT projects (TransOeste and TransCarioca) is partly due to the perception that operational risk in these corridors has been mitigated by an active public policy, reducing the risk premium.

5.3 The illusion of the metro during crisis

There is a political culture in Rio de Janeiro that views the metro as the only “worthy” transport solution. However, from an allocative efficiency perspective, expanding the metro today is a regressive policy. Investing R$10 billion to add 10 km of metro in the South Zone or downtown, serving 100,000 new passengers, while 1 million residents of the Baixada endure degraded train services due to a lack of R$2 billion in maintenance, is a choice that deepens inequality. The ranking shows that the social return of each Real invested in restoring the existing network is exponentially higher than building new metro segments or lines.

6 Final considerations and recommendations

Given the above, the mobility strategy for Rio de Janeiro in the 2025–2030 horizon, under the Fiscal Recovery Regime, cannot be a “wish list” of very expensive projects. Projects with very high implementation and operating costs relative to the number of passengers served should be avoided or postponed.

Given the fiscal constraints of the State and many municipalities in the metropolitan region, the resource allocation strategy must follow a precise plan focused on efficiency and recovery. Three pillars of political and technical action are

recommended:

- Absolute priority: recover before expanding:

  The state government must redirect its investment capacity (and borrowing capacity, when possible) toward the rehabilitation of SuperVia. This includes signaling modernization, rolling stock acquisition, and station refurbishment. It is the fastest and cheapest way to restore dignity to 1.5 million people living within the railway system's area of influence.

  Investments in BRT should also be a priority, although they are mostly the responsibility of the Rio City Hall, except for the TransBaixada BRT (7th in the ranking), which would theoretically fall under the State Government.

- Security integrated into the budget (guaranteed OPEX):

  No project should be tendered without explicit budget allocation for security. It is recommended to create a "Transport Security Fund," possibly financed by a fraction of fares or environmental compensation mechanisms, to fund dedicated police units. Security cannot be a fluctuating budget line subject to cuts; it must be permanent.

- Adoption of multicriteria methodology as a decision-support tool:

  Project selection can be guided by multicriteria methodologies. The adoption of a transparent MCDA matrix, such as the one proposed in this article, can support public managers in defining priorities within the Multiannual Plans (PPAs) at different levels of government. This ensures that scarce resources are allocated where they generate the greatest social welfare.

In times of scarcity, true innovation is not building the new, but making the existing work with excellence. For Rio de Janeiro, the mobility revolution begins by ensuring that trains arrive on time with quality and reliability, guaranteeing passengers safety, comfort, and speed.

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Conceptualization, [WRP, JCLSF, JFCF]; methodology, [WRP, JCLSF, JFCF]; formal analysis, [WRP, JCLSF, JFCF]; investigation, [insert initials]; writing—original draft preparation, [WRP]; writing—review and editing, [WRP, JCLSF, JFCF]. All authors have read and agreed to the published version of the manuscript.

Conflicts of Interest

The authors declare no conflicts of interest.

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Coleção Estudos Cariocas (ISSN 1984-7203) is a publication dedicated to studies and research on the Municipality of Rio de Janeiro, affiliated with the Pereira Passos

Institute (IPP) of the Rio de Janeiro City Hall.

Its objective is to disseminate technical and scientific production on topics related to the city of Rio de Janeiro, as well as its metropolitan connections and its role in regional, national, and international contexts. The collection is open to all researchers (whether municipal employees or not) and covers a wide range of fields — provided they partially or fully address the spatial scope of the city of Rio de Janeiro.

Articles must also align with the Institute's objectives, which are:

1. to promote and coordinate public intervention in the city's urban space;
2. to provide and integrate the activities of the city's geographic, cartographic, monographic, and statistical information systems;
3. to support the establishment of basic guidelines for the city's socioeconomic development.

Special emphasis will be given to the articulation of the articles with the city's economic development proposal. Thus, it is expected that the multidisciplinary articles submitted to the journal will address the urban development needs of Rio de Janeiro.