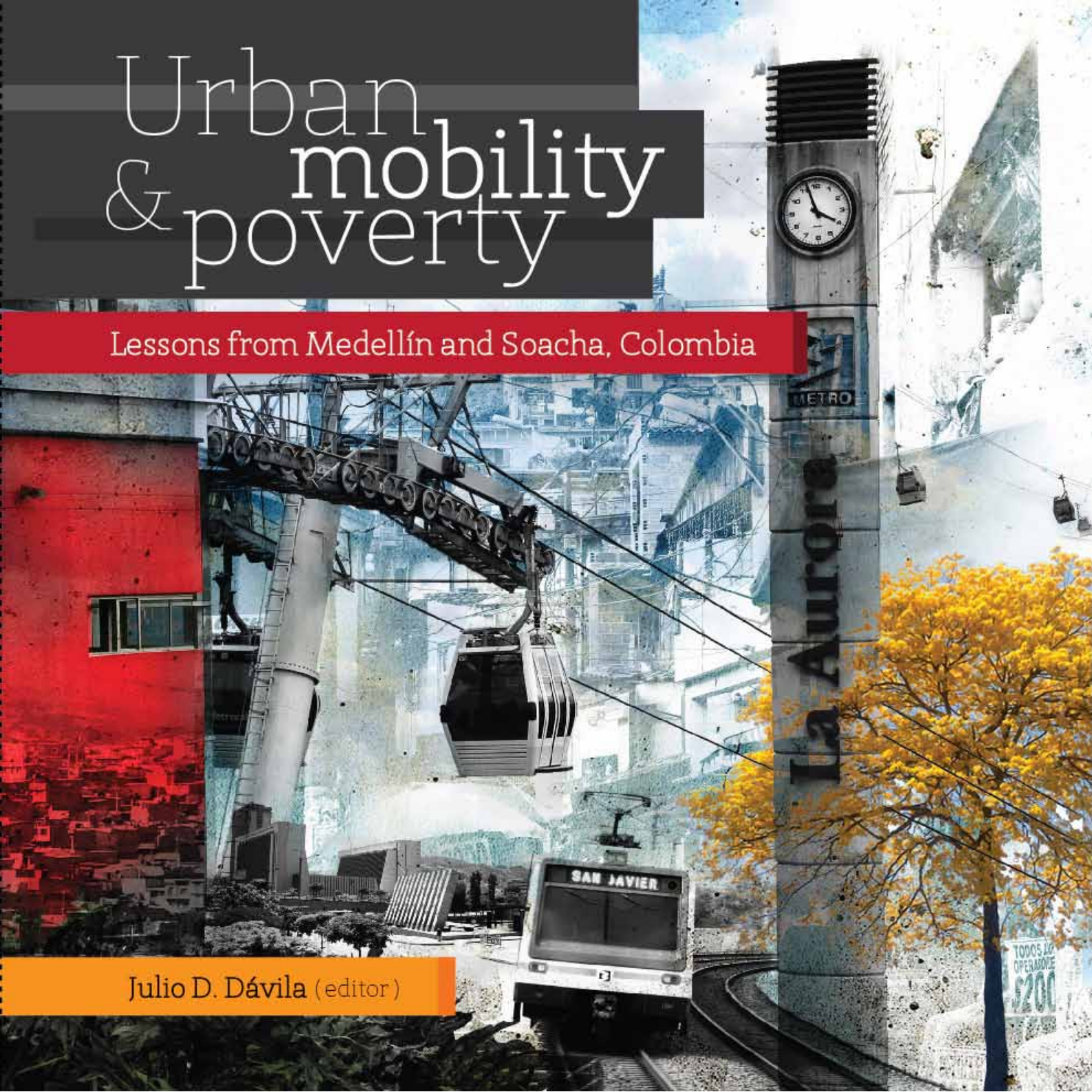


Urban & mobility & poverty

Lessons from Medellín and Soacha, Colombia

Julio D. Dávila (editor)



Urban & mobility poverty

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05

Outskirts of Medellin metropolitan area



Introduction

Urban & mobility poverty

Lessons from Medellín and Soacha, Colombia

Julio D. Dávila

As the title suggests, the two central themes of this book are urban mobility and poverty. Mobility refers as much to the act of moving from one place to another using some mode of transport, as to the social and cultural meaning of this movement. Urban poverty, a growing phenomenon in many countries around the world, is seen here not as an isolated object of study but rather in its relationship with mobility.

A city dweller's ability to move on a daily or occasional basis hinges on factors such as the ease of physical access to a mode of transport, the frequency of the mode and the economic cost of travelling, represented, for example, in public

transport fares or in the opportunity cost of travel time using different modes. Indeed, in the absence of money to cover a fare, as is often the case in the poorest households, an individual's capacity for movement will likely result from a household strategy, giving priority to one or two members of the family to travel. In an urban context in which access to income earning opportunities, education and leisure tends to be mediated by the capacity to move, such a decision might deprive other household members of these essential elements for personal and social development.

As the world's population continues to urbanise, cities represent an ever-higher

proportion of the national and global economy and human activities leave a growing footprint in the atmosphere through climate change. In this context it becomes ever more urgent and necessary to find forms of equitable urban management and planning which maximise society's individual and collective development potential and, at the same time, lead to a more sustainable use of natural resources. It is a well-known fact that more than half of the world's population lives in urban areas. In Latin America and the Caribbean this proportion is even higher and varies roughly in accordance with national income, surpassing 80% in some countries. In the majority of African, Middle Eastern and Asian countries urbanisation is of the order of a third of the national population, but the next decades are likely to see a substantial increase, in some cases an accelerated increase, in the proportion of the population living temporarily or permanently in urban areas.

Globalisation, which has been experienced by nearly all countries across the world, has been accompanied by a phenomenon of increasing income concentration within ever-smaller segments of the national and global population. In many cities this is reflected in the spatial concentration of wealthier groups in areas isolated from the rest of the urban population, in gated communities or other forms of physical and social isolation often in municipalities adjacent to traditional urban centres. Latin America has been a pioneer amongst the so called 'developing countries' in allowing the proliferation of these urban 'ghettoes', but the trend in many other



Figure 1: Medellín's Metrocable K Line, launched in 2004

countries which are undergoing a process of accelerated urbanisation is very similar. At the same time, the poorest populations continue to live in areas which are physically and socially marginal, areas where land prices and rents are more accessible, in neighbourhoods often far from the city centre, on steep terrains, or locations at risk of landslides and flooding, even settling on sanitary landfills.

Within this panorama of generalised and uncontrolled urban expansion, social, spatial and administrative fragmentation, and high levels of physical and indeed social and economic isolation, it is inspiring to examine in detail the experience of success stories. That is, cities that have been able to contain, or at least, re-direct what appeared to be irredeemable phenomena, with explicit criteria for equity and sustainability whilst resorting to creativity and solidarity.



Figure 2: London's Emirates Air Line, launched in June 2012

After having been associated for a long time in the global media with violence linked to the drug trade, in recent years Medellín, Colombia's second city, has become an inspiring example of urban change led by the municipal government. In the context of a particularly difficult topography, a dense and spatially segregated urban fabric, and high levels of income concentration, over the first decade of this century the local government actively searched for ways in which to redress these social and spatial imbalances. This is represented emblematically by the *Metrocables*, aerial cable-car lines connecting high-density hilly neighbourhoods with the rest of the city (Figure 1). The aerial cable-cars (usually known in Spanish and Portuguese as *teleféricos*) do not in themselves constitute a technological innovation; they are a tried and tested technology on ski pistes around the world. With the exception of the *Aerial Tramway* of Roosevelt Island in New York, in urban areas they have been mainly used to transport tourists, such as can be seen in the recent example of London's *Emirates Air Line* (Figure 2). Medellín is the first city in the world to use this technology as a means of mass transport exclusively aimed at low-income populations. The first *Metrocable* line, inaugurated in 2004, connects the so called 'north-western communes', neighbourhoods marked over the years by the stigma of poverty, violence and almost total control of illegal militias and drug traffickers, with the city's overground Metro system.

The novel use of an aerial cable-car in these conditions in itself would merit closer

scrutiny, with the aim of measuring, for example, its effectiveness as a mass transit system and its limited environmental impact. But the underlying motivation of this book stems from the fact that this technology is not used in Medellín in an isolated manner as a solution to the transport problems of neighbourhood residents, but is instead part of a much wider set of interventions. These seek to integrate the neighbourhoods with the rest of the city while improving opportunities for those that live or work there through a range of projects: upgrading of housing and public spaces, social infrastructure with eye-catching architectural design in schools and libraries, economic and social support programmes. But at their core lies a political approach to local government involvement that seeks to deliver physical and infrastructure change through more active forms of community participation than the top-down forms usually present in widespread patron-client practices.

The vigorous defence of the first *Metrocable* line by commune residents in Medellín reflects not only the central importance that cable-cars have acquired as a mode of transport, but also a sense that they have helped revalue these neighbourhoods in the eyes of residents and visitors alike, including a growing number of foreign tourists. These interventions are part of a new generation of urban upgrading projects in Latin America and the Caribbean. In the cases documented here, urban transport and, more concretely, mobility, have a central role in upgrading that is at the same time both real and symbolic.

This book is the product of a two-year research project examining the social and urban impacts of the *Metrocables* and the upgrading projects associated with them. The research also sought to examine the possible impacts of a similar system in Soacha, a municipality adjacent to Bogotá, Colombia's capital.

The research team brought together five institutions. The project was coordinated by University College London's (UCL) Development Planning Unit, and researchers from the following universities participated: *Universidad Nacional de Colombia* (Medellín campus), *Universidad de los Andes* (Bogotá), Department of Civil, Environmental and Geomatic Engineering at UCL (London) and *Universidad del Rosario* (Bogotá). The research was jointly funded (*Research Grant RES-167-25-0562*) by the United Kingdom's *Economic and Social Research Council* (ESRC) and the *Department for International Development* (DFID).

This book can be downloaded for free in English and Spanish from the project's website (www.bartlett.ucl.ac.uk/dpu/metrocables) where other project outputs can also be found.

The book has four sections. The first section provides theoretical explorations of mobility and transport in the context of an urbanised society. The second section outlines with some level of detail the case study of Medellín, including the institutional background of the interventions, the communities' socio-economic profiles, the travel patterns and the opinions of users and non-users of the *Metrocables*, and the system's political resonance. The third section reflects upon the

feasibility of building an aerial cable-car system in the municipality of Soacha, a project announced by the President of Colombia in a speech given to local residents. Soacha embodies a marked contrast to Medellín, as it lacks the financial, institutional and political conditions that made the changes documented in the second section possible. The fourth section groups various experiences in other cities, from descriptions of the systems in Caracas and Rio de Janeiro, inspired by Medellín, to proposals for aerial cable-cars in La Paz and Cali. The final section concludes with reflections on the lessons arising from contrasting the context and experiences in Medellín and Soacha.

This book and the other project outputs would not have been possible without the crucial support of numerous people and institutions. I especially want to thank all the members of the research team from the five institutions for their hard and rigorous work in collecting and analysing primary and secondary information, and for their wholehearted participation in national workshops in Medellín (September 2010) and Bogotá (March 2011), and also in the international workshop in Medellín (December 2011). Their valuable contributions can be seen in the chapters of this book, in articles in specialised journals and in two reports available (in Spanish) on the project's website. I am particularly indebted to Peter Brand, Françoise Coupé, Juan Pablo Bocarejo, Jorge Acevedo and Iván Sarmiento for enthusiastically agreeing to my proposal of exploring these two fascinating case studies.

I owe my considerable thanks also to the participants and organisers of the workshops for their support, their time and their insights into the two cases studies. In particular, Soledad Betancur and José Fernando Angel not only gave us their valuable time in two of the workshops, but they also shared their extensive experience of more than a decade as professionals at the centre of change and critical reflection in Medellín. The smooth operation of the international workshop in Medellín was due, in large part, to the hard work of Alejandra Jaramillo, Beatriz Marín and Carolina García to whom I am very grateful.

The research would not have reached a successful end without the support and time of those who gave us access to crucial information, be this official documentation or personal opinions, or both. In particular, I would like to thank former Medellín mayors Sergio Fajardo and Luis Pérez; in the Metro Company, Ramiro Márquez Ramírez (CEO), Tomás Elejalde and Engineers Luis R. Pérez and Theodor Kurk Echeverri; and Federico Restrepo (until 2011) CEO of Medellín's Public Utilities Company (EPM) and former Director of Municipal Planning under Sergio Fajardo's administration.

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Finally, on behalf of the research team, I want to express my sincere thanks to all the inhabitants of Communes 1, 2, 7 and 13 in Medellín and Commune 4 in Soacha for giving us their time, sharing their daily experiences through interviews and focus groups, and welcoming us with warmth and generosity. Luis Alberto Camargo, a leader in Soacha's Commune 4, gave us more time than a researcher can dare to dream in their fieldwork. The staff in *Casa de los Derechos* (Human Rights House) in Soacha's Commune 4 kindly received us and lent us their premises for the first set of focus groups and interviews. To all of them I would like to dedicate this personal and collective effort.

01

Society,
Mobility,
and the City

The Social S of Mobility



Metrocable J Line, Medellín

Significance

Peter Brand

Mobility has become a defining characteristic of the contemporary world. The movement of ever greater quantities of goods, people, money and information, at ever lower cost, and at higher speed, has exponentially increased over the last three decades. Revolutionary advances in transport infrastructure and information and telecommunication technologies have been an integral part of this and have driven globalisation in all its dimensions: economic, political, social and cultural.

For cities, the capacity to integrate into this perpetual movement, intensified at a global scale, has become a fundamental condition for their participation in the economic circuits of organised networks. This obliges cities to carry out substantial investments in transport infrastructure and virtual connectivity. At the same time, the problem of congestion intensifies, and with it new responses are being tried out, such as restrictions on the use of private vehicles, the search for clean technologies, the promotion of public transport

and the use of non-mechanised means of transport (bicycling, walking). Mobility is also transforming urban living, leading to a rethinking of the way in which individuals and groups interact and participate in social activities. However this is a very heterogeneous phenomenon, and for large segments of the population, especially in developing countries, life continues to unfold primarily in local geographical spaces, in relative isolation from and without easy access to the opportunities and demands of the globalised city.

As the following section will show, Medellín's *Metrocables* have a special interest due to the way in which they combine the following two dimensions: innovation in the use of transport technology, and its application in the poorest and most marginalised sectors of the city. This chapter synthesises some approaches on the sociology of mobility, with the aim of conceptually structuring the significance and possible consequence of an increase in mobility for such a social group. These ideas and their usefulness evolved and matured throughout the research that led to this book.

Transport, Accessibility and Mobility

For some authors, mobility and its consequences constitute phenomena of such magnitude as to demand a new paradigm for the social sciences (Urry, 2007). In place of the traditional sociological concern centred on social structures, Urry and others argue that movement and flows should be placed at the forefront, as the organising elements of social life. As such, mobility is a far from minor issue; it is understood, rather, as a characteristic, a condition and a requirement of contemporary societies.

The growing field of mobility studies emphasises plurality in the means and types of movement. By including both physical movement and virtual flows, there is a tendency to refer to ‘mobilities’ in plural, in their relation to both social and spatial organisation. Here there is an important difference between more technical transport studies and those that take a sociological approach around the notion of ‘mobilities’. A central concept in transport studies is that of accessibility, understood as a measure of “the place’s connectedness to means of transport and the place’s attractiveness in terms of opportunities that can be realised there”, referring to the objective conditions for moving something or someone, based on the principle of utility maximisation (Ohnmacht et al., 2009: 16). From this perspective, speed and cost are the primary concerns, but recently other variables have acquired importance, such as energy consumption, the environment

and social equity (Bocarejo and Oviedo, 2010). In contrast, the concept of mobility is directed more towards the logics and practices of the actor: how an actor builds his/her relationship with space, with less emphasis placed on the objective opportunities offered by a territory itself (Flamm and Kaufmann, 2006: 169).

However, the analysis of accessibility is not limited to infrastructure supply. It also includes attraction factors such as land use and activity clusters, as well as obstacles to user access. Of these latter, cost in relation to income is probably given most attention, but the physical limitations and cognitive disadvantages of different users, gender discrimination, and so on, have become increasingly important. In this way, a concern for poverty and social inequality opens the way for the analysis of significance of different transport options for the poorest and most vulnerable social groups. This builds an important bridge between accessibility and mobility.

Mobility, Inequality and Poverty

Although poverty reduction was not an explicit driver in the origin of Medellín’s first *Metrocable* line (see Coupé, Brand and Dávila’s chapter in the following section), as time passed great expectations arose in terms of the social benefits that could result for the poor and marginalised sectors of the population who lived in areas where the *Metrocables* were built. Such

expectations rested on the belief that greater accessibility through a new mobility option would bring with it, in and of itself, enhanced opportunities and better living conditions.

While there is abundant evidence to demonstrate that, in general, a lack of mobility constitutes an integral part of a condition of social disadvantage, the opposite is not necessarily true. That is to say, marginal increases in options for mobility do not inevitably and inexorably lead to social improvement.

In general, greater mobility implies greater opportunities, but this presupposes the availability of the economic, physical and cognitive resources necessary to take advantage of those opportunities. At one extreme, mobility, once a luxury, has become a generalised necessity and a heavy burden (Bauman, 2000); to be in movement, real or virtual, is to be permanently connected, and this has become a stressful and demanding condition of contemporary life. At the other extreme are social groups anchored to a local territory due to their absolute lack of resources for mobility. As Bauman points out, an increase in mobility does not homogenise societies, rather it stratifies and polarises them: it liberates some individuals to act at distance without any kind of territorial attachment, while imprisoning others in a particular place.

For poor communities who are relatively disconnected from the modern formal economy, collective life continues to revolve around a local personalised space. The local territory or neighbourhood (*barrio*) continues to be a central

point of reference and source of livelihood and identity. In other words, in the areas of influence of the Medellín *Metrocables*, one can still expect to find relatively strong local spatial communities, where the lack of mobility constitutes, from this perspective, a heightened disadvantage. In this sense, Ohnmacht et al. (2009) propose two ways of addressing the relationship between mobility and inequality:

- In its relationship with classical forms of inequality: how different levels of mobility are related to the uneven distribution of wealth, income, education and status.
- New forms of inequality related to different mobilities: in addition to the 'vertical' inequalities within society, mobilities produce new 'horizontal' inequalities though their effects within a more complex and diverse social organisation; for example, in relation to age, gender, ethnicity and lifestyle.

The first relationship has received more attention in conventional transport studies. As Ohnmacht et al. (2009) have pointed out, the relationship between accessibility and social exclusion has been a secondary but important issue within transport engineering and policy. It is well known that high-income people travel more and travel faster than people with low incomes, and that the lack of access to transport can drastically reduce the life opportunities of the poorest in urban society. For the poorest social

groups that live in the urban periphery, lack of mobility means that geographical marginalisation exacerbates social exclusion (Ureta, 2008), as can be seen in the case of Soacha municipality; a more detailed discussion can be found in later chapters of this book.

New 'horizontal' inequalities, which derive from a lack of access to transport infrastructure and services, affect not only the poor but also the young, the elderly, the disabled and the least educated. For their part, new communication technologies, such as the internet and mobile telephones, demand economic resources but also require an additional dose of technical skills and cultural capital, and lacking these further accentuates social divisions.

'Motility'

Building on the above, there arises a paradox whereby despite the hyper-mobility of contemporary societies, social structures tend to remain relatively stable. In fact social differentiation has intensified and inequality has become more pronounced. The term 'motility' has been used to help explain this phenomenon. Motility is understood as "the capacity of entities (e.g. goods, information or persons) to be mobile in social and geographical space, or as the way in which such entities access and appropriate the capacity for socio-spatial mobility according to their own circumstances" (Kaufmann et al., 2004: 750). In contrast with 'mobility', the notion

of 'motility' incorporates the "structural and cultural dimensions of movement and action in that the actual or potential capacity for spatio-social mobility may be realized differently or have different consequences across varying socio-cultural contexts" (Kaufmann et al., *ibid.*).

The important thing is the recognition that mobility is not static and uniform in character, meaning and consequences; rather, mobility becomes a new good or form of 'capital.' Following Kaufman et al. (2004), three inter-dependent elements may be identified:

- Access, or the possibility to take advantage of the diverse transport and communication options that a particular territory offers, and the conditions of access to those options (cost, logistics and other restrictions).
- Competencies, or the knowledge and skills necessary to access and make use of those transport and communication options.
- Appropriation, or how agents (individuals, groups, networks and institutions) interpret and act on those options, which in turn is shaped by the needs and aspirations of those agents and their strategies, values and habits.

Implications for a Research Project on Medellín's Metrocables

A sociological investigation of the type outlined above was beyond the scope of this research project.



Bangalore

Nonetheless, there are important lessons that should be considered. On the basis of Kaufmann *et al.*'s outline, it is clear that social groups in the areas of influence of the *Metrocables* project are relatively homogenous from the point of view of orthodox statistical criteria, and undoubtedly suffer mobility restrictions, not just in terms of their limited economic capacity to access 'mobilities,' but also in terms of the knowledge and skills required. With regard to the supply of transport services, the *Metrocables* were built in areas where walking is still the main mode of transport and where the bus continues to be the most common motorised mode, although there is increasing access to motorcycles as a private mode of transport.

However, the most important aspect is the third element proposed by Kaufmann et

al.: the needs, motivations and aspirations of individuals and groups. We must avoid falling into the trap of presuming that greater mobility has the same meaning for each social group, with the same consequences for social trajectories. Increased mobility can integrate individuals and social groups, or conversely, it can fragment identities and diversify social trajectories. For the purposes of the *Metrocables* study, the usefulness of the concept of motility may be specified in the following way:

— It should not be assumed that aerial cable-car systems will lead directly and inexorably to a greater integration of poor neighbourhoods with the rest of the city and to poverty reduction.

— The conditions of informality in these sectors should be taken into account with regard to

income-earning activities, access to public services, the relationship to administrative authority, and the local structures of power and prestige.

■ It is vitally important to take into account the set of barriers and obstacles to a greater urban integration through improved mobility: the daily routines of the population in all its diversity, social horizons and individual expectations.

Moreover, in a more general sense, it is important to:

■ Recognise how the public sphere can contribute to greater mobility in a context in which private options remain seriously restricted. The possibilities for social integration through increased mobility are a direct consequence of state intervention.

■ Differentiate between the logic of a city's management (in its eagerness to 'modernise' poor neighbourhoods and integrate them into the formal city) and the logic of the inhabitants of these neighbourhoods in the context of their everyday urgency to survive and improve (and even resist). The inhabitants in the areas of influence of the *Metrocables* project have their own lifestyles and aspirations which influence the way in which they make use, or not, of the *Metrocables*.

■ Differentiate and then re-articulate the technical-engineering rationality of planning

strategies, on the one hand, and the logics and interests of governance on the other; the desire to normalise aspirations and behaviours of the population can work in favour of or against the daily realities of life in the neighbourhood. ■

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Transport, Diversity, and the **Socially Just City:** The Significance of Gender Relations

Caren Levy

One of the hallmarks of contemporary towns and cities globally is the extraordinary diversity of their populations and the complex activities associated with the lives they lead. Alongside and intersecting with this diversity is great inequality. However, while the degree and scale of this diversity and inequality may be different, towns and cities have always reflected these relations of difference and injustice – conditions and processes that, more often than not, planning has been unable to address (Levy, 2009). Planning practices were and continue to be imbued with conscious or unconscious assumptions and biases about how

women and men, girls and boys in households and communities live in the city.

Over the last 25 years, transport planning, despite on-going concerns with gender mainstreaming in other policy and planning, has been particularly resistant to the recognition of difference and inequality in urban areas. In contemporary neo liberal approaches to the city, transport has been recognised as critical to the development of the ‘competitive city’, but often at the expense of a socially just city. Yet, urban transport is one of the most critical entry points for both the efficiency of and the equal access to opportunities in the city of the 21st century. This

paper will focus on three common challenges faced by transport infrastructure and services in fast growing cities:

1. How can the provision of transport in fast growing cities respond to, as well as strategically lead, urban development so that it benefits all citizens and responds to their diverse interests and needs?
2. How can the provision of transport which involves mobility in different kinds of public space, contribute to the equal appropriation of the city by its diverse population in a way that enhances the collective space and aspiration in the city?
3. How can the provision of urban transport contribute to the progressive governance of cities, incorporating an inclusive vision of the right to participate in decisions affecting urban dwellers?

The subsequent sections will briefly address each question in turn, within the framework of a socially just city that addresses gender justice, wherever possible using examples of the research project of which this book is an output. Following Young (1991), the socially just city comprises a material and an institutional dimension, which are in continual interaction. The first refers to the distribution of material benefits and burdens in the city, and in transport terms relates to the accessibility and mobility of all urban citizens, addressing the first and second questions above. The second addresses the institutional procedures and practices of governance in the city,

and relates to participation in decision making in transport policy and planning, thus addressing the third question.

The following sections will explore gender justice in the material and institutional dimensions of social justice, as defined above. Although the focus is on gender relations, it should be understood that gender intersects with other social relations of class, ethnicity, religion, race, sexuality, mental and physical ability, and age, and hence an exploration of gender in all its diversity will weave into the discussions of urban poverty and inequality in the subsequent sections of the paper.

Transport Planning in the Context of Diversity: Gender Relations in Accessibility

Transport accessibility to urban opportunities relates not only to time/distance, but also to cost, safety and comfort. Transport accessibility also has an integrative dimension in people's lives, enabling them to balance – or orchestrate activities on a daily basis (see next chapter by Jirón). While recognising the context specificity of travel patterns in any urban setting, research over the last 25 years on gender relations in transport in different cities demonstrates the importance of the social position of urban citizens in transport access, exhibiting some common tendencies (see for example, Anand and Tiwari, 2006; GTZ, 2007;

Levy, 1992 and 2013; Salon and Gulyani, 2010). In broad terms, based on their different social position, the purposes, modes and experiences of women's travel tend to differ from that of men, as do their temporal and spatial patterns of movement in cities.

Over the last 50 years an increasing number of women have moved into the formal workforce, so that in most contemporary urban situations, travel to work accounts for the highest proportion of both women and men's trips. However, men tend to do proportionally many more work trips than do women. Women tend to do more trips than men related to reproductive activities in the household, for example, shopping, taking children to school, and taking family members to health facilities. Trip patterns also reflect the different way in which women and men organise their daily activities. Thus in most urban contexts, women do more multi-purpose trips (or 'trip chaining') than men, combining different activities in a travel outing. Research also shows that travel for these different purposes exhibit different temporal patterns. In most contexts, men do more peak travelling than women while women do more off-peak travelling than men. The latter is important to recognise as women are often travelling to meet family needs when transport services are less frequent.

A critical influence in these travel patterns is the gender division of labour and the way in which women and men take on and balance productive, reproductive and other roles and responsibilities in households and communities

in a different and unequally valued manner. The need for women to balance productive and reproductive activities accounts for the higher proportion of women in part-time work, and overall the shorter distances travelled by many women compared to men. These patterns are also strongly mediated by class and other social relations. The informal sector is an important source of income for most poor people; for example, between 2001-2005 in Medellín it comprised 55% of the working population (see the chapter by Coupé). Furthermore, in most of these contexts, poor women account for the highest proportion of workers in the informal sector, which is differently distributed spatially from the formal sector in the city, and thus a factor in the different travel patterns of working women and men of different classes.

This intersectionality comes out strongly in the different modes of transport used by women and men. Where there is a family car, men will tend to have priority use of it. While a sense of patriarchal entitlement to this household resource is a strong factor here, women in most countries of the Global South are less likely to have a driving licence than men. However, in poor households, where a car is unaffordable, women and men tend to walk more. In Medellín, this trade-off between cost and time is clearly demonstrated in the number of people walking instead of paying for public transport (see the chapter by Sarmiento *et al.*). In most urban contexts, women tend to walk most, reflecting their unequal access to resources.

The research in Soacha shows that the transport patterns of women and men, girls and boys can be greatly affected in situations of urban conflict and violence. In an area which has grown due to migration as a result of Colombia's internal conflict and in which much of the anatomy of that conflict – along with state neglect – has been reproduced, the journeys made by Soacha residents, particularly women, are shaped and drastically confined, like their lives, by fear (see the chapter by Bocarejo and Álvarez Rivadulla).

The research findings generated over the last 25 years talk to the importance of recognising gender and other social relations in the way transport forecasting and planning is done. However, they need to be understood in a wider context, beyond a behavioural understanding of difference in travel patterns. Firstly these travel patterns do not reflect the actual travel interests and needs of women and men. For example, they do not show trips that were suppressed, postponed or re-routed (Vasconcellos, 2001). This is because current transport planning and provision in most cities has been done on the basis of a number of questionable assumptions about gender and class relations. In gender terms these relate to stereotypes about household structure, the gender division of labour and the distribution of resources in the household. These intersect with a focus on motorized transport, in particular the private car, and the (male) journey to work (Levy, 1992 and 2013). Because these assumptions do not reflect the reality of people's lives, transport planning contributes to the reproduction and perpetuation of urban

inequality. This exclusion is further exacerbated by the increased privatisation of transport provision in countries where the state has historically played a comparatively big role in transport provision. Furthermore, the articulation of transport infrastructure and services in public space acts as yet another critical factor in the reproduction of urban inequality and social exclusion.

Transport Planning and Public Space: Gender Relations in Mobility

Transport accounts for a high proportion of the public space in any urban context. While this public space is critical to urban connectivity and the provision of access to essential urban activities, it is more than that. Streets, transport hubs like railway and bus stations, and public transport modes are all shared urban spaces, part of the conviviality of the city in which urban citizens live, enjoy and celebrate urbanity. This is more about mobility than access in transport, that is, the freedom and right of all citizens to move in public space with safety and security – and without censure and social control (Levy, 2013). As with other public space, the public realm of transport is contested space, imbued with power and meaning in all societies, rooted in the intersecting relations of class, gender, ethnicity, religion, sexuality, mental and physical ability, and age.

The significance of gender relations is at the heart of the distinction between public

and private space, a false dichotomy between reproduction and consumption associated with women in the private sphere, and production and politics associated with men in the public sphere. Other social relations like ethnicity and religion, depending on the context, reinforce this basic division of labour in different ways. Thus, in most societies women's mobility in public space is subject to a range of mechanisms of control, combined with decisions about travel – where, when and how – negotiated in the private sphere of the household and extended family networks (see also the chapter by Jirón). This common gendered reality is the reason for the importance of safety, fear and violence in gender and transport research across countries. The research in Soacha is illustrative of how women's mobility can be influenced by factors both outside and inside the home. As Bocarejo and Álvarez Rivadulla show in their discussion of the perceptions of Cazucá's inhabitants, women are confined to their home, “afraid to leave, in fear that their houses will be broken into and their daughters raped” but also because they are prevented from working outside the home by their partners (see chapter by Bocarejo and Álvarez Rivadulla).

There are at least two implications for transport planning. Within the transport system itself, interventions need to be sought which promote the planning and design of transport hubs, routes and modes as defensible, comfortable and welcoming spaces. The research in Medellín demonstrates how gendered perceptions of modal safety affect the modal choice of bus over

Metrocable by women (see chapter by Sarmiento *et al.*). Practices to challenge violence in Medellín also show that this is more than a physical undertaking. The creation of *Cultura Metro*, a set of behavioural norms enforced in Medellín's mass-transport system (see chapters by Brand and Dávila, and Agudelo *et al.*), is a powerful ideology in which the balance between social control, respect for, and freedom of individuals is delicate and needs constant monitoring. Although *Cultura Metro* is not explicitly gender aware, women recognise that they would be worse off without it, at the same time as complaining about its negative impacts – and still report sexual harassment in the *Metrocable* queues and on the crowded Metro (see the chapter by Coupé).

The second implication is the integration of transport planning with other urban planning interventions and especially physical upgrading of low-income areas. For example, the interface between transport routes and hubs and the neighbouring area or citywide facilities, is critical both for access to transport and for mobility in urban areas. The co-operation between the Metro Company and the municipality in Medellín, particularly in the development of K Line, provides an excellent example of the link between the planning and construction of the *Metrocable* alongside the integrated urban projects (*Proyectos Urbanos Integrales* or PUIs) to upgrade the public space around and between *Metrocable* stations (see chapters by Brand and Dávila; by Coupé, Brand and Dávila; and by Coupé and Cardona). Similarly, the location of public libraries in relation to the

Metrocable and Metro stations in Medellín is an example of the meshing of transport hubs with citywide facilities. The residents of Soacha clearly also perceive – and hope – that the creation of the *Cazucable* could attract a similar package of urban investment, recognition and visibility (see chapter by Bocarejo and Álvarez Rivadulla). While a gender perspective is not explicitly mainstreamed in the interventions in Medellín, the way spaces have been upgraded and developed make them safer and more secure for women and men, girls and boys.

In assembling the components of this kind of integration between transport and other local and citywide planning, the involvement of urban citizens has an essential contribution to make.

Transport Planning and Governance: Gender Relations in Decision-Making

Despite decentralisation and the increasing recognition of the significance of local government, coupled with the extension of democracy in local governance in contemporary cities, the practice of urban transport planning internationally is not known for its active incorporation of citizen participation. Yet, transport has powerful and often intrusive implications for daily individual and collective lives, which do not go unrecognised by urban citizens themselves, who often mobilise

collectively against the negative impacts of transport decisions. These include protest against high fares, questions of safety (the rape and sexual harassment of women in public space and public transport), and the eviction of slum dwellers through the expansion and development of transport routes (for example in Mumbai where women have played active roles alongside men in social movements).

Because of the deep-rooted gender ideology relating to public and private space, women are underrepresented in formal political structures in most countries. Ensuring the equal participation of women in city-wide and neighbourhood political processes requires a conscious effort to reach out to women and some men who, because of their social identities, are excluded from political decision making processes.

The notion of ‘social urbanism’ developed in Medellín presents an interesting challenge to the usual technical focus of transport planning. Participatory planning in local development plans and participatory budgets (affecting between 5%-10% of municipal investment resources) were viewed as central to neighbourhood upgrading through the PUIs – and ultimately to the process of reclaiming these marginalised areas of the city (see the chapter by Coupé, Brand and Dávila). While participation was not consciously gendered and did not seek equal representation from women and men, some women did participate and appear to have learned and benefitted from the opportunities afforded by these processes and even felt empowered (see the chapter by Coupé).

Reframing 'Travel Choice' in the Right to the City

Urban citizens are making daily trade offs about their use of transport to access essential activities in the city. These trade-offs are deeply gendered, and reinforced by other social relations. They are not optimal free 'choices', as transport planning assumes. Rather, travel decisions are made in the context of:

1. Transport systems that do not recognise the diverse needs and complex daily experiences of urban citizens.
2. Gendered expectations in the private sphere of the household and the extended family.
3. And contested notion of public space that is fashioned by societal norms that result in controlling freedom of movement on the basis of social identities (Levy, 2013).

The 'Medellín model' and the notion of 'social urbanism' developed in the city are a metaphor for an integrated approach to transport and urban development, and for the power of the strategic potential of this integrated approach to address urban inequality. While class is clearly central to this inclusive perspective, embracing a wider notion of difference and inequality may offer one avenue for strengthening this challenging notion and its wider application.

Taking this a step further, as I have argued elsewhere (Levy, 2013), locating a gendered view of transport within a Right to the City framework may more powerfully promote its recognition as central to the right to appropriation and the right to participation (Lefebvre, 1996) by

diverse urban citizens. This is not just a normative endeavour, but also a challenge to gender-blind transport planning which is an obstacle to its effectiveness in addressing diversity and inequality in contemporary urban areas. ■

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The Importance of the Experience of Mobility in Transport Planning. Learning from Santiago de Chile

Paola Jirón

Incorporating a focus of daily mobility is one of the newest forms of approaching urban transport planning today. A mobility approach has contributed substantially to advance discussion regarding current phenomena in the social sciences and has also raised questions and produced new points of view in terms of thinking about a given territory. One aspect to which daily mobility specifically refers is the possibility of linking the daily experience of travel with new forms of improving transport and urban planning. This work aims to shed light on these issues, using information from a study called “Daily urban mobility and urban social exclusion in Santiago de

Chile” regarding the experience of travellers’ daily mobility in Santiago, the capital and main urban centre in Chile¹.

Mobility has been extensively studied from a transport perspective; essentially from the disciplines of engineering, economics, geography and transport planning, business administration and regional studies (Johnston, 1981; Small, 2001). These are generally interested in understanding the travel patterns by means of origin and destination of daily journeys. In contrast, the “mobility turn”

¹ Funded by FONDECYT, Chile, N° 1090198. The author was Principal Investigator of the research project. For more information, see: www.santiagoosemueve.com

in the social sciences has revealed that the majority of transport research departs from an idea of space and the use that people make of space as fixed and restricted to certain areas. However, living in the city is directly related to people's daily experiences and the space of the city through a complex process of interaction between travellers, activities, spaces, places and mobility factors.

Mobility is central in understanding contemporary life in terms of how it changes and how it can develop over the next few decades (Urry, 2003a) and it refers to all the forms in which people relate socially to the change of place (Bourdin, 2003), which involves more than the sum of trips carried out. Urry (2003b) points out that movement has not been adequately researched, except for work by engineers and transport economist who tend to examine simple journey categories. However, to understand these connections means to concentrate more in the experiences that these 'mobilities' generate than only in the types and forms of transport, as mobility is above anything else a means by which to carry out activities of a social nature and not the aim of those activities in and of itself.

At the same time, while transport research fails to adequately consider the social processes involved in different journeys and how these affect peoples' lives, a large part of the research in the social sciences involved in travel/journeys have been 'a-mobile'. It ignores the movements that people make to get to work, to school, to meet up with family members, and access leisure facilities. Hence, they leave

to one side an examination of *how* social life presupposes both real and imaginary movements from place to place, person to person, and event to event (Urry, 2003a). A comprehensive focus of mobility practices requires that we comprehend the contemporary reality of movement (Lussault, 2003) and the impact that these make in terms of the construction of urban places, that is to say, the appropriation and meaning of urban space.

A deeper comprehension of the multiple and hybrid experiences of mobility appears necessary given that mobility is an increasingly dominant and constitutive element of contemporary life and urban space. On closer inspection of people's experiences, ideas regarding fixity, permanence that is present in the most part of urban analysis, one may begin to interrogate mobile experiences that emerge as fluid and multi-scalar processes in their situated complexity. This way of analysing mobility practices is part of the "mobility turn" which is allowing considerable theoretical, methodological and practical advances in the social sciences and in understanding contemporary societies.

On the other hand, one of the daily experiences that cause the greatest impact in the quality of urban life is daily mobility. Contemporary urban life is increasingly impacted by mobility, whether this be physical or virtual, in bus or car, on foot or bicycle. In the same way, *immobility*, or restricted mobility, can be clearly reflected in inequalities that are lived in our cities, due to the diverse dynamics that affect urban centres today.

Nowadays, mobility experiences reflect different access to education, employment, health, and recreation, amongst others. Moreover, they are based on distinct social conditions influencing one's possibility of encounters or dis-encounters during one's experience. That is to say, daily mobility is relevant to the quality of one's urban life, on one hand related to access to different spaces in the city, but on the other, it is also important with regard to how, when and with whom mobility is achieved or not.

It is worth highlighting that the experience of mobility has implications in people's lives, and these are not homogeneous; urban experiences are different for men and women, boys and girls. This means that the practice of inhabiting the city is different for all concerned and indeed has diverse implications, such as in the possible policy recommendations to overcome inequalities. Within this practice, there are different forms of experiencing the city, amongst other factors, these include gender differences, which intersect with generational and life-cycle differences, those of ethnicity, income, (dis)ability.

From an analysis of journey experiences, one may discover different 'mobilities,' that is to say, travel experiences are very different depending on who lives them: a child, a teenager, a mother with small children, an adult with luggage, a pregnant woman, and an older person.

On the other hand, "daily" refers to what people live on a daily basis: it is connected to places where women and men, girls and boys live, work, consume, enjoy, and relate with others,

building identities, facing or defying routine, habits and norms of established conduct. In the framework of these experiences, on the bus, walking, moving, standing, meeting people, sharing moments; these are the things that constitute the essence of being urban.

Understanding people's daily activities in time and space is important for three reasons. First, because current urban interventions do not incorporate the way in which people experience the city as urban and transport planning inform mainly through abstract data about the city, added to the fact that there is very limited recognition of how daily life feeds into policies and vice versa. There is a danger of 'instrumentalising' the 'daily' and cataloguing it in such a way that planning mechanises daily life, and in trying to modify behaviour as a form of social engineering. Second, it may be understood as a closer means of understanding what is really happening, how lives are affected by events, rather than abstract numbers and theories which are often dissociated from what people do.

Finally, the use of appropriate methodologies influences how one can understand daily life, in this case, as will be shown in this chapter, an ethnographic focus is the most suitable methodology for the research to better understand this daily reality.

It is important to analyse the practices and experiences of mobility of a person within a complex system of relations with other people or objects that form part of their decisions, practices, and experiences regarding daily movements. The

concept of inter-dependence is appropriate for describing, discussing and comprehending the conditions and consequences of the forms of daily mobility among the inhabitants of Santiago de Chile as they relate to social exclusion (Jirón and Cortés, 2011).

The study of daily mobility, from this perspective, constitutes a means through which to approach people's daily lives in terms of how they are organised or "orchestrated," given that the majority of people pass the great majority of their days orchestrating, like an orchestra conductor, in continuous movements in relation to others (Jarvis, 2005). There are then multiple relations of a diverse nature which make up daily life and yet allow a relatively rational organisation based on people's needs and resources. Explicit and implicit negotiations are key to these relations, alongside emotional and practical links that are found amongst family members, communities or through hiring services. These links can be seen when one approaches the practices and experience of mobility from the point of view of the people involved, as movement appears as a need to carry out daily activities, but also as an instance in which people negotiate and try to resolve varied aspects of daily life which on many occasions stress the closest social relations. From an inter-dependency perspective, mobility appears as a network that articulates diverse routines, resources, needs, interests, expectations, productive and reproductive roles of a varied number of people who relate to one another through emotional and/or practical links in the organisation of their daily

lives, which currently are not conceived without the existence of others in that network. The roles and position that each person has within this are not static and vary in accordance with stages in the life cycle, economic conditions and gender roles, amongst other variables such as ethnicity and physical conditions. The number of connections is also not fixed (Cortés, 2012). To show how this happens, we will present the travel experience of the members of a middle-income family who lives in the north of the city of Santiago and together use diverse modes of transport to inhabit space.

Gloria is married to Fernando and they live in a closed condominium in the Huechuraba Commune in the northern sector of Santiago. Fernando is a graphic designer and works in a construction firm in the 'Sanhattan' neighbourhood, the capital's new business centre. Gloria is in charge of all domestic tasks. They have three children: Sebastián, who is 19, is about to enter university and is attending pre-university in a centre in the city; Javier who is a teenager and in tenth grade in a boys school in Providencia Commune and Paulina, who is 10, is in fifth grade in an all-girls' school in Independencia Commune.

Until three years ago Gloria did not drive; all that she did depended on public transport, she went to the fair, to carry out paperwork or to search for a school for her daughter or visiting family in buses or shared taxis². In general, this meant long tiring trips, but she also had to organise her time well and spent more time at

² Taxis with fixed destination but flexible routes.

home or in her mother's house. Later, she learned to drive and the family bought an automatic car to make driving easier. At the beginning, she was scared and ashamed, she was intimidated when she drove with her husband, but little by little she got the hang of it, and began to take longer routes, and soon she was taking to the motorways without fear. Driving has been an important challenge for her; it has given her independence and allowed her to feel that she has conquered a great fear. At the same time, to be the holder of a driving license has granted her the title of the family's official driver, a dynamic family, with diverse daily activities, for those that move, she has become a slave to the car.

Although she has always been the family's core, this new ability made her indispensable, not simply for her nuclear family but also for her extended family. Gloria lives for the activities of others.

As they have only one car, she drops her husband in the morning and, to avoid the rush hour, they must leave before 7 am. Gloria wakes up early to prepare breakfast for everyone and their respective lunch packs. In this trip they take full advantage by bringing the two younger children who leave half asleep, eating their breakfast or listening to music with headphones. In this stretch, Fernando drives, initially on the Vespucio Norte motorway towards Providencia, they pass through the San Cristóbal tunnel and they enter Isidora Goyenechea where Fernando gets out and she then shifts to the driving seat. The trip is comfortable: despite the rain, the car heating means they do not feel the cold of the street.

Fernando leaves work at around 6 pm and takes the bus home with a friend and neighbour. This trip is more complex, the buses are full, and people leave almost asleep after a long day's work; they talk, sharing work gossip. They often have to change and wait for the next bus to come in the rain, and later walk two long blocks to get home. The journey is better together. Every Wednesday Fernando plays football with one of his sons. This is the day when Gloria rests and does not go out. After leaving Fernando each morning, Gloria continues her journey to Providencia, and later on to Bellavista to drop off her son Javier. Javier is in his mid-teens; he speaks as if he was older, but he is still young and his mother takes care of him. Every day he is dropped off at school after his father. In the afternoon he is grown up enough to use the metro, and travels with his friends to the metro station where his mother picks him up on her way to pick up her daughter Paulina. Sometimes he travels by bus and she picks him up at the nearest stop. They also have parties and visit friends and when they are very far from their neighbourhood she picks him up from their friends' homes.

Sebastián left school last year, and despite having good grades, he needs a very good score for acceptance in the Engineering degree at *Universidad de Chile*. He attends a foundation course close to the República neighbourhood and although his classes only start later, he takes advantage of the trip with his mother so he can be dropped at the city centre, close to a metro station.

Although Sebastián generally takes the metro or bus, he often calls his mother to pick him up, and if not to the centre, at least to the Américo Vespucio Norte Metro Station. Juan also plays music and just bought a guitar.

Paulina is 10 years old and still goes to school, she has a gym class and also music; she stays at school until 5 pm almost every day to do extra-curricular activities after which Gloria picks her up. She doesn't like her to walk alone and as the school is close to Gloria's mother's home, she often lets her stay with her in the afternoons and picks her up to take her home later.

Gloria and Fernando have always lived close to both parents in the El Salto neighbourhood, and they help with the chores of both families. Gloria's mother has a place in the neighbourhood fair on Fridays, and Gloria generally keeps her company. Her two sisters live close to her mother's house; one has a bakery and the other lives next to her mother. Gloria knows the neighbourhood well. A few months ago, her mother was diagnosed with breast cancer and Gloria accompanied her to the doctor each time she needed it. She is very concerned by the situation, but she says that

the best way to be close is to take her to have tests done, and it is the car that allows her to do this.

A large part of their family activities are concentrated in the El Salto sector. Family members and friends have lived there for as long as Gloria can remember. With her being so close to her family and to Fernando's family, she offers help whenever they need something. A few days ago, her great uncle needed to go to the doctor and she took him. If her sister needs her help to buy something, she also goes. And so it is that at least once a week, she transports one or other of her family members or friends to some part of Santiago, to doctors, supermarkets, for shopping, administrative tasks, and so on.

But, at the same time, she is the family home-maker, and thus on top of transporting her kin to their respective activities, she also has to go shopping and manage the family budget. She spends a large part of the day transporting people, and the few hours that she has left she dedicates to tidying up the house, cooking, cleaning, washing, ironing and doing her own chores. At the end of the day, she has chained herself to the car, and the freedom of knowing how to drive, has turned into a form of slavery. ■

Conclusions

Mobility experiences can shed light on more specific processes of how people organise their daily journeys, the complexities that they face and how they either do or do not interact with the city and modes of transport in this process. In this way, generally, transport and urban planners know little about how travellers coordinate their daily tasks, and how they overcome the obstacles that the city can impose on them.

One can see from this case study that mobility decisions are not individual, but are strongly linked to decisions of other members of the household, family members and friends. What decision they take can seem at times to be irrational when seen from the point of view of an efficient system, but fully rational if one understands the logic of the home. This implies that peoples' 'mobilities' are inter-dependent, that is to say, each decision is related to the responsibilities, tasks and desires that are orchestrated daily.

This also implies that inter-dependence happens not only between small children and their parents; there is inter-dependence between diverse social groups. In Gloria's case, the decision to buy the car, its use, and their daily schedule are all closely related to what both she and her husband can do. On the other hand, she and her children are inter-dependent and, although they are no longer so young, there is still a special care for them, mainly for her younger daughter, as she is

more apprehensive for her condition as a woman. Indeed, she and her mother also have an inter-dependent relationship due to her mother's age and failing health requiring that Gloria's mobility decisions are closely linked to what happens to her mother. This inter-dependence ensures that her daily planning is inter-connected with the decisions of others.

Moreover, it would seem that, although an important part of her journeys are carried out using a car, the journeys of others around her are not uni-modal. That is to say, mobility decisions are diverse and have multiple combinations, depending on specific circumstances, the ease of access to public transport, the possibility of traveling with others, and the ease of finding the best routes for their own ends.

It is important to highlight that practitioners of both transport and urban planning need to come to terms with the reality of contemporary urban phenomena. This implies not only rethinking citizen participation but, overall, the way in which a city is created, the way in which transport is modelled, the variables included in models, how these are combined with other sources of information, how space is designed for movement and non-movement and how, through an appreciation of the multiple and complex journeys that people really carry out, understand the way in which the city is used.

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Transport, Technology, and Urban Development: Reference Points for a Timeline

Hernando Vargas Caicedo

In order to offer some criteria to allow us to connect the generic notions of transport, technology and urban development, this chapter proposes some pointers to examine the historical development of cities as it relates to transport and technology.

The appearance of human settlements in the shape of linear villages arises from the gradual accretion of dwellings along traditional human and animal paths or new roads connecting gradually differentiated spaces, with some order, direction and purpose, in communities whose connections with the outside world are constantly changing. Settlements were established over rivers and other natural routes in resource-rich and fertile areas, and many societies were able to grow due

to economic and cultural exchanges that helped accelerate their evolution. Regularity and order offer foundations for improvement, as Confucius suggested in the 5th Century B.C., and proof of this were the unification of the size of wheels, writing and accepted norms of behaviour. With the security of dynastic power, trading centres drove economic growth on the basis of trading systems over long distances. Rome had substantial economic resources to form and control an empire thanks to its road system; in the European Middle Ages and the Renaissance communications were slowly taken up and future modes of transport such as carriages without horses and flying machines were dreamed up to conquer the world through exploration.

Societies such as the Phoenicians and later cities, leagues of cities or nations such as Venice, the Hanseatic League and the Netherlands focused on navigation and commerce. Already in imperial Rome there was road congestion that pushed cart traffic well into the night. Caravan cities turned into markets, with hostel and *caravanserai* infrastructure. Canals helped shape fields and cities, forming new landscapes and specialised technical labour. Groups of human ‘beasts of burden’ such as the Mexican *tamemes* transported goods over long distances; this all preceded the road networks on wheels that the mining industry would bring in colonial times.

Later, the narrow walled city gave rise to alternatives such as that of Leonardo da Vinci for the separation of roads and new ideal cities with wider streets and squares. On the eve of the Industrial Revolution, the European city had extended slowly and small industries began to appear in the countryside. Communication networks radiating out from France’s largest settlements were proposed and built as public goods in a centralised manner in the 17th Century. Ports, boats, docks, lighthouses and small shops were reinvented. In England, investors expanded the canal network, preceding both the road network and private investment in railways and the beginnings of the steam era.

The urban scene bore testament to new mobility needs. From litters and carriages for the privileged, such as hand-drawn carts, there began to appear omnibuses pulled by horses in the Paris of the 1820s, and this foreshadowed the appearance

of rail and trams. There was fascination with these machines, their sound and smoke, and they were celebrated as signals of progress and a new age. For them, the Saint-Simonian utopia proposed the construction of universal communication systems by strong leaders committed to the material and energy economy. This era so the appearance of collective urban transport services while steam trains appeared on the urban periphery, with stations that connected regions and markets allow trade to prosper. Trains crossed continents, traversed mountains, making great strides, before the steam engine and the internal combustion engine jockeyed for position, until the arrival of electricity.

The old urban centres faced growing populations and reformists such as Cerdà in Barcelona proposed suburbs without congestion, with city intersections, new steam ship itineraries and tarmacked roads that offered regional routes for cars and omnibuses. By the beginning of the 19th Century, trains covered Manhattan, in Paris there were protests regarding private concessions and in London the first underground rail system was built. In Paris, Haussmann embarked on widening roads in the old city, interconnecting peripheral train stations. Modernisation began to require bonds and private investment, and this became the fulcrum of public debate. Cities on plains, such as Chicago or Buenos Aires sprawled along train lines where new working class neighbourhoods appeared. In response to radial urban growth, there came claims to build ring roads to reduce congestion in the city centres. Entire ‘railway towns’ were founded and

a process of colonisation of areas away from the heavily populated coasts was made possible at first thanks to basic road access to connect networks of towns. Railways were central in connecting export economies with seaports. The railroad systems transformed large spaces and helped to impel growth. The linear city was a continuous economic space where population would grow alongside roads, as in the Soviet Union's new industrial cities of the 1930s. In these new societies, mobility management was made simpler by central planning and control of the ownership of land by the state.

In metropolitan areas, physical barriers to expansion were vanquished with draw-bridges, viaducts and sub-aquatic tunnels to ensure access and movement. Lifts allowed more intense land use in higher buildings and escalators sped up movement in public spaces. Cities such as Lisbon, Valparaíso, San Francisco and Salvador benefited from devices to move passengers on steep slopes. In areas where the economy was largely export-oriented, such as the coffee regions of Colombia, aerial cable-cars connected great distances and allowed both cargo and people to be transported along hilly inter-urban topographies. Electrification meant a growing constellation of interests, and alongside this came the municipalisation of the railways and the dawn of automobiles that faced increasing popular hostility.

The internal combustion engine and the automobile, a horse-free machine able to travel at high speed with the power of many horses, offered the promise of adapting to a range of demands,

localities, routes and freight needs. Lewis Mumford noted that mistakes made in the railways were again repeated with the car, as main roads criss-crossed the city despite the clustering, noise pollution and risks they brought with it. The Futurists believed in the cult of speed, and other interest groups promoted tourism, security regulations, surging suburban malls and exclusive suburban or national road systems. Real estate and industrial interests praised regional motorways as expressions of national power. Directorates of Public Works were created, taxes for gasoline and vehicles and tolls were raised, pavements, routes, road intersections, traffic lights, and organisations to control traffic were enlarged and modernised, and suburbs grew. Bus and taxi companies appeared, public trains and trams seemed inefficient and inflexible and electric buses became more important. Airplanes began to fly commercial routes demanding airports that required various changes and extensions facing the confluence of urban growth and technological change.

Urban systems that were sensitive to the ubiquitous car were proposed with large self-sufficient housing complexes and motorways over the buildings in city designs that combined large roads and speed with islands of green space, dwellings with increasing density and paths for pedestrian. Le Corbusier, through the Athens Charter, summarised concern for the centres, the traffic and the separation of city activities. Urban sprawl was made possible by a range of road sizes while streets in city centres were widened. In North America, urban motorway systems appeared with trefoils elevated above neighbourhoods and

communities. Ad hoc authorities had to be created to coordinate the construction of parks, roads, homes, bridges and tunnels in next to vast road complexes. Parallel to the idea of dispersing urban populations in new towns on the periphery of large cities, a range of incipient tools converged into a master plan as an overall tool to guide urban form, construction and mobility. For decades, the unlimited sprawl of many cities was the result of private developers taking advantage of the mobility offered by railways, buses and cars, a model that by the mid-20th Century was starting to stall. In many cities the state built low-income housing and allowed urban perimeters to expand into the surrounding agricultural land. In Mexico, Sao Paulo and Caracas large arterial roads were built to recover capacity and speed.

Rapid urbanisation took place first in industrialised and then in non-industrialised nations spurred on by a range of different causes, leading to uncontrolled sprawl and often the death of city centres. The existence of a single core increasingly gave way to the idea of multiple poles to revitalise and organise urban space, and the notion of 'cities within cities' was mooted. Pioneering traffic studies pointed the way to drawing on complex cross-disciplinary knowledge in pursuit of modal integration.

In the growing chaos arising from busy crossroads, multiple uses of streets, lack of car parks and congested peak hours, there arose radical proposals to appropriate new land or the alternative of a better traffic architecture, with an overall design that seeks to integrate the city, its traffic and

the built environment. In post-war Europe urban centres could no longer accommodate cars, which gradually gave way to pedestrians and bicycles and the regeneration of public spaces. Inspired in the urbanism of garden cities with roads doubling as green spaces, urban planning refocused much of its efforts on road systems, which were either newly planned or widened, followed by housing developments which broke the continuity of previous grid-patterned streets. Urban inter-municipal bus terminals and the relocation of massive wholesale markets brought new challenges for planning. Inter-urban systems with coordinated transport modes evolved in order to link urban nodes within large conurbations.

The 'unintended cities' of the developing world and many 'premature metropolises', as well as a growing number of newly-planned cities, can be contrasted with the host of utopian cities that were proposed, particularly in the 1960 and 1970s. The poor, often located in the urban periphery in areas of high risk, at significant distances from their work, in neighbourhoods with limited access, were increasingly segregated and marginalised from jobs and services, in the context of inadequate official upgrading efforts. The majority of cities could not afford the cost of large mass transport systems, a gap that was filled by a growing number of intermediate and often informal forms of transport, and official attempts to rationalise urban transit systems.

Dreams of models involving mega-structures superimposed on interlinked mobility systems appeared in some of the more dense cities

in the 1960s. There was greater awareness of the importance of time, leisure, wellbeing, personal choice (albeit subject to the ubiquitous factors of income and physical ability). In practice, there was a need to create mass transit authorities, propose models for urban growth, stages and scales of the structure of mobility, reorganise trams, trolleybuses, and railroads and build the first stretches of new metros.

In recognition of the specificities of urban life, in cases like Curitiba, Brazil, there were proposals to accommodate an integrated set of elements to ensure greater order and quality. The widening of roads, construction of intersections and new traffic light systems proved insufficient against the levels of motorisation impelled by social and economic changes. Air and noise pollution and energy consumption levels became growing concerns. The precepts of universal design were providing greater accessibility to transport systems. Once the attraction of the exclusively residential suburb had waned, there arose regional and urban periphery models incorporating small-scale neighbourhoods.

In developed economies, following the OPEC crisis of the 1970s, there were changes in patterns of economic activity within a context of increasingly flexible work and markets: expanded automated production, increases in geographic mobility, fast changes in consumption patterns, privatisation, deregulation and a reduced role of the State.

With the appearance of new technologies, automation and integration systems, we are now witnessing a greater commitment to the environment, more awareness about service quality, advances in management models in the fields of planning, construction and operation, and the re-discovery and updating of transport technologies such as light railways and aerial cable-cars. The performance of urban mobility systems embodies a society's awareness of the need to design and offer sustainable transport modes that make the most of technology with the aim of improving the quality of urban life. 'Zero emission corridors' and tolled motorways have superseded elevated urban motorways. In contemporary metropolises marked by a diversity of mixed land-use areas, large and dispersed populations with high levels of job rotation settle in areas of frantic economic activity.

New goals for cities include reducing the need for mobility whilst maximising access to transport systems, improve access to all areas of the city and the region, and reduce sprawl, integrate urban functions, and create a greater sense of ownership of the neighbourhood by its residents and workers, seeking to balance innovation with spatial organisation. In transport this marks a return to light railways, a recognition of the advantages of a range of modes, and whenever possible restricting movement to limited areas within the city. As the philosopher Emil Cioran argued, in the search for utopia we can only act when faced with the fascination of what is impossible. ■

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Lessons from
Medellín:

Aerial Cable-Cars, Poverty,
and Urban Development

Metrocables and 'Social Urbanism': Two Complementary Strategies

Peter Brand and Julio D. Dávila

In the formal city where accessibility is a dominant factor, new transport infrastructure generally energises real estate markets and stimulates new activities and patterns of land use. This principle is not so clearly applicable in poor and informal sectors of the city, which tend to function around more closed local economies and where lack of accessibility is simply one of a number of urban deficiencies experienced by the inhabitants of those sectors. From this point of view, it would be illogical to suppose that aerial cable-car projects such as the *Metrocables* in Medellín will provoke, in and of themselves, broader processes of urban improvement.

When the first *Metrocable* line was launched in 2004, the main objective was to improve access of the residents of those sectors to the main Metro system, while simultaneously taking advantage of the under-used capacity of the city's overground Metro. Once built, however, the city administration became aware of the potential of the *Metrocable* as a reference point for broader and more comprehensive urban interventions. Over time this set of complementary urban interventions became known as 'social urbanism' (Echeverri and Orsini, 2010; Alcaldía de Medellín/Universia, 2008) which in turn formed part of the

‘Medellín Model’, a project which was subsequently formalised at the annual meeting of the Inter-American Development Bank held in Medellín in 2009 and supported by that organisation through the creation of an observatory to systematise and disseminate the city’s experience.

The model itself is a conventional but well executed formula of good urban governance practice, comprising good governance (planning, fiscal discipline, transparency, participation and communication) and stressing education, inclusion, culture, conviviality and entrepreneurship, as well as social urbanism.¹ An analysis of the impacts of the *Metrocables* that fails to include the complementary interventions brought about by ‘social urbanism’ would be flawed. Innovations in mobility and urbanism go hand in hand, as will be shown in this chapter.

The *Metrocables*: Complement to a Mass Transport System

The idea of aerial cable-cars began to take form in Medellín in the mid-1990s. The first line began operating in 2004, the second in 2008, the third (a tourist line) in 2010, and two other projects are earmarked for completion by 2014. What is new about Medellín’s cable-cars is the use of established technology generally associated with ski *pistes*

¹ For an overview of some current official approaches to this type of interventions in Latin America, see Rojas (2010).

and tourist sites as a means of public transport in high-gradient low-income sectors of the city. Medellín was the first city in the world to make this imaginative leap.

The *Metrocables* form part of the Metro system (see Figure 1), which consists of two main, partially elevated rail lines and three aerial cable-car lines: K Line (which serves Communes 1 and 2 in the north-west of the city), J Line (Communes 7 and 13 in the west) and L Line (a tourist line, setting out from the K Line terminus and giving access to the Arví Natural Park some 800 metres above the Medellín valley). As is explained in the next chapter by Coupé, Brand and Dávila, funding for Lines K and J was provided by Medellín Municipality and the Metro Company, while L Line had additional funding from the Province (*Departamento*) of Antioquia, of which Medellín is the capital, as well as from the national government (see Table 1).²

Compared with other urban transport systems, cable-cars can be built over a relatively short period of time and at comparatively low cost as they require little in the way of land acquisition. The cost of K Line was around US\$24 million and that of J Line around US\$47 million. A notable disadvantage is that it is not technically possible to exceed 3,000 journeys per hour without incurring

² According to the national population census, in 2005 the municipality of Medellín had a population of 2.2 million; it is the most populated and most resource-rich municipality of the ten that form the metropolitan area, with a total population of 3.1 million in 2005. ‘Communes’ (*comunas* in Spanish) are administrative sub-divisions within Medellín municipality.



Figure 1: The Metro System in the Metropolitan Area of the Aburrá Valley / Source: Medellín Metro Company

high additional costs.³ However, a big advantage is that in a context of global concern over-dependence on fossil fuels and the effect of emissions on climate change, Medellín's aerial cable-cars operate with electricity mostly from hydro-electric sources, with virtually no local emissions (Dávila and Daste, 2011).

Although the Metro Company insists that the first *Metrocable* was a social project which aimed to extend the benefits of the mass transport system to poor and inaccessible neighbourhoods, the incorporation of high-density neighbourhoods into the Metro system's area of influence, until then served only by buses and taxis, meant a significant increase in the number of passengers for a then under-utilised system (Brand and Dávila, 2011).

By 2012, K Line had reached its near maximum capacity of 30,000 journeys per day, with the majority of passengers transferring to the main Metro line (see chapters in this section on travel patterns and users' opinions of the system). At the time of writing in mid-2012 J Line carried less than half this figure, but as the number of residents increases in the new urban expansion area of *Ciudadela Nuevo Occidente* located at the line's terminus, a similar number of passengers is expected in the near future. This implies a not insignificant contribution to the total of around 520,000 passengers transported daily by the Metro system.⁴

³ Personal communication, Eng. Luis Pérez, Medellín Metro Company, December 2011.

⁴ Data from personal communication by Eng. Theodor Kurk, Planning Directorate, *Empresa de Transporte Masivo del Valle de Aburrá Ltda.* (Metro de Medellín), December 2011.

Table 1: Metrocable Lines: Basic Information

	K Line	J Line	L Line
Launch date	August 2004	March 2008	February 2010
Construction time	14 months	15 months	10 months
Length	2,072 m	2,782 m	4,469 m
Commercial speed	5 m/s	5 m/s	6 m/s
Number of pylons	20	31	25
Number of stations	4 (including Metro station)	4 (including Metro station)	2
Number of cabins (capacity 10)	93	119	27
Distance between cabins	60 m	60 m	340 m
Operational capacity	3,000 passengers/hour	3,000 passengers/hour	1,200 passengers/hour
Estimated total cost	US\$24 million (at average 2003 exchange rate)	US\$47 million (at average 2007 exchange rate)	US\$21 million (at average 2009 exchange rate)
Cost per kilometre	US\$11.6 million	US\$16.9 million	US\$4.7 million
Funding sources	Municipality: 55% Metro: 45%	Municipality: 73% Metro: 27%	Municipality: 38% Metro: 34% Provincial government: 17% Transport Ministry: 9% Other: 2%

‘Social Urbanism’: Origins and Significance

‘Social urbanism’ in Medellín emerged from around the time the first cable-car began operation in 2004, and hinges on refocusing significant public investment towards the city’s poorest areas.⁵ Arguing that

⁵ The expression ‘social urbanism’ had been previously used in 1952 by Karl Brunner, an Austrian urban planner, who had a decisive influence in the planning of Santiago de Chile,

the city owed a ‘historic debt’ to these forgotten areas (see chapter by Coupé, Brand and Dávila), compensation for the ‘debt’ was to come from the construction of high quality infrastructure and

Bogotá and Panamá in the 1930s and 1940s before returning to post-war Austria where he became Director of Vienna’s Planning Directorate (Hofer, 1996).

striking architecture. With the slogan “the most beautiful for the humblest” (mayor Sergio Fajardo) the aim was “to activate the power of aesthetics as a motor for social change” (mayor Alonso Salazar). This involved a variety of urban projects structured around the *Metrocable* involving educational and cultural facilities, environmental upgrading and new public spaces, organised in space through the so-called Integrated Urban Projects (*Proyectos Urbanos Integrales*, or PUIs). Following the successful experience around the first *Metrocable*, similar interventions have been carried out in other areas of the city (Alcaldía de Medellín, 2010).

In practice, Medellín’s ‘social urbanism’ consists of a set of ideas and experiences, some original, others borrowed, developed over the past fifteen years. The *Metrocables* are the jewels of this crown. Like all ‘social urbanism’ projects, the *Metrocables* were implemented with close involvement and participation of local communities. Despite their low passenger-carrying capacity, the *Metrocables* do notably improve mobility conditions within the catchment area of the stations and their use involve no additional cost for Metro users (see chapter by Sarmiento *et al.*). They have also had a notable effect on urban integration. Marginal zones were given modern infrastructure that helps create connections and make residents feel part of the rest of the city (in the case of K Line, the journey from the city periphery 10 Km out to the highest point 350 metres above the valley on which the city centre lies can take as little as 20 minutes, excluding waiting times). Additionally, the *Metrocables* improved

access to what were previously considered dangerous areas and opened them up to local, national and international tourism (see the chapters by Coupé and by Agudelo *et al.* in this book).

‘Social urbanism’ then developed a series of interventions around these infrastructural axes. In the case of the first *Metrocable* (K Line), attention can be drawn to the Juan Bobo **housing** project, which received a ‘best practice’ award in Dubai in 2008. On difficult, steeply-sloping and unstable land stretching along a small stream, the project improved access, ordered public space, relocated in situ and improved housing, and mitigated environmental risks. This was all done through an intensive, micro-scale participatory process involving existing residents. There were no evictions, no land acquisition outside voluntary agreements, and no significant costs for local residents.

The **park-libraries** are a development of a series of projects implemented by Bogotá’s authorities a few years earlier, aimed at strengthening the presence of the state in low-income sectors of the city. In these, a wide range of services are offered to the community: access to books, information technology, training courses, cultural activities, recreation and sports spaces, social programmes, support for the creation of micro-businesses, among others. However, with six new high quality schools also built in the poor neighbourhoods of the municipality, the presence of the state is above all architectural: striking buildings which due to their scale, form, materials and colour stand out and contrast strongly with the monotonous housing environment, and loudly proclaim that the city



España Library-Park, Commune 1

administration provides them with infrastructure and facilities worthy of the well-off sectors of the city. The architectural designs were selected through international competition, but most are by young Colombian architects; the Moravia Cultural Centre is the last public work of Rogelio Salmons, one of Colombia's most outstanding architects. Beyond their immediate urban impact, these works have also stimulated a healthy debate on the quality of architecture in the city.

In terms of **project implementation** within the 'Medellín Model', three aspects deserve mention. First, the municipality established an extraordinary capacity for project management, centred on the Urban Development Agency (*Empresa de Desarrollo Urbano*, EDU). Created in 2002, this public enterprise unit brought together established technicians, fresh young professionals and academics new to public administration, a fortunate combination which allowed the implementation of novel ideas in short periods of time (in the case of park-libraries, for example, as little as 12-15 months). The existence of politically independent municipal administrations was also important in avoiding old clientelistic practices; this was especially the case under the Fajardo (2004-2007) and Salazar (2008-2011) administrations.

The second aspect relates to **financing**. Although the projects do not have especially high costs, all the projects have been financed by the city itself without having to resort to loans or international aid. EPM, Medellín's public utilities company (see chapter by Coupé, Brand and Dávila) has been an important source of finance for other

urban interventions by providing substantial social investment funds to the city (close to US\$900 million in 2010-2011) through the transfer of part of its financial surplus. This includes a significant contribution to 'social urbanism' and can be seen as a clear example of the benefits of not privatising strategic public enterprises.

Finally, it is worth underlining the **functional coordination and spatial coherence** of these projects, in the sense that the aim was to go beyond site-specific interventions, develop synergies and create conditions for area-wide improvement.

Social Significance

Behind these commendable and successful initiatives there was a deeper and more serious purpose: the reconstitution of the social fabric that had been shattered by decades of violence and which severely affected the city's population (Hylton, 2007). All urbanism has an explicit social content, but 'social urbanism' in Medellín went beyond the conventional. The municipal administration spoke not only of "building better architecture, which the people can be proud of and builds the community's self-esteem and sense of belonging", but also of 'leverage projects' that "lead to a profound social transformation". The aspiration was to build, literally, a new 'social contract' through the provision of spaces of citizenship, places for democracy and environments of conviviality (Alcaldía de Medellín/Universia, 2008).

There are, however, many obstacles to achieving these high ends: a city which is increasingly socially unequal and spatially segregated, with high levels of poverty, a growing social housing crisis, structural unemployment, alarming levels of informality and underemployment, and restricted opportunities for young people. Add the presence of youth gangs and criminal organisations resulting from the incomplete reinsertion of illegal armed movements in Colombia, the trafficking and consumption of drugs, and turf wars for territorial control, and the challenges remain considerable (Brand, 2010).

During a visit to Medellín a few years ago, the Catalan urban planner Oriol Bohigas voiced his admiration for an urban policy which he regarded as “fantastic, [and] of an extraordinary efficacy”, then adding “one has to say the good things and also the bad things. We are talking about a city which in reality is a catastrophe, with a high percentage of the population living in shacks [...] we are talking about a city scarred by very serious problems” (*El Colombiano*, 2007). Given the magnitude of the city’s material problems that social urbanism tries to address, the efficacy to which Bohigas refers cannot be but symbolic: the creation of *sensations* of social inclusion and the right to enjoy the city; the exercise of – if not full – at least a decent level of citizenship. The importance of the symbolic dimension and social potential of public buildings resulting from good design and high-quality construction should not be underestimated. But this on its own does not lead to miracles.

Conclusions

In this chapter we have drawn attention to the close relationship between the first *Metrocable* line and the complementary projects of ‘social urbanism’ implemented around it. When this combination was attempted in the case of the second *Metrocable* line, the same close articulation between these two elements and with the surrounding urban and social fabric failed to materialise, for several reasons: the topography was more difficult, complementary interventions were spatially disconnected from each other, there were lower levels of community participation, and J Line to a large extent sought to leap-frog the neighbourhoods closer to the Metro station in a bid to connect as efficiently as possible the newly developed area of *Ciudadela Nueva Occidente*, outside the municipality’s built-up area (see chapter by Coupé). In the case of J Line, the *Metrocable* and the practice of ‘social urbanism’ were pulling in different directions.

The contrast between the two areas underlines the importance of the close articulation between the aerial cable-cars and wider improvements through complementary urban projects. Firstly, while the construction of an aerial cable-car system is relatively quick and easy, exploiting its potential to improve the quality of the inhabitants’ urban experience demands a broad and constant effort closely aligned to the wishes of the local community. Only in this way is it possible to ensure that cable-car benefits

extend to the whole community, users and non-users alike. Continuous complementary urban improvement works also help consolidate trust in the city administration and foster private initiatives, whether individual, community or market inspired.

Secondly, aerial cable-cars should be the start of solid public investment in the sector, not only in a financial sense but also in terms of institutional resources and committed personnel. In the case of the *Metrocable's* first line, in the four years following its introduction, the city invested seven times the cost of the cable-car system in complementary urban projects.

Other elements of the contemporary urban agenda such as economic competitiveness have not been disregarded in the city, and spaces for the business sector have been created with the same or greater care as 'social urbanism' has been applied in low-income areas of the city. Profound social differences remain and continue to deepen. The leitmotif of the Alonso Salazar administration (2008-2011) was "Medellín: Solidarity and Competitiveness." At first sight this is contradictory, alluding, it might be supposed, to an internal solidarity and an external competitiveness. 'Social urbanism' in Medellín is, at root, the juggling of these two difficult to reconcile logics, kept afloat to date through imagination and commitment. ■

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Medellín: Institutional Context and Urban Paradigm Change

Françoise Coupé, Peter Brand and Julio D. Dávila

In the first decade of the new millennium Medellín underwent a series of major urban changes that have been widely documented in the local and international media. The city seemed to awaken from a dark period marked by economic stagnation, a lack of social cohesion and a sense of hopelessness arising from the violence that characterised the daily life of its inhabitants, especially the poorest.

In 2009, an official publication prepared jointly by the Medellín Municipality and the Inter-American Development Bank for the Bank's annual assembly which took place in the city that year (Alcaldía de Medellín and IDB, 2009), made reference to the city's 'extraordinary transformation', which it attributed, to a large

extent, to a series of policies and programmes of the municipal government, in particular the successive administrations of mayors Sergio Fajardo and Alfonso Salazar. The publication went so far as to name this sequence of interventions as "the Medellín Model of good governance and integrated social development." It was a second official baptism for the city administration: a few years earlier the term 'social urbanism' had been coined to refer to a range of localised urban interventions by the municipality (see previous chapter by Brand and Dávila).

For the sake of brevity we will not probe into the accuracy of these assertions. As was noted in the introductory chapter, our objective is rather to examine the nature and impact of some

of these local government interventions. We do not doubt that the city underwent considerable changes, especially in terms of a decline in levels of violence (particularly homicides), noteworthy improvements in the range and quality of public transport services and, in general, advances in quality of life indicators even for the poorest. In all of these the city administration played a central role, by channelling human, financial and political resources to sectors of the population, economy and infrastructure that desperately needed them.

This chapter outlines the administrative and institutional framework underpinning the urban interventions that have made Medellín an almost paradigmatic example for Latin America's medium-sized cities and other parts of the developing world. To the extent that the lessons from Medellín cannot be transferred to other cities without adaptation to their specific social, political and economic contexts, this background is indispensable to understanding the conditions that allowed Medellín municipality to direct substantial resources to a large sector of the low-income populations who were relatively marginalised from the rest of the city. Our focus is on some of the poorest sectors of the city most severely affected by everyday violence, but who were also the main beneficiaries of the municipality's urban and social programmes: Communes 1 and 2, in the north-eastern hills of the city, and Communes 7 and 13, in the north-west.

Medellín is the core of the Metropolitan Area of the Aburrá Valley, a conurbation and administrative authority comprising nine

municipalities in the *Departamento* (province) of Antioquia, located in the north-west of Colombia (see Map 1).⁶ Medellín is the richest and most populated municipality in the conurbation, with a budget that is considerably larger than the sum of the other municipalities.⁷ Of the approximately three million inhabitants of the metropolitan area, 2.3 million live in Medellín.

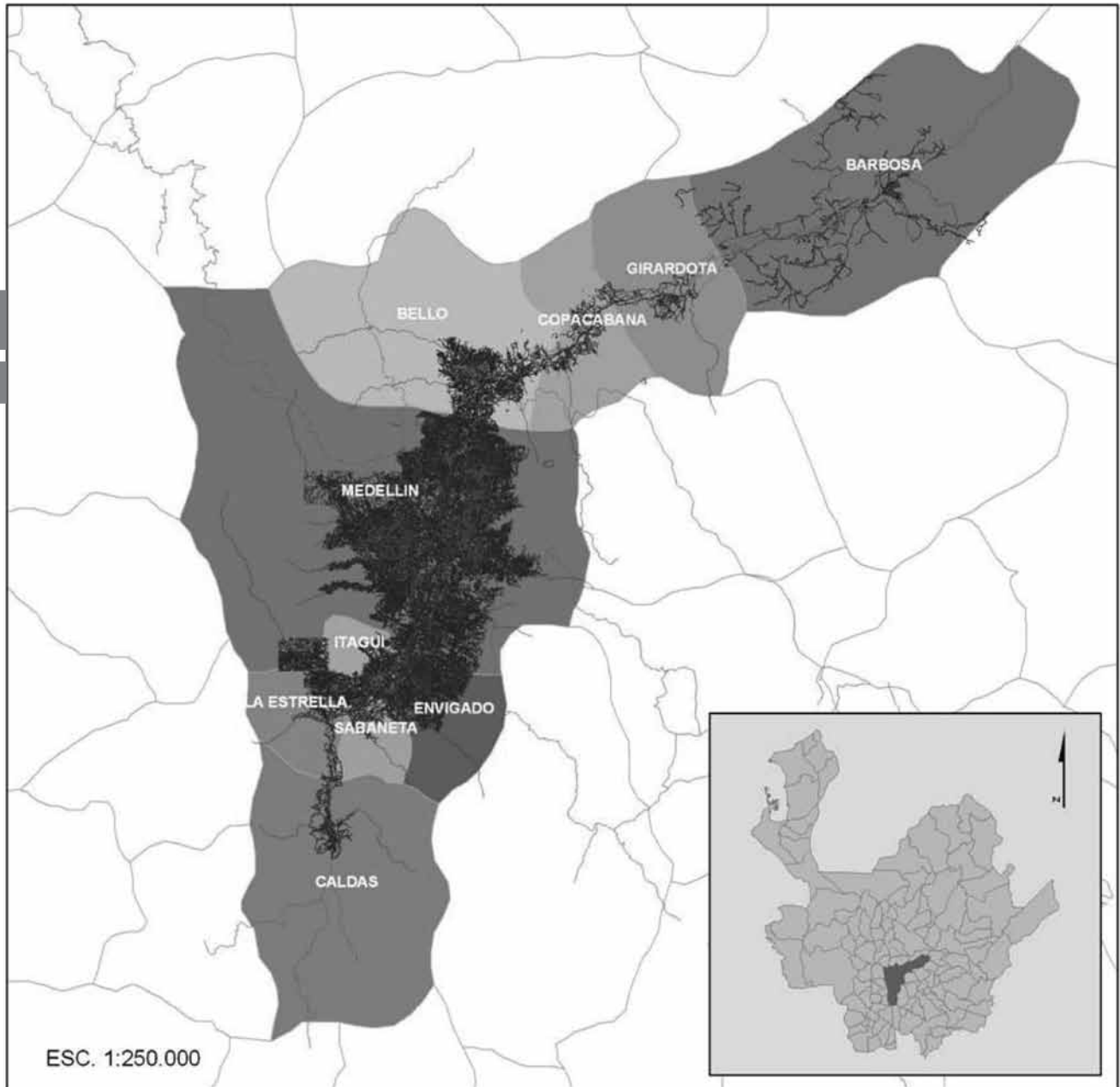
Map 1: Municipalities in the Metropolitan Area of the Aburrá Valley

Source: Área Metropolitana del Valle de Aburrá

While the metropolitan area extends in a linear fashion along the Medellín river, the city's pattern of growth is characterised by its expansion up the slopes of the narrow and deep valley, especially in the low-income neighbourhoods. In these areas, mostly built informally, coverage

⁶ A tenth municipality, Envigado, is part of the conurbation but not of the Metropolitan Area.

⁷ However, according to former mayor Sergio Fajardo, Medellín does not dominate the metropolitan area: "Medellín's mayor chairs the Metropolitan Board and has the right of veto; but I've never used it. Indeed, I would argue that far more integration is needed. As individual mayors [of autonomous municipalities] have so much power, then the mayor of the smallest municipality has as much power as I do as mayor of Medellín. I can't mess with their affairs and we play clean. Medellín contributes almost 85% of the resources to the metropolitan authority, and I've never said 'well, as we contribute all this, I want so much back in jobs or projects or such like, or I want influence over this or that.' Rather, it must be transparent." (Sergio Fajardo, interviewed by Julio D. Dávila shortly before the end of his mandate as mayor; Medellín, 10th December 2007).



M e t

of basic infrastructure services supplied by the municipality is adequate although other dimensions of urban development remain inadequate.

In particular, the number and quality of roads in these areas of the city are deficient and road construction is made difficult by a steeply-sloping and hazardous topography. This is the backdrop to the *Metrocable* systems, a flexible (though not strictly-speaking mass-transit) public transport system, connected to the main Metro system that complements the traditional land infrastructure and responds to the travel needs of a portion of local residents. The characteristics of the *Metrocables* and their relation to the municipality's urban interventions will be examined in the chapters that follow.

1976: Study for the improvement of the North-east Commune

'84 '85 '86 '87 '88 '89

1988-1989
Juan Gómez

1978: Metropolitan Transport Company (EMTVA) created

1984: Construction of Medellín Metro starts

1981: Metropolitan authority (Área Metropolitana del Valle de Aburrá) created

1985: Metropolitan Road Plan (includes first hint of *Metrocable* K Line) completed



Medellín's Communes / Source: Alcaldía de Medellín

Figure 1: Conception, Construction and Operationalization of Metrocables and 'Social Urbanism'

'90	'91	'92	'93	'94	'95	'96	'97	'98	'99	'00	'01	'02	'03	'04	'05	'06	'07	'08	'09	'10	'11												
1990-1991 Omar Flórez												1992-1994 Luis A. Ramos		1993: Primed · Integrated Neighbourhood Upgrading Programme			1995-1997 Sergio Naranjo			1996: Nuclei of Citizen Life Programme			1998-2000 Juan Gómez			2001-2003 Luis Pérez		2004-2007 Sergio Fajardo			2008-2011 Alonso Salazar		
Construction work on the Metro halted					1995: Metro inaugurated (30 November)					2001: <i>Metrocable</i> K Line contracted					2004: <i>Metrocable</i> K Line inaugurated (August 7) 2006: <i>Metrocable</i> J Line contracted (26 October)					2008: <i>Metrocable</i> J Line inaugurated (3 March) 2008: <i>Metrocable</i> L Line contracted (22 October)													
Development of ideas and preliminary studies about the <i>Metrocable</i>										Current Head of the Metro Company appointed										2010: <i>Metrocable</i> K Line inaugurated (Arví Park) (10 February)													
												Integrated Transport System expanded to include: · BRT <i>Metroplus</i> (approved in 2005) · Tram (approved in 2011)																					
												Consolidation of "social urbanism": · Library-parks · High quality schools · Integrated Urban Projects (PUIs) · New police stations in the city periphery																					

The history of the *Metrocables* is closely linked to three successive mayors of the municipality of Medellín (Figure 1) all of whom were young, highly qualified academically and intellectually distinguished, and each with their own vision for the city that went beyond that of traditional political groups. The first one, Luis Pérez (2001–2003), had been a professor at *Universidad Nacional de Colombia* (Medellín campus) and rector of *Universidad de Antioquia*. Although he was a candidate for the Liberal Party, his proposal, and often his style of government and actions, bore his personal stamp. When the Metro Company unveiled its technical studies for the first aerial cable-car in 1999, based on the Metropolitan Road Plan of 1985 which hinted at the need for some sort of link to the low-income hilly areas in the north-east of the city, he was alone among all the mayoral candidates at the time (including the subsequent mayor, Sergio Fajardo) in committing himself unreservedly to the project. In the midst of much cynicism concerning this new urban ‘toy’, as some called it, Pérez had the political courage, personal determination and management skill to carry out the project. He describes the situation as follows:

Medellín is a city that perpetuates and accentuates poverty [...] All popular leaders in a class-conscious society are looked upon with suspicion. Low-income neighbourhoods [...] lacked large projects [...] The municipality carried out small paternalistic projects, which didn't help anyone come out of poverty.

[As mayor] I looked for a strategy which would help redistribute income, bring progress

and urban development [...] The Colombian Constitution creates the conditions for what I call the right to the city [...] I said ‘we must implement projects for the poor as if they were for the rich; the poor are entitled to more than conventional projects for the poor [...] Poverty means no access to credit or to any of that which is essential for personal development.

Out every 100 pesos invested in public infrastructure, only one peso reaches low-income neighbourhoods [...] I decreed that contracts of up to 40 million pesos (US\$20,000) be awarded to community organisations [...] This was a radical change in the way the city is conceived.

[For the first Metrocable] we had to purchase land. Our initial fear was that, this being a very violent neighbourhood, gang leaders would oppose property sales, but this was made by analogy with upper class neighbourhoods [...] where the rich initially refuse to sell, have their properties valued and then expect to be paid double for them. [However] local gang leaders issued the order to ‘sell your property because progress is coming’ [...].

[For the construction of the Metrocable itself] we invited tenders, as required by law, for an insurance policy on project implementation [which protects the state and the contractor against unforeseen occurrences]. The first tender was unsuccessful since no insurance company was willing to take the risk. This was a terrible discrimination against a poor sector of the city [...]. The same happened with a second tender invitation, that is, it was impossible to secure

insurance. That was humiliating. They said we were too generous, that we were going to simply throw money away. I ordered the Secretary of Finance to create a trust to let the money sit there, public money, to underwrite the insurance policy. This meant freezing around 20,000 million pesos (US\$10 million) until the project was completed [...]. This gives an idea of the tortuous path required to begin a project which today stands as a thing of beauty and where everybody takes pictures of themselves.

To be honest, I also had my fears. What would happen if one of the cabins fell to the ground [...]. I'd be in prison today.

[After inauguration] residents of those neighbourhoods told me 'I used to say I'm going to Medellín, now I say I'm going to the city centre.' They didn't grow up as Medellín citizens. This little device integrates them [...] they don't feel discriminated against. We began to tear down those imaginary walls. I believe that this is a process.

[The Metrocable] increased the value of the poor's property [...] and injected some dynamism in the sector's economy. It's the first time that a bank has opened a branch there [...]. It brought economic dynamism and people feel proud.

The Metrocable cost us 70,000 million pesos at that time, about US\$30 million, to transport 40,000 people daily [sic]. And one very important thing: in Colombia we don't produce gasoline, but we do produce electricity [...]. The Metrocable is a success due to the seriousness of the Metro (Company), to the wonderful social

work it did. People love this means of transport, and this means that they respect it and take care of it.⁸

The first Cable was inaugurated by Pérez's successor, mayor Sergio Fajardo (2004-2007). The son of a well-known Medellín architect and urban planner, with a PhD in mathematics from a US university, he enjoyed a successful academic career at the *Universidad de los Andes* in Bogotá before becoming an independent mayoral candidate. His campaign manifesto was based on a rejection of political 'clientelism', a belief in the sacredness of public money, the importance of ethical behaviour and the professional competence of public officials, and the potential of the state to positively affect the lives of citizens. On receiving the first *Metrocable* he saw it as a platform to act with spirit and imagination in the poorer sectors of the city. Interviewed towards the end of his administration, he summed up his achievements as follows:

[In my time as mayor] we are carrying out some significant interventions in low-income areas, but I think that the majority of people in the city, when you ask them, will say: 'these are investments in us, the people of Medellín'.

There is a phrase by [the writer] Héctor Abad, who is a very good friend of mine, who said that we carried out wealth distribution without appealing to a discourse of anger or aggression. And in that sense [...] we have built park libraries, the whole of Medellín knows that there are park-libraries and everyone knows

⁸ Luis Pérez, interviewed by Julio D. Dávila and Peter Brand (Medellín, 17th October 2010)

where they are [...] and even if they don't use them, they still make people feel proud, feel part of society. We have vindicated the public sphere. We've put in all our efforts in the public sphere. We've supported state education, at a time when the general trend is towards privatisation with the argument that state education is of poor quality [...]. Instead we argued that it should remain in public hands, as it embodies citizenship and solidarity. And in Medellín we have given great emphasis to public education because it is an opportunity for social development.

I don't have any doubt that we have produced an incredible, incredible mental-conceptual change in this city. And the city needed it. It has historic value. Within a few years when they look back on it, people will say 'that was when they turned it around.' What happened in the recent elections? A candidate won who is from our political movement, something that never happened before, not even in Bogotá.

We changed the skin [of the city]. Where once there was hopelessness, now there are public spaces where people can come together. Violence had isolated us. We found ourselves and established new relationships. But everything we built in a public sense is associated with knowledge, with culture, with productive development, in a fight against social inequality and a search for conviviality.⁹

Alonso Salazar (2008-2011) succeeded Sergio Fajardo. He was Government Secretary

during the Fajardo administration and prior to that had no previous experience in public administration. Salazar was a journalist, writer and sharp analyst, with an unequalled knowledge of popular culture and the world of drug trafficking that affected the city. He kept the main thrust of the urban programme of the previous administration, further developing the proposals for aerial cable-cars and complementary urban projects.



⁹ Sergio Fajardo, interviewed by Julio D. Dávila (Medellín, 10th December 2007)

Without doubt they are all vital and important figures, but it would be wrong to personalise the analysis too much. It would also be a mistake to talk of a new ‘urban regime’ in the European or North American sense of a more or less formal and tight alliance of interests between a political leadership and an economic elite. Rather, the period is characterised by continuous and changing confrontations within a diversity of interests in the city. However, what sustained this urban policy effervescence and innovation was an underlying unity that drew on the strong regional identity and sense of pride of Antioquia province and its capital Medellín, along with the solidity and stability of its large business corporations and the local bourgeoisie. Moreover, the city could draw on a long tradition of well-established urban planning capacity.

The Municipality and the Metro Company

The Metro Company (Empresa de Transporte Masivo del Valle de Aburrá – Metro de Medellín Ltda.) was created in 1979 to manage and operate the mass transport system in the city. Construction of the main metro system began in 1984, and after long delays finally began operating in 1995. The Metro Company is responsible not only for the *Metrocables* but also for the bus rapid transit (BRT) system inaugurated in 2011, which brought dedicated road lanes to a fleet of high-capacity articulated buses. Since 2006 the Metro Company

has been consistently voted the most appreciated public body in citizen surveys (Medellín Cómo Vamos, 2012).

The Metro Company is owned in equal parts by the Medellín municipality and the *Departamento* (province) of Antioquia. Its board of directors is made up of two representatives of the governor of the *Departamento* of Antioquia, two representatives of the mayor of Medellín, and four representatives of the central government appointed by the country’s President. Its board originally appeared to have a strong political tint, but later acquired a more stable and business-oriented management. The representatives from central government tend to be local business figures who help ensure stable technical-financial management,¹⁰ and indeed, the current chief executive has occupied the post since 2001. The Metro Company is one of the very few metros in the world that is self-financing in operational terms, and enjoys an AA- financial rating (Fitch Ratings, 2011). The functional autonomy of the Metro Company and the priority it gives to financial stability can, however, cause friction with the Medellín mayor’s office in other matters related to urban development,¹¹ but it undoubtedly constitutes a technically efficient and financially

10 Ramiro Márquez Ramírez, General Manager of the Medellín Metro Company, interviewed by Peter Brand and Julio D. Dávila (Medellín, 16th September, 2010).

11 José Fernando Ángel, previously Transport and Transit Secretary for the Medellín Municipality under the Fajardo administration, interviewed by Peter Brand, Julio D. Dávila and Iván Sarmiento (Medellín, 29th March 2011).

solid company. The construction of the *Metrocables* was carried out on these firm bases. This is very important in the Colombian context since central government, in principle, does not co-finance urban aerial cable-cars due to their limited capacity (3,000 passengers/hour) which is well below that of other mass-transit systems such as the BRT.¹²

Medellín's Public Utilities Company (EPM)

Another important public body in the construction of the *Metrocables* and implementation of complementary urban projects is the city's public utilities company (*Empresas Públicas de Medellín* S.A. - EPM), a municipality-owned public

company providing water, sewerage, energy and communications services. It also produces 20% of the country's electrical energy and has investments in other countries, especially in energy generation. It is the second largest company in Colombia after the national petroleum company (*Ecopetrol*), with an AAA national financial quality rating (Fitch Ratings, 2011).

EPM not only provides, at commercial prices, the energy (largely from hydro-electric sources) for the Metro, but also makes a significant contribution to capital investment projects in the city. Between 2001 and 2011, EPM transferred an average of 50% of its surplus to the municipality, which represented 27% of the city's capital investment.¹³ Given the size and

Table 1: EPM Transfers to Medellín Municipality, 2008-2011 (in millions of Col\$)

	2008	2009	2010	2011	%
Ordinary transfers	333,327	399,519	509,343	437,346	55%
Discretionary transfers	187,500	187,500	337,500	360,154	45%
Total transfers	520,827	587,019	846,843	797,500	100%
Annual change in transfers		13%	44%	-6%	
US\$ equivalent (millions)*	265	272	446	431	

Sources: EPM, 2012 (www.epm.com.co/site/Home/Institucional/Relaci%C3%B3nconelMunicipio.aspx) and Banco de la República, 2012 (http://www.banrep.gov.co/series-estadisticas/see_ts_trm.htm#tasa)

* Average annual exchange rate.

¹² Pedro Luis Jiménez, Coordinator, Management Unit for Private Participation in Infrastructure, National Planning Department, interviewed by Julio D. Dávila (Bogotá, 2nd July 2009).

¹³ Federico Restrepo, EPM CEO (and former Director of Municipal Planning in Medellín under the Fajardo administration), interviewed by Françoise Coupé and Julio D. Dávila (Medellín, 25th March 2011).

profitability of EPM (in 2010 the company's assets were valued at US\$10 billion), these transfers are considerable (see Table 1) and a significant element in the city's capacity to finance the *Metrocables* and complementary urban projects. In the period 2010-2011, EPM's contribution to the municipality amounted to US\$877 million. This gives an idea of the relevance of maintaining public ownership of the company (and its surplus) in terms of the social and economic development of the city.

All of the above suggests a structure consisting of very solid political institutions and public companies: technically efficient, economically profitable, and well coordinated around urban development policy.

The Relationship of the Municipal Administration with Citizens and Their Organisations

The institutional structure described above is effective for the implementation of projects, but in and of itself does not guarantee their success in social terms. In the case of upgrading projects in low-income settlements, it is particularly vital to establish a close relationship with communities and local organisations so that such projects can be assimilated and 'owned' by residents. Medellín has a long tradition of planning and urban management, and over recent years considerable effort has been made to strengthen relations

with local communities and citizens in general. It is worth underlining two dimensions of this relationship: participatory planning and participatory budgets.

Participatory Planning

The 1991 Colombian Political Constitution placed participatory planning at the centre of a national political accord, with the aim of strengthening and controlling development plans at all scales so as to convert them into key participatory features of a new collectively constructed rationality.

In the following years this idea was developed through extensive legislation, some of the most important concerning the programmatic vote (Law 131 of 1994), mechanisms for participation mechanisms (Law 134 of 1994), the creation of Local Administrative Councils (Law 136 of 1994), and participatory budgeting (National Decree 111 of 1996 and *Acuerdo* 43 of 1997 of the Medellín City Council). Building on these foundations, Medellín's planning system is considered one of the most interesting and advanced in the country.

Participatory planning has great potential when carried out with transparency and respect: it generates ties of mutual trust between civil society and the state, and constitutes valuable social capital for municipal or rural development. This social capital is a crucial factor in promoting administrative efficiency and community

participation, in that it allows information sharing in the collective analysis of complex processes, and studies demonstrate that it can help break the cycle of violence, political clientelism and corruption. It also encourages the participation of sectors generally excluded from public decision-making, and the integration of actors with different and at times contradictory interests. Finally, it can be seen as a strategy to gain the commitment of civil society in the implementation of development and spatial plans, along with their specific programmes and projects.

The inclusion of social capital in urban management in Medellín has been an important feature extending across all stages of the process, from problem analysis to decision-making. As an objective it has been announced in the titles of successive development plans: “Medellín: A commitment for all citizens” under the Sergio Fajardo administration (2004-7), and “Medellín: Solidarity and competitiveness” under the Alonso Salazar administration (2008-11).

Participatory Budgeting

Participatory budgeting is a tool for annual planning which helps to prioritise demands through co-management (UN-Habitat, 2004). This had previously been carried out in other cities, of course. Porto Alegre in Brazil pioneered participatory budgets in 1989 and by 2007 around

150 cities had some experience of participatory budgeting. Medellín gave some tentative steps in this direction before 2004 (Valencia *et al.*, 2008). From 2007 onwards these were strengthened and participatory budgeting was made into a central strategy to improve and strengthen the relationship between the local state and society. Through this mechanism, the aim was to generate trust and governability via exercises in the collective construction of local development plans and the political participation of local populations (Carvajal, 2009).

Participatory budgeting was the operational framework used during the construction and operation of *Metrocable* Lines K and J. The municipality invested substantial sums of money in the 16 communes and the five rural zones (*corregimientos*) within its administrative boundaries: around US\$348.2 million between 2004 and 2011. The largest investments were carried out in Communes 1 and 2 (commonly known as Popular and Santa Cruz) in the area of influence of *Metrocable* K Line.

Through a participatory budgeting process local communities decide how to spend between 5% and 10% of municipal capital investment. Initially seen as a risky political commitment, today it is widely seen as an excellent management strategy. Though still a small proportion of total resources, communities have responded with enthusiasm, and participatory budgets have helped strengthen social and local community organisations. At the same time, these have developed a much broader

conception of local development. While they at first directed these resources to tangible physical works, they now assign a large part to processes of social advancement such as university scholarships for young people in Commune 1 and programmes promoting conviviality and citizen participation. ■

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The *Metrocables*: Risk, Poverty, and Inclusion

Françoise Coupé

“If you ask about the Cable and its current use, about the good and the bad of the system, you will hear different opinions. But don’t worry [...]. Everyone has their point of view depending on various issues [...]. Go on asking and you’ll see ...”

A commuter queuing to get on to K Line



An important part of the socio-economic analysis of the study areas served by the *Metrocables* consisted in visits to the communes and field observations, meetings with community leaders, and individual and group interviews with the inhabitants of the neighbourhoods traversed by both Lines J and K. In this chapter we illustrate the results of some of these activities, giving special emphasis to the opinions of commune residents.

A Trip Through the Neighbourhoods

Metrocable K Line starts from Acevedo station on the main Metro A Line, from where it crosses the river and rises up above Communes 2 and 1 until it reaches the Santo Domingo neighbourhood. There are significant contrasts along the route.

The neighbourhoods in Commune 2 have smoothly graded slopes and have an informal origin. This first lower part of the commune was established more than 50 years ago, when plots were laid out without planning permission but using a formal grid pattern which allowed for future road and utility connections. The property developer sold the plots on an instalment basis to poor families; there was no initial public service provision and land deals were negotiated at the legal margins. Nevertheless, this urbanisation process subsequently allowed the route of the cable-car system to follow a road with good specifications through a neighbourhood with relatively ample public spaces.



In this initial period housing was produced in stages, in accordance with the needs and economic possibilities of those who bought the plots. Bearing in mind that housing was largely self-built by dwellers themselves, the quality of construction is reasonably good. However, there are instability problems and the risk of landslides in some of the areas located alongside the steep stream valleys crossing the sector. There is also evidence of recent precariously built housing,

some of which has benefited from interventions by the city's Urban Development Agency (*Empresa de Desarrollo Urbano, EDU*) within the framework of neighbourhood upgrading programmes, parts of which received a 'good practice' award by the United Nations (see earlier chapter by Brand and Dávila).

Continuing upwards towards Commune 1, the topography gets more difficult and the majority of the steeply-sloping areas were developed following invasions of land by residents who could not afford to buy legal plots of land. These began in the 1970s through long and often violent processes of land appropriation, usually involving land belonging to private owners. This form of land occupation helps to explain why the urban layout has poor specifications. Here the cable-car hovers above the dwellings, and

its construction required the expropriation of numerous houses and changes to rights of way. Such were the spatial limitations of this sector that new public spaces were developed around the *Metrocables* by both the Metro Company and the municipality through its first Integrated Urban Project (PUI) (see previous chapter by Coupé, Brand and Dávila).

Here houses are generally smaller than in Commune 2, having started life as basic shacks though regularly consolidated and upgraded, while the neighbourhood around them became more densely built. This type of housing still characterises the more recent settlements located in risk zones on the highest gradient slopes above the K Line's terminus station (Santo Domingo).

Conditions are quite different along the route of J Line, conceived as a way of connecting



the Metro system to the municipality's main area of expansion. Departing from the San Javier terminal station of B Line of the main Metro system, it traverses zones at the edges of Communes 13 and 7. The terminal station is located in the established sub-centre of San Javier, a consolidated neighbourhood whose core is under transformation from increased commercial activity. From there the cable-car system passes above an informal neighbourhood and then a land invasion sector, but contrary to what happened in Commune 1, here the Metro acquired little land or access rights.

The Cable then continues through a marginal sector of Commune 7, above several 'barrios' (neighbourhoods) that originated as land invasions – some inhabited and others abandoned due to the severe social conflict that afflicts the area, especially due to the presence of illegal armed organisations – all on high gradient terrain. It then falls sharply down the valley to the La Iguaná river before climbing up to the city's expansion zone, *Ciudadela Nuevo Occidente*, developed by the municipality in partnership with the private sector, and currently undergoing intensive development consisting of social housing estates.

This information is important in order to understand the differences in urban processes and living conditions in a city where 25,000 people arrive every year as a result of the low-level violence that has marked some regions throughout Colombia's recent history (see chapter by Coupé and Cardona).

Informality, Education, and Violence

Although the economic impact of the *Metrocables* is discussed in the chapter by Coupé and Cardona, an examination of impact should not restrict itself solely to questions of employment and income patterns in the zones of influence of the aerial cable-car lines. The deep inter-personal inequalities that characterise Medellín is a composite of many factors, including “the type of insertion in labour markets, the instability and variability of incomes, household composition and the fragmentation of social spaces” (Universidad Nacional de Colombia, 2006).

Levels of unemployment are high, to which should be added those people working in the informal sector of the economy. According to the previously cited report, between 2001 and 2005 the proportion of the working population in the informal sector of the labour market was over 53% for Colombia as a whole, and in Medellín this figure reached 55%. This proportion is even higher in Communes 1 and 2 and in some sectors of Communes 13 and 7. Despite new policies and considerable investment that helped improve living conditions, the city's human development index and levels of inequality (through measures like Gini coefficient), suggest that levels of inequality remain high (see Figure 1).

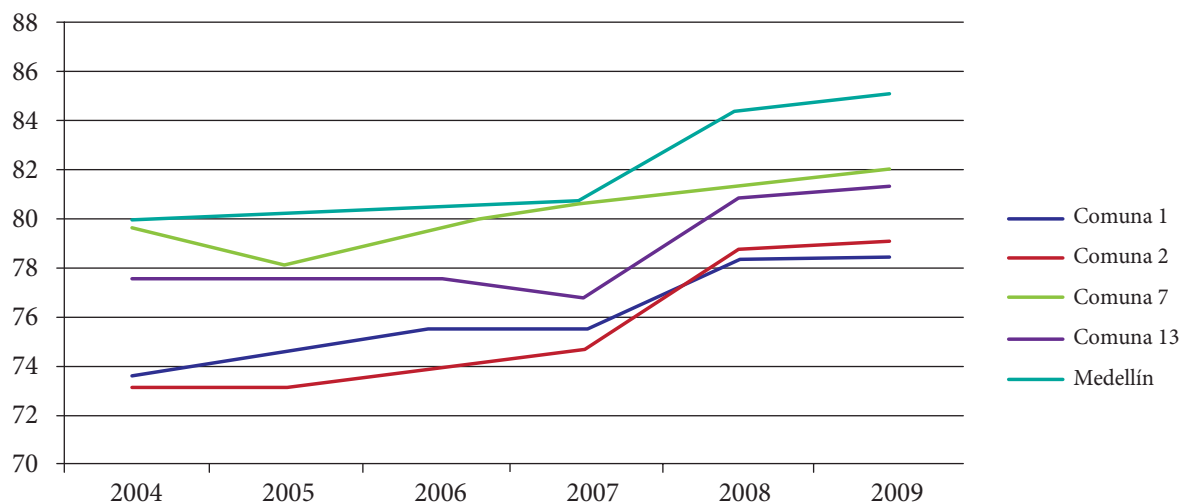


Figure 1: Human Development Index in the Area of Influence of Metrocables and Medellín, 2004-2009 / Source: Área Metropolitana del Valle de Aburrá (AMVA)

This situation particularly affects sectors with the highest level of work and economic insecurity, which at the same time face problems of social vulnerability associated with low levels of education and precarious health conditions. Moreover, they have high exposure to natural and socio-natural risks, high levels of drug dependence, teenage pregnancies and break-ups of traditional family structures, factors that contribute to the reproduction and perpetuation of inequality. These conditions are also expressed in spatial organisation, with a trend towards social stigmatisation insofar as the general public tends to associate poverty with violence, and consequently a marked segregation of those populations. All this helps explain

why residents we spoke to saw in *Metrocable K* Line a significant means to “make poor neighbourhoods visible” to the rest of the city.

This type of understanding developed by the city’s inhabitants, those that live in the communes and those using the *Metrocables*, contributes to major processes of community organisation, participation and local management. This is aided by the practice of participatory budgeting (see chapter by Coupé, Brand and Dávila), and is articulated to wider consultations leading to the joint formulation and implementation of local development plans by residents and local authorities.

In this context, one of the greatest issues of concern is education, which is intimately connected

to expectations for economic and social change. For example, the inhabitants of Commune 1 regard education as the best and most efficient strategy to counteract violence and inequality, to generate new job opportunities and to improve conviviality. They are aware of the limitations they face due to educational deficits so are prepared to give their unambiguous support to the municipality's early-learning ('Good Start') programmes for the under-fives. This also explains why education is an important community issue in participatory budgets, especially with regard to adult access to higher education, in which many community leaders take part.

In addition to low levels of education in the four study communes, we should also highlight the question of access to the subsidised state health system¹⁴ as an important indicator of poverty and dependency on the state. In 2004, 57.4% of the population in Commune 1, 53.7% in Commune 2, and more than 30% in Communes 13 and 7 relied on state-subsidised access to the health system. These figures have dropped in recent years due, amongst other reasons, to some household heads entering the formal labour market, regulatory changes that prohibit multiple affiliations, a change of methodology in the application of the system, and a national reduction in quotas. At the same

¹⁴ In the Colombian contributory health subsidy regime a person formally linked to a firm pays a percentage of their salary to have access to healthcare, a pension and professional liability insurance for them and their family. An individual who is not formally linked to a firm does not have access to these services and as a result is vulnerable, and must resort to state subsidies for temporary access to healthcare services.



time there has been a steady increase in the proportion of the population contributing to the state social security system. Over the period 2004-2009, the number of affiliates rose by 45% in Commune 2, by 60% in Commune 2, by 11% in Commune 13, and by 70% in Commune 7.

Finally, mention should be made of the issue of public order linked to the presence of armed actors in all the four communes, who engage in acts of frequent and sometimes extreme violence in order to gain control of local territories. Their presence seriously affects time and place and has a considerable impact on the population's living conditions, subjecting them to extortion, aggression and a permanent state of anxiety. This was especially evident during the workshops carried out as part of this research with the population from Commune 13, who pointed out the impact for resi-

dents of intra-urban displacement, and complained about the high numbers of homicides and illegal disappearances.

In the context of decades of limited institutional presence, beginning with the urbanisation process itself and later extending to new forms of vulnerability, the *Metrocables* acquire a special meaning for the neighbourhoods served by them. They are perceived as an element in a gradual process of forging new links between the many instances of the municipal government and the Metro Company and what were until recently forgotten areas of the city.

Residents' Opinions

Interviews with residents and users of the transport system took place in the Metro, on buses and in public spaces or during the workshops held as part of the research. The aim was to help understand and analyse the diverse perceptions of the *Metrocables*,

and enrich our own reflections and observations with their experience and opinions. Many similarities but also differences and even contradictions came to light, with people coinciding over one issue and expressing marked differences over another.

However, one aspect of general agreement emerged in the areas of influence of both *Metrocable* lines: the way in which the cable-cars lines have contributed to making more visible those populations discriminated against due to their poverty and the violent environment in which they must live. The creation of stigmatised and segregated areas of the city based on their conditions of informality, irregularity and sometimes illegality, was seen as evidence of the 'historical debt' owed them by a protracted institutional absence of the municipality from these areas, and the need to generate transformations.

The Medellín population as a whole seems to agree, shown in their curiosity to "ride the cable-car" or "get to know the city that we have turned our



back on”. This is the case especially in relation to K Line (which terminates at Santo Domingo close to the España park-library and connects to the tourist aerial cable-car line to the Arví Park). Far fewer numbers have travelled on J Line (which connects to the San Javier Metro station) to visit *Ciudadela de Occidente*, even though it doubled as the ‘Olympic village’ for athletes during the South American Games hosted by Medellín in 2010.

Following this first approximation, a range of opinions began to emerge in different shades regarding the impact of the *Metrocables*.

Many people interviewed along K Line spoke enthusiastically about the new “environmental tourism” in their area, even before the construction of the tourist L Line that connects up to the Arví Park.

They quote visitors’ words such as “it was well worth coming ... amazing scenery!”; “what a great view of the valley and the city!”. Yet few visitors seem to notice the neighbourhoods around the stations. Residents mention new job opportunities, the opening of a restaurant or the flourishing commercial activities but also refer, timidly, to the situation of many young people who act as local visitor guides, some of whom had had abandoned their studies and appear involved in “sex tourism”.

One inhabitant from Commune 1 insisted that “the Cable is here and not in another area because it is strategic for different geopolitical reasons: public order problems, the opening of a route to Guarne [a nearby rural village], controlling informal transport, amongst others.” He added: “if you want



Focus group in Granizal neighbourhood

proof of what I've said, just note your own presence here, doing a study with researchers from abroad.”

This issue caused a reaction among participants in one of the workshops. They responded that before the *Metrocables* “electricity could only be supplied via illegal hook-ups”, “businesses provided no income”, “people were afraid of coming up to these parts” and “they transported us in vehicles (buses) that were 50 years old and lacked proper breaks”. They then proudly announced that “progress is clear” in their neighbourhoods where, besides the cable-car system itself, there are new and/or renovated educational institutions, well-



conceived public spaces or ones that are under construction, astro-turfed football pitches and business start-up centres (*Cedezos*).

These references to a ‘before’ sparked further observations regarding the consequences of the construction of the *Metrocables*. Some people interviewed complained that “the local labour force that was hired during project construction has returned to informal jobs and now face great difficulties in re-establishing access to subsidized healthcare services [which they had to give up] once they were employed formally through contracts with the municipality and the Metro [Company].

There were also inhabitants who pointed out, with some resentment, what the projects had meant for those people who had lost their dwellings or jobs due to the construction of K Line. They spoke of families that had to sell their housing “which was no longer a mere shack” for the construction of the stations or public spaces, that “had received money but not sufficient assistance, despite being victims of the project”, and of bus and taxi drivers who had lost their jobs and family livelihoods. And they added comments about the “change of socioeconomic classification of Street 107 and what will happen [to local residents] when the agreements made with mayor Fajardo get forgotten” (see the chapter by Brand and Dávila).

Returning to the present, many people mentioned the impact of the *Metrocables* in terms of how environmental risk zones are understood. For example inhabitants in J Line’s area of influence, especially people from the steep slopes of the La Iguaná valley, commented: “the Cable pylons

are constructed where we weren't allowed to live because [they told us] the land is unstable and prone to landslides [...] The problem, then, is not one of risk but poverty and the lack of resources to stabilise the soil and build on these slopes." References to K Line took a similar form, insisting that several families were evicted to build the España park-library, even though this new construction was "much heavier than the shacks."

The issue of drops in levels of inter-personal inequality was little-mentioned at first, despite its importance for the municipal authorities and the Metro Company (see the chapter by Coupé, Brand and Dávila). However, the impact of the *Metrocables* on inequality did emerge through two related issues. Firstly, some women, especially in Communes 1 and 2, referred to their experience as a learning process, with regard to the construction of the cable-car system, the implementation of the Integrated Urban Projects, the formulation of local development plans and participatory budgets:

"women are empowered; more than the other leaders, they know the reality of the sector and they make efforts to generate spaces for discussion and debate. What's more, everyone recognises how women have taken advantage of training programmes at all levels. In this sector women are strong and exercise leadership to transform living conditions." This could be interpreted as meaning that inhabitants of the four communes consider a decrease in gender inequality more a result of their own efforts rather than an achievement that comes from urban and social policy or from inter-institutional and community processes.

There are divergent views among residents of the *Metrocables* as a mode of transport: some point out a lowering of travel costs and time savings, whereas others complain about the long queues at peak hours.

The chapter on the economic impacts of the cable-cars by Coupé and Cardona indicates that transport costs have fallen considerably for



those who make multi-modal trips (cable-Metro-feeder bus), and this compensates for the waiting time lost during peak hours. In this respect, one user of the K Line argues that “the week when the [Metro] company carries out [annual] maintenance on the Cable and there’s no service is the most costly week of the year for me – it costs me twice what I normally pay – and it’s when I have to get up earliest to get to work.”

Some participants mentioned difficulties in acquiring tickets and pointed out that “we would lose less time with the ‘Civic Card’ (a magnetic card for use in the Metro system, similar to a debit card), but to charge it and avoid having to queue twice, first to pay and then to get into the cable-car, you have to have money in your pocket for more than one journey, and here we all live a hand-to-mouth existence.”

However, the price of a ticket and journey times are not the only things which influence the decisions of both users and non-users of the *Metrocables* when they opt for one or other means of transport. The people consulted also take into account issues such as destination, personal conditions, activities to be undertaken, safety and comfort, distance to the station, trip motives and who is accompanying them. Some young people added that “in the buses it’s possible to get on through the back door without paying, ask for a discount, or even arrange to pay later if you know the driver.”

Furthermore, particular groups have specific and important comments which complement or contradict the opinions already expressed.

Young pre-secondary school age children seldom use the *Metrocables* and, when they do, an adult generally accompanies them. For them, “taking the Cable is for fun,” an “adventure in the sky” or a “something to do” at the weekend.

Some informal sector workers complain that they are not allowed to use the *Metrocables* and even the Metro when they travel with their tool bags or lunch pots and argue that “the controls might be good, but they should also take into account that we live from the work we get here and there; due to the hassle [of the Metro], we have to travel on one or more buses or buy a motorbike; that’s not good.”

Other workers highlighted the fact that their activity (e.g. messenger, goods distributor and so on) requires many trips and “in this case, there is nothing like a motorbike, though it’s no good for the whole family”.

Some workers or employees of large companies mention that they get Metro tickets as part of their wages, which forces them to use this means of transport, independent of travel distances from home, complexity of the journey or potentially better options, such as a motorbike.

For their part women often expressed their opinion from a gender perspective and mentioned that on both cable-car lines they are subjected to aggressive behaviour. Comments were made such as: “we get touched a lot at peak hours and the ‘Metro Culture’ which is important but also repressive, inhibits us from shouting out or protesting” or “the Cable is very useful for long trips made with just one ticket, the only thing is that although

in the cable-cars people respect you, in the Metro, which gets very full at six in the evening, there are a lot of badly-behaved men.” Men tend to agree with this: “the Cable is cheap; the bad thing is the queues which start at four in the morning. A man can do it, but it’s worse for women because they get hassled a lot.”

Women portray their safety and comfort in terms such as: “if I can afford to, I travel by cable” or “when I’m dressed up it’s better to travel comfortably in a cabin because getting on a bus is difficult and a taxi is too expensive.” Women tended to refer more than men to the ‘Metro Culture’ programme of strict rules regulating behaviour in the system, which they saw as an educational process whose impact is waning over time. They complained of the

negative tone of its messages (“Don’t eat”, or “Don’t lean against the wall”) and of the lack of assistance from the young police officers who are “very strict and often rude.” But they end up asking: “What would we do without the ‘Metro Culture’; where would we be?”

Disabled people represent a social group of almost 50,000 people in Medellín. Their reflections are similar to those of older people, arguing that the public transport system in general fails to take into account their difficulties, and that it has only recently started to change in this respect. Disability experts argue that it is important to recognise and take into account all types of disability in the design of access to and movement within stations, adding that some modifications introduced by the



Disabled Metro users often have to ask for help from assistant Police officers



Metro such as ramps are not always the best solutions and because they are remedial they turn out to be very costly. They also point out the risks faced by Metro/*Metrocable* wheelchair users, people with crutches, the blind or deaf, or those with walking limitations, and conclude that a lack of forethought created obstacles which generate a level of dependency which could have been avoided, and which is very annoying for disabled users who have to ask for help.

Conrado, a 71-year-old man, observed: “They don’t let me on the lift for disabled people and I have to walk up the stairs. I’ve even seen a girl who arrived with her old mother and they only let the mother use the lift; the daughter had to run to get up there when the lift door opened. This is ridiculous because they have to travel together. The *Metrocable* was not thought for people with disabilities, and disability is not only for those who use wheelchairs.”

A respondent who has links to a foundation who helps people with disabilities added “As the lack of attention to populations who suffer disabilities constitutes a legal violation, the Metro Company has invested considerable sums in

improving transport, while the municipality has to provide subsidies to people who are unable to use the Metro system.”

Finally, in their evaluation of the *Metrocables* some inhabitants in the K Line zone of influence, especially students, refer to the additional services that the Metro provides, complaining of the lack of toilets but celebrating the existence of lending libraries inside the Metro stations equipped with computers for users.

A young woman from Commune 1 said that she did her homework and borrowed books in the Bello or Acevedo stations before returning home, adding that her dream is to work for the Metro but “not to sell tickets or give orders or to control the queues; only to drive a train on the A Line, which is the longest and most interesting of all.” ■

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Metrocables and Travel Patterns in Medellín: The Inclusion of Latent Variables in Transport Models

Iván Sarmiento O., Jorge Córdoba M., Ángela Mejía G. and Laura Agudelo V.

This chapter uses primary and secondary data gathered as part of the research project of which this book is an output, to analyse users' travel patterns in Medellín's *Metrocables* system. After summarising the main characteristics of the mass transport system in the city and its surrounding municipalities, the chapter places travel patterns in context according to different modes of transport used by the residents of the study communes. It then outlines the results of the analysis of primary data through discrete choice models, including the influence of factors such as perceptions of safety, comfort, cost and time in the choice of transport mode.

At the time of writing in mid-2012 the mass transport system of the Metropolitan

Region of the Aburrá Valley (RMVA)¹ comprises the Metro (overground), the *Metrocables* and the *Metroplús* (BRT system of articulated buses with dedicated road lanes). The Metro A Line is 23.2 km long and runs along the Aburrá Valley from Bello in the north to Itagüí in the south. It has a total

¹ For the purposes of our analysis, Medellín is part of the metropolitan **region** of the Aburrá valley (RMVA), comprised by the nine municipalities in the Metropolitan Area (which from south to north are: Caldas, La Estrella, Sabaneta, Itagüí, Medellín, Bello, Copacabana, Girardota, Barbosa), plus Envigado municipality, which is not part of the metropolitan administrative authority. The RMVA has an urban area of 184 km² and a rural area of 965 km², and a population of close to 3.5 million people in 2012 (see also chapter by Coupé, Brand and Dávila).

of 19 stations and, by mid-2012, two more were under construction. The B Line is 5.6 km long, has six elevated stations and runs from the centre of Medellín out to the west of the city, terminating at road level in San Javier station. Excluding waiting, total journey times are 38 minutes for A Line (between Niquía in Bello and Itagüí) and 10 minutes for B Line (between San Antonio in the city centre and San Javier) (AMVA, 2007).

As was noted in Brand and Dávila's chapter, the *Metrocable* K Line has three stations and runs for 2 km in the north-east of the city in Communes 1 and 2. It connects to the Metro system at Acevedo station and users can transfer



Figure 1: Lines of the Medellín Metro System
Source: www.metrodemedellin.gov.co.



with no additional fare payment. The J Line also has three stations and extends 2.9 km to the west of the city through Communes 7 and 13. It connects to the Metro at San Javier station and again transfers are free of any additional cost to users. Finally, the L Line has an extension of 4.6 km and allows access to the ecotourism Arví Park (an undulating highland tropical forest area). It connects to the Metro via K Line's Santo Domingo terminal station and terminates at the village of El Tambo in the rural district of Santa Elena (see Figure 2). This is the Metro's first tourist line. It has no fare integration with the main Metro system, and the standard fare price is higher than the typical Metro fare (3,500 pesos in early 2012 or approximately US\$2) although low-income families, students, the elderly and disabled benefit from a 90% discount on the fare.

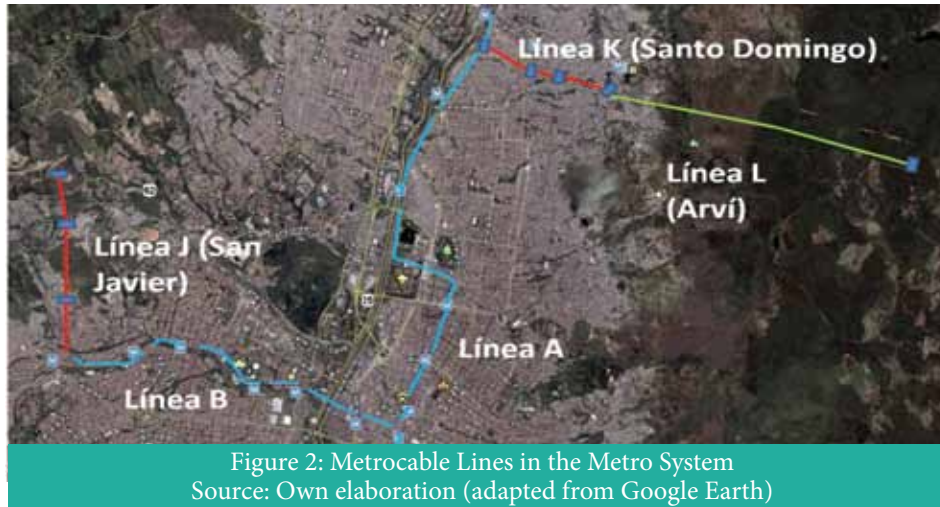


Figure 2: Metrocable Lines in the Metro System
Source: Own elaboration (adapted from Google Earth)

The metropolitan mass transport system covers four municipalities and bus routes integrate the whole area of the 10 municipalities that make up the metropolitan region. However, the focus of this research was on the municipality of Medellín, the most populous of the ten municipalities (70% of metropolitan total). Medellín is divided into 16 communes and five rural zones (*corregimientos*). The K Line's catchment area comprises 23 neighbourhoods (*barrios*) with approximately 230,000 inhabitants: 12 neighbourhoods in Commune 1 (129,806 inhabitants) and 11 in Commune 2 (99,381 inhabitants).

In the case of the J Line's catchment area there are a total of 37 neighbourhoods with approximately 315,000 inhabitants: 24 in Commune 7 (181,970 inhabitants) and 20 in 13 (134,365 inhabitants). According to a 2005 Origin

and Destination Survey (*Área Metropolitana del Valle de Aburrá*, 2006), the inhabitants of Communes 1 and 2 (K Line) made a total of 278,894 journeys per day, which is equivalent to 5.5% of the 5,036,100 journeys in the RMVA on working days (in 2005). The journeys of inhabitants of Communes 7 and 13 represented 9.2% of the RMVA total. Table 2 shows that in Communes 1 and 2 walking is the main mode of transport, followed by bus and Metro. This contrasts with Communes 7 and 13 where bus is most common, followed by journeys on foot and the Metro, with a notably lower percentage to that in Communes 1 and 2. This low incidence of Metro usage is explained mainly by the fact that when the survey was carried out in 2005, the J Line was not in operation and access to the nearest Metro stations was difficult for residents in Communes 7 and 13.

Table 2: Modal Distribution of Journeys in Study Areas and RMVA, 2005

Source: Calculations based on the 2005 origin-destination survey
(Área Metropolitana del Valle de Aburrá, 2006)

Mode of Transport	No. of journeys Communes 7 and 13	%	No. of journeys Communes 1 and 2	%	RMVA	%
Public transport (bus)	175,720	37.91	90,070	32.30	1,593,000	31.63
Metro	40,971	8.84	51,587	18.50	376,000	7.47
Taxi	34,881	7.53	10,586	3.80	570,000	11.32
Car	38,578	8.32	5,069	1.82	597,500	11.86
Plane	130	0.03	40	0.01	10,000	0.20
School transport	19,331	4.17	3,449	1.24	200,000	3.97
Motorbike	22,475	4.85	9,570	3.43	228,200	4.53
Bicycle	2,950	0.64	1,542	0.55	45,100	0.90
On foot	128,445	27.71	106,981	38.36	1,416,300	28.12
Total	463,480	100.00	278,894	100.00	5,036,100	100.00

Impacts on Transport Decisions of Metrocables Systems

This section summarises the results of the analysis of the impact of the introduction of the *Metrocable* K and J Lines on the transport decisions of residents in the two study areas. The analysis is based on information produced through two types of instrument: firstly, four focus groups, two carried out in each of the *Metrocable* catchment areas (see chapter by Agudelo *et al.* for a more detailed explanation of the process and

results; see also Córdoba, 2011), and secondly a stated choice survey based on a total of 392 questionnaires (187 for J Line and 205 for K Line). With the aim of identifying and analysing the impact of the aerial cable-car system on people in the catchment area of the aerial cable-car systems, the population was classified in terms of users (of the cable-car system) and non-users (bus users). From the stated choice survey carried out on each

of these groups, the main interest was to determine quantitative (journey time) and qualitative accessibility variables, so as to describe journey patterns before and after the implementation of the *Metrocable* systems, as well as exploring the reasons that underlie the use or non-use of this mode of transport.

In conventional transport studies, modal choice models are based on quantitative variables such as time and cost as a representation of user decision-making. However this is a simplification of choice decisions that to some extent distorts a more complex reality, in that it fails to acknowledge the particularities of each individual when making decisions of this kind. For this reason, it is increasingly important to include other variables such as safety and comfort, known as 'latent variables', which lead to a more complex model but one that more closely reflects reality. The definition of these variables was obtained by using primary data collected through qualitative research techniques. As mentioned earlier, in this case we used focus groups.

To better gauge the conditions of users of the transport system, the first stage of qualitative research involved the identification of the changes in mobility patterns and their implications in terms of accessibility. The changes were presented in terms of three dependent variables: impedance to accessing the system, changes in access to opportunities, and changes in family or individual purchasing power. The analysis also considered two independent variables: gender and age.

Furthermore, in addition to the qualitative latent variables (safety and comfort) we identified three quantitative time variables (access, waiting and journey times) and one of cost (fare). The variables for safety and comfort were constructed on the basis of latent variable indicators: three on safety and four on comfort. Indicators were obtained via a question using a Likert-type scale (from 1 to 7). These indicators were measured for both bus and *Metrocable* users.

To incorporate latent variables as explanatory factors in discrete choice models we used the methodology developed by Ben-Akiva *et al.* (2002). The result of this methodology is an integration of latent variable models, which aim to operationalise and quantify unobservable concepts using discrete choice methods; in other words, a model integrating choice and latent variables. This methodology incorporates indicators of latent variables derived from the survey responses, and used to calibrate the model.

We developed discrete choice models (DCM), multiple indicator-multiple cause models (MIMC) or structural equations, and hybrid models. For the analysis of the results obtained with each model, the TEST-t values of each variable were measured, requiring a level of 1.96 or above for a variable to be meaningful with a margin of error of 95%, or 1.64 for a margin of error of 90%. Utility functions for each modal alternative are shown below:

$$\begin{aligned}
\text{Bus:} & \quad \beta c * C_b + \beta Ta * Tab + \beta Te * Teb + \beta Tv * Tvb & (1) \\
\text{Cable:} & \quad ASC_{\text{cable}} + \beta c * C_c + \beta Ta * Tac + \beta Te * Tec + \beta Tv * Tvc & (2) \\
\text{Cable+ integrated:} & \quad ASC_{\text{Cable+integrated}} + \beta c * C_{cri} + \beta Ta * Tacri + \beta Te * Tecri + \beta Tv * Tvcri & (3)
\end{aligned}$$

Where: C_b is the cost of the bus fare; Tab is the time of accessing the bus; Teb is the waiting time at a bus stop; Tvb is the travel time on the bus; C_c is the cost of Cable fare²; Tac is the time to access the Cable; Tec is the waiting time at the Cable station; Tvc is the travel time in the Cable; C_{cri} is the combined cost of the Cable fare plus an integrated bus route; $Tacri$ is the time to access the Cable plus an integrated bus route; $Tecri$ is the waiting time at a stop at the Cable plus an integrated bus route; $Tvcri$ is the travel time in the Cable plus an integrated bus route. ASC_{bus} , ASC_{cable} and $ASC_{\text{cable+integrated}}$ provide an idea of the attractiveness of a mode compared to the bus, which is established as the constant at zero. The β parameters are the parameters of each one of the types of variable: cost, access time, waiting time and travel time. In the case of the β parameters we expect a negative sign that indicates a 'de-utility' in terms of investing time and money for a journey whether it be by bus or Cable. With the β values utility functions were arrived at which allow us to predict, in accordance with variations in the values of time and cost, how many people have a higher probability of electing one mode or another.

² When referring to the Cable mode, this includes a combination of aerial cable-car and Metro, as users can transfer from one to the other without payment of an additional fare.

According to the stated choice survey (carried out in 2010, that is, two years after the J Line began operating), the probability of a user choosing the Cable in the catchment area of the K Line is substantially higher (62.9%) than the J Line zone of influence (50.6%). This is not surprising given that the K Line is more established than the J Line, having been inaugurated six years before and being, moreover, in an area of higher population density. At the same time, municipal urban interventions (through the Integrated Urban Projects, PUIs) have been considerably more extensive in Communes 1 and 2, which help improve access to the *Metrocable* stations. Finally, the J Line catchment area continues to experience violence on a regular basis, a product of confrontations between armed gangs (see chapter by Coupé), so local residents may occasionally feel exposed to risks when walking to *Metrocable* stations. It is important to point out that although the share of respondents who choose the Cable is high amongst those surveyed, in practice it is not possible for the Cable to meet this level of demand given its limited technical capacity (3,000 passengers per hour). In the case of the K Line, capacity would need to be increased or perhaps a parallel Cable built to meet this demand, which suggests that more detailed demands studies are needed.

Hybrid Models

Hybrid models were developed on the basis of results obtained with discrete choice econometric models (using socioeconomic and attribute variables) and structural equations (perception variables). These models allow us to inter-relate considerations developed independently by each model type. Estimation was made sequentially and simultaneously, in this way running a single model

that includes perception variables with attributes and socio-economic variables, the latter being the ones used in traditional transport modelling. The latent variables are an expression of the socio-economic characteristics (age and gender) and the most important perception indicators used to explain the choice of mode in relation to this attribute (age, gender). Some of the results from the hybrid models that combine quantitative variables of time and cost (fare) with latent variables (safety and comfort) are outlined in Table 3.

Table 3: 'Safety' Latent Variable on Bus and Cable with Data Taken from the Bus and Cable, Respectively, and 'Safety' in the Bus with Data Taken on the Cable and Bus for the Study Area, Communes 1 and 2 (K Line)
Source: Own elaboration

VARIABLES	Hybrid Model 1		Hybrid Model 4	
	PARAMETERS	TEST-t	PARAMETERS	TEST-t
ASC_{bus}	Constant		Constant	
ASC_{Cable}	0.524	1.45	0.871	3.65
$ASC_{cable+integrated}$	0.0363	0.12	0.603	2.96
β_{Ta} ($\beta_{access\ time}$)	-0.0613	-8.79	-0.0524	-12.20
β_{Te} ($\beta_{waiting\ time}$)	-0.0411	-6.54	-0.0433	-10.34
β_{Tv} ($\beta_{travel\ time}$)	-0.0360	-4.78	-0.0363	-7.33
β_c (β_{cost})	-0.00140	-6.05	-0.00104	-7.20
B_{seg} (β_{safety})	2.21	2.46	-0.958	-2.54
$\ell(\beta)$	-593.687		-1418.822	
r^2	0.230		0.249	
n	702		1719	
$\ell(\beta)$ =log-likelihood, r^2 = correlation coefficient, n = number of observations				

In the hybrid model 1, the safety variable has a value of 2.46 in the TEST-t, which suggests that safety is a highly important variable. As the perception of safety on the bus depends on gender, the gender variable has a value of 1 in the case of a woman and 0 for men, this indicates that in Communes 1 and 2 the perception of safety when using the bus is higher for women than for men. However, in the Cable (with times and fares being equal) the modal constant of 0.524 confers greater utility to the Cable than to the bus.

The results obtained in the study indicate that for bus users (data taken on the bus) in Communes 7 and 13, the T-test of the comfort indicator relating to the probability of finding an empty seat in the Cable (ICADC) had a value of 3.5, which confirms that comfort in the Cable mode of transport is significantly defined by this indicator. For the same respondents the indicator for bus comfort (ICADB) does not appear to be significant, as shown by a value below 1.96 (1.409).

Safety is an important variable for both bus and Cable users. From a gender perspective, the women surveyed consider the Cable far less safe and comfortable than men. In the case of the bus, women consider it safer than men.

In general terms, data taken in both the Cable and the bus show that the J Line is perceived as less safe than the K Line, which coincides with the general perception of the city, given the violent confrontations that have taken place in the immediate vicinity of the J Line. According to bus users surveyed, the bus route running parallel to

the J Line is considered less safe than that of the K Line. This relates to the above in that although bus users in the J Line catchment area feel less vulnerable than when using the Cable, they are still aware of the problems of the area. Finally, data taken from Cable users suggests that bus use in the catchment area of K Line is perceived to be less safe than in the J Line area. This is also reasonable given that the users of the K Line regard the Cable to be far safer than the bus, which is given a very low score. This contrasts with the J Line zone where Cable users, conscious of the risk that stray bullets may occasionally criss-cross the air, see the bus as a safer mode of transport. ■

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Impact of the *Metrocables* on the Local Economy

Françoise Coupé and Juan Guillermo Cardona

It is difficult to ascertain with precision whether the Medellín *Metrocables* lines have had an impact on the economy of the study areas. This is because it is difficult to disentangle their effect from city-wide trends such as macro-economic processes, the effect of urban and social policies and other spatial-physical interventions, and the levels of violence linked to criminal gangs vying for control of local territories (Hylton, 2008; Brand & Dávila, 2011; Fukuyama & Colby, 2011). For this reason, we centre our analysis on issues of employment and income, neighbourhood businesses and real estate transactions, and identify trends on the basis of information available.

Jobs and Income

There appears to be an association over time between the policy of promoting small business development and the construction of the first two *Metrocable* lines. These lines, as discussed earlier, are in turn associated with the Medellín Municipality's Integrated Urban Projects, local planning processes and participatory budgets implemented during the Fajardo and Salazar administrations (see chapter by Coupé, Brand and Dávila).

Mayor Luis Pérez (2001-2003) promoted a "Bank of the Poor" which was later to become the "Opportunities Bank", to provide micro-credit

with flexible terms and repayment periods seeking to help generate incomes and raise living standards among residents in Medellín's more vulnerable areas. Following this, the local authorities took steps to catalyse Medellín's potential in the face of early signs of urban economic stagnation, through the creation of innovative businesses focused on key products and services. This hinged on creating strategic public-private partnerships for business development and included, amongst other instruments, the creation of so-called Zonal Business Development Centres (*Centros de Desarrollo Empresarial Zonal* or *Cedezos*), a microcredit network (Bateman *et al.*, 2011) and the application of a participatory budgeting methodology with the support of neighbourhood and community promoters. These initiatives were included in the city's development plans and were located in close proximity to the *Metrocable* line stations and in the heart of the Integrated Urban Projects in Communes 1 and 13.

In Communes 1 and 2 (served by *Metrocable* K Line) these interventions were proposed as "re-payment of an historical debt" owed by the city to those who live at the margins of formal processes, and whose livelihoods are disadvantaged by being forced to operate in the informal sector of the economy. The economic response of residents in these neighbourhoods is explained in an official document from the municipality: "Low levels of education and training, the age of the population and/or the end of a labour cycle, and the belief that work opportunities in the modern sector are scarce lead

many people to start up their own businesses with little working capital, in home-based locations and as family enterprises."¹ Thus, for example, local government officials identified a high concentration of such businesses close to the terminal station of the *Metrocable* K Line, so chose this as the strategic location of a *Cedezo* as a way of maximising its benefits for residents with this profile in Commune 1.



The type and location of smalls businesses can spur the development of efficient local networks with suppliers and customers, as well as with consultancy and training bodies, to help exploit the benefits of association, territorial

¹ Source: <http://www.culturaemedellin.gov.co/sites/CulturaE/CulturaE/Paginas/CulturaE.aspx>. Consulted 20th April, 2011. Pp. 35 and 36.

proximity, agglomeration economies and close relationships between partners and collaborators.”²

In Communes 13 and 7 (*Metrocable J Line*) the impact of such a strategy has been restricted to the immediate area of the Metro-*Metrocable* transfer station, in what was in any case a stable urban sector with an important amount of established commercial and business activity and the presence of supporting organisations: banks and municipal administrative services as well as a *Cedezo*.

Impacts are very limited beyond this central area due to the configuration of the J Line, its orientation towards the *Nuevo Occidente* urban expansion zone and the weak linkages of the Integrated Urban Project to this urban sector (see earlier chapter by Coupé). Moreover, here statistical data on local economic and commercial activities are not particularly helpful, since they consist of averages for one of the most heterogeneous communes in the city. Information is unavailable on the immediate area of influence of the *Metrocable J Line* which is tangential to the two communes, and whose main objective is that of connecting to *Nuevo Occidente*, a large and rapidly growing concentration of municipal social housing projects.

Two questions arise in this context. On one hand, what has been the impact of this set of interventions on the job and income conditions in the *Metrocable's* area of influence and, on the other, what has been the impact of transport costs on household income and expenditure?

² Op. Cit. pp. 73-75.

Table 1: Employment of Household Heads in the Catchment Areas of K and J *Metrocable* Lines, 2004-2010

Year Commune	2004		2008-2010	
	In Work	In Search of Work	In Work	In Search of Work
1	29.6%	5.0%	29.9% m - 39.9% f - 20.8%	7.2% m - 8.8% f - 5.7%
2	31.5%	7.6%	31.5% m - 42.0% f - 22.2%	4.5% m - 5.8% f - 3.4%
13	30.6%	9.6%	34.3% m - 44.3% f - 25.3%	6.2% m - 6.7% f - 5.7%
7	34.0%	6.1%	35.9% m - 45.5% f - 27.3%	7.0% m - 8.3% f - 5.9%

Source: Own calculations, based on data from Medellín Quality of Life Survey

For statistical purposes, the activity of household heads falls within one of the following: working, in search of work, studying, housewife/husband, retired or receiving a pension, permanently disabled and unable to work. However, it is worth pointing out that the category ‘working’ is a complex one, and during our field work we found a variety of situations: some people considered that a trip into the city to buy food in shops or markets was ‘work’, and young household heads who engage in odd jobs and also study are sometimes considered as ‘working’.



Businesses near Santo Domingo Metrocable station (K Line)

The number of people that declare themselves as working changed little between 2004 and 2008/10 in Communes 1 and 2, and increased in Communes 13 and 7. In the latter, the impact of the *Metrocable* is difficult to assess since over this period the municipality was building one of its largest housing developments in this sector. There are also numerous and difficult issues concerning

the reliability of data, especially regarding the origin and previous employment situation of newly settled households (Table 1). Whenever it was possible to elucidate the differences between men's and women's work situation (shown as 'm' and 'f' in the table), data for 2008/10 suggest that the share of male household heads who work is almost twice that of women.

Table 2: Average Income for Men and Women Household Heads by Commune, 2004-2009
Source: Own calculations, based on data from the Ministry for Social Protection (legal minimum wage), and Medellín Quality of Life Survey (income); exchange rate is US\$1=1,780 pesos.

	2004 (Legal minimum wage: US\$201)					2009 (Legal Minimum Wage: US\$279)				
	Comm. 1	Comm. 2	Comm. 13	Comm. 7	Medellín	Comm. 1	Comm. 2	Comm. 13	Comm. 7	Medellín
Men	141	142	165	200	248	303	310	343	360	493
Women	108	110	127	154	191	266	269	324	357	455

Statistical data refer to five possible sources of income: from work, in kind, from secondary employment, from rents and from pensions (Alcaldía de Medellín, 2004). Between 2004 and 2009 (see Table 2) Commune 1 had the lowest average income not only within the study areas but in Medellín municipality as a whole. This is despite significant investments carried out in this area by the local government, in the form of public space, social infrastructure and transport, and other investments in social development (see chapter by Brand and Dávila).

In interpreting this information it should also be remembered that the minimum legal wage is insufficient to sustain a family. In all four communes situated in the *Metrocables'* catchment areas, incomes of male heads of household were below the legal minimum wage in 2004, but in 2009 they were above this statutory level. The same thing happened with the incomes of female heads of household in Communes 13 and 7, while in Communes 1 and 2 they remained below but close to the legal minimum wage.³

³ The value of the legal minimum wage is adjusted yearly by the national government and is the minimum that the law demands as payment for a full day's work. Adjustments are made taking into account the previous year's inflation rate and a productivity factor based on GDP growth or industrial sector and other considerations as defined by the Labour Ministry. By and large this legal minimum wage does not cover the cost of all basic goods and services needed to support an average-sized urban household. According to the National Statistics Agency (DANE), a person is considered poor if he/she earns less than the equivalent of US\$2 per day, and extremely poor if they earn less than the equivalent of US\$1 per day. A family of four is poor if they have an income of less than the equivalent of US\$240 per month and extremely poor if they earn less than the equivalent of US\$120 per month.

The cost of transport has a considerable effect on the income of those who travel for study or work purposes and *Metrocable* users frequently point out that especially in multi-modal travel (Cable-metro-feeder bus) they spend less on fares than when using more than one bus route.⁴ In 2012, while a journey involving two bus routes cost 3,200 pesos, the integrated route (Cable-metro-bus) cost 2,150 pesos. The case was mentioned in an earlier chapter of a school teacher who commutes daily from Santo Domingo to a semi-rural school in Envigado to the south of the metropolitan area who finds that transport costs more than double for her during the week when the Metro Company shuts the aerial cable-car system down for annual maintenance.

However, within a context of scarce household resources and the high weight of transport costs on household budgets, both users and non-users of the *Metrocables* are only too well aware of the advantages and disadvantages of the Metro system in relation to alternatives such as the bus, motorcycle or on foot (see earlier chapter by Coupé on residents opinions). It is not surprising that many people prefer to work in their own neighbourhood and open small shops.

Neighbourhood Shops

The neighbourhood shop is a deeply rooted institution in Colombian society. According to calculations by Nielsen (2004) despite a significant growth in the share of large supermarkets in

⁴ Data gathered in interviews and workshops undertaken as part of the research project.

overall sales over the last decade, small shops still account for 51% of the food market. Their role in low-income settlements of large cities is particularly important since not only are they accessible but they also constitute an important source of income for many residents.

A study carried out in Medellín, Soacha and Manizales between 2008 and 2010 in the framework of an FAO-supported project (Rodríguez Reyes, 2010) outlines the context and a set of associated problems that are common to the three cities: shops generally sell a combination of food products including fruits and vegetables, personal hygiene products and other basic necessities purchased in bulk from wholesale markets, but few processed foods or animal protein. Shopkeepers are mindful of supplying good quality of products, they open seven days a week from dawn to dusk and, despite being in areas where people have very limited resources, including the shopkeepers themselves, they have access to basic road and transport infrastructure and water, electricity and telephone services.

They are mostly family-run businesses in which the owner is also the administrator. The labour force they employ includes his/her own family with no remuneration, as this is considered an extension of domestic responsibilities rather than payable work.

In the three cities unemployed people with little in the way of business experience or

training started close to 60% of the shops. As a consequence, businesses tend to be unstable and vulnerable, and some face local challenges in terms of adapting to a constantly changing customer base and even extortion from local criminal gangs. The shops provide households with a source of sustenance and resources are managed in a fairly informal manner.

Customers, who belong to the same socio-economic strata as the shopkeepers, buy products regularly and in small quantities for their daily needs since they lack the purchasing power to buy and store in bulk. In the relationship between shopkeeper and customer, proximity, personalised attention and credit are the greatest strengths, whereas lack of choice, high prices and poor presentation are the shops' greatest weaknesses.

In Medellín the shopkeepers complain of the high cost of infrastructure services and local taxes, lack of support from the authorities and difficulties in accessing credit. However, those who interact with local authorities on a regular basis report good relations with them. "These businesses now form part of an extensive urban food distribution network. Municipal authorities have the opportunity to work jointly with shopkeepers to improve the quality and variety of foods offered, strengthen their business management capacity, and promote their potential as service providers that can go beyond food provision" (Guarín, 2010).

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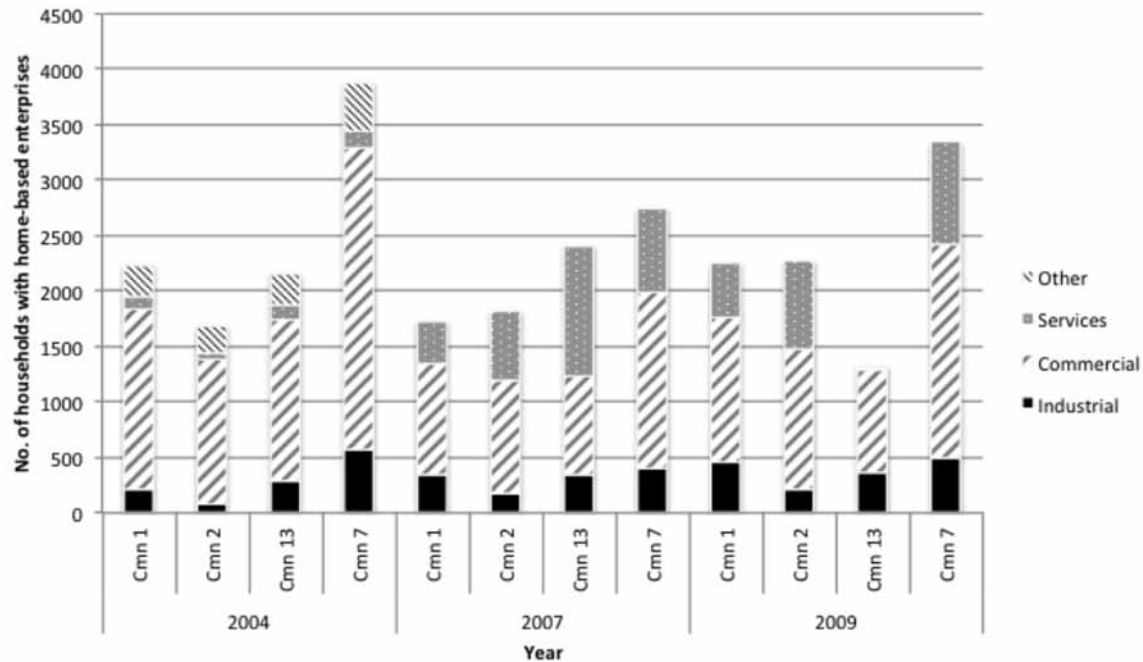
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Figure 1. Home-Based Enterprises in Study Areas by Type, 2000-2009



Source: Own calculations, based on information from the Medellín Quality of Life Survey 2004-2009, Medellín Planning Department.

Figure 1 shows changes in home-based enterprises in the catchment areas of the *Metrocable* stations. In Commune 1 there was a significant increase in 'industrial' activity (e.g. small metal-working workshops) of 113% between 2004 and 2009. The number of home-based retail establishments initially declined by 38% between 2004 and 2007 and then rose by 30% while home-based services grew by 363% (the sector denominated 'other')

arose from a methodology applied by the municipal administration in 2004 and which was subsequently abandoned). These trends follow with the launch of the first *Metrocable* and the Integrated Urban Project. However, a causal relationship cannot be unambiguously established when taking other significant factors into account improvements in levels of security, both locally and city-wide, and an associated increase in local rates of population growth.

In Commune 2, industrial activity grew 164% between 2004 and 2009; retail activities followed a similar trend to that in Commune 1 with an initial reduction between 2004 and 2007 followed by an increase of 26% afterwards; the service sector shows a very large increase of 1,369% over the period. Contrary to what occurred in Commune 1, Commune 2 shows a constant increase in the number of homes with some type of economic activity and a certain level of specialisation during the period.

In Commune 13, where the J Line began operating in March 2008, there was an increase in industrial activity over the study period, with an initial increase of 23% and later 6%; the retail sector initially dropped drastically by 66%, probably due to the uncertainty produced by problems of violence and the so-called *Orión Operation* (an intervention of the armed forces to retake zones under the control of gangs and *guerrillas* towards the end of the Luis Pérez administration); by 2009 this had increased by 5%; the service sector shows a very fast pace of growth of 890% between 2004 and 2007 and later a moderate increase. This coincides with increased commercial activity around San Javier Metro station.

In Commune 7, residentially-based industrial activity declined by 37% up to 2007 and later increased by a modest 21%; the retail sector also dropped by 72% between 2004 and 2007 due to an escalation of violence which affected residents in certain neighbourhoods of the Commune, followed later by a 17% increase; paradoxically the service sector, although

operating on a no-credit basis generates greater income than retailing since it involves businesses such as sales of mobile phone credit and local 'casinos' or slot machine joints; service activities rose by 538% between 2004 and 2009, a trend no doubt reinforced by the arrival of nearly 20,000 new residents in *Ciudadela Nuevo Occidente* at the end of the J Line.



In all four communes a significant proportion of these activities tend to be of a subsistence nature. Many informal businesses

barely manage to survive, especially in the case of small shops selling through house windows. As said earlier, through programmes such as *Cedezos*, microcredit, and the 'E-Culture' (enterprise culture) programme to support business development and income generation, the municipal administration hopes to encourage entrepreneurs to develop their ideas and so speed up the transition from informal to formal enterprises. This process also seeks to diversify sales and production towards products with greater value added. However in low-income settlements such as those in the areas of influence of the *Metrocables*, all this is only possible if businesses become economically sustainable economic in the long-term and criminality and violence are brought under control, including extortion and the uncertainty fostered by daily violence.

As mentioned at the beginning of the chapter, in the *Metrocable* catchment areas we

can only analyse overall trends at the scale of the Commune, as there is no more disaggregated information available on job creation or impacts on income levels. These trends do have implications in terms of real estate transactions, the subject of the next section.

The Dynamics of Property Transactions

In the first decade of the new millennium Medellín underwent sustained population and economic growth with significant implications for land development. Land use became more intensive and land values increased, especially due to limited land supply arising from the city's difficult geomorphological conditions and the densely populated metropolitan area in which it sits (DPU-UCL *et al.*, 2006; Naranjo Giraldo, 1992).



The highest land prices are found in the south of the city where high-income residential neighbourhoods, large shopping centres and head offices of the financial sector and other specialised services are located. There has been an outward movement of manufacturing establishment to a region located some 800 m above the river valley towards the east of the city, encouraged by the presence of free-trade zones, proximity to the José María Córdova International Airport, and ready access to the main highway to Colombia's capital, Bogotá.

However, land prices for retail activity in the high, medium and low socio-economic areas of the city do not differ that much. This is due to the fact that a retail outlet in low-income areas of the city can be as or more profitable than a similarly sized unit in middle and upper income areas, with the exception of units in top-market shopping centres.

Given these general circumstances and the urban interventions in some poor neighbourhoods, there have been substantial increases in real estate transactions in sectors where the land market had been previously flat. The municipality's Observatory for Land and Real Estate Markets began collecting data in 2004 and has contrasted it with comparable information from 1997. This is very useful for the analysis of the impact of the implementation of both aerial cable-car lines.

In Communes 1 and 2, in the K Line's area of influence, real estate transactions for residential, commercial and service use for the

period 2000-2007 can be seen in Figures 2 and 3. This refers only to legal transactions such as those undertaken by the Metro Company, duly registered in public records and registers and bringing property tax obligations for the property-owner. Many other types of transaction, for example those in settlements on recent land invasions or relating to the sub-division of a property between members of the same family or friends, often remain as informal transactions for a long time and fail to be recorded in official registers.⁵

Between 2000 and 2006 some 91% of recorded real estate transactions in Commune 1 referred to residential properties (see Figure 2). However the number of recorded transactions in the commercial and service sectors rose significantly from 25 in 2000 to 77 in 2007 (see Figure 3), which confirms observations from our field work with regard to the appearance of numerous new commercial activities in residential properties.

However, this overall trend was not continuous. In the period 2002-2003, armed conflict escalated and violence levels rose sharply, with the result that families were forced to leave the Commune, dwellings were temporarily abandoned and the number of transactions fell, especially in Commune 2 (Santa Cruz). By contrast, between 2005 and 2006 the number of transactions increased due to the start of a demobilisation process of paramilitary groups, a reduction in the level of urban conflict and

⁵ The municipal Observatory uses information from the register of property sales provided by notary solicitors and the Office for the Register of Public Instruments.

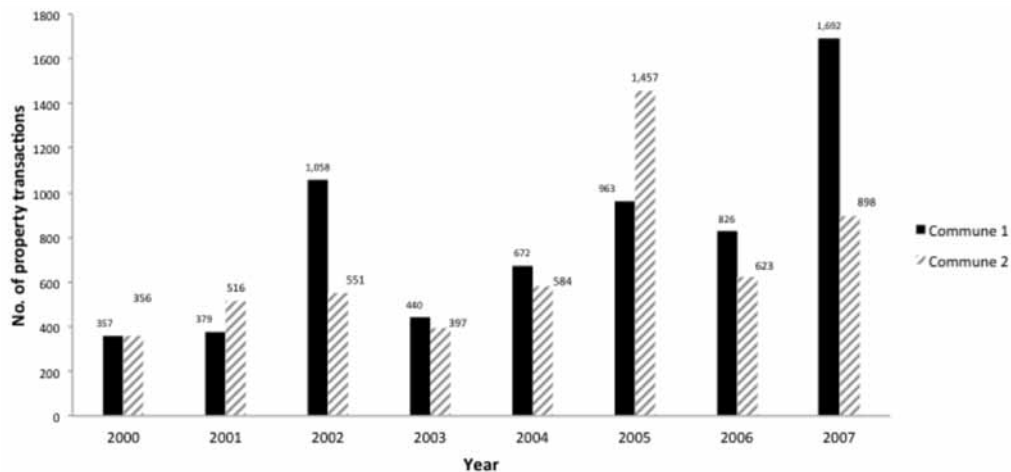


Figure 2. Residential Property Transactions in Communes 1 and 2, 2000-2007

Source: Own calculations, based on data from the Land and Real Estate Markets Observatory, Medellín Planning Department.

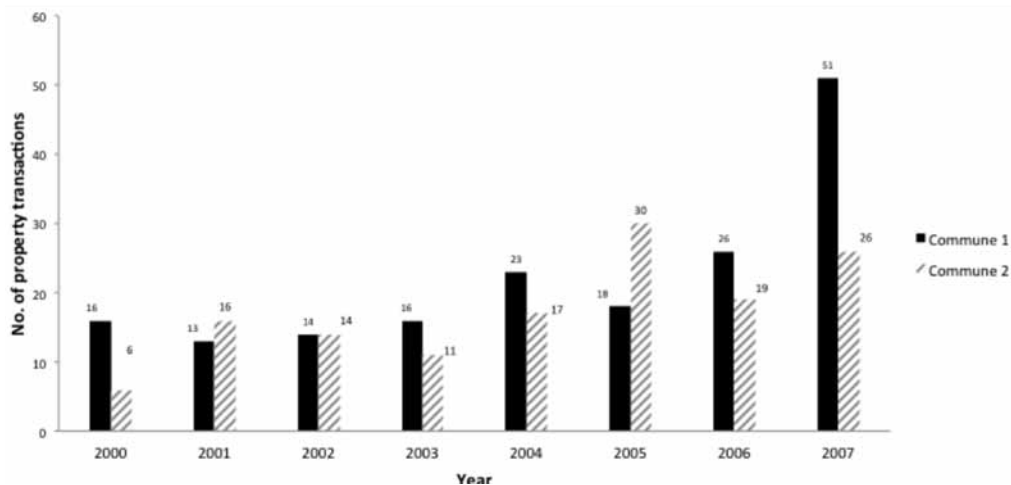


Figure 3. Commercial and Service Property Transactions in Communes 1 and 2, 2000-2007

Source: Own calculations, based on data from the Land and Real Estate Markets Observatory, Medellín Planning Department.

a consequent perception of greater safety, and expectations of neighbourhood upgrading arising from the construction of the *Metrocable* and subsequent implementation of the urban interventions and social programmes described earlier. Property owners no doubt anticipated that a resurgence of their neighbourhoods would have a positive effect on the value of their property. Tenants, who make up between 44 and 62% of Commune residents, saw rents rise, though because such transactions are not officially recorded there is no reliable information to measure such increases.

In Commune 2, 89% of real estate transactions were carried out in the residential sector. However, there were two hiccups in this upward

trend of property sales. The first occurred over the 2002-3 period, as in Commune 1, and a second one took place between 2005 and 2006 when property owners or those in possession held out for the higher prices which were expected as a result of the urban upgrading projects being developed or programmed. As a result of the drastic drops in transaction resulting from earlier uncertainties, these two communes experienced a much more vigorous market dynamic than in the higher socio-economic sectors of the city such as Communes 14, 11 and 10 (El Poblado, Laureles and La Candelaria). Similarly, the cadastral value of properties increased considerably over these seven years, especially in Commune 1 (see Figure 4) although absolute values remained comparatively low.

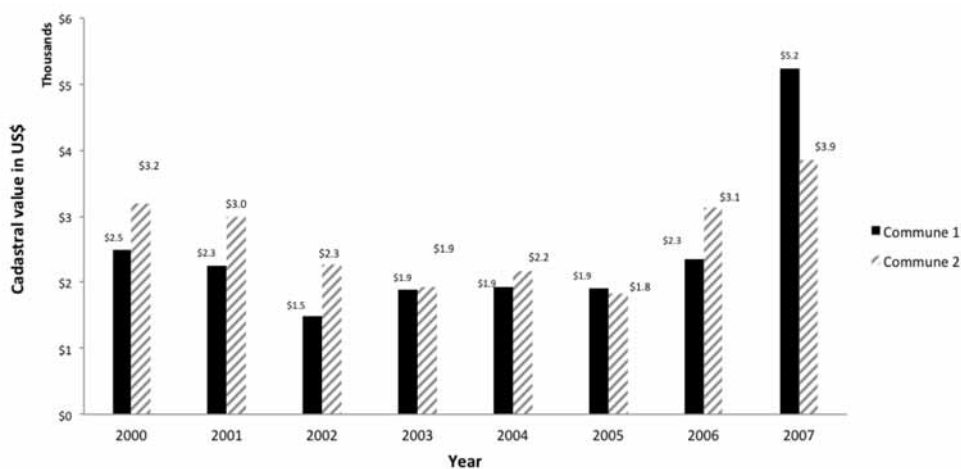


Figure 4. Average Cadastral Value of Property in Communes 1 and 2, 2000-2007 (Constant Value, Thousands of US\$)

Source: Own calculations, based on data from the Land and Real Estate Markets Observatory, Medellín Planning Department.

Along J Line land and property transactions have a lesser significance for this study in that they obey different urban processes. Besides, available data only spans the period prior to the launch of the J Line cable-car system in Communes 13 and 7. By and large, the market was more active in Commune 13 than in Commune 7, though skewed by the intense activity around the San Javier Metro Station area, which gradually shifted in character from predominantly residential towards increased retail and service activities. The increased activity probably reflects the initial effects of the Commune's Integrated Urban Project initiated by the municipality there.

The number of transactions in Commune 7 increased annually on average by 11% during the period, about the same as the city average. However, there was a sudden jump of 51% in 2001-2 and another important increase over the period 2006-7, the latter attributable to the arrival of new households at the new *Ciudadela Nuevo Occidente* where state subsidies for low-income first-time homebuyers could be used.

Finally, according to data from Medellín's Quality of Life Survey, in Communes 1 and 2 more new houses were built than flats. In contrast, in Communes 13 and 7 (J Line area of influence) the number of flats increased faster than the number of houses. These divergent trends reflect different development processes; the first case being one of piecemeal and still often informal development, the second being a case of urban renewal with single dwelling plots being bought to build flats or new large-scale developments in the form of apartment blocks.

The same survey also provides information on changes in house tenancy, giving a complementary perspective on transaction trends. For both *Metrocable* areas of influence, between 2004 and 2009 the number of properties owned outright grew significantly: over the 2001-2009 period the number of households living in a debt-free property increased by 12% in Commune 2, by 16.2% in Commune 1, by 32% in Commune 13 and by 11.6% in Commune 7.

The incidence of rental housing also shows interesting trends in these neighbourhoods. In Commune 2 the number of rented dwellings increased by a very modest 4%, but in Commune 1 it rose by a more significant 32%, from 9,069 in 2004 to 11,889 in 2009. Commune 13 also saw a major hike of 30% while Commune 7 saw a more modest 11% increase.

Conclusion

The construction and operation of both *Metrocables* lines brought a new energy to the urban economies in their areas of influence. This was the result of a joint strategy involving the Metro Company and the Medellín municipality, supported by a range of other public and private institutions. There is little doubt that some key indicators of economic activity improved in the decade following the launch of the K Line and the subsequent major urban upgrading efforts, but income levels still remain below those of other city sectors, and physical upgrading and the associated social and economic development programmes

appear to have proven so far insufficient to overcome the city's serious inequality problems between rich and poor areas.

A comparison of what has happened around the K and J Lines makes it abundantly clear that integrated, localised, parallel and coordinated strategies of intervention generate far greater benefits than the sum of independent, diffuse and sequential projects. The continuing 'snowball effects' of the former can be seen in such things as the local development plans and participatory budget management. ■

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Users' Daily Experience of Aerial Cable-Cars

Laura Agudelo V., Ángela Mejía G., Iván Sarmiento O., Jorge Córdoba M.

The benefits of the Medellín cable-car systems have been strongly promoted through publicity and educational campaigns, and generally accepted by the city and those who are infrequent users of the system (Metro de Medellín, 2005a and 2005b; Agudelo, 2008). However, the content of these campaigns tends to contrast with the experience, particularly at peak times, of those who use the aerial cable-cars on a day-to-day basis, as dictated by the low-income imperative of keeping transport expenditure to a minimum.

These and other realities were brought to light in conversations held through focus groups carried out with people who live in the study area.

The focus groups were organised according to the zones of influence of the *Metrocable* lines (K and J) of the mass transport system for the Metropolitan Region of the Aburrá Valley (RMVA), located in the communes to the north-east and west of Medellín (see chapter by Sarmiento *et al.*).

Our intention here is to illustrate the attitudes of the inhabitants of the zone of influence of the *Metrocables* regarding the use and non-use of the system, and the reasons that led them to choose one mode of transport over another. With regard to non-users (bus users or users of other modes of transport) we were particularly interested in clarifying the importance of time and

cost factors in their decision to maintain their old transport habits and not to use the *Metrocables*. Regarding those people who do use the cable-car, we wanted to understand what it is that they appreciate of the system that leads them to choose it. Gauging sensations and perceptions of inhabitants in the *Metrocables'* zones of influence was the main goal of the focus groups, particularly in relation to impedance in accessing the system, changes in access to opportunities, and changes in the purchasing power of households and individuals. Guide questions were used during the focus groups to explore each of these in greater depth. With the help of these questions a semiological matrix was developed which allowed us to systematise the information and classify quantitative and qualitative variables.

Applying this qualitative research technique involved organising focus group discussions for each of the two cable-car line's areas of influence, the composition of which took into account household conditions, age and gender. In each zone of influence two focus groups discussions were conducted, one with a group for young people and another with adults; homogeneous groups facilitate individual expression and avoid possible inter-generational interference.

In the J Line's zone of influence the two focus groups were conducted in Commune 13's park-library in the San Javier neighbourhood on 5th December 2010. The first focus group consisted of 12 adults over 25 years of age, all of whom live in the study area. The second focus group

consisted of 10 young people between 15 and 25 years of age living in the study area.

The focus group discussions on the K Line were carried out in the España park-library in Commune 1, located in the Santo Domingo Savio neighbourhood, on 12th December 2010. The first focus group consisted of 16 adults above 25 years of age living in the study area. The second focus group consisted of eight young people between 15 and 25 living in the study area.

Barriers to Accessing the System

Access impedance was defined as the obstacles that transport users face in accessing the system, taking into account different conditions of access and the particularities that impede their use. An initial question: 'How many times a week do you use the *Metrocable*?' aimed to differentiate between frequent travellers and the non-users of the system. It is worth highlighting that, although the question does not refer to the use of other means of transport, some participants said they were not *Metrocable* users because they had access to other modes of transport. Within the group of adults in Santo Domingo, for example, Yaned and her husband Germán own a motorcycle and do not use either the bus or the *Metrocable*. Meanwhile, William uses the *Metrocable* every day because "that is what there is... there's nothing else". This suggests that in certain cases people who have access to other means of motorised private

transport prefer that over the *Metrocable* or over all other form of mass transport. In this case, the *Metrocable* will capture users who previously used the bus, although it is likely that other users are attracted by the fare savings offered by the *Metrocable*.

In this sense, travel cost savings mean that the participants had a low resistance to choosing the *Metrocable* as a means of transport, even when taking into account the amount of walking that *Metrocable* use often implies. For example, to the question, 'How far are you prepared to walk to take the *Metrocable*?', Robeiro (construction worker, adult focus group, J Line) replied:

"In the morning [walking] takes me half an hour and in the afternoon at least forty minutes. In the morning I go on the Metrocable to Santa Lucía and from there I walk to Castel (in La Castellana) where I'm working, and in the afternoon I walk back to Floresta Station and take the integrated-fare bus and that way I save money. It's not much [...] but every peso counts."

This user buys an integrated Metro-bus ticket for 2,000 pesos (approximately US\$1), although this involves in fact two separate tickets (one for the integrated bus and another for the Metro and/or *Metrocable*). In order to save 50% of the total journey cost, he uses one of the tickets (that of the *Metrocable*/Metro) in the morning, getting on the *Metrocable* as far as the Santa Lucía Metro station, and from there he walks for

20 minutes to his workplace. He uses the other half (the integrated bus part of the ticket) for the afternoon return journey, walking 40 minutes to the Floresta Station from where he can use the integrated bus which takes him home (to date the Metro has no way of controlling this separate use of an integrated ticket, nor is there any regulation requiring it). If someone like Robeiro is willing to walk an extra 50 minutes per day to save 1,000 pesos, it means that the valuation of their time is 20 pesos per minute (the result of dividing 1,000 pesos by 50 minutes).

Using the results obtained from discrete choice modelling (see earlier chapter by Sarmiento *et al.*), a Subjective Time Value (STV) was obtained for the inhabitants of the study zone. In determining the STV, the aim was to identify how the group of users value their time. For the inhabitants living in the *Metrocable* J Line zone of influence (Communes 13 and 7) the STV was 46 pesos/minute. For the K Line (Communes 1 and 2) this value was 42 pesos/minute. This is equivalent to 2,520 pesos/hour (US\$1.4/hour), 20,160 pesos/day, and 604,800 pesos/month (US\$336/month). The monthly amount is close to the current legal minimum wage in Colombia. The majority of journeys registered in the surveys are for work or study, representing more than 70% of the different motives for homeward journeys.¹

¹ The stated choice surveys used in this project were carried out at peak hours of the morning and afternoon and some intermediate times, talking to people in line waiting to access the *Metrocable* and accompanying the user in their journey; for the non-users we boarded the buses of the public transport system in the study area.

From the focus groups we may conclude that with such considerable travel cost saving, there is little resistance to choosing the *Metrocable* mode independently of walking and waiting times.

Some testimonies help to illustrate this:

“I go this way [using the integrated Metro-bus ticket in two separate journeys] because it’s cheaper; if I pay two fares on the Metrocable, it will cost me 3,100 pesos, whereas this costs me 1,900.” Robeiro (construction worker, adult focus group, J Line).

“The thing is that people walk according to what they have in their pocket, because if you can pay [for transport], you pay, but if you can’t pay, you walk, for an hour or even more. If it’s raining you use an umbrella; come rain, thunder and lightning, you just have to walk.” William (construction worker, adult focus group, K Line).

“As I’m a student a ticket costs me 300 pesos less; I walk about 20 blocks, because from the university to the Metro there are about six blocks and from the Metrocable back to my house is like fifteen blocks. I’m used to walking a lot, I love walking.” Manuel (University student, young focus group, J Line).

Other *Metrocable* users tend to estimate their journeys in time rather than distance, but it is worth pointing out again the low value they give to their time. People walk long distances to access the Cable and to get to their final destination. For example, Rosalía (a domestic worker, adult focus

group, K Line) when asked the question ‘What would be the maximum you would walk, four blocks, for example?’ She replied ‘Oh no, I’d walk two hours’.

And María (a cleaner, adult focus group, K Line) replied the following to the same question:

“I walk every day and it takes me 23 to 24 minutes and I do that every day because [transport] is really expensive; I pay nearly 6,000 pesos if I travel by bus. So I get to the Floresta station at 5:05 am and I get to the university [walking] at 5:24 am. In terms of blocks, I don’t know how many I walk.”

Users measure their journeys in time rather than distance as they are interested in the savings they make by walking some stages of their journey. Two women walk every day from the Metro station to their workplace, around 1.5 km at a speed of around 3.8 km/hour. The men who participated in the focus groups were prepared to walk more than the women whatever the weather. They reported walking for an hour twice a day, over a distance of between four and five kilometres, at around 5km/hour. They acknowledge that:

“We have to get up earlier [to use the Metrocable] because with the bus I’d get there quicker, but you have to be patient with the queue [for the Metrocable] because here it is very long.” Orlando (construction worker, adult focus group, K Line)



A second question focused on the particularities that impede users' from using a transport mode. To the question 'Have you stopped using the *Metrocable* for fear of heights, rain, anxiety, insecurity, long queues?', the following answers were given:

"When there's a heavy storm they close the Metrocable and ask people to get off; they have to go back and then they have

to take the bus..." Robeiro (construction worker, adult focus group, J Line).

"Well, we often go ticket in hand [to the Metrocable station] and they tell us there's no service operating. So what can we do, if you're going to work you have to call and tell work what's happened, and if they're helpful they'll say OK catch a bus and we'll give you a bit of extra time to get in." Jorge Ignacio Jaramillo (construction worker, adult focus group, J Line).

The adverse weather conditions which sporadically cause interruptions to *Metrocable* operations also produce inconformity with the service, with users complaining that these inconveniences increase travel time and cost.

Changes in Access to Opportunities

Here we examine the incidence of the *Metrocable* in terms of changes in living conditions of residents. Implementation of the *Metrocables* brought changes to areas immediately adjacent to the transport system, with notable improvements in the quality and quantity of public space (viewing platforms, green areas and other public spaces), façades of buildings and an increase in the number of retail shops (Metro Company, 1998; see also Coupé and Cardona in this book). To the question 'What would you consider to be the incidence of the *Metrocable* in changing or improving your

living conditions?, there were a large number of interesting answers:

“I see commercial changes. La Campiña was a neighbourhood with very few shops, with very little going on. It’s as if seeing so many people living close to La Campiña; a lot of things began to happen. The number of businesses just multiplied.” Manuel

(student, youth focus group, J Line).

“Vallejuelos changed completely; they painted everything to make it look nicer. The neighbourhood changed a lot [...]. It’s nice, the houses are nicely painted. Below the Metrocable station is the police station, and the church is really close”. Maryori

(student, youth focus group, J Line).
“[Things changed] especially in the places close to the Metrocable pylons and about three blocks around the stations.” Jhonatan (construction worker, youth focus group, J Line).

“[Changes happened] in areas that are closest to the Metrocable.” Camilo (youth focus group, J Line).

“In La Campiña you don’t feel the change very much because it’s a bit far off. In other areas [closer to the Metrocable], in Vallejuelos, Juan XXIII, La Aurora, you can see changes, but in La Campiña not much has happened.” Flor Alba

Residents in the neighbourhoods noted a fall in the incidence of violence related to gang warfare, improved leisure activities for children, new meeting places for young people, the new public library as a new landmark, as well as rent increases and rises in the number of both informal street sellers and formal commercial outlets such as shops and bars.

“As far as I know around the viewing platform there’s been an increase, not so much of shops as of street sellers, to the extent the municipality make them wear distinctive jackets; they sell a lot because there are lots of people. There’s the donkeys and colourful open buses for tourists; it’s a lively commercial area.” María Alejandra



“Around the Granizal sports pitch that’s improved a lot because they’ve put in lots of clothes’ shops and bars.” Duver (youth focus group, K Line).

“Well, here on Sundays at the terminal on the station side, they have put in lots of stores; there are some that are more for dancing, the park is more for fun and there’s something for everybody.” Verónica (student, youth focus group, K Line).

Safety

Participants expressed fears related to public-order problems in Commune 13 (J Line).

“Although I use it [the Metrocable] a lot, I’m afraid of the violence that’s going on [in the neighbourhood], and there’s a lot of it right here. They say you shouldn’t go there, that it’s better to get off and take the bus...” Ángela (domestic worker, adult focus group, J Line).

“I have three kids and when I travel I travel with them. How am I going to risk taking them there [where the Metrocable station is]? So I prefer to take a bus or taxi.” Alejandra (housewife, adult focus group, J Line).

“For example, when all that [violence] was going on in the Juan XXIII [neighbourhood] I only travelled by bus”. Fredys (construction worker, adult focus group, J Line).

To the question ‘Do you feel safer taking the Metrocable than the bus?’, the following responses were heard:

“What’s more, when I’m carrying a bit of money in my pocket, the Metrocable seems safer to me.” Flor Alba (nurse, youth focus group, J Line)

“For example that particular place, at least as it affects me, the Juan XXIII Metrocable station is the point which is closest to the violence and the random shootings.” Angela (domestic worker, adult focus group, J Line).

“For me there is a difference because there’s better surveillance by the steps closest to the Metro station. You can see a lot more chaos in a public square than in the Metro because there’s more control and they don’t let people throw rubbish or, for example, if a child stands too close to the fountain they’ll make him move away.” María Alejandra (housewife, youth focus group, K Line).

“The thing is that the Metro system didn’t just increase the value of properties close to the lines, but increased it for the whole metropolitan area. The Metro did all this. Medellín is not what it used to be. Before we didn’t feel the presence of the police; now there is greater safety, there is more surveillance; we can walk about more safely. There is greater safety, if you go around the Metro line and nearby areas you’ll find more security.” William (construction worker, adult focus group, K Line).

‘Metro Culture’ and Social Regulation

An important feature of Medellín’s Metro system is contained in the Company’s set of regulations known as *Cultura Metro* (Metro Culture) that seek

to govern the behaviour of users. This is reinforced through a number of educational and publicity campaigns in the Metro and elsewhere. In recent years, in response to changes in Colombian law, the Metro Company has sought to improve transport and accessibility conditions for people with limited mobility (PLM). For example the use of lifts, which only exist in 40% of stations, is restricted to extreme cases of physical disability.² In other stations mechanical platforms have been installed on stairways, and these can take up to 10 minutes to ascend. These and other related issues were also the subject of discussion in the focus groups.

To the question ‘Why do you or would you stop using the *Metrocable*?, answers included:

“When there are lots of tourists, because of a queue of five hundred people when I’m hungry and tired on the way home [...]” Manuel (university student, youth focus group, J Line)
“For example during the City’s Flower Festival³ and in December.” Johana (student, youth focus group, J Line)

Notwithstanding the inconveniences suggested by Cable users relating to the flow of tourists at some times of the year and during certain events, the Metro Company uses these dates and events to promote the advantages of the *Metrocable* as a means of transport and as a city tourist destination.

² According to the Metro Company, in 2012 there were close to 1,000 registered PLM users (Metro de Medellín, 2012).

³ Traditional week-long festival celebrated annually in Medellín in which the central event is a parade of large manually-carried flower displays, the motto of which is “When a float goes by it’s Antioquia on show”.

The Metro Company also makes an effort to alert users ahead of time, encouraging them to buy tickets in advance or top up their ‘Civic Card’⁴ in order to avoid congestion and long queues. The Metro Company ignores the difficult economic conditions of many users when it urges people to top up their card or buy tickets in advance. This may be possible for those with a regular income, but even then such announcements may not coincide with pay-day. For many, buying tickets on a daily basis is the only option, whether in the peak period or outside it.

In this respect, people from the adult focus group for the K Line commented:

“Every week I top up my Civic Card to avoid the queues. You have to avoid wasting time, avoid the queues, because the 1st of December when I came to pick up my kids, the queue at the station flowed way outside but as I had my card I whizzed through easily. Before I had a Civic Card I would buy the ticket at night. That’s what my brother does. He buys his tickets at night or on Sunday for the rest of the week; that saves time. I think everyone should try and save time”. María (employee, adult focus group, K Line)
“I top up the Civic Card every week [...] and at the end of the week I recharge it again”. Orlando (construction worker, adult focus group, K Line).

⁴ This is a contact-less intelligent card (TISC in Spanish), a pre-paid magnetic card available for journeys on the main Metro, the aerial cable-car lines and some buses. This technology offers quicker access and lower fares on these modes of transport, speeds movement through turnstiles, avoids handling of cash, and saves users time (so long as the card has enough credit on it) (Metro de Medellín, 2012).



“I recharge every fortnight or on pay-day”. William (construction worker, adult focus group, K Line).

“Now that I have to, I buy the integrated tickets each fortnight”. Diomar (light equipment operator, adult focus groups, K Line).

“I buy a ticket every time I travel”. Eucaris (domestic worker, adult focus group, K Line).

“Yes, every time we travel we buy [tickets]”. Janed (shop attendant, adult focus group, K Line).

“Depends on how much I’ve got in my pocket”. Fredys (construction worker, adult focus group, K Line).

On the same issue, one of the adults on the J Line (San Javier) observed:

“It depends, if you travel daily you recharge more often. If you travel only now and again, you have to top up less.” Luz Marina (self-employed, adult focus group, J Line).

To the question, ‘What do to miss if you go on the Metrocable instead of the bus?, the following answers were given:

“On the bus you can eat, and often you get on when you’re really hungry. In the bus you can buy sweets for the kids when you have nothing to bring them, although you do sometimes get tired of (the walk-on hawkers)...” Angela (domestic worker, adult focus group, J Line).

“I like the fact that in the Metro you’re not allowed to eat because sometimes there is lots of rubbish and I like the fact that on the Metro there is only one stop. On the bus there are lots of stops, you stop here, stop there, everywhere, every five minutes.” Alejandra (housewife, adult focus group, J Line).

“Ah yes, that is the bad thing [on the Metro] and it’s like that [gesturing to eat secretly]. I personally miss chewing a ‘Bom Bom Bum’[a popular sweet] or something to entertain yourself in the journey, but nothing is allowed; sometimes they even make you throw away your chewing gum”. María Alejandra (housewife, youth focus group, K Line).

“If you’re eating something you have to do it quickly if you’re going to get on the Metro”.

Verónica (student, youth focus group, K Line).

“Sometimes if I buy something on the way, when I get home to eat it I don’t really want it anymore.” María Fernanda (student, youth focus group, K Line).

“And by then [the food] is cold, and that’s really bad”. Verónica (student, youth focus group, K Line).

*“I’m a pretty happy person, what I miss is the music; the buses have their music, I miss that”.*⁵

Camilo (construction worker, youth focus group, J Line).

Comfort

To the question ‘What do you *not* like about using the *Metrocable*?’ there were various responses:

*“The stairways, because sometimes there are several floors to walk up. You used to be able to use the lift. I don’t know if that was while it [the *Metrocable*] was being launched, but you can’t anymore.”* Angela (domestic worker, adult focus group, J Line).

⁵ The Metro Company requires users of personal music systems to keep the volume down.

“You can’t sit down, on the platform floor that is; the platforms are so big that there are parts where no one is standing and [sitting down] wouldn’t block the evacuation routes; you should be able to sit on the floor.” Manuel (student, youth focus group, J Line).

“Peak times, the congestion.” Ower Arley (construction worker, adult focus group, J Line).

“The queues when you get there; it’s get in line, get in line, and it takes ages”. Jorge Ignacio (construction worker, adult focus group, J Line).

“The overcrowding can get terrible and sometimes it’s better just to take the bus”. Ower Arley (construction worker, adult focus group, J Line).

“In December it’s very crowded”. Alejandra (housewife, adult focus group, J Line).

“One thing that affects me, is that I live opposite a [Metrocable] pylon and at 11 or 12 at night when it stops you immediately feel a peace, at rest, the stress stops. I live right here opposite, in this little park, there’s the pylon. That’s where I live and my flat is on the third floor so you hear it a lot.” María Alejandra (housewife, youth focus group, K Line).

In summary, there is a gap between the Metro Company’s official messages and the daily experience and perceptions of users, for example in matters of safety, comfort and impacts.

Although no one can deny that there has been a remarkable upgrading in the areas close to the stations, this becomes less evident two blocks away from the stations. Furthermore, the carefully controlled and closely surveyed Metro/*Metrocable* system conveys an image of security, but people’s perceptions and the environment of



violence outside the system, such as on the J Line, questions this institutional image. At peak times the comfort of the system is drastically reduced by long queues and difficulties in topping up user cards.

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Political Resonances of the *Metrocables*

Peter Brand

Beyond 'Good Government'

Aerial cable-car systems are politically attractive. In the case of Colombia, even the then president showed his unrestrained enthusiasm for the Medellín *Metrocables* and gave his commitment to promote a similar system in Soacha (as discussed in the following section of this book). Normally it is local political leaders, especially mayors, who have seen aerial cable-cars as projects with a substantial political return: relatively cheap, possible to construct within a single administrative term and highly visible, aerial cable-cars respond well to the legitimate interests of a city administration.

On the other hand the Medellín case demonstrates that the effects produced by a cable-car system on the material quality of life of urban residents are modest. They do not transport large numbers of people, and respond to the mobility needs of a relatively reduced number of people within the areas of influence. The improvements in social indicators seem to be more attributable to the general economic conditions within the city and the effect of conventional social programmes in poor neighbourhoods. Nor have the *Metrocables* and complementary urban works been able to prevent growing social inequality in a period in

which Medellín became the city with the worst income distribution in Colombia.

However, the perceptions of people (neighbourhood residents, the city's population in general and especially visitors from outside) paint a picture of considerable success. The visits of official delegations and treatment in the media have hailed the *Metrocables* as a 'good practice' that should be replicated in many cities. Citizens in general became enamoured with the aerial cable-cars, and community leaders in the areas of influence are among their most ardent defenders.

It is relevant, then, to consider the political logic of the aerial cable-cars and explore their limitations and risks. This is not to question the political interests themselves or attempt to submit them to technical rationality. Every successful urban administration creates hope and moulds citizen imaginaries. What is important, however, is to ensure that those legitimate political intentions surrounding the aerial cable-cars do not run aground.

Public Power and Government Legitimation

City governments today face acute challenges of legitimacy in the poorest urban sectors, confronted by those excluded from the economic and social circuits of globalisation. The driving force behind urban development policy is economic competitiveness, which privileges the interests of both national and international capital and at the

same time and almost universally, produces greater social inequality and the exclusion of those least able to participate in the 'globalised' city. Medellín's aerial cable-cars, built in the poorest sectors of the city, clearly intend to demonstrate a concern for the lives of the most disadvantaged sectors of the population.

In this sense, Medellín's aerial cable-cars may be seen as going beyond the conceptual limits of governance understood simply as 'good government', with its principles of efficiency, transparency and formal inclusion. The *Metrocables* are better understood within the framework of the challenges for local democracy to recognise and incorporate those who have been excluded from urban life (Dávila and Brand, 2013). Government legitimation involves governance in the sense of the technical capacity to carry out programmes, but in the poor and informal sectors of the city it simultaneously implies a strategy for (re)establishing authority over urban sectors under weak state control. Such a situation requires new forms of government and innovative interventions in urban space (Swyngedouw, 2005) and the aerial cable-cars are a good example in this sense.

The eminently public character of the aerial cable-cars is therefore not surprising. In the case of Medellín the *Metrocables* were conceived, financed, managed and operated by public bodies and companies. Moreover, especially in the construction phase and commencement of operations, there was extensive inter-institutional management and a close relationship with the beneficiary communities. In contrast, there was no significant participation of the private sector, other

than sporadic publicity and sponsorship of civic messages on the cable-cars and support of some cultural programmes within the Metro system. The criticism of a 'democratic deficit' levelled at so many public-private partnerships can hardly be applied to the *Metrocables*.

The Political Potential of Aerial Cable-cars

In the case of Medellín, the *Metrocables* became key elements of an urban project presented discursively as the re-payment of an 'historical debt' that the city owed to its forgotten poor sectors. However, the modest impacts of the *Metrocables* on the material life of those residents, suggests that the political logic and coherence of the aerial cable-cars lies elsewhere; certainly beyond the conventional reach of governance understood as the judicious administration of the city (World Bank, 2000). It is clear that the Metro and *Metrocables* have contributed to the construction of an image of a city that is presented as not only economically competitive and innovative, but also socially progressive and committed to the poor (see also Stienen, 2009). In trying to understand how this has been achieved, the following aspects can be highlighted:

Symbolic efficacy: While only a small portion of the population in the areas of influence can be considered frequent users, the *Metrocables* produce wide and authentic perceptions of connection with and inclusion in the city on the

part of the inhabitants of those neighbourhoods. Inclusion is not necessarily concretised in more travel and significant increases in participation in labour markets and the material life of the city. It is more a question of the *sensations* that the *Metrocables* produce as symbols of inclusion of those neighbourhoods in the urban agenda, the attention and investment of the city administration, positive media coverage and the arrival of visitors of all kinds.

These effects are potentiated by the high visibility of the aerial cable-cars and the kinaesthetic experience that they offer. A conventional road and bus system may have the capacity to move a higher volume of passengers, but they lack the visual and aesthetic appeal of the aerial cable-cars. In this sense the *Metrocables* fit within the logic of the urbanism of spectacle (Debord, 1994) as a dominant trend in the restructuring of cities, based on the political economy of commercialised cultural consumption through festivals, concerts, shows and similar events. The logic of local spectacles can also, however, sow seeds of dissent and constitute a terrain for reflexive action that "provoke radical critiques of inequality" (Fox Gotham, 2005) although there are few signs of this in the case of Medellín and the *Metrocables*.

State incursion: Studies of the increased mobility offered by the aerial cable-cars tend to focus on the opportunities from within or the possibility of more and easier movement of the inhabitants of those areas towards the rest of the city. However, mobility is multidirectional.

Equally and perhaps even more important is the fact that the aerial cable-cars also allow the rest of the city to penetrate urban sectors that were previously inaccessible, unknown and perceived as highly dangerous. And it does this in a very particular way. The aerial cable-cars are closed systems, strictly controlled and heavily surveyed, and they offer a secure form of transport for both local residents and visitors, and a dramatic aesthetic and kinaesthetic experience. The passenger, sealed off in a cable-car capsule offering impressive panoramic views, glides silently above the rooftops with glimpses into the private life of the poor neighbourhoods. The *Metrocables* allow visitors (including tourists, international experts and journalists) a peculiar proximity to a distant world, so close yet at the same time so far from the experience of the passenger him or herself.

Taking this to its extreme, it produces what could be called the 'King of Spain syndrome'. King Juan Carlos I rode the *Metrocable* to inaugurate the park-library located close to the terminal on the first line, which carries the name of his country. As the mayors of Medellín have often said, what was important was not the (very modest) support from the Spanish government in equipping the library, but the mere *presence* of the King: a ritualistic celebration of the conquest of this sector of the city on the part of the local administration. When this type of state presence is complemented by the presence of new institutions of law and intensified police and military installations, the aerial cable-cars constitute the civic side of a process of 'pacification' of the poor sectors of the city.

Neighbourhood normalisation and social control: The *Metrocables* bring with them demanding conditions of use, strict rules of behaviour and rigid citizen surveillance, especially within the Metro/Metrocable system but also in relation to neighbourhood life in general. Within the system, the 'Metro Culture' programme promoted by the Metro Company (Metro de Medellín, 2007) places strong emphasis on the notion of the 'good citizen' in terms of the values, attitudes and behaviour of users. The poorly dressed, the badly spoken and those under the effect of alcohol have no room on the Metro or *Metrocable*; neither do those who carry large packages and even less so those without sufficient money to pay the fare (whom bus drivers often let enter free by the back door). While the majority of residents tend to accept all the above as something necessary and often positive, it can also provoke unease, inconformity and resistance among some users.

At the same time, the construction of the *Metrocables* opened the way for the fuller presence of state institutions, until then substantially excluded from or with restricted influence over those sectors. In this way the *Metrocables* facilitated the imposition of the rules of the formal city: legal connections to public infrastructure services, payment of taxes, inclusion in official registers, and so on, in such a way that the *Metrocables* became a dispositive for the normalisation of urban life and the regulation of citizens, carried out through multiple and subtle mechanisms.

Conclusions

The political effects of the Metrocables described above, and with them the increased influence and legitimation accruing to local government, are not guaranteed. For lasting political yield, such effects of an aerial cable-car system have to be exploited systematically and in various ways: through discursive production, complementary investment and social support programmes. In short, the Medellín experience allows us to highlight the importance of the following aspects:

The need to integrate an aerial cable-car into the urban fabric and insert it in the daily routines of the inhabitants of the areas of influence. It is not absolutely necessary that all inhabitants use them; what matters is that they feel that it belongs to them.

The importance of the permanent and positive presence of the state in the areas of influence, continued by other means once an aerial cable-car commences operation. A passing, gestural intervention will be perceived as such by inhabitants. Complementary urban projects concerning improvements in public space, social infrastructure and programmes, local planning processes and participatory budgets, and so on, validate and consolidate the effects of improved mobility that an aerial cable-car offers.

The creation of sensations of social inclusion is strengthened to the degree that an aerial cable-car system forms part of a coherent 'city project', allowing a potentially isolated artefact such as an aerial cable-car to spearhead an inclusive project in all dimensions of city life.

The political art of the aerial cable-car consists in the creation of authentic sensations of the inclusion of poor sectors of the city, sensations that need to be constructed and materialised in many different ways. An aerial cable-car that hangs over an unchangingly impoverished social and urban landscape loses all charm and positive political significance. ■

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L Line to Arví Park

The Land-Use Links of Medellín's *Metrocables*

Ralph Gakenheimer

Medellín's *Metrocables* are a glorious initiative of urban development and democratisation of access. They provide a link to the metropolitan economy for populations that have been remote from its opportunities. They change the whole shape of economic opportunity for hillside communities. They have already been replicated in Caracas and Rio de Janeiro and will surely continue to be so by many of the cities represented at the project workshop in Medellín (carried out in December 2011 as part of this research) from all over Latin America, and thereafter by cities with hillside settlements throughout the world. They will significantly reduce the social stigma of living on the hillsides and significantly raise the incomes and opportunities of those families.

At the same time, this is a moment to consider the relentless land development dynamics likely to take place. It is necessary to empower hillside individuals and communities to take advantage of the positive impacts of this new mode and to cope with the potentially damaging impacts. The latter could be an embarrassment to the otherwise great future of the mode.

Intensification of Land Use

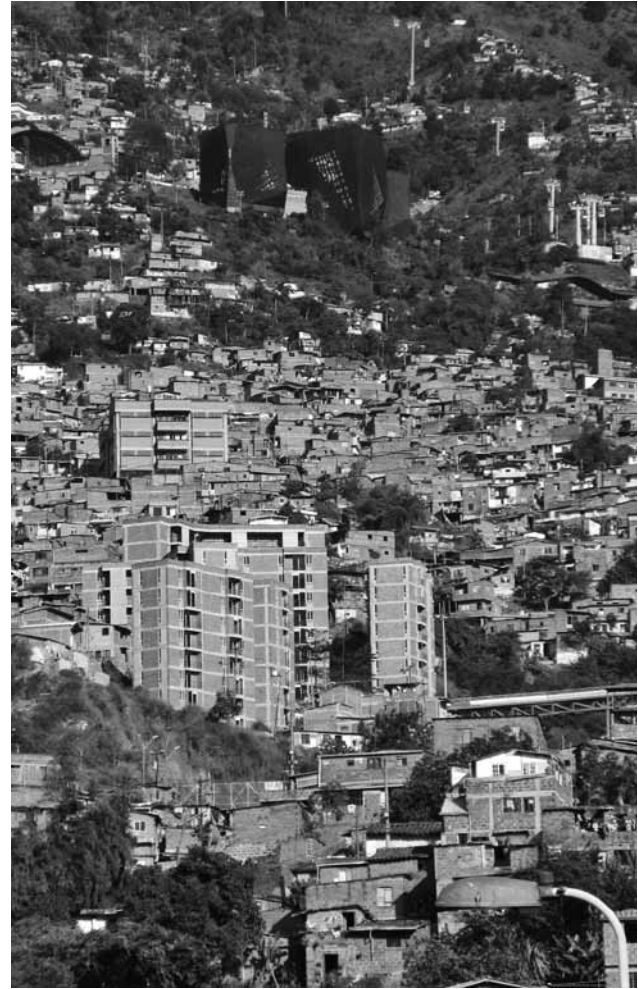
In particular, the localities of stations of the *Metrocable* in Medellín are already heavily used as commercial and service localities, but the new access is going to generate much higher demand for such activities because of the very high movement of passengers through the stations.

New client-serving establishments will appear, such as banks, restaurants, cafés, and food stores. It will be much easier for passengers to buy their groceries on arrival rather than carry them through the transit connections and in the transit cars. Accordingly, there will be strong forces toward increasing building densities and heights. Part of this commercial expansion will occur along the lateral access streets, but with a premium on being close to the *Metrocable* stations. There may also be efforts to develop smaller, more numerous housing units along the lateral access streets.

Further Research to Meet Short Term Requirements

The whole shape of access flows and use densities will be subject to new pressures. The geotechnical conditions of these zones have already withstood significant loads as a result of urbanisation. New developments will increase this load yet further, dispersed over the length of the lateral contours of the slopes. There could therefore be need for additional studies to examine geotechnical conditions where the stations are situated, including other zones further away.

These communities are originally products of spontaneous settlement, but it is important to develop community group capabilities for the guidance of private development initiatives. Development control capability will be a complicated task



requiring significant public technical and authority support. Another alternative is more direct official government guidance of the development. It is important that locational decisions be backed up by official sources to assure safety in development.

The Future

We must acknowledge that the future is sure to bring rapidly increasing construction of additional *Metrocable* lines, and therefore need for greater guidance for its land development effects.

There will be increased demand for system capacity and increasing means of serving it. After all, the current *Metrocable* lines are transporting commuters by using mechanical systems basically designed for ski stations and tourist attractions—travel flows which are in general not peaked, and in which each passenger should have a good view. Greater capacity in the immediate future would require custom designed equipment and would be economically untenable. But the industry is sure to catch on to the promise of the *Metrocable* and will soon market equipment designed to serve it. It is surely feasible to multiply passenger line capacity by a substantial number.

When that happens it is likely that existing *Metrocables* will not be soon replaced because the sunk costs would be so great (assuming that the suspension would have to be replaced as well as the cars). However we should be thinking about advice for future *Metrocable* construction. There needs to be careful examination of subsoil conditions, and zoning for permitted intensity and types of land uses. There needs to be specific plans for infrastructure capacity. The construction and

operation of water, stormwater and wastewater facilities will be a challenge. These services will be quite costly and precarious.

Planning for the street transport that complements *Metrocable* will be a particular challenge. The problem has a unique form. The population surrounding the stations will show high residential densities, low auto-motorisation, but probably high use of motorised two-wheelers. The passengers may show high use of informal transport systems along lateral connectors. In brief, this is a very new micro-environment for public transport.

One thing that is quite clear is that the priority for pedestrian circulation is higher in the locality of *Metrocable* stations than in other travel environments. There needs to be separate consideration of pedestrian transport—directions, volumes and modes. That includes the use of stairways, lifts, and public escalators (already installed in one neighbourhood in Medellín's Commune 13).

The entire policy and management aspect of this unique transport environment presents new requirements for which the existing public services are not prepared in any existing metropolitan area. This stimulates the idea of creating a new *Metrocable* transit management authority that can address this multimodal transport and land use environment. ■





An Outlandish Idea?
Soacha's
Cazucable

Soacha, the Cazucable, and Bogotá D.C.: A Difficult Relationship

Nicolás Rueda García and Luis Hernán Sáenz

Soacha: From Autonomous Municipality to a Strategic Component of the Metropolitan Area

The municipality of Soacha is located on a high plateau of the western part of the Andes known as the ‘Bogotá Savannah’. It lies at 2,500 metres above sea level and is a meeting point between some of the region’s strategic ecosystems¹. Its urban territory is cut off by the Western Ridge of the Colombian Andes on one side and the Bogotá River on the other and is traversed by the basin of the Soacha River. It is one of 116 municipalities in the *Departamento* (province) of Cundinamarca and occupies an important place in Colombia’s central region as

1 These include the high and low moorlands of Sumapaz, the Bogotá Savannah high plateau, Bogotá’s river valley, and its physical connection with the Magdalena River valley, Colombia’s main river artery (SDP, 2010).

the most populated municipality neighbouring the country’s capital city, Bogotá. Today, Soacha has the tenth largest population in the country, housing some of Bogotá’s population over-flow of the last 30 years and part of the city’s recent migrant population, especially from low income households. In 2010, Soacha had a population of 456,000 inhabitants living on 3,110 hectares of urban land, with a density² of 146.6 inhabitants/hectare³ (Montenegro, 2011).

2 Density is calculated by dividing the number of inhabitants by the urban land area (measured in hectares).

3 Soacha’s population density is slightly lower than that of the largest Colombian cities: Bogotá (194 inhabitants/hectare), Medellín (221 inhabitants/hectare) and Cali (187 inhabitants/hectare).

Soacha is also the municipality with the second highest concentration of industrial and productive establishments in the region. Over the last few years, it has been the object of important urban and regional projects, such as the extension of the dual carriageway in the Bogotá-Girardot road (one of the main road axes in Colombia), the development of the *Ciudad Verde* Social Housing Macro-project with a production target of 42,000 dwellings, and the future extension of the southern trunk road of Bogotá's BRT Mass Transport System (*Transmilenio*) which will incorporate Soacha within the system⁴. The municipality is located on one of the most important road intersections of central Colombia, connecting the capital region with the south, south-east and west of the country.

Soacha was founded in 1600, a little more than 60 years after Bogotá (FEDES, 2010). Its recent history and growth are highly influenced by the process of development and expansion of Bogotá's southern periphery, especially the localities of Bosa and Ciudad Bolívar.⁵ The construction of major infrastructure projects such as the El Charquito hydro-electric plant at the end of the 19th Century, the Muña dam in the 1930s and the southern railway line which connected Bogotá with Girardot in 1898, and

which provided the layout for construction of the Southern Motorway, have all marked the form and growth of Soacha's urban area (Bonilla, 2009). These elements of infrastructure brought about considerable tension between the local authorities of Bogotá and Soacha, until the physical separation between the two vanished with the gradual appearance of a conurbation.

The area of Cazucá, where an aerial cable-car project informally known as *Cazucable* is planned, and located on a hilly area south of the Southern Motorway on the border with Bogotá, is an example of the conurbation between Soacha and Bogotá (see Figure 3). Cazucá grew with the help of two fairly typical mechanisms in the development of urban informal settlements in Colombia: the first one, which was prevalent during the 1970s and 1980s, consisted of land invasions carried out through the illegal occupation of private lands by groups of families. With the support of the Communist party through the *Central Nacional Provivienda* (Cenaprov), this gave birth to two neighbourhoods known as the Julio Rincón neighbourhood, founded in 1978, and the Villa Mercedes neighbourhood, founded in 1988 (Pinzón, 2007). The second came about when some of the leaders of these invasions divided part of the land into plots to sell at low cost to households who arrived later, a practice commonly known in Colombia as 'pirate sub-division.'

The images in Figure 1 illustrate the process of rapid urbanisation that Cazucá underwent between 1996 and 2007. The layout of *Ciudadela Sucre*, a relatively recent pirate sub-

⁴ The construction of the *Transmilenio* extension to Soacha began in 2010 but at the time of writing in mid-2012 it has stalled and will not be completed within the original timeframe of the project (see the chapter by Bocarejo and Velásquez in this section).

⁵ 'Localities' are political-administrative divisions in Bogotá's Capital District administered by local mayors appointed by the Mayor of Bogotá. Bogotá is sub-divided into 20 localities containing over 1,200 neighbourhoods (*barrios* in Spanish).

division located in the background of the 2007 photo, shows evidence of urban design by the 'pirate developers'. In contrast, the Cazucá neighbourhoods in the foreground show evidence of a chaotic, spontaneous and dense land occupation, the outcome of successive episodes of land invasion.



Figure 1: Expansion of Cazucá Between 1996 and 2007
Source: Torres (2008)

Main Functional Relations Between Soacha and Bogotá

The spatial and functional conurbation of Bogotá-Soacha is the most dynamic in the area of the Bogotá Savannah. The high population pressures to which Soacha has been subjected and its strategic location have led to chaotic urbanisation. This has been compounded by institutional and governance difficulties (see the next chapter by Acevedo *et al.*) that left the municipality at the mercy of the informal land market, the result of which are vast informal settlements lacking adequate basic infrastructure services, educational facilities, parks and road infrastructure.

The main element that defines the functional relationship between Soacha and Bogotá is the Southern Motorway. The Motorway traverses all Bogotá's urban area from north to south, and turns into a National Motorway (connecting the capital with the southern and south eastern regions of the country) as it enters Soacha municipality.

Urban growth in Soacha has developed in a linear fashion along the Southern Motorway where a range of economic activities are located, providing access to urban services and, crucially, being a point of access and a link to job opportunities in Bogotá's labour market (Bonilla, 2009). With the construction of the *Transmilenio* bus rapid transit system in 2000, Bogotá was able to link up the peripheral populations in the north, south and west of the capital. In 2006 the trunk

route for *Transmilenio* to the Portal Sur terminus station was inaugurated, in the limits between Bogotá and Soacha, thus giving greater and more efficient access for Soacha's inhabitants to Bogotá's urban services, and in this way completing the transport links between the two.

Beyond the functional relationship through the Southern Motorway, the urban fabric that defines the border between Soacha and Bogotá as the physical limit between the two territories has disappeared. Neighbourhoods such as Cazucá with high levels of informality and located in areas which are difficult to access due to topographical and social factors, find their functional relationship to be more effective with Bogotá than with Soacha itself. Domestic water and energy supply in places like Cazucá can easily be provided illegally due to their proximity to Bogotá's trunk networks.

The Cazucable Project

The idea of building an aerial cable-car system in Cazucá's hilly area initially came out of a 'community council meeting' carried out in the municipality by the then President of Colombia Álvaro Uribe Vélez in 2009. The proposed project, known informally as *Cazucable* and developed by the Medellín Metro Company,⁶ consists of four stations covering a distance of 2.8 km and rising to 155 metres above the Southern Motorway. It links up with the Southern Motorway at the proposed

⁶ Information on the aerial cable-car project presented and analysed in this section comes from pre-feasibility studies carried out by the Medellín Metro Company in 2009.

Terreros Station and rises up Cazucá's hills, with the three remaining stations located along the way. The third station on the route called Santo Domingo Station is located on the highest point, on the border with Ciudad Bolívar. The route design does not follow the street layout, which is irregular and has developed organically. As a result, pylons are not located on the widest roads in the area.

The Terreros Station is designed as a modal interchange point where users can transfer between *Transmilenio* and the *Cazucable*, and will be developed in a building complex to be used as a transport node. The three stations located on Cazucá's slopes are located in areas designated for integrated upgrading by the municipality which bear the marks of being the outcome of non-existent planning, with narrow, unpaved streets, and inadequate provision of public space. The residential fabric shows high levels of occupation in single- or two-storey housing, with a single-family typology built with poor-quality materials, in plots with an average area of 72 m².

In contrast to the existing housing, the proposed *Cazucable* stations are buildings with an average height of 25 metres and with a proposed ground floor area of 700 m² on average, which creates a conflict in terms of scale and impact in the neighbourhood (Metro de Medellín, 2009). Additionally, the current design aims to provide some facilities and public space areas in the catchment areas of each station, with the aim of helping to meet major gaps while contributing to upgrading potential of the neighbourhoods.



Figure 1: Area of Intervention and Santo Domingo Cazucable Station

Source: Author's elaboration based on information from the pre-feasibility Cazucable project (Medellín Metro Company) on Google Earth aerial photographs (2011).

Planning Shortfalls of the Cazucable Project

Lack of a Metropolitan Vision

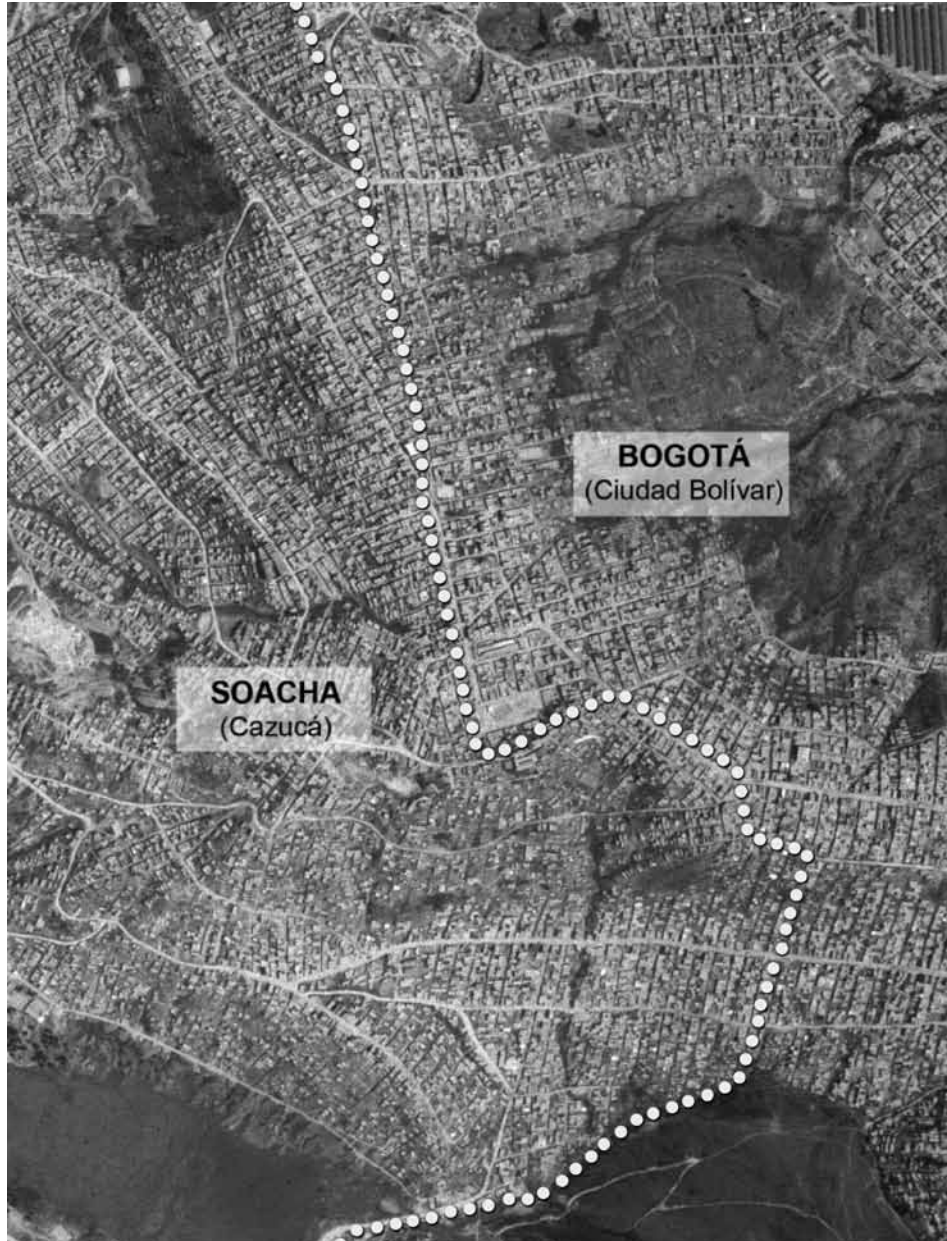
Despite being politically and administratively independent, the functional and spatial relationships between Bogotá D.C. and the municipality of Soacha are such that they currently are part of a conurbation (or metropolitan functional region). For various reasons, this has not been led to the creation of a metropolitan political-administrative entity (as is the case in Medellín with the Metropolitan Area). Despite the absence of a legal body, the formulation of an major development project such as the *Cazucable* should have arisen from recognising that this conurbation is a current reality, thus seeking to overcome the virtual border between the two administrations (see the chapter by Acevedo *et al.*).

In the north western hills of Soacha municipality lies Altos de Cazucá, a residential area within Soacha's Commune 4.⁷. Adjacent to it are the neighbourhoods of Estancia and Paraíso, within the Ciudad Bolívar district of Bogotá D.C. As mentioned earlier, these neighbourhoods are a

⁷ Communes are administrative sub-divisions within Colombia's medium-sized municipalities. They consist of clusters of neighbourhoods (*barrios*) and are administered by a Local Administrative Council (JAL), elected by popular vote. Soacha is sub-divided into six communes.

continuously urbanised area that seems to defy the virtual boundary between the two administrative areas. To the untrained eye of a visitor, these residential areas appear as examples of the morphology and shortcomings resulting from informal and chaotic processes of urban growth, with poor or non-existent road infrastructure, basic infrastructure services and community facilities. Although Ciudad Bolívar is one of the poorest and most under-developed districts in Bogotá, its inhabitants fare better than those in Soacha's neighbouring Commune 4. This is because Ciudad Bolívar is located within the city of Bogotá, which ensures access to its residents of the benefits of local government action, such as integrated neighbourhood upgrading programmes, including the provision of road infrastructure and basic infrastructure services as well as community facilities for education, leisure and culture. These programmes also help improve connections with public transport systems and through this medium to other services that the city has to offer (see the chapter by Álvarez Rivadulla and Bocarejo).

It is somewhat puzzling that, despite the close proximity between these neighbourhoods, the proposed *Cazucable* route does not stretch onto Ciudad Bolívar. The potential administrative impasse arising from spanning two independent territorial units could easily be resolved through an agreement between the two local authorities. This would permit spatial interventions in the two administrative areas, and equitably outline the rights and financial responsibilities of each party.



Source: Own elaboration based on Google Earth aerial photographs (2011).

Figure 2: The Boundary Between Soacha and Bogotá

Apparent Underestimation of the Land's Geological Conditions

Deficiencies in the conception and planning of the project meant that some critical features of the terrain in Altos de Cazucá were underestimated. Quarries (e.g. clay, sand, and aggregates) towards the west of the area have been mined for decades leading a growing problem of terrain instability. In the municipality's latest Urban Development Plan (POT)⁸ land use in the Cazucá sector is defined as residential, though this is expected to co-exist with the extraction of non-renewable natural resources, leading to severe land use conflicts. Over the past decade or so there have been a number of major landslides, which are the result of seismic conditions, the intensity of rainfall in the area, and human activity (digging of building foundations and inadequate disposal of grey water). By way of example, in March 2009 a landslide buried 17 houses and put at risk more than 4,500 families

⁸ In 1997 Colombia adopted a spatial development law (Ley 388) which decrees that all municipalities and districts with a population above 100,000 inhabitants should carry out an Urban Development Plan (POT in its Spanish acronym). All physical development should be guided by the rules and norms adopted there. The POT is the instrument that defines land use within the municipal territory: it defines the ecological structure that should be preserved; it defines areas exposed to hazards and natural risks, areas where development is not permitted; it defines the perimeter surrounding lands for urban use and areas for potential expansion; it defines the location of the road plan and common facilities for parks and other public open spaces.

who were supposed to be the object of a relocation programme. Following this, there were similar events that have decisively compromised the stability and the real possibilities of consolidation of this residential settlement. In August 2006 a report by Ingeominas⁹ and the Soacha Mayor's Office entitled 'Zoning of Threats by Landslides in Three Sectors of the Municipality of Soacha – Phase 1', included 'Plans for the 'critical zones for landslides in the sector of Cazucá' where the most critical zones were identified (Zmc) and the critical zones (Zc) which can be seen in Figure 4 (key: zmc: dark grey and Zc: light grey).

As part of the Cazucable proposal, the firm INTEINSA was commissioned to undertake basic geotechnical studies by the Medellín Metro Company. The October 2009 preliminary report outlines the geo-technical analysis and recommendations for the design of the foundations of the stations and the pylons for the aerial cable-car system. Despite a careful analysis of the geological characteristics of the study area, and mention of 27 major landslides and mudslides, it suggests going ahead with the feasibility study for the construction of the aerial cable-car system. Notwithstanding the conclusions of this study, the geological conditions in Cazucá should be considered as critical, and in constant evolution and ever-greater deterioration.

This issue has been a serious source of concern for the municipal administration and the Soacha community. However, the Medellín

⁹ Colombian Institute for Geology and Mining.



Figure 4: Cazucá Landslide Risk Zoning

Source: Ingeominas (2006)

Metro Company tried to allay fears in a technical study. Acosta (2009), writing in the national daily newspaper *El Tiempo* considers the situation thus: “Widespread fears that the soil in Soacha’s hills would not be able to sustain the support infrastructure for an aerial cable-car system due to frequent landslides during the rainy season was dismissed in the results of the project’s pre-feasibility study. The terrain can take the weight of the stations and pillars, and it does not compromise the stability of the project.”

It would seem that the studies carried out by the Medellín Metro Company offer the necessary confidence for construction. However, it is perhaps worrisome that the aerial cable-car project has clearly established a marked separation between the transport by cable, on one side, and the problematic residential area of Cazucá, on the other. Although it appears that the stability and solidity of the stations and pylons can be guaranteed, the project fails to include interventions to substantially improve the critical geological conditions of the surrounding residential zones. That is, should landslides become more frequent and more acute, the stations and pillars would remain in place, while some of the users of *Cazucable*’s services might well disappear. ■

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The Presidential Promise of an **Aerial Cable-Car**: Institutional Limitations and Political Realities

Jorge Acevedo, Juan Miguel Velásquez and Juan Pablo Bocarejo

The experience of Medellín has attracted attention from other developing cities and has served as inspiration for aerial cable-car projects in Colombia and elsewhere. The aim of this chapter is to explore whether lessons from Medellín can be applied to the planned aerial cable-car project that has been planned in the zone known as the Altos de Cazucá, a marginal community in Soacha, a suburban municipality adjacent to Colombia's capital city (see previous chapter by Rueda García and Sáenz García). Despite apparent similarities between Medellín's

Metrocables and the *Cazucable* project, when examined in some level of detail notable differences arise. The most obvious is institutional. It would seem no exaggeration to suggest that a large part of the apparent success of Medellín's projects are the result of the existence of a particularly solid agency (in technical, financial and political terms) in charge of designing the project, securing its funding, building the infrastructure and operating the service and financing any operational deficits. This was further strengthened by the strong commitment of one



municipal mayor, which was instrumental in gaining the support of other municipal bodies and subsequently helped ensure the project's success and the development of major complementary urban upgrading interventions by the mayor's successors.

In institutional terms, the *Cazucable* case contrasts radically with that of Medellín. Despite being a de facto conurbation, the jurisdictions of Bogotá's Capital District and the municipality of Soacha are independent. The project was born

out of a local proposal and a Presidential offer of support for the zone, the leadership of the project then passed to the hands of Soacha's mayor. Due to political difficulties, this mayor was suspended for more than a year until May 2011 and was reintegrated in his position with only a few months left before his term expired at the end of that year.

Of the municipalities that surround Bogotá, Soacha has the largest population, representing 26.8% of the regional total, followed

by Zipaquirá with 10.3%. This size demonstrates its importance and weight in the process of urbanisation of the metropolitan region. Given its growth and the development and expansion of Bogotá, the border between Soacha and Bogotá began to disappear close to an old railway corridor, especially in the area of Bosa, one Bogotá's 20 administrative sub-divisions.

Despite Soacha's considerable size, the municipal government's institutional capacity in fiscal, administrative and political terms is extremely weak. There are various bodies, amongst them the Bogotá Chamber of Commerce (CCB, 2005) and the Entrepreneurs Association of Sibaté, Soacha and the south of Bogotá (Asomuña, 2006), which argue that the municipality's structure and administrative capacity are ineffectual because it has been unable to develop at the same rate as the population and has serious problems of political instability. The Bogotá Chamber of Commerce report further points out that this political instability has led to policy instability, a lack of transparency in the public sector, an absence of coordination between the public and private sectors, and a lack of medium and long term planning culture.

Indeed, Soacha's 2008 Municipal Development Plan states that the municipality has experienced a gradual de-institutionalisation over the last few decades, thus giving rise to a series of socio-economic problems that have in turn hindered further development (Alcaldía de Soacha, 2008). The municipality's institutional

weakness is also apparent to official bodies based in the capital city, both at local and national levels. In interviews with representatives from Bogotá's Planning Secretariat (SDP) and the city's mass transport company (*Transmilenio S.A.*, henceforth TMSA), for example, their view of Soacha came through. For the SDP, one of Soacha's main problems is its inability to raise taxes and the on-going drop in municipal revenues, which limits possibilities to develop joint projects between the two local authorities. For TMSA's officials, Soacha suffers from a problem of high employee turnover, which hinders any joint planning exercises. All of this puts in doubt Soacha's capacity to plan and implement a project such as the *Cazucable*.

The National Planning Department (DNP)¹⁰ developed a methodology to measure the performance of Colombian municipalities in five areas: efficacy, efficiency, compliance with legal requirements, management, and environment. The DNP calculates indicators annually to monitor municipalities' performance and ranks its results from best to worst amongst all Colombian municipalities (close to 1,000). The indicator for Soacha between 2005 and 2009 is shown in Table 1.

¹⁰ DNP is a technical advisory body of the National Government that guides the programming and monitoring of investment resources towards the achievement of national goals over the medium to long term. It also influences policies and projects throughout the country, through inter-institutional work in coordination with both national and regional agencies.

Table 1: Soacha's Ranking Among Colombia's Municipalities, 2005-2009

Year	2005	2006	2007	2008	2009
National rank	265	285	147	173	311

Source: DNP, Evaluation and monitoring of decentralisation (several years).

Although there are large fluctuations from one year to another, which might suggest problems in DNP's methodology, the fact that the 10th largest municipality is placed either as 147th (at best) or 311th (at worst) is a dramatic indicator of Soacha's institutional weakness.

For the development of the *Cazucable* project, the municipality's financial capacity is particularly important. The DNP calculates detailed indicators to assess the evolution of municipal finances in the country. Table 2 shows two indicators for the period 2005-2009, the most recent available information at the time of writing (in mid-2012).

The municipality's fiscal performance is in continual decline. Soacha's revenues have dropped as a consequence of its limited capacity to raise taxes and due to a weakened economic activity within the municipality. Soacha depends more and more on fiscal transfers from the National Government, and as a consequence its investment capacity is very limited.

The municipality's population is aware of this institutional weakness. Testimonies from inhabitants in Cazucá clearly give off this perception. The most common problems pointed out are related to the lack of presence of local authorities in the zone, social programmes have

Table 2: Selected Financial Indicators for Soacha

Year	Current expenditure as a share of municipal revenues	Own sources as a share of total revenue
2006	31.6	25.8
2007	36.9	20.6
2008	48.1	22.0
2009	58.5	20.3

Source: DNP, Evaluation and monitoring of decentralisation (several years).

limited impact, and the security services are ineffectual. Likewise, the community has little knowledge of and influence in government decisions related to the commune¹¹.

Soacha's population size is that of a major medium-sized city, and yet the administration and capacity of the municipality are more akin to those of a town. This is exacerbated because its economy is so closely linked to Bogotá's. As the availability of land that can be built upon within the administrative boundaries of Bogotá's Capital District has significantly dwindled – particularly land that can accommodate social housing for people displaced by Colombia's internal conflict – there has been an influx into Soacha of some of the poorest and most forgotten families in the region who migrated to Bogotá but cannot afford to pay even the cheapest rents in the capital city. Soacha is a medium-sized city comprising some of the region's poorest people, the majority of who work in Bogotá and use its services. Bogotá is the backbone of a region that is plagued by a range of needs and problems, and yet the attitude of its authorities shows a form of myopia in ignoring Soacha's throbbing social problems that, sooner rather than later, will end up falling on its shoulders and will use up some of its resources. But currently, relations between the two authorities are almost non-existent.

The *Cazucable* was officially born out of a promise from President Uribe, who entrusted the

Medellín Metro Company¹² (see the second section in this book) with deciding the best location and designing the project. TMSA's participation was requested in an apparent attempt to apply Medellín's institutional framework to the capital region. TMSA carried out various demand studies for the projected line, but it has not taken on leadership of the project (and it could not do so because the *Cazucable* lies outside its jurisdiction



11 Data gathered in the field in 2010 and 2011 by the research team.

12 The official name of the company is *Empresa de Transporte Masivo del Valle de Aburrá (ETMVA)*, Medellín Metro Company for short.



Photo: Luis Hernán Sáenz

and because TMSA was not in a position to undertake the construction and operation of the project). As a result, no one has yet proposed a realistic mechanism to fund either the capital costs or the operational deficits of the line once it is completed.

Worse still, no official body has proposed even a simple list (with funding sources) of urban upgrading projects to complement the construction of the *Cazucable*, which as shown in earlier chapters seem to explain a substantial part of Medellín's success. In line with all this is, the technical studies done so far appear to be rather sketchy (planning considerations, issues of land stability, and costs), while attempts to engage the community have been

very limited. The design, as it stands at the time of writing in mid-2012, hinges on the need to relocate many households while the terrain is marked by severe geological instability problems (see chapter by Rueda García and Sáenz García).

The *Cazucable* project faces very complex institutional problems to convert the plan into reality. Resolving these problems requires defining who has ownership of the project. By 'owner' we mean a public body with *the capacity to make decisions* over the whole project in its different components: in terms of its design (location, technical elements, urban and social elements, complemented with urban design and infrastructure interventions in the catchment area,

environmental impact assessment, and mechanisms for citizen participation in decision making); in its construction (property purchase, relocation of affected households, detailed designs, hiring suppliers and builders, auditing, monitoring, and accountability); in terms of funding the project, including any unforeseen costs (both own funding sources as well as timely access to funding from the National Government, the provincial government, Bogotá, and Soacha municipality, and bringing together all funding sources into a special fund for the project; in terms of operating the service once built (selection and hiring of an operating agency, permanent supervision of these services, management negotiation and signing of agreements for integration with *Transmilenio* services); in the financial structuring of the operation (mechanisms and criteria to set and to adjust fares; fare integration with other transport services; delineation of the requirements of funds to subsidise the line's operation and sources of funding for subsidies (with municipal funds and perhaps funds from Bogotá specifically earmarked for this); and, finally, effective coordination with other entities within the Soacha municipality for the definition of complementary urban infrastructure projects, and to ensure that an appropriate design is done in consultation with the local community, as well as the timely execution and financing of the project.

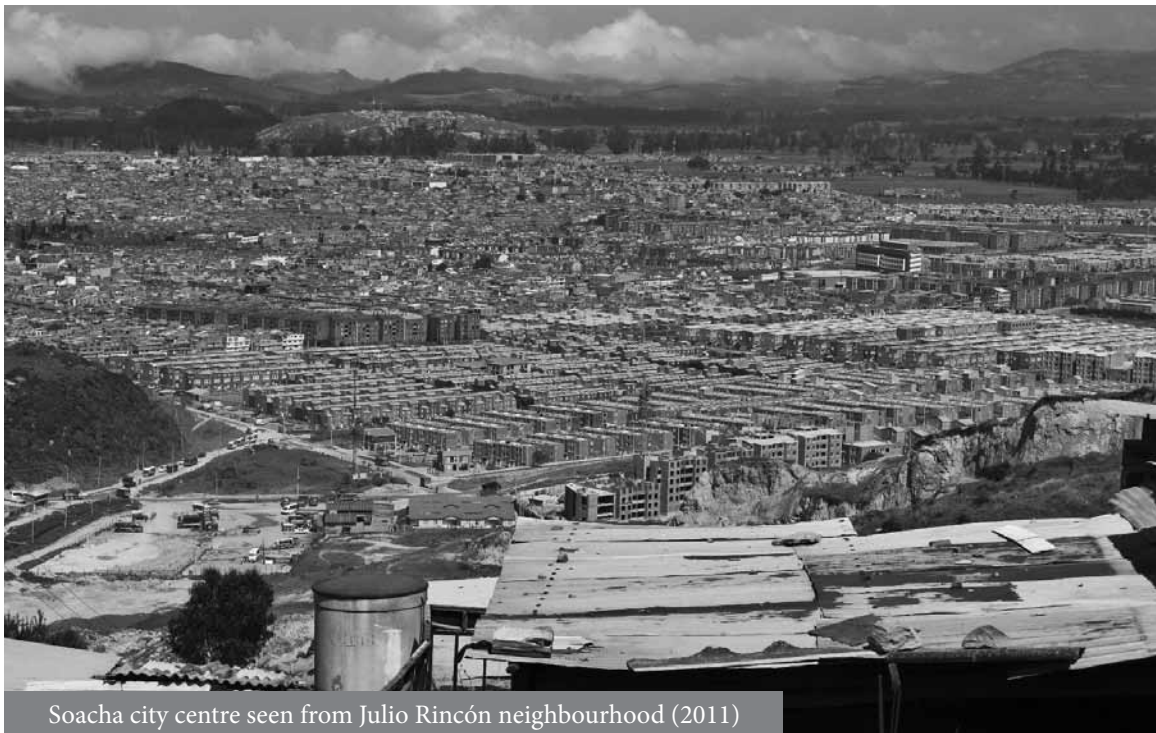
No municipal government body has the capacity to take on the aforementioned functions. The person most naturally endowed with the necessary competency to achieve success would appear to be the municipal mayor, with the help of a technical advisory team. However, institutional weakness within the municipality does not bode well for the project. In conclusion, the good results shown in Medellín and the lessons from this process would appear to be very difficult to replicate in the case of the *Cazucable*. ■

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The Socio-Economic Context of Soacha's **Commune 4**: Vulnerability, Confinement, and Stigma

María José Álvarez Rivadulla and Diana Bocarejo



Soacha city centre seen from Julio Rincón neighbourhood (2011)

Soacha's Commune 4, where the neighbourhood of Cazucá is located, is a zone of extreme social vulnerability. On various occasions during our interviews in the area we heard phrases like "Cazucá is like a Colombia in miniature". This does not refer to the country's beauty or the extraordinary diversity of its flora and fauna; rather it alludes to a convergence of the country's worst problems in this reduced space: a mixture of poverty, unemployment, forced internal displacement, violence, gangs, drug trafficking, environmental degradation, urban informality, to mention just the most visible. All these characteristics lead us to see this zone as a ghetto, or a 'hyper-ghetto' to use Wacquant's (2001a) term, an excluded and stigmatised space¹. And it is within this context, as we will see in the following subsection, that the enormous expectations of the local population towards a project such as the proposed aerial cable-car system should be understood (see previous chapter by Acevedo *et al.*).

According to data from Colombia's 2005 population census, approximately 70,000 people live in the area. The population is young, and there is a large proportion of children. Today this number can safely be said to have risen due to the rapid growth in an area with a considerable inflow of new

¹ The term 'hyper-ghetto' is used by Wacquant to refer to the worsening of living conditions in black ghettos in American cities provoked by economic liberalisation (disappearance of labour opportunities, weakening of neighbourhood institutions and flight of the Afro-American middle classes to other areas of the city). See for example Wacquant (2001b) and Wilson (1996).

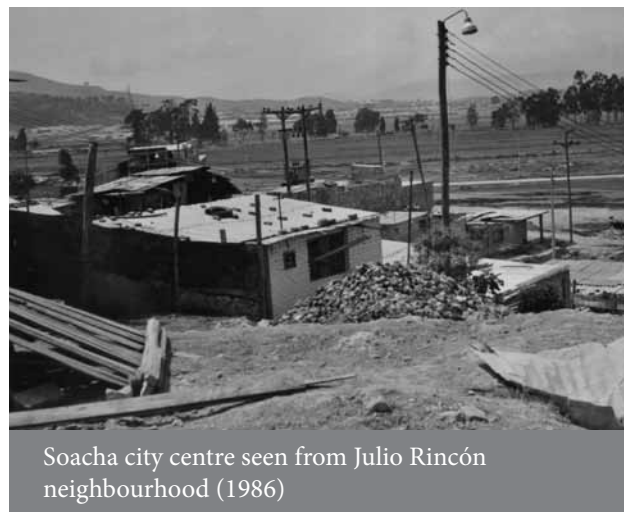
inhabitants every day. Almost 80% of the population living in Commune 4 today were not born there. Of these migrants there are a high proportion of people who arrived due to displacement resulting from Colombia's low-intensity internal conflict over many decades. Number estimates vary. In 2005, the United Nations High Commission for Refugees (UNHCR) estimated that 40% of Cazucá's population consisted of internally displaced people (IDP)². It was because of this high figure that UNCHR, jointly with the country's Ombudsman office (*Defensoría del Pueblo*) set up a 'House of Rights' in the area, a safe place where IDPs can seek support to ensure that their rights as enshrined in Law are respected, including receiving State subsidy and other forms of support. The House is an important landmark in the neighbourhood and, in addition to registering IDPs, they attend to many other demands including organising training workshops.

Commune 4 constitutes an even poorer area than neighbouring Ciudad Bolívar in Bogotá (see the chapter by Rueda García and Sáenz García). This is one of the poorest areas of the capital, but it nonetheless belongs to Bogotá, and so it benefits from much more organised and better endowed local government action, such as infrastructure upgrading as part neighbourhood regularisation programmes, social services such as libraries and parks, and connection to the public transport system and, through this, access to many of the capital city's services. The border between Ciudad Bolívar and Commune 4 appears as completely

² ACNUR

blurred for any visitor looking towards Cazucá; what one sees is an uninterrupted spatial continuum of simple dwellings. Residents of Cazucá, however, are very clear in their mind about which street separates them from Bogotá. Those who live on their side of this invisible line, for example, do not have access to reliable water services.

Table 1 shows some vulnerability indicators of the populations in Commune 4 and Ciudad Bolívar and the average for Bogotá. Some indicators, such as access to utilities, have improved since 2005 as some settlements in Commune 4 have been legalised and regularised. Nonetheless, the majority of the population still lack access to piped water, and their inhabitants are subject to the stark daily consequences of their structural vulnerability.



Soacha city centre seen from Julio Rincón neighbourhood (1986)

Table 1: Soacha's Commune 4, Ciudad Bolívar and Average for Bogotá: Some Indicators of Vulnerability (percentages)

	Share of dwellings without piped water	Share of dwellings without sewerage	Share of dwellings without gas	Incidence of teenage pregnancy*	Share of people over 12 with no primary education
Bogotá	1.4	2.1	20.2	6.8	10.2
Ciudad Bolívar	5.5	6.5	14.1	11.2	17.9
Commune 4	73.9	66.1	63.5	13.1	26.2

* Share of women aged between 12 and 19 years who have had at least one child born alive.

Source: Own calculations based on DANE, national population census 2005

The enormous differences in access to basic infrastructure services are not as marked as those shown by the last two indicators, which highlight severe social problems. The high levels of teenage pregnancy and non-completion of primary education in *Ciudad Bolívar* suggest that improvements in public service provision are on their own insufficient to solve these structural social problems.

When asking people what are the most important problems in the zone, insecurity appears as the most recurrent issue (alongside lack of legalisation of their land, followed by lack of access to water). Insecurity and fear shape people's lives, routines, journeys, and their confinement: "those that leave before 6 am have to walk down in groups

towards the Southern Motorway"; or "after 8 pm this becomes critical"; these are common phrases from the focus groups (on methodology, see next chapter by Bocarejo and Álvarez Rivadulla). At nightfall armed gangs impose a curfew in the neighbourhood: those who decide to go out risk the possibility of being robbed in the street on their way to work. What they fear is being mugged by one of the area's youth gangs.

We found that this particularly affects women. Many spend the majority of their time stuck at home, afraid to leave, in fear that their houses will be broken into and their daughters raped. They participate far less than men in the labour market. But fear is not the only reason that keeps them there. They have to take care of their



Mini-bus stop in Ciudadela Sucre neighbourhood, Soacha

children, carry out household chores and, in many cases also because their partners do not let them work. Stories of domestic violence are common, including the control of women's activities. Added to all this is the fact that the neighbourhood does not have public spaces in which to socialise, and it is perceived as an area where "there is nothing to see." This means that being confined in the reduced space of their homes is very common for women.³

The effects of internal displacement are another source of fear and a central problem (also see Pérez Martínez, 2006; and Garzón, 2005). The presence of local armed groups is a difficult issue to quantify and investigate, but it appears often in conversation with residents and local officials. A discussion of this issue is almost inevitably conditioned on turning off the tape recorder and often speaking in whispers, as others can potentially overhear, and the consequences of speaking about this can be serious. Reference to these groups appears when speaking about 'social cleansing' as the operatives of killers by young paramilitary groups.⁴ The people associate these armed groups with certain spaces within the neighbourhood (e.g. "that hill belongs to him") and of drug-trafficking in the area.

3 For a gender diagnosis of the zone see Garzón (2005).

4 According to some estimations, close to 200 young people were murdered between 2000 and 2005 in Soacha, many of whom perhaps in 'social cleansing' operations aimed at ridding the area of what are perceived as 'undesirable' characters. Out of this silent massacre only a little more than a dozen cases have been solved, an indication of dereliction of the judicial system's duties (see Ruiz, 2005).

Locals' perception is that this situation is counter-balanced by state action. Police presence is almost non-existent. Indeed, during the field work carried out for this research the only police cabin in the zone, located in the *La Isla* neighbourhood, was burned down. Beyond the police, state presence in the zone is low. It is not that the state is entirely absent. Indeed the majority of people with whom we spoke mentioned said to be in receipt of some form of subsidy (in particular the conditional cash transfer programme known as *Familias en Acción*⁵). But even this form of action leaves much to be desired. The cost of a subsidy for nutrition, for example, is around US\$25 per month for a family with one or more young children. The subsidy for secondary education is around US\$20 for each child school-goer. The state schools in the area constitute what is perhaps the strongest state presence and yet they have many problems; amongst these are low numbers of teachers, poor teacher training, limited material resources, and threats from youth gangs. To this, we can add the labour market uncertainty faced by young people upon completing their schooling.

Due to all these problems, the relationship between inhabitants and the physical space they inhabit is ambivalent. In a small survey we carried out, the majority of people responded that if they had the opportunity, they would leave the commune.

5 The *Familias en Acción* programme consists of providing direct cash support to beneficiary mothers, conditioned on compliance with commitments by their offspring. This involves guaranteeing children's attendance to school, and regular health check-ups to monitor growth.

Preference for staying is always justified on the basis of low living costs (land, utility services, housing, and rent⁶), despite the stigma as perceived in the press or in the labour market (“once they learn where we live we won’t be hired, especially by large firms”). We did not hear anyone praise the area, or highlight such factors found in other contexts such as solidarity amongst neighbours.

The reasoning given is that residents remain *despite* the negative aspects of the area and not due to any particular positive reason. But what is clear is that they are there to stay, given that the chance of finding a better job and a higher income elsewhere is low. This is relevant since one might see Commune 4 as a transit area, one step on the way to settling in Bogotá. But this does not appear to be the case for many of those we spoke to.

In sum, the population for whom the Cazucable project has been planned is extremely vulnerable, even compared to other vulnerable areas in Bogotá and certainly when compared to the neighbourhoods from which inspiration for the project is drawn – the Medellín communes which, as described in detail in the second section of this book, have benefitted from the Metrocables. Despite their undeniable social and urban problems, Medellín’s communes were more centrally located, had better access to infrastructure services, and already benefitted from proximity to better infrastructure than Soacha

before the aerial cable-cars were introduced. These considerations suggest that, in order to maximise the impacts of an infrastructure project in a highly deprived area like Cazucá, this should be accompanied by a series of more wide-ranging economic, urban and social interventions. ■

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6 36.5% of households in Commune 4 are tenants and 57.7% are owner-occupiers. The numbers for Bogotá are 43 and 49% respectively.

Hoping to Be Seen: Perceptions of Commune 4's Inhabitants About the Possible Construction of an Aerial Cable-Car System

Diana Bocarejo and María José Álvarez Rivadulla¹

"That's really lovely, really nice! That is...

how can I say it, I have no words to describe the Metrocable.

We agree that there should be a Metrocable in Soacha and Altos de Cazucá".

Nubia, President of the Council for Community Action following a visit to Medellín's *Metrocable*.

"It's important for people. It improves our lives.

It creates a good and dignified city.

Roberto, Commune 4 resident.

"Beautiful, beautiful. Well, for us it would be like touching the sky with our hands, for sure (...). It would improve security and would also benefit labour conditions (...). We need this; it should be launched as soon as possible to give us access to jobs. It will also solve the transport problem".

Luis, community leader.

¹ We would like to thank our students at the Universidad del Rosario who provided us with research assistance: Ivette González, Laura Diaz, Sebastián Villamizar and Natalia Duarte.



How should we interpret people's fascination with an aerial cable-car system in areas of extreme poverty such as Cazucá? How is it that, despite the enormous needs of the inhabitants of Soacha's Commune 4 and their daily litany of problems, an aerial cable-car is a project that inspires hope in them? The value of aerial cable-cars in places such as Cazucá goes beyond its possible transport benefits and is associated with the desires of thousands of inhabitants who wish to be seen and be socially included. We should ask ourselves about the meaning of the aerial cable-car along with many other infrastructure and technology projects which imply an understanding, not just in terms of operational and economic progress, but also its social and cultural

relevance (see, for example, Kaika and Swyngedow, 2000; and Siemiatycki, 2005). Moreover, there is a growing literature pointing to the paradoxes arising from the enormous expectations fuelled by some urban mega-projects, and which can lead to significant failures and unfulfilled promises (Siemiatycki, 2006).

The general conclusion from our research suggests that this positive perception of the *Cazucable* can be explained by the new social and political visibility that the inhabitants of Cazucá hope to gain. As shown in the previous chapter, they feel isolated and marginalised, abandoned and stigmatised both by local institutions and by other citizens in both Soacha and Bogotá. Rather than seeing the aerial cable-car system in all its

technical detail as a project that will solve their transport problems, the inhabitants of Cazucá see it as a potential social, economic and political catalyst through which they hope to lead more dignified living conditions. In this way, the great enthusiasm of the population facing the possibility of building an aerial cable-car is associated with the meaning of the cable-car as a symbol of state presence.

Like any other symbol, the meaning of the *Cazucable* and residents' expectations towards the possible impacts arising from its construction should be understood from Cazucá's particular context. Suffice it to mention a few conditions that help explain why this proposed infrastructure project generates such expectations: i) a widespread perception of social and political neglect of the area (see the previous chapters in this section for more information on the socio-economic situation and the institutional context); ii) any project that commits local institutions in Soacha, Bogotá's local authorities and, even better, the national government, is perceived as a precondition for future projects in Cazucá; iii) the inhabitants see in the cable-car line a new proposal that can overcome local political inertia, scepticism and fragmentation among the citizenry; iv) a high degree of uncertainty surrounds the legalisation and regularisation of land in the area, which in turns hinders the upgrading of basic infrastructure services and other services (including leisure facilities such as parks and open spaces). The Cable is seen as a project that can help integrate disparate state agencies, and thus help channel and commit resources from the local and national State,

leading to the regularisation and a degree of urban planning intervention in the commune.

An attempt to gauge perceptions and expectations as regards the future Cable compared to other types of social intervention turned out to be very difficult for there is almost no record of unambiguous and substantial interventions by state agencies in the area. Cazucá residents are unaware of other completed or even planned interventions to compare and contrast against the proposed aerial cable-car. The *Cazucable*



is perceived as a project with the potential to generate positive effects for residents. The first effect is associated directly with the improvement of transport although, in the absence of other transport projects, residents fail to see that this will give rise to any potential synergies.

For Commune 4 residents, the absence of state institutions is reflected, amongst other areas, in the quality of access roads and the absence of an authority that regulates transport services in the area. As a leader of the Council for Community Action pointed out, regarding the quality of road infrastructure, “the Mayor’s Office has received many official complaints, but there are always excuses: the mayor is not here, you need to fill out the form again, the mayor is in house detention, I don’t know what else.” Another leader says that transport is a very old problem and it is not restricted to the quality of roads, but also relates to how it is regulated, and to how the local authority assigns bus routes. According to this leader, and this is a common view among many other residents, the issue “unfortunately (...) is that there is a serious lack of political will.”

The new transport possibilities that can be generated thanks to the aerial cable-car should seriously take into account the economic possibilities of local inhabitants. For the majority of Commune 4 residents, regular use of the aerial cable-car would depend on the cost of fares, its hours of operation, and the range of transport links it opens to them. The proposal so far appears somewhat blurred to residents, and thus the specific improvements that it might bring are uncertain.

Beyond the solutions that the aerial cable-car offers in transport terms, the most hoped-for positive effect for the inhabitants of Commune 4 is the social and political visibility that could arise thanks to the *Cazucable*. It is significant that, despite the complex social situation in Commune 4 (as described in the previous chapter), its inhabitants give priority to the *Cazucable* project precisely because they think that it will be a catalysing intervention and indeed it is the only proposal for the area of which they are aware.

The inhabitants hope that the *Cazucable* will help them legalise and regularise land tenure, thus kick-starting a process of upgrading of basic infrastructure services and construction of other urban infrastructure. That is to say, despite the serious problems in the area (water supply, land tenure, and insecurity), local residents see in the *Cazucable* a new project that can provide them with the necessary visibility to generate investment commitments from the local and national governments.

Cazucá’s residents also hope that the Cable will lead to major urban planning interventions including the kinds of small open spaces and parks that were created in Medellín with the implementation of the Integrated Urban Projects after the first *Metrocable* line had been built (with a minimum relocation of households). Residents hope that this will lead to surfaced streets, pavements, and leisure facilities. For example, the only open spaces whose potential is mentioned regularly by the inhabitants of Commune 4, with the hope to one day turn it into a park, is a private plot owned by the largest



(informal) developer in the area, Mr. Forero Fetecua, in whose land lies an artificial lagoon that has been abandoned for many years and has brought many health and safety problems to children from the area.

Other hopes from the *Cazucable* include upgrading of commercial areas and the hope that this will create jobs (although it is not very clear if they hope that these new possibilities be born in the zone or as a consequence of transport improvement). However, for some inhabitants the Cable may involve higher transport fares but also possible rises in the cost of land, rents and public services.

Perhaps due to the local community leaders' visit to Medellín and thanks to the

publicity and visibility of the *Metrocable* as a new symbol of the city, another hoped-for effect is that it will attract tourists. The idea of tourism is presented in a rather vague way and the positive effects expected arise from the belief that local residents would better look after their homes and make them "look prettier." Young people like Edwin also explain that "a cable-car here would make the neighbourhood look more modern, don't you think? With the cable-car people will pay more attention to what happens here and more people will come, and that will get rid of all the gangs [...]; tourists will come to look at this."

For one of the officials working with internally displaced people in the area the aerial

cable-car “can be something positive and can help the community to move forward; tourism can become an income-earner thanks to the more direct links between Soacha and Bogotá (...). In this neighbourhood you have potential, you have people from everywhere, from the Atlantic and Pacific Coasts, the Amazon; you can make it as touristy as you want to, but how much will depend on where you want it to go.”

To conclude, the value that the *Cazucable* has acquired for the population in Commune 4 rests in its power as a symbol of social, economic and political intervention. Medellín’s *Metrocables*, and the manner in which this model has been “exported” nationally and internationally, has generated expectations that transcend the field of transport. Moreover, for the inhabitants of Cazucá the hoped-for effects from transport are not very clear, as they do not yet know fare prices, hours of operation and the range of transport links it will bring with it. The value of the aerial cable-car therefore is rooted in its capacity to become a catalyst for social intervention. One of the

challenges for the *Cazucable*, if it is implemented, is to respond to residents’ expectations as a multiplier of social investment. Without clear intervention commitments, whether these be in terms of improved urban planning or social interventions, the value of building the *Cazucable* is unlikely to meet these expectations. ■

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Obstacles in the Implementation of 'Trendy' Transport Projects. Reflections on the Soacha Case

Juan Pablo Bocarejo and Juan Miguel Velásquez

Over the last decade, Colombian cities have contributed to a large amount of innovation in urban mobility. The implementation of *Transmilenio*, Bogotá's bus rapid transit (BRT) system, and Medellín's aerial-cable cars (examined in detail in earlier chapters of this book) provide successful examples of how mobility can be improved in developing country cities.

Indeed, BRT projects have proliferated globally following the launch of *Transmilenio* in 2000. Some have been implemented successfully while others have amounted to little more than an idea put forward by a particular administration or social actor. Asian cities, Latin American cities and even some cities in developed countries have systems of this type, with over 100 projects built in the last decade (Hidalgo *et al.*, 2007). In the case of the

aerial cable-cars, although a smaller number so far, they have also generated a growing interest and taken on concrete shape in cities such as Rio de Janeiro and Caracas (see chapters by Amorim da Silva, and Naranjo, respectively, in the following section).

However, attempts to replicate these projects have met with mixed results. Medellín and Bogotá's successful projects have been replicated in some of Colombia's main cities. Some of the BRT systems were seriously delayed, some over a decade after being planned. Although many cable-car projects have been proposed as a mobility solution for low-income populations in hilly areas, their financial and political viability is as yet uncertain.

As part of the joint research between University College London, Universidad Nacional (Medellín campus) and Universidad de Los Andes

in Bogotá, of which this book is an output, we were able to explore the situation of mobility in the municipality of Soacha, the largest ‘dormitory’ municipality for the Colombia’s capital city. As can be seen in the chapters by Rueda García and Sáenz García, and Álvarez Rivadulla and Bocarejo, the inhabitants of this zone are predominantly low income groups, who experience enormous difficulties in accessing job, education, culture and leisure opportunities, yet they seem to be aware of the promise of ‘trendy’ projects: *Transmilenio* and the cable-car form a central part of a proposal to improve living conditions in the area. However, more than a decade after the former was proposed, and following a range of studies for the latter, there are no tangible changes.

Soacha’s *Transmilenio* extension was planned shortly after it was first launched in Bogotá. After some speedy transport research, a line was defined to link with the expanding mass transit system. The project was led at first by the National Government, specifically the National Planning Department (DNP), which had simultaneously outlined BRT systems for six other cities. Support was also received from the agency that created and operated the *Transmilenio* system. In 2003 construction commenced. At the time of writing in mid-2012, the construction of a 5.5 km route to link Soacha and Bogotá had not yet been completed. Today, the inhabitants of Soacha spend around 90 minutes travelling each way to get to work.

Similarly, the Cable project for Soacha’s Cazucá area (and known informally as ‘*Cazucable*’), arose out of an initiative from the

National Government, and more precisely from a presidential initiative (see chapters by Rueda García and Sáenz García, and by Acevedo *et al.*).

While the BRT line has its origins in a technocratic context, the *Cazucable* proposal arose out of a political process, a ‘community council meeting’, one of many carried out by then President Álvaro Uribe over his two terms (2002-2006 and 2006-2010), which in some way ended up replacing the planning and decision-making processes. The Medellín Metro Company, which by that time had developed the necessary expertise in the development of urban aerial cable-car systems, led the project.

One might well ask: If both of Soacha’s transport projects have the necessary national government support and were designed by those responsible for the (internationally recognised) success stories in Bogotá and Medellín, why then have they met with such a different fate? In what follows in this chapter we intend to respond to this question.

Transmilenio and *Metrocables*: Integrated Implementation

The two successful projects in Bogotá and Medellín, respectively, have common elements that can offer clues as to what might be required to successfully replicate such ‘trendy’ projects. Firstly, these projects arose out of local demands.



The projects were managed, led, financed and executed by the cities themselves. Successive local administrations showed total political commitment to them, and these were therefore included in the city's long-term plans.

Secondly, the projects had a clear technical direction and stable sources of funding. In the case of *Transmilenio* a management group (Ardila, 2003) provided leadership to a complex web of actors, but also led the operational and financial design, to finally end up with an institution capable of taking charge of the system's daily operation. In Medellín's case, the agency responsible for the project was the Medellín Metro Company, which had already demonstrated its operational and management capacity through an exemplary operation of the metro system.

Finally, the project's conception was complemented by a vision that went beyond transport. In the Bogotá case, *Transmilenio* was included within a larger plan to improve public space, serve low-income areas with the new transport system, and in parallel provide social housing within its area of influence. A decade after its implementation it has had significant impacts on density, property values, and land use (Bocarejo *et al.*, 2012). In the Medellín case, the *Metrocables* were complemented by substantial public investment (exceeding by many orders of magnitude that of the Cables themselves) in urban development in the zones of influence of the projects, upgrading of public space, developing high quality facilities at a metropolitan scale, and housing upgrading within the context of Integrated

Urban Projects (PUIs) (see the chapter by Brand and Dávila).

Our case study, the municipality of Soacha, does not appear to show any of these common elements. Both the BRT and the aerial cable-car were imposed from above by the National Government. The mayor of this impoverished municipality saw the opportunity of a "gift" from the Nation, but neither his technical team nor his political agenda saw it as a priority. Neither did they truly have the project in their hands. The project has no owner and one of the main gaps, which makes its future uncertain, is the absence of an institution who can be responsible for it and provide the necessary technical capacity to implement it. Because in Colombia the national government cannot impose itself within the municipal realm, the project's quality as a "gift" from on-high meant that it had little rooting or connection with existing urban development plans or public space projects drawn up by the municipality.

The Importance of Adaptation to Local Needs

The idea of "best practice" is all about replicating successful projects. These Colombian examples are especially attractive, as they came out of what are regarded as previously critical urban conditions and had far-reaching (positive) consequences. However, a large part of the success

in implementing such projects in new locations has to do with the extent to which this adequately considers the characteristics of that place.

Transport demand studies that gauge a population's travel needs, along with an adequate knowledge of the functional connections within the city, are key elements that cannot be underestimated in the formulation of projects of this nature. A failure to acknowledge users' characteristics and their needs has generated, in many cases, low demands for the BRT and the cable systems, which makes them financially unviable or even unnecessary.



Bangalore

In the case of the *Cazucable*, passenger demand is quite low, if one considers the investment proposed. Accessibility to the cable system depends on the quality of infrastructure (stairs, walkways) allowing people to reach the stations. In some cases, walking times make it more attractive to continue using poor quality systems that are more easily accessible. Likewise, affordability has an important role. On occasion, even with good access to new systems, individual mobility may not increase significantly, and informal systems with cheaper fares continue to be preferred by users.

The challenge of integrating new systems with those already in operation is also crucial. The experience in the implementation of BRT systems in Colombia shows that the integration between a disorganised and partially informal system and the new systems is complex. Indeed, it tends to generate unfair competition rather than integration. This is one of the reasons why the implementation of these projects in other Colombian cities has been beset by low demand and financial unsustainability.

Any Type of Accessibility?

The main criticism that can be levied of 'trendy' projects is that they can generate immediate political capital, and yet they often stand in the way of more serious, well thought-out, long-term policies. The main pitch made by salesmen of these



Jakarta

projects is that politicians who make the decision will be able to “inaugurate” his/her own project within a single term in office.

In this sense, the *Cazucable* project faces a major dilemma: was the priority to ensure accessibility (through a cable-car) to a population in environmentally risk areas, as is the case in Medellín’s first *Metrocable* line, or was it preferable to plan an adequate relocation of the population at risk?

In this case, access to a highly precarious and risky area with a visible project was preferred to an action that would probably have generated better living conditions over the long term.

However, the relocation and construction of a

more adequate urban space is a longer process than merely developing a cable line and probably less attractive in political terms.

Recommendations for a Successful Adaptation of ‘Trendy’ Projects

‘Trendy’ transport projects commonly fall ‘out of the blue’ and are not adequately researched in each context, nor integrated with land use and urban development plans and any existing transport

systems. As a summary of these reflections we can then highlight some basic elements to facilitate their adaptation to other contexts.

Firstly, baseline studies are extremely important in allowing us to understand, in detail, the social and mobility condition of the people who use the systems, while urban functionality and future plans should not be underestimated.

This step allows us to arrive at the second essential issue, which is building institutional capacity. Studies should be developed jointly with those that will inherit and operate the project. Institution building was an essential element for the *Transmilenio* and *Metrocable* projects, to the extent that the agencies in charge of these had provide successful consultancy services for the implementation of these systems in other cities, not just in Colombia, but also internationally.

A third issue is the development of integrated projects which include public space upgrading, while taking advantage of opportunities for social and urban development. Physical and fare integration with other modes of transport is another essential dimension without which the number of users would reduce considerably.

Finally, the proposed project must be assessed against alternative proposals, which should not be restricted to other transport options, but also to improvements in the living conditions of low income populations who have little option but to establish themselves in areas of high environmental risk in developing cities. ■

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SOBERANÍA



A New Paradigm
for **Urban Transport?**
Experiences
from Other Cities

Community Initiatives and Their Adoption by **Local Government:** **The MIOCABLE in Cali, Colombia**

Diana Daste

Introduction¹

¹ This chapter is one of several outputs of the research project “Governance, Urban Mobility and Poverty Reduction. Lessons from Medellín, Colombia” led by the Development Planning Unit (DPU), UCL, run jointly with Universidad Nacional de Colombia (Medellín campus), Universidad de los Andes, and the Department of Civil, Environmental and Geomatic Engineering at UCL. The Cali case study was funded by the DPU as a complement to the two case studies presented in detail in this book. The views are solely those of the researcher,

and she owes particular thanks to local government officials in Cali and Metrocali (2010, 2011 and 2012) who contributed valuable information and views. She would also like to thank community leaders David Gómez, Héctor Fabio Ospina, Yonny Rojas, and Harvey Mina for their support in the research, and their contribution to a deeper understanding of the Commune and their initiatives. Thanks go to the SIDOC Foundation and all those who through their participation contributed to improve our understanding of this case study.

A branch of institutional theory (Easterly, 2008) argues that public policy sustainability is achieved when top down initiatives are supported by bottom up proposals. That is to say, when informal institutions (culture, relations, behaviour) and formal institutions (such as grassroots organisations, Councils for Community Action, and NGOs) coincide and reciprocally support the implementation of government projects.

Cali, Colombia's third largest city, with a population of 2.1 million in 2005 (Alcaldía de Santiago de Cali, 2008), has seen the progressive weakening of its political institutions and has seen its national leadership erode away. Through the MIOCABLE aerial cable-car project, Cali has a chance of improving mobility and urban development for some of the city's most vulnerable sectors. However, at the time of writing in mid-2012 the project has been halted. This chapter tells how a proposal for integrated development – conceived and managed in its initial stages by the leaders of a vulnerable sector – can end up in limbo, thus revealing a lack of vision and a sense of exclusion on the part of the local government.

Origins of the Idea

The idea of building an aerial cable car to connect the mountainous and very poor Commune 20 (commonly known as Siloé from one of its neighbourhoods) with the flat zone of the city (see Map 1), date back to the end of the 1950s.

Siloé Cali.
 Marzo 16 1958
 Reunión Comunal de la zona de
 Siloé. En la presencia de
 el partido liberal, por haber
 presionado elecciones de Sr. Jarama
 El momento nos presenta que
 se leamos. vos dan un fin
 de de unan. Gosseno, como
 el de unan.
 La reunión de marzo, a las 538
 vos sitan reunión de Siloé
 Eugenio Zaldívar
 Carlos Puente
 ALBERTO POSADA

Figure 1: 'Promise' Document to Build an Aerial Cable-Car, 1958
 Source: Community leaders, Commune 20

According to documents kept by local leaders, in 1958 a certain “Mr Santamaría” promised to the residents that the Liberal Party would install a cable-car (such as that which had been in use to transport coffee for export from the city of Manizales) if they voted for him. More than a party strategy, this promise (Figure 1), was a tactic to legitimise the creation of the so-called National Front, a political and electoral alliance in which Liberals and Conservatives alternated in the reins of power from 1958 until 1974, starting with the Liberal President Alberto Lleras Camargo (Pécaut 2006). Despite the fact that the Party did not fulfil its promise, the community began to dream and think about how this idea could materialise, in their aim of promoting the development of Cali’s Commune 20.

Commune 20

Cali is composed of 22 administrative sub-divisions known as communes. Commune 20 has a population of some 70,000 inhabitants (Table 1), representing close to 4% of Cali’s total population. This area developed informally between the 1930s and 1940s through the illegal occupation of municipal land by miners coming from Marmato and other neighbouring municipalities in the *Departamento* (province) of Caldas. The new settlers surfaced the streets, installed a sewerage system and brought water to the area² (DAGMA 2009).

² Initially they built community taps where residents could fill buckets, pots and other utensils.

Table 1: Population in Neighbourhoods of Commune 20, 2005

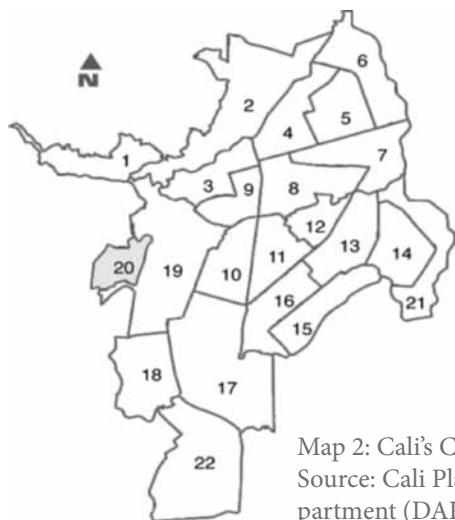
Neighbourhood	Population
El Cortijo	1,467
Belisario Caicedo	3,255
Siloé	26,583
Lleras Camargo	7,204
Belén	8,041
Brisas de Mayo	12,144
Venezuela - Urb. Canaveralejo	2,890

Source: DAPM, 2010

Today, a large part of the land property deeds have been legalised and the Commune has been gradually formalised, but there remain sectors that sprang out of residents invading public land where tenure remains unclear. A mere 44.3% of the settlers have completed basic primary education. Incomes are amongst the lowest in the city, with 83.4% of its population classified as socio-economic stratum 1 and none in strata 4, 5 or 6 (DAPM 2007).³ Coverage of basic infrastructure services supplied by the municipality ranges between 81 and 88% of

³ The stratum division (0 being the lowest and 6 the highest) is an instrument used by the Colombian State to classify residential property, based on the physical attributes of the housing units and the settlement, such as access to services and infrastructure. Stratification helps determine tax levels, utility rates, and access to housing and healthcare, amongst others.

households in the Commune. Neighbourhoods at the top of the hills and those originating in recent land invasions lack basic services, and many of the users complain about irregularity in the supply of services like water and electricity (DAGMA, 2009).



Map 2: Cali's Communes
Source: Cali Planning Department (DAPM)

In to deficiencies in public service infrastructure, Commune 20 only has three public libraries, it lacks leisure and culture facilities, and has few sporting facilities most of which are unserviceable due to their poor condition. All this contributes to the reproduction of a cycle of poverty and insecurity in the zone,⁴ a result of the lack of options for children, the youth and the community in general, to make positive use of their free time.

4 Recent data estimates that there were 99.3 homicides per 100,000 inhabitants according to the Cali Mayor's Office (2010).

Commune 20 is a zone stigmatised by violence and social and political marginalisation. It nonetheless has a history of leadership and self-management. The community regularly puts forward proposals for transformation in a bid to demand from the city that it covers the historic deficits arising from decades of inadequate investment in infrastructure and social development.

MIOCABLE's Political Passage Development Proposals

From the middle of the 1990s several local leaders and grassroots organisations designed proposals to make an aerial cable-car line the initial axis for the transformation of Commune 20. Fundación Nueva Luz proposed connecting Cali's mountainous zone through an aerial cable-car system that includes Commune 20 in a long route from south to north, as well as important natural and prominent local destinations such as the Virgin of Yanaconas, Cristo Rey, the Tres Cruces hill, and the Los Farallones National Park. Concerned with environmental conservation in the area, the project has as a strategic motivation to "turn the Cable into a sentinel that protects important city resources such as Los Farallones Park from the pressures of urbanisation" (Gómez, 2011). At the end of the 1990s, community leader Rubén Hurtado, resident of the Commune and Coordinator for La Estrella Sports Centre,



Figure 2: Commune 20: Siloé Neighbourhood. Photo: Diana Daste

developed a touristic and ecological proposal for the Commune. His proposal was to convert one of the most dangerous zones of the city into an ecological and touristic district, using the topographical advantages of the area to help overcome poverty and marginalisation.⁵ The Cable would become a tourist attraction, offering transport to link hilly areas with the city's flat areas and other tourist sectors of the city. Medellín's *Metrocable* K Line

⁵ The source is Rubén Hurtado's proposal to convert Commune 20 into a Tourist and Ecological District; document for private use, to which the author had access.

shows that a combination of urban tourism with mass-transport is a viable option.⁶ The project contemplated a broad participation of the community in terms of turning the Commune into a legally constituted Tourist District, assessing and quantifying costs of the intervention, designing routes and creating businesses with a capacity-building component.

⁶ The *Metrocable* has not simply fostered tourism in the zone but it has integrated tourist lines (L Line to Arví Natural Park) with the mass-transit system (K Line, Santo Domingo Station). See chapters in Medellín section in this book.

Business clusters were seen as a keystone in attracting tourism (restaurants, cultural centres, artisanal squares, sporting events) and also ecological concerns (reforestation and watercourse cleaning). Although this proposal did not resonate with the local government because of difficulties for the local authority in securing a Tourist District classification, it nonetheless served as an input for eventual debates in the Municipal Council chambers.

MIOCABLE: A Transport Solution

In 2006, due to an electoral coincidence, Councillor Carlos A. Urresty was responsible for managing the proposed project as President of the Cali Municipal Council. Urresty saw in the MIOCABLE the chance of attracting votes to support a future campaign for mayor and earmarked the resources to make it possible. Although his aspiration was to become mayor, this never materialised, but this gave the project a first debate in the Council during the administration of Mayor Apolinar Salcedo (2004-2007). This administration was in charge of the construction of the city's first mass transport system a Bus Rapid Transit System (BRT) called MIO (Mass Western Integrated System). The MIO was launched in 2009 under the government of Mayor Jorge Iván Ospina (2008-2011), who would approve the MIOCABLE as a means of

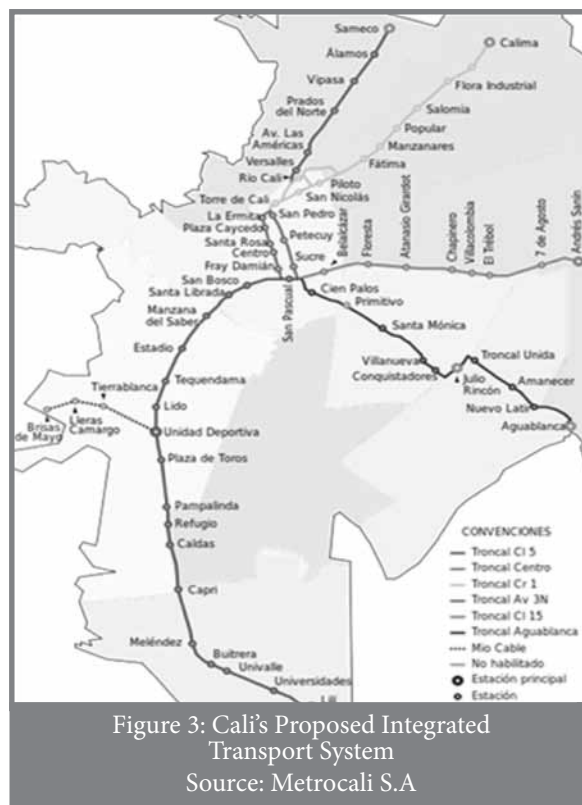


Figure 3: Cali's Proposed Integrated Transport System
Source: Metrocali S.A

integrating Commune 20 with the MIO system (see Figure 3). During this political passage the project lost, almost in its entirety, the tourist and local business components proposed by Hurtado a decade earlier.⁷

⁷ Although the Mayor's Office expressed its interest in carrying out an urban upgrading project similar to that of Cerro Santa Ana in Guayaquil, Ecuador, this article argues that the management of the MIOCABLE was restricted only to providing a mode of transport.



Figure 4: MIOCABLE Cabin Prototype
Source: Metrocali S.A

In 2008 Metrocali, the public institution in charge of the management, design, construction and operation of the integrated transport system (SITM-MIO), started feasibility studies and negotiation of property acquisition for the MIOCABLE. Financing was approved using the proceeds from a petrol surcharge tax, of which the Municipality destined 70% to financing the SITM, including close to forty million US dollars to finance the MIOCABLE. This is a tax of 18.5% paid by major producers, importers and distributors of gasoline and diesel oil.⁸

⁸ It is estimated that this will inject some US\$266 million into the SITM over the period 2009-2018.

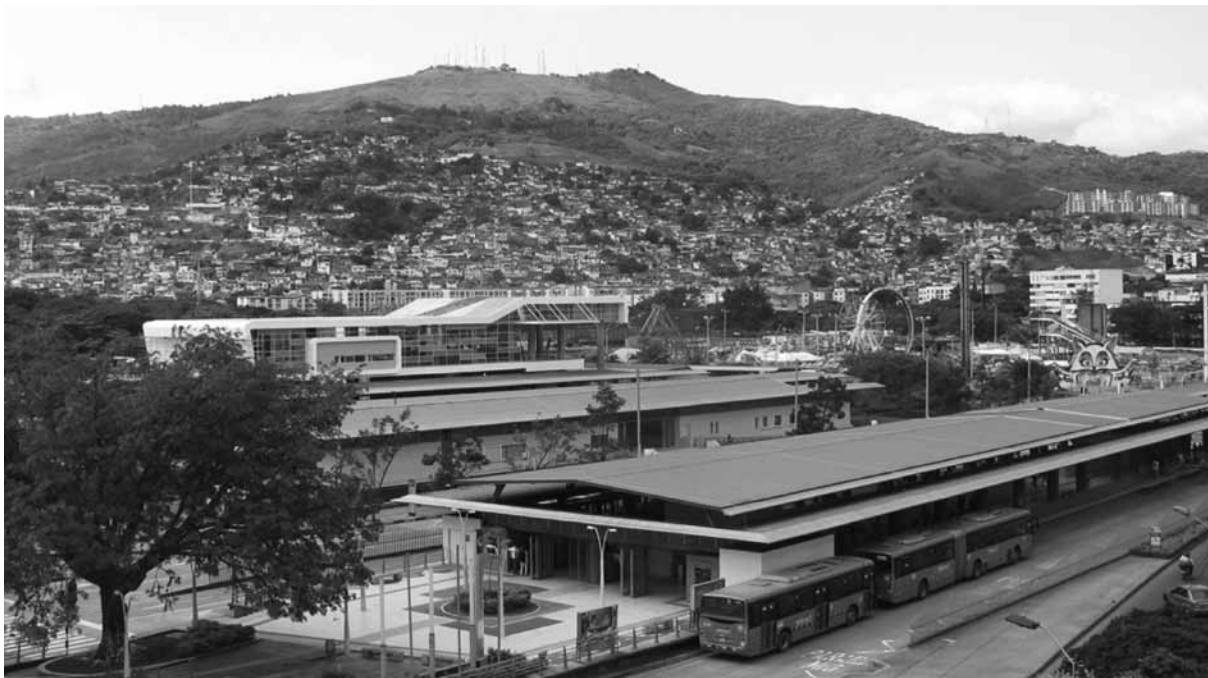


Figure 4: MIOCABLE Cañaveralejo Interchange Station, MIO Cosmocentro and Commune 20
Photo: Diana Daste

Table 2: MIOCABLE Project: Technical, Institutional and Financial Features

Length	2.2 km
Capacity	60 cabins (8 passengers each)
Operational capacity	22,000 passengers/day
Capital investment	US\$38 million
Funding sources	Municipality (petrol tax)
Contractor & project management	Unión Temporal MIOCABLE (Leither, Ingeocable, Conalvías)
Auditing	Consortio Integración Modal

Source: Own elaboration, based on information from Metrocali S.A.

Soil stability studies concluded in 2010 but by early 2012 some plots of land were still in dispute. It was originally estimated that the MIOCABLE would be launched in the first trimester of 2012, with an expected demand of 20,000 trips per day. The construction of the system started in April 2011. The Cañaveralejo Interchange Station, connecting the MIOCABLE with the MIO BRT via transfers at the Cosmocentro Station (see Figure 5) was inaugurated on 30th December 2011 (one day before the Ospina's term came to an end). Construction of MIOCABLE was halted in March 2012.

Isolation from the Municipality

Negotiation and Implementation

Prior to its eventual resumption, a number of problems must be sorted out, such as a shortfall of

some US\$15 million, land acquisition problems, and the need to update designs to comply with risk mitigation by-laws. This chapter does not intend to disentangle the reasons for the suspension of the project. Its aim is to show how an integrated project born out of a grassroots initiative becomes detached from social demands and local know-how once the local authority takes it up. The implementation of the MIOCABLE is characterised by a lack of vision in relation to its potential for urban transformation with social impact, and a communications gap between public and private actors to optimise resources and mechanisms for crosscutting development.

A Policy of 'Little Islands'

The MIOCABLE is included in the municipal development plan for 2008-2011 under 'alternative means of transport' (Alcaldía de Santiago de Cali, 2008).

Conceived in this manner, Metrocali has the mandate for execution, so will be carried out in complete isolation from other local entities. Cali's Planning Department (DAPM) was involved in the process through its participation in the 'Committee for Technical Coordination' where, alongside the city's Environment Department (DAGMA) and Metrocali, urban impacts on infrastructure and mobility are examined.⁹

The project is proposed in such a limited way that the local officials in charge defined it exclusively as a transport solution, one not framed within any integrated development plan and whose implementation focused on complying with operational technical and institutional requirements rather than promoting social and economic development for Cali or Commune 20 residents.¹⁰ It is disheartening that there was no dialogue between municipal agencies that could potentially contribute to the project such as the Secretariat for Transit and Transport or the Secretariat for Housing. The latter is in charge of 'Cali es mi casa' (Cali is my home), a programme that aims to provide city-wide services, public space, leisure facilities and parks alongside promoting a citizen culture and reducing the housing deficit, mainly social housing. It is a crosscutting project, which also includes rural zones within the municipality (Alcaldía de Santiago de Cali, 2008). This reflected a

⁹ On occasion they invite other municipal departments to analyse the impacts thematically.

¹⁰ Interview conducted by the author with local government officials.

management style that a local official would later dismiss as "a policy of little islands", in which each body concerned itself with its own problems with no reference towards a common project.

Actors and Resources

A similar situation is seen in the relationship with non-governmental actors. Business foundations that participate in development projects in Commune 20 saw in the MIOCABLE the potential for a project for neighbourhood reorganisation and upgrading. The SIDOC foundation, backed up by universities and the community, designed a project to improve access, provide social infrastructure, improved street layouts, and housing improvements.¹¹ SIDOC had the capacity to manage resources earmarked for the process, so they presented the proposal to the Mayor's Office. As they were granted no official support, they limited their efforts to the private and non-governmental sectors.

On Deaf Ears

Local authority consultations about the MIOCABLE project paid little heed to people in the Commune who insisted on a more broad-ranging project and one which took into account

¹¹ Interview conducted by the author with Viviane Armitage, director of the SIDOC Foundation, who also provided documents and studies carried out jointly with the *Universidad de Cali* and *Santiago de Cali*, January 2012.

the environmental risks of the area. They ignored these demands and dropped the tourism and business components of the proposal. Consultations centred instead on presenting the aerial cable-car route, instructions on the use of the future system, and advocating for the advantages of building an artisanal cluster and local job creation. The cluster was supposed to be ready for the first phase of the project but, by early 2012 little progress had been made in the proposal design. The over 1,000 jobs to be created remain a promise.

The fact that large sections of Commune 20 was categorised as a zone of medium and high environmental risk (DAGMA, 1998) justified, for many years, the lack of official investment in the area. The proposal for a cable-car line highlighted fears about the stability and safety of the system. Community leaders voiced these

during consultation events.¹² Again, these fears fell on deaf ears for the local government, which today is evidenced by the project's suspension.

The 'Gualas': Claims and Opportunity

"Guala" is the local name given to 4-wheel-drive vehicles providing informal transport services in Commune 20. These are manually adapted to the steep terrain covering routes that neither the MIO nor the MIOCABLE can reach. An eventual formal integration of these vehicles into the SITM would open opportunities for residents and local

¹² Interview conducted by the author with members of Commune 20, community leaders and journalists.



Figure 6: A 'Guala' / Photo: Diana Daste

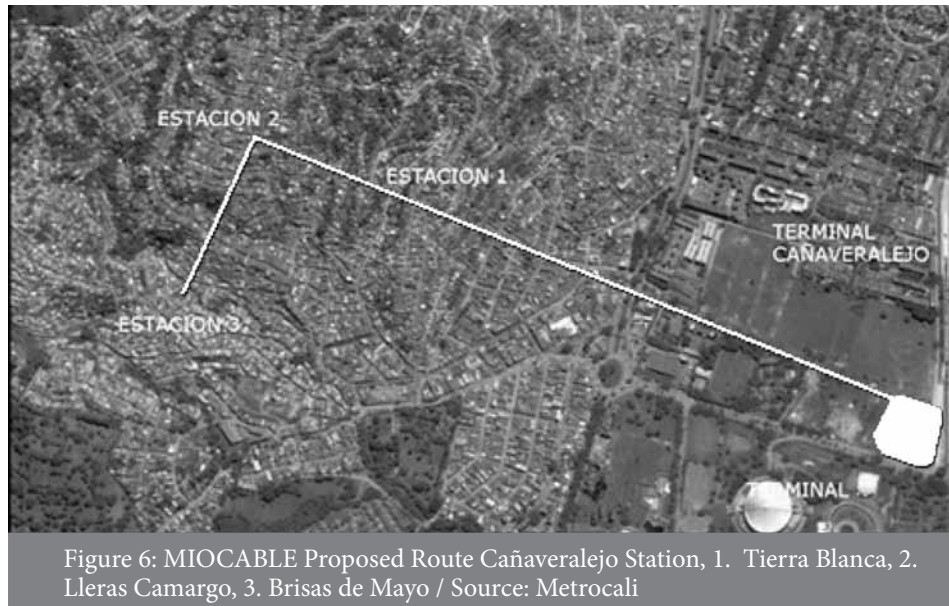


Figure 6: MIOCABLE Proposed Route Cañaveralejo Station, 1. Tierra Blanca, 2. Lleras Camargo, 3. Brisas de Mayo / Source: Metrocali

entrepreneurs to become involved in the system. The owners of the vehicles, the Municipality and Metrocali, who continue to search for mutually beneficial solutions, have seen this as a possibility ever since the MIO was given the green light. Their official acceptance as transport service providers would help counteract at least three limitations of the proposed aerial cable-car system: insecurity by gangs who take control of routes within the catchment areas of the stations, the considerable distance between the proposed stations, and the difficult topographical conditions which are often difficult for pedestrians.

Fare integration based on assigning routes and a form of mode sharing that is favourable for

transport workers, for the Municipality and for users is a considerable challenge. By mid-2012, a single trip on the MIO costs 1,600 pesos (US\$ 0.84) while 'guala' fares (albeit with limited coverage in the city) range between 800 and 1,000 pesos (US\$0.45-US\$0.56). The central axes of opposition are the high costs involved in enabling these vehicles to comply with standards of safety, comfort and punctuality. The municipal government should support the funding of this process, in the understanding that the majority of these transport workers, who are residents in the commune, lack the financial capital to make the necessary adjustments to operate formally. To facilitate this, the Mayor's Office would probably need to provide some financial support.

Conclusion

The MIOCABLE is an urban grassroots initiative that ended up being officially implemented in a limited and exclusionary manner. The case study shows that, in spite of financial, institutional, human and legal resources, the project has not exploited its transformational potential because it failed to integrate top down policies and institutions with bottom up initiatives. On the basis of the valuable lessons from Medellín documented in this book, the Municipality of Cali still has a chance to promote a progressive form of urban renewal, within a broader framework of improved mobility and citizen culture. This would require integrating strategic actors and sectors from different levels of society who are keen to contribute to the design and management of their own development. ■

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The San Agustín MetroCable in Caracas: The Price of Urban Integration

Nathalie Naranjo



Figure 1: Location of San Agustín District in the City of Caracas
Source: Inmetra Caracas, 2006

The San Agustín MetroCable is a non-conventional public transport system in an informal human settlement (or ‘barrio’ as it is locally known) in Caracas, capital of Venezuela. It represents an attempt to integrate an area of restricted accessibility with the city’s Metro network and, at the same time, provide equality of opportunities for the inhabitants of the San Agustín del Sur Ward to integrate into the city’s activities.

Feasibility studies had been carried out by 2006 with a view to develop aerial cable-car lines in two of the city’s low-income areas. In early 2007 the President of the Republic announced that Caracas would have the first, non-recreational, public transport system, using aerial cable-car technology, in the San Agustín del Sur zone, a small but densely built-up area in the central part of the city. In this sector the proposed system would join the Metro’s Line 4 and then through which it subsequently connects with lines 1 and 2¹. Preliminary studies, first contact with the community and exploratory work were made in March 2007, when the San Agustín *MetroCable* project officially commenced. The budget until completion of the work was estimated at US\$54 million, but the project suffered a series of setbacks and its inauguration was postponed on six different occasions, with test period starting on the 19th November 2008, and operations starting formally on 20th January 2010, with a service

1 http://www.metrodecaracas.com.ve/mapa_rutas/mapa_met_mbus.html

that was initially free for users. A second aerial cable-car line (*MetroCable Mariche*) with a total projected length of 4.84 km is currently under construction in the east of the city.²

The Urban Context in San Agustín del Sur

The San Agustín ward (*parroquia* in the Spanish original) is located in Libertador municipality of Caracas Capital District. A clear barrier constituted by the Guaire River and the Francisco Fajardo motorway, the main access road in the city, separates the area into two distinct parts: San Agustín del Norte (North) and San Agustín del Sur (South), between which there is no physical and functional integration. It is also formed by the sectors Av. Bolívar, Parque Central and El Conde. San Agustín del Sur comprises La Charneca, Hornos de Cal, La Ceiba, El Manguito and El Casquillo. The ward extends over 1.59 Km² with a population of some 40,000 inhabitants in 2007.

San Agustín del Norte has an excellent location within the Metropolitan District of Caracas with accessibility to the city centre, and also with direct connection to the east and west. However, San Agustín del Sur does not have the

2_ http://www.metrodecaracas.com.ve/obrasyproy/proy_mc_mariche.html



Figure 2: Aerial View of the San Agustín Ward / Source: Based on Google Earth
1. San Agustín del Norte / 2. Autopista Francisco Fajardo – Río Guaire / 3. San Agustín del Sur

same advantages given by virtue of its location between the Fuerzas Armadas Avenue and the Helicoide to the east, the Botanical Gardens to the east and an informal settlement to the south, not having main access roads other than Leonardo Ruiz Pineda Avenue, which has created particular dynamics for each sector of the ward and its internal zones. The San Agustín

del Sur sector is weakly integrated with the rest of the ward and the centre of the city through a pedestrian bridge that joins both sectors; likewise the connection is indirect due to a poorly defined connection that joins with the Fuerzas Armadas Avenue. It is linked with the rest of the city through the Francisco Fajardo Motorway. This sector has a better connection towards the East

in the direction of Venezuela Square and to the West with Leonardo Ruiz Pineda Avenue towards Puente Hierro.

Both sectors of the ward are poorly endowed in terms of roads, infrastructure and real estate, which has gradually led to further deterioration. The San Agustín del Sur sector can be divided into two large zones:

- *The formally developed zone.* This includes the strip of the Leonardo Ruiz Pineda Avenue, the sector of Los Pasajes, developed by the Worker's Bank (*Banco Obrero*), and the area of the Vuelta El Casquillo.
- *The informally developed zone.* This comprises the following neighbourhoods: La Charneca, Hornos de Cal, Marín, La Ceiba, El Manguito, El Mamón and El Helicoide (as listed under the third inventory of neighbourhoods carried out by FUNDACOMUN, 1989).

Urban dynamics in the San Agustín del Sur sector is very slow and change is almost imperceptible. The informal zone appears to be more chaotic with poorly constructed buildings and marked contrasts. The few open spaces are located in areas prone to landslides where high levels of environmental risk act as deterrents to future occupants.

It is worth mentioning the space generated by the steps, which are the only means of communication and key interaction in the majority of the informal areas of the city. In the

case of San Agustín del Sur, perhaps due to its steep topography, the spaces generated by the steps are basically North-South, with very few East-West connection points, and this reinforces the creation of relatively isolated areas within the neighbourhood.

In 2008 some houses benefited from the “substitute a shack for a house” programme of the Ministry for Habitat and Housing jointly with the Mayor's Office of the Metropolitan District of Caracas and the Libertador municipality. In this programme, dwellings in highly precarious conditions were replaced with newly built 80 m² two-storey houses, comprising three bedrooms and two bathrooms. In parallel, on the other side of the hill line by Terrazas de las Acacias, the Terrazas del Alba development was built, a social residential complex to provide housing for people in need, and where those affected by the building of the MetroCable stations were relocated.

According to the views of local residents³, basic need products can be bought in San Agustín del Norte by residents of the formal sector of San Agustín del Sur, or towards Victoria Avenue, El Cementerio and rural areas for residents of the informal sector, especially if they live in the higher parts, close to the Terrazas de las Acacias urbanisation. Networked services such as water and electricity have been gradually regularised, although in a sporadic and precarious manner; electricity, for example, is provided by overhead

³ Interviews were carried out with different neighbourhood residents as part of the fieldwork for the Environmental Impact Study of the San Agustín MetroCable.

cables (as opposed to underground lines). Drinking water is supplied regularly at least three times a week. Gas is bought in canisters from service providers twice a week, both in the lower part of Los Pasajes and in the Terrazas de las Acacias sector, from where residents can hire ‘wheelbarrow’ services to take the canisters to any part of the neighbourhood. The telephone service is managed directly by the national telephone company in some sectors, such as the formal part and the La Ceiba neighbourhood, while those without landlines must resort to using mobile phones, which have good coverage with any of the major operators.

Solid waste is regarded as the most deficient public service, as there is no adequate system to collect it regularly, especially in the higher parts of the neighbourhood, where fly tipping is common, and open spaces converted into improvised dumps. The municipality has tried to solve this problem by building waste drainpipes to transport solid waste down the hills where it can more easily be collected and disposed of.

The San Agustín MetroCable Project

The San Agustín *MetroCable* was located in the San Agustín del Sur sector to serve the poorest population in the zone, thereby connecting them with the Metro system at Parque Central Station, but also offering local residents a valuable alternative to the arduous access through long

steep routes consisting of concrete staircases which currently provide the only access route to their dwellings. Residents must negotiate an average of 800 steps to climb up the 200 metres between the lowest part of the neighbourhood and the mountain ridge.

The C.A. Metro de Caracas administers the project. The aims of the cable-car lines were:

- “To build a mass transport system of a cable-car type to meet the mobility and accessibility demands of the San Agustín del Sur sector, in the Libertador Municipality of the Capital District”.
- “The project aims to improve the quality of life of the inhabitants in the areas served by the project, and also contribute to redistribute the local population over space towards the Ministry of Habitat and Housing’s plans in the poorest zones.”
- “This system will contribute to upgrade the spaces around the stations, complemented with new buildings for the provision of services and leisure such as parks, libraries, school canteens, internet rooms, and nurseries, as well as education and health facilities, amongst others”⁴.

Work began in early 2007 and, as said earlier, operations formally began in 2010 at no initial cost to users. Fares were introduced three months later including single trips on the aerial cable-car, or integrated fares comprising use of the

⁴ http://www.metrodecaracas.com.ve/obrasproy/fichatec_mcable.html



Figure 3: San Agustín MetroCable Route
Source: Cametro, 2008

Metro system. The cost of the project was initially estimated at US\$54 million (Cametro, 2008). Three years on, total costs had been revised upwards to US\$318 million, with expenditures of some US\$257 million by mid-2012⁵, including complementary buildings and facilities around the stations. The line was projected for a daily demand estimated at 15,000 passengers (1,200/hour), a length of 1.8 kilometres, 51 cabins with a capacity of eight people each (six seated and two standing), and a commercial speed of five metres per second for a total of journey duration of nine minutes for all five stations (Cametro, 2008).

It is unquestionable that the *MetroCable* made a mark on the inhabitants of one of the most depressed neighbourhoods in the capital

city, including: greater accessibility to the mass transit network, reductions in travel times to connect to the city, improved accessibility to the mass transit system for people with special mobility needs; improvements in specific infrastructure such as rubbish shoots, schools, sports facilities; and jobs for local inhabitants (approximately 200 between cabin attendants and maintenance of outside areas). However, despite meeting the proposed objectives, it has not achieved the main goal to transport the greatest number of people possible and connect them with the rest of the city. By mid-2012, the system was operating well below capacity, with estimates ranging between 4,500 passengers/day⁶ and an official estimate of over 6,000 passenger

⁵ Cametro Official site: www.metrodecaracas.com.ve

⁶ <http://www.vtv.gov.ve/index.php/nacionales/75414>

s/day⁷, low figures given the system's operational capacity of up to 15,000/day. According to official projections (Cametro, 2008), by early 2013 it should be transporting 11,000 passengers daily, a number which seems unlikely given the low number of service users at the time of writing in mid-2012.

Alongside the low demand for the system, we could point out other aspects that merit more in-depth research such as: lack of connection to the system for inhabitants in the lower part of the neighbourhood, lack of pedestrian connection between stations, the fact that people cannot carry loads in the cabins (an expectation generated before operation commenced), which is especially important for people working in the formal and informal commercial sector. The fact that, in contrast with the case of the K Line in Medellín's *Metrocable* (see the earlier chapter by Brand and Dávila), a tourist route for Caracas has not been contemplated in the plan, local activities such as the manufacture of musical instruments

⁷ <http://venezuela-us.org/es/2011/01/21/metrocable-san-agustin-cumple-un-ano-al-servicio-de-los-venezolanos/>

(a local tradition in the area) have also not been included in any proposal, policing is only provided inside the stations, and issues of privacy remain unresolved, which has caused complaints from people who resent the invasion of their privacy by cable-car users due to the proximity between houses and the cabins⁸. And all this at a cost of US\$318 million. ■

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La Paz-El Alto: The Old Dream of an Aerial Cable-Car

Freddy Koch

Historical Background

The city of La Paz is the capital of the *Departamento* (province) of La Paz and seat of government for the executive and the legislative powers in Bolivia. It was first founded in 1548 by Alonso de Mendoza in Laja, a zone in the high plain (*altiplano*) characterised by its flat topography, windy and cold climate, and the city was established as a resting point between Cusco and Potosí.

Three days after its founding, it was moved to the east, at the border of the high plain where the ravines start and where the climate is slightly warmer, called Chuquiago. From this moment, La Paz sealed its destiny as a unique city enclosed in an open valley in the form of a bowl, with an exit to the south following the Choqueyapu River.

In the lowest part of the city one can find the institutional and historical centre, meeting place of political powers, with residential neighbourhoods rising up the slopes to each side. Later the growth of the city and, crucially, the migration processes from the countryside, gave rise to the birth of a commuter town in higher up the hills where the *altiplano* begins known as the city of El Alto, with a population that today is larger than that of the valley.

According to the 2001 census the population stood at 1,552,156 inhabitants in the metropolitan area including the city of El Alto (INE, 2001). The city centre is at approximately 3,650 metres above sea level and forms – together with the city of El Alto – the main urban nucleus in Bolivia.

The Trams: A Sustainable Transport System

At the beginning of the 20th Century railroad transport tended to prevail in Bolivia's cities. Tram systems were developed in La Paz, Cochabamba, Santa Cruz and Oruro, which date from the same period when the motorcar first appeared, and which in that era was considered merely for luxury private use.

Despite its topographical characteristics (heights and gradient of streets), an electric system of eight trams of one single car-motor within the urban radius was inaugurated in La Paz on 16th July 1909¹. Figure 1 shows the coverage of the tramlines in La Paz in the 1920s.

In 1913, the service initially reached San Jorge in the southern stretch; later it was extended to the residential zone of Obrajes and in 1921 a route was inaugurated which went towards Miraflores. At the end of the 1920s the routes were reorganised: the rails of the Comercio Street were moved to Ingavi Street, the route of the Arce Avenue was moved to the 6 de Agosto Avenue and the itinerary of the Sopocachi line was also altered (see Figures 2 and 3). In 1936, the Bolivian Power Co. reported a fleet of 20 working vehicles and a route of 15 kilometres of rails. Unfortunately, the majority of the tram routes travelling in both directions had to share a single rail track in double route streets, which made traffic intolerable, and this was sufficient reason for the La Paz tram to close its operations in 1950.

¹ See <http://www.tramz.com/bo>

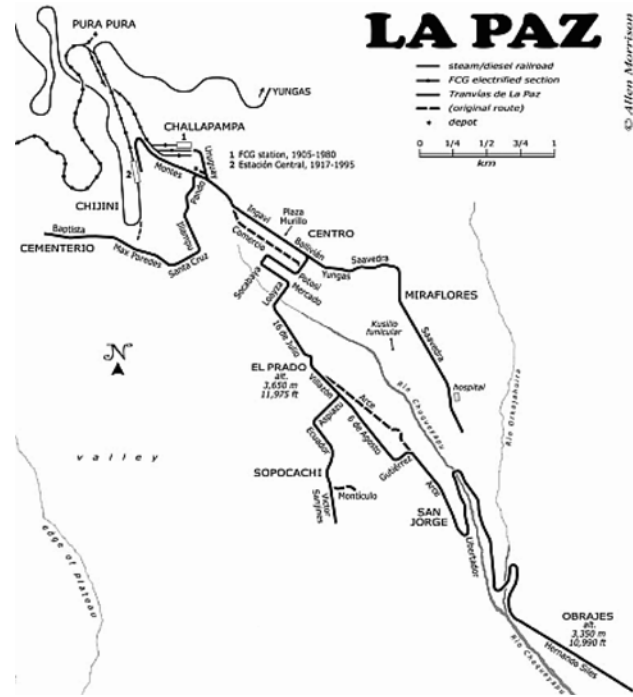


Figure 1: Tram System in La Paz, Bolivian Power Co., 1921 / Source: Allen Morrison Collection

Development of Transport Plans

From that period until the 1980s, the number of vehicles in La Paz grew slowly at rates under 4% per year. The first public transport systems were organised and administered by independent transport providers organised in unions and most trips were covered by this service and individual transport. At the end of the 1970s, the



Figure 2: Trams in the Centre of La Paz, 1920s
Source: Allen Morrison Collection

configuration of the city through the length of the tight valley meant that there was significant congestion of private vehicles and the inefficiencies of the unionised transport system became more evident. The transport systems between La Paz and El Alto (private buses for between 50 and 60 passengers) began to decline with service deteriorating markedly. At this point, the first ideas to change the system and search for alternatives arose. The first change in the transport system was the configuration of the Municipal Company for Automotive Transport (EMTA) that provided

services for trunk routes with fixed bus stops and buses with a capacity of up to 105 passengers. Later, this system would fail due to terrible public administration, lack of reserves and strong competition from unionised transport. In 1986 La Paz had a population of 993,000 inhabitants with an average annual growth of around 4%. Approximately a third of the population lived in El Alto, which had a far faster growth than the valley, due largely to greater availability of space (Oster, Gakenheimer and Menéndez, 1988).

The then mayor of the city of La Paz Ronald McLean Avaroa, based in the Project for Municipal Strengthening (PFM), designed with the support of the World Bank, saw the modernisation of transport systems as a political opportunity and a priority, mainly in relation to routes leading towards the south of the city and links with El Alto. This led to an international call for proposals for mass transit systems between La Paz and El Alto. El Alto by this

time had already turned into a municipality in its own right (2nd March 1985). Table 1 summarises the most important proposals presented:

Professor Ralph Gakenheimer of the Massachusetts Institute of Technology (MIT) was approached to evaluate the proposals. A team of doctoral students from MIT then carried out more in-depth evaluations of the different options for the La Paz-El Alto transport system at the end of 1988.

Table 1: Mass Transit Proposals Between La Paz and El Alto, 1986
Source: Gakenheimer (1986)

Company	Estimated cost (US\$ million)	Mode	Capacity (passengers/hour)	Journey time (minutes)
Romania Auto Export-Im Romelétrico	13	Trolley bus 68 units	6,800	N/A
MAS-Tectronic Pentepala-Brazil	29	Trolley bus 101 units	12,000 18,000	51
German Group Hansa-Siemens Hochteil	100	Light Train	60,000	17
Fomerbol-Alshtom BCEOM-France	65	Light Train	20,000	43.5
Grenier Doppelmayr Austria	6.4 (min) 19.4 (max)	Aerial cable-car	5,000 18,000	7.5
German Group Hansa-Siemens Hochteil	23.8 (min) 95.2 (max)	Aerial cable-car	5,000 18,000	7.5
Pomagalsky/ Barrengu France-Argentina	14.4 (min) 4.2 (max)	Aerial cable-car	5,000 18,000	7.5

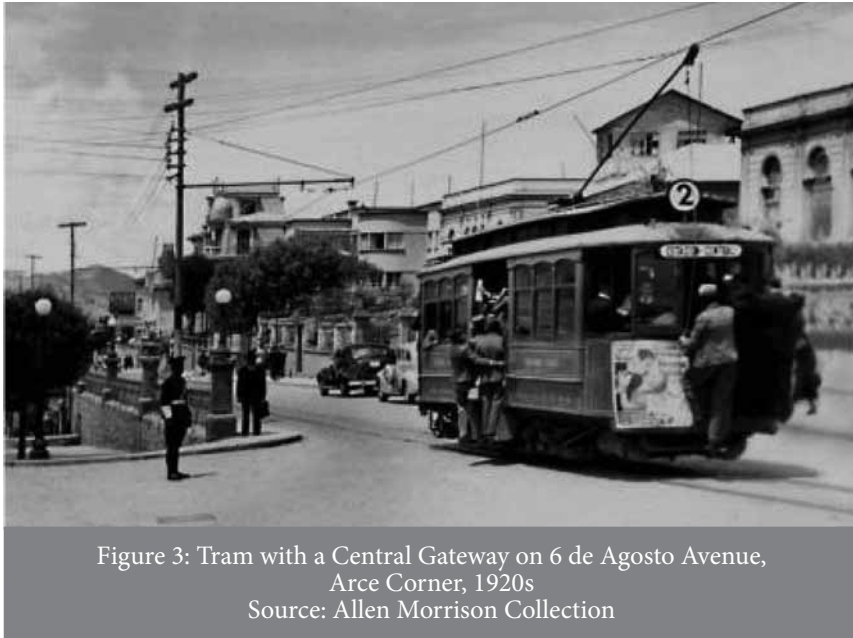


Figure 3: Tram with a Central Gateway on 6 de Agosto Avenue,
Arce Corner, 1920s
Source: Allen Morrison Collection

The conclusions from Gakenheimer's work highlight a number of issues: i) the highest demand is between the centre of the city and El Alto; indeed it is the transport system between these two zones that would define the rest of the system; ii) the most attractive option is the trolley bus system, due to the low costs and high capacity; iii) more financial, technical and demand studies are necessary to take a well-reasoned decision. The students' report in 1988, more than simply providing more detail in the evaluation, highlights the important issue that rather than a merely technical, the decision is essentially a political one where large economic interests are in play. This included not merely the service providers

but also the multilateral banks who bet for one system or another. In the end, nothing concrete came out of the bids.

In the 1990s, the national government policy to liberalise public transport as a form of countering high unemployment led to the rapid expansion of transport unions. These, along with other groupings such as transport cooperatives and other public transport associations, turned the transport sector into a strong political lobbying group, and one with whom municipal mayors preferred not to quarrel. None of mayor McLean's successors proposed structural changes to the system and allowed instead the public transport system to grow and develop in a chaotic manner.

The weak policies of the 1990s bore fruit in the following decade. Thousands of 15-passenger minibuses became the public system's most important mode of transport. By 2001 there was over 35% of spare capacity on public transport routes and, with little renovation of an ageing fleet, the system began to falter.

In 2001, La Paz's mayor, Juan del Granado, launched an initiative for the presentation of urban infrastructure projects whereby bidders would gain additional points in the tender should their proposal be eligible for funding. Within this framework, the Bolink Company outlined a project to build an aerial cable-car line between La Paz and El Alto. The proposal estimated that it could attract 25.7% of the demand (52,000 of a total of 234,000 trips/day). This proposal was at the level of 'pre-design' and it showed various flaws, or at least many of its assumptions can be questioned. Another project that was born from this conjuncture is the construction of an elevated train above the Choqueyapu River, as an additional solution to meet the demands in the southern zone of the city.

An important milestone appeared in 2004 when the Tonichi Sistra Consortium, with funding from the Inter-American Development Bank, unveiled a study for the final design of a mass transport system using BRT (Rapid Transit Bus) technology. The conclusion and value of this study does not lie so much in entertaining a viable alternative to systems such as the aerial cable-car line, but it shows that the implementation and success of this system could only be possible by

dislodging at least 5,000 transport suppliers from the current system. This was a decisive issue in causing decision-making to stall once again.

By the time of the municipal elections of April 2010 none of the candidates could leave to one side the urgency of tackling the city's public transport problems. Without doubt this issue was now high in the public agenda.

Luis Revilla, who won the mayoral elections in La Paz, bet on solving the transport problem as the first of ten main tasks of his administration. The creation of solid urban mobility technical teams to sort out the problem was one of his first actions. At the time of writing in mid-2012, the urgent tasks for these teams involve updating studies and outlining a system within which the aerial cable-car is part of an integrated transport system.

Within the current conjuncture, in August 2011 the National Government approved the General Transport Law No. 165, which would create a legal umbrella for the implementation of transport systems based on principles of equity, efficiency, and sustainability. This law was very well received by the Bolivian public, and in some way was used also as a political flag for the National Government of President Evo Morales in the months following its promulgation.

Within the framework of this Law, the Law for Autonomies and Administrative Decentralisation and the State Political Constitution, on the 12th April 2011 the Municipal Government of La Paz promulgated the Municipal Autonomy Law No. 15 – the Municipal Transport

Conclusions

La Paz's steep topography would seem to suggest that aerial cable-cars are a fast, clean and efficient way to transport passengers between the two municipalities. This will always be present in the collective imagination.

The features and international publicity of Medellín's aerial cable-cars showing that can be built quickly and can offer efficient transport services to low-income populations in faraway zones, while contributing to reduce crime and insecurity, have turned this project into a politically popular reference point in Bolivia, despite high costs when compared with other options.

During Bolivia's neoliberal period the cable-car project hinged on private concessions and profitability to be sustainable. The main reason why it was not built was perhaps the high initial investment involved. Today, the national government of Evo Morales, on the back of healthy fiscal reserves (partly the result of fiscal appropriation of mineral exports), is more prepared than previous governments to tackle projects of great complexity, such as a comprehensive national road networks. As we understand it, the aerial cable-car lines will draw on the same financial base, and as such will not have to rely on future fare collection as a means to repay the initial investment. Moreover, it would seem that the future operation of the system will be assumed by the state.

It is worth highlighting two issues arising from the aforementioned: i) This is the first time

that Bolivia decides to spend substantial resources on an urban transport project; undoubtedly this should give way to investment in future projects, not only in La Paz but in other cities too; ii) the aerial cable-car project for La Paz-El Alto is more a political project than a means of alleviating transport problems as suggested by the estimation that it will absorb 20% of the public transport demand between La Paz and El Alto. If the objective were to meet the demand, investments should have gone towards funding the BRT mass transit system.

At the time of writing in mid-2012 the great challenge still to be resolved is to link the aerial cable-car project (championed by the national government) – as it has now become a fact – with proposals for the BRT mass transit system (championed by local governments) to ensure that there is fare integration. The overall aim should be to create a transport system that provides citizens with improved mobility and better quality of life. ■

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Context and Potential Impact of the Aerial Cable-car on the Population of Complexo de Alemão, Rio de Janeiro

Vânia Regina Amorim da Silva

Introduction

The Programme for Accelerated Growth (PAC) launched in 2007 by Brazil's federal government includes a set of interventions in low-income settlements and large investments in urban facilities and services and support to local inhabitants (BRAZ, 2010). A social and urban planning intervention in the neighbourhood known as Complexo do Alemão (IUCA) was carried out as part of this programme. This was a joint implemented by the government of the State of Rio de Janeiro and the Mayor's Office of the city of Rio de Janeiro, aided by transfers from the federal government. The intervention in Complexo do Alemão is considered in Latin America to be an emblematic case of intervention in an informal

settlement. The choice of this area was due to the precariousness of its urban infrastructure, lack of facilities and poor basic public services, its high levels of social vulnerability, and the presence of armed gangs which made the area known as the headquarters of Comando Vermelho, one of the main criminal gangs which control drug trafficking in the informal settlements (favelas) of Rio de Janeiro.

According to the Public Works Enterprise of the State of Rio de Janeiro (EMOP), the PAC Alemão, which began in 2008 inspired by the experience of Medellín, comprised investments and integrated actions in diverse fields such as infrastructure, the supply of public facilities, improvement of housing and construction of

new dwellings, street layouts, risk mitigation, and policies for land regularisation and job and income generation programmes. The project has been hailed especially for its action for urban mobility, such as in the construction of an aerial cable-car lines integrating five hills of *Complexo do Alemão* with a network of trains that serve Rio de Janeiro's Metropolitan Region.

Social and Planning Features of Complexo do Alemão

Situated in Rio de Janeiro's northern zone, *Complexo do Alemão* is a group of fifteen communes.¹ These are built on the Sierra de la Misericórdia, and the majority of these settlements were born out of informal occupation of the area, and subsequent proliferation of poor quality housing units, insecure tenancy and unregulated sub-divisions (see Figure 1).

Based on data from the 2010 population census, *Instituto Pereira Passos* estimates that the communities of *Complexo do Alemão* live in an area of 177 hectares, with a population of 60,583 inhabitants and 18,442 housing units. The area has a high population density when compared with the city's average: in the communes there were 323.2

1 Vila Matinha, Parque Alvorada, Morro das palmeiras, Rua 1 pela Ademas, Rua Armando Sodré, Morro do Alemão, Joaquim de Queiróz, Nova Brasília, Mourão Filho, Morro da Baiana, Estrada do Itararé, Itararé, Morro do Adeus, Morro do Piancó and Relicário.

inhabitants per hectare in 2010 and an average of 3.29 per housing unit, while city-wide averages were 110.7 inhabitants per hectare and 2.94 per unit.

Chaotic land occupation coupled with high densities and occupation of steep slopes has given rise to a road network of tortuously tight streets, without space for vehicle circulation and often without pavements. This situation makes mobility and accessibility very difficult, and indeed made access of essential public services such as, for example, solid waste collection and ambulances, very difficult if not impossible.

The lack of public transport was replaced by informal networks, with the support of politicians and drug traffickers, as in the case of the van cooperatives and motorbike-taxis which operate in the *Complexo*. These are more flexible than formal transport networks and offer some residents a viable income-earning option. Poor presence of state agencies, according to Kleiman (2010), led to the creation of alternative networks to provide basic services that can be seen not only in transport but also in the supply of water, sewerage services and electricity. Funk dance events, *pagodes* and *forrós* offered by grassroots organisations (Associações de Moradores who own sound systems) are virtually the only entertainment available to local communities.

The *Complexo do Alemão* is an area segregated from the rest of the city. This can be seen in the social, infrastructure and public service indicators (see Table 1). A study carried out by *Serasa Experian* showed that 37% of young people in the communes lack professional qualifications



Figure 1: Communities of the Complexo do Alemão and the Aerial Cable-Car Line
Sources: EMOP, 2012; IPP, 2011.

Table 1: Social Indicators in Complexo do Alemão and in Rio de Janeiro (percentages)
Source: IBGE, 2010 Population Census

Area	No latrine/toilet inside the house	Inadequate disposal of solid waste	Residents aged 15 years or more who are illiterate
Rio de Janeiro	0,1	0,7	2,9
<i>Complexo do Alemão</i> Communes	0,2	8,2	7,7

and educational incentives, compared to 18% for the city in general, another indication of the considerable vulnerability of this social group.

Interventions in Complexo do Alemão

According to a study by Nery and Flaeschen (2010), the PAC resources from the Caixa Econômica Federal, added to local matching funds, amounted to US\$405 million² in investments in *Complexo do Alemão*. The majority of the communities of *Complexo* benefited, with the exception of the Relicário community. PAC interventions included infrastructure work in water supply, sewerage, drainage, street lighting, pavement improvements and slope stabilisation. There was also supply of education and health infrastructure such as the Colégio Estadual Jornalista Tim Lopes, the Centro de Educação Tecnológica e Profissionalizante (CETEP), Centro Integrado de Atuação em Saúde, a 1,540 m² library with areas reserved for the arts, music studio rooms, a computer room with 100 computers and video library, a sporting facility with a half-length Olympic pool, an income generation centre and a legal aid centre.

According to the State government, other community facilities were proposed such as a shopping centre, a police post, a post office,

² The investment in Brazilian Reais was R\$827,721,089.17. The exchange rate between the dollar and the real is based on data from the Banco Central do Brasil issued on the 23rd July 2012.



Photo: Frédéric Monié

the construction of 2,620 new homes and the improvement of close to 5,600 houses. In this project they included the total recovery of the *Parque Municipal Urbano da Serra da Misericórdia*. There was also an aim to regularise land tenure of all properties in the *Complexo*, as well they employment and income generation initiatives for the community who have benefited from the broader programme.

One highly visible project was the aerial cable-car line, inaugurated in July 2011, comprising six stations: Bonsucesso, Adeus, Baiana, Alemão, Itararé/ Alvorada and Palmeiras, on a route of 3.4 kilometres. According to EMOP information, the system is composed of 152 gondolas, with a capacity of ten passengers each, with an operational capacity of 3,000 passengers/hour. The journey between Palmeiras and Bonsucesso, which previously took one hour, was reduced to 17 minutes excluding waiting time. This also has the advantage of being integrated into the railway system through transfers at Bonsucesso Station. The intention was to reduce the journey time, facilitating access to places of employment, leisure time and cultural facilities, improving urban mobility, especially in the highest points of the hills where access to alternative transport is more difficult.

According to EMOP, the construction of the cable-car line cost US\$103 million³.

Construction took three years and employed around 3,500 workers, many of whom came from the communities. Local young people aged between sixteen and twenty-four are employed as attendants in the cable-car stations.

According to Ícaro Moreno, president of EMOP, the Medellín Metro Company acted as consultants to produce a study with the aim of modelling the operation, maintenance, emergency recovery, proposal for the collection of fares and even the profiles of future workers. The State established that residents from the *Complexo* had the right to two free return trips per day.⁴ In less than a year of operation, it has transported more than two million people. Supervia, the company administering the cable-car concession, reports that they transport ten thousand passengers every day (compared with 30,000 on Medellín's K Line).

The Secretariat of the *Segurança do Estado do Rio de Janeiro* created four Police Pacification Units (UPP) that covered all the communities. These represent a new model of public security, which aims to restore and assure territorial control through community police, stimulating greater links between the community and the police.

³ The investment in Brazilian Reais was R\$ 210,000,000.00. The exchange rate between the dollar and the real is based on data from the Banco Central do Brasil for 23rd July 2012.

⁴ Each ticket costs R\$1.00 and a fare integrated with train services costs R\$2.90. Working hours are Monday to Friday 6 am to 9 pm; Saturday from 8 am to 8 pm; and Sunday and holidays from 7 am to 7 pm.

Impacts of the Cable-Car in Complexo do Alemão

An accessible, efficient and quality collective transport service which guarantees access for the population to all the urban space can “(...) considerably increase the availability of income and time for the poorest, facilitate access to basic social services (health, education and leisure) and to work opportunities” (Gomide, 2003, p.8). For this reason, the cable car was an important action in terms of reducing socio-spatial inequalities and the integration of this area with its surrounding area. It has also allowed inhabitants to rediscover their neighbourhood given that, before the cable-car line was launched, many of them did not walk between the communities due to difficult access and insecurity. Moreover, it has stimulated tourist exploration of the zone, and it receives visitors from outside, it has generated income and contributed to the decline of stereotypes by breaking down symbolic boundaries.

The cable stations have been transformed into new urban nodes, offering public and private services, such as free basic education and professional courses offered by SESI and SENAI (Sistema FIRJAN- Federação das Indústrias do Estado do Rio de Janeiro) in the Itararé Station. A Reference Centre for Social Assistance, a post office, an INSS attention post – a body of Brazil’s Federal Government for social wellbeing, a Youth Referral Centre in Alemaõ Station. In the Adeus Station an agency of Banco do Brasil was opened,

with ATM machines from the Caixa Econômica Federal and Banco Bradesco. The Mayor’s Office installed a point for urban and social orientation in Baiana station. Another positive aspect of the planning interventions was the number of social actions implemented in the communities, which have benefited from a number of educational, cultural and sporting events.

Despite visibility, the use of the system amongst residents is limited. For example, a news programme of Jornal RJTV from the O Globo TV network (24th January 2012) pointed out that, according to Supervia, only 12% of the inhabitants of *Complexo do Alemão* had used the cable-car. The inhabitants maintain that the cable-car only benefits residents in the higher parts of the hills. For inhabitants in the lower parts access to the stations is more difficult, and they continue to use other means of transport. On the Adeus hill, for example, it is necessary to climb stairs to reach the station, or to walk long distances. Another argument for not using the cable-car is fear of being stuck in the air due to technical problems.

The construction of the cable-car line has had much criticism, such as that stressing that it took up more than a quarter of the programme budget. Some residents argue that decisions regarding facilities and interventions were done with no broad popular consultation (Migon, 2011). Moreover, there is much disquiet on the decision to relocate 2,000 families (Agencia Brasil, 2010) in order to meet deadlines and complete all the construction work in the *Complexo*. According to Freitas (2012), 920 houses were built within or close to the *Complexo*



Photo: Frédéric Monié

to relocate these families. Some families receive rent support while their houses are completed. Houses were purchased for 654 families who had to be relocated due to environmental risks. However, the demand for housing in the Alemão zone is large. The PAC has an additional contribution from the Caixa Econômica Federal for the construction of more than 1,500 houses for these families.

Social participation and community mobilisation in the first phase of the project and during the implementation of works have also left much to be desired. Despite the fact that participatory planning is highlighted in the *Estatuto das Cidades*⁵, researchers from Instituto de Pesquisa Econômica Aplicada (IPEA), the public federal foundation linked to the Secretariat for Strategic Matters of the Presidency of Brazil, reported the need for greater participation of residents in

⁵ Law 10.257 de 10/07/2001 regulating urban policy in Brazil, and outlines conditions for the transfer of federal resources to municipalities.

decision-making and pointed out that they should have been given more detailed information about the project (Nery and Flaeschen, 2010).

Final Thoughts

The PAC Alemão arises from a policy framework of integrated planning, where public transport is seen as an important urban poverty reduction mechanism. Despite these good intentions, the social and economic impact of such interventions in the ground must be examined once they have been completed. In particular, it remains to be seen to what extent the aerial cable-car line contributed to an improvement in the mobility of communities in the *Complexo* and further integration of these areas with the rest of the city. More remains to be done in terms of complementary actions for employment generation and social and cultural affirmation for local residents and workers. ■

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What Have
We Learned from
Medellín
and Soacha?

Conclusions : What Have We Learned from Medellín and Soacha?

Julio D. Dávila, Peter Brand, Jorge Acevedo and Juan Pablo Bocarejo

The contributions in this book offer a relatively complete panorama of the possible effects that a series of technological and institutional innovations supported by a local government such as the Medellín municipality can have on some of the city's poorest populations. And in documenting the Soacha case, a neighbouring municipality to Bogotá, we can see the enormous difficulties of carrying out a similar project where similar conditions to Medellín, which is now considered almost iconic, are lacking. Despite not yet being documented in the same level of detail, the experiences of other cities such as Rio de Janeiro and Caracas, where similar aerial cable-car systems to those of Medellín have been launched, or those of La Paz and Cali, where

these are being considered, still offer valuable and important lessons.

In this last chapter we reflect on the most important lessons from the research project of which this book is a product. In analysing two municipalities with a common national legislation and institutional framework, we believe that contrasting Medellín and Soacha is a particularly useful exercise, and without doubt the other examples in this book are a valuable complement to these reflections.

The effectiveness of a set of interventions such as those documented here for Medellín can be gauged with the help of three inter-related criteria. The first of these is an increase in mobility. The second is the degree of poverty reduction

in the population who lives and works in the neighbourhoods affected by the intervention, which is tied to increased opportunities for self-development both individually and collectively. The third is the level of urban integration of the neighbourhoods that, although this might be seen as a result of the previous two, also refers to the perception that the rest of the city has of these neighbourhoods, along with their physical linkages with the rest of the city.

Before contrasting the differences between the communes in Medellín and Soacha, it is worth briefly outlining the institutional and legislative framework that these two local governments share. Colombia adopted a decentralisation programme over 20 years ago, and this has given its municipalities considerable political autonomy (the mayors and local legislative executive are democratically elected every four years), administrative autonomy (the municipalities decide on road infrastructure and public space, the management of public transport, public utilities, education and health, amongst others) and, to a lesser degree, fiscal autonomy, given that taxation levels are determined through national legislation (including local taxes). In compensation, a considerable proportion of national revenues are distributed amongst the *Departamentos* (provinces) and municipalities to complement the resources they have to exercise these functions. This distribution is carried out in accordance with formulae designed to help redistribute resources from the richest and most developed regions to the poorest and most backward ones.

However, the management of local taxes (to property values, to the gross turnover of industry and local commerce, along with betterment taxes) depends on the adequate organisation and efficiency of local governments, and in particular, of updating of property values through regular cadastral surveys. As such, the more modern and best organised municipalities tend to collect substantial local revenues to supplement national transfers, while the most backward ones depend on these central transfers for the bulk of their budget. Medellín is an excellent example of the first group, whereas Soacha is perhaps the country's largest municipality belonging to the second group. This is aggravated by the fact that Soacha's population is mainly poor, many of them are settled on illegally occupied sites, and as such their property is of low value or impossible to incorporate into the property register.

In the case of Medellín, it is worth distinguishing between the nature and the effects that the two interventions have had, represented in the two *Metrocable* lines. Likewise, it is worth pointing out the differences between the effects of the aerial cable-car line and the effects of urban, social and institutional interventions embodied in the Integrated Urban Projects (PUIs) and other municipal programmes. The first, without doubt the most striking for the visitor, refers to the *Metrocable* K Line (Santo Domingo and Parque España), as it is not only the most visible to the rest of the city due to its proximity to the city centre and the main Metro line, but also due to the



Municipality's deliberate strategy of connecting it with the L Line to Arví Park, today oft frequented by the Medellín public and tourists from outside the city. It also concerns the neighbourhoods where the interventions of the Urban Development Agency, through the PUIs, have perhaps been more effective, as was documented earlier in the chapters on Medellín. Urban upgrading around the J Line appears less visible to a visitor but, at the time of completing this research project, it has had a significantly lesser impact in terms of our three criteria: mobility of local residents, improved opportunities, and degree of urban integration with the city. We are far from suggesting that the second line has failed simply by virtue of the fact that it carries a third of passengers in the K Line (and similar to the *Complexo de Alemão* in Rio), as the main aim of the line is to unite the distant

Ciudadela Nuevo Occidente through an integrated transport system with the rest of the city. Indeed, there is no doubt that the very existence of the line and the housing complexes that continue to be built are an indication of a palpable institutional presence of the local government.

What, then, are the most obvious differences between Medellín and Soacha? What explains the pessimistic tone of the chapters on Soacha in this book in terms of the feasibility of an aerial cable and its potential in achieving an urban transformation as significant as that seen in whole neighbourhoods in Medellín's Communes 1 and 2? And, perhaps more importantly, what can we learn from the contrast between the two that can be useful for other urban contexts?

The first key lesson refers to making urban poverty more visible, thereby ensuring its

presence in the city's political agenda. Medellín's high population density and its topography of a long valley and steep hills means that large parts of the city are visible from the train carriages on the Metro A Line: the elegant residential towers of the exclusive *El Poblado* neighbourhood, the old recycled industrial buildings of the *Ciudadela del Río*, the sculptures by Maestro Botero close to the *Parque Berrío* station, the *Orquideorama* in the Botanical Gardens, and the low-income neighbourhoods of Moravia, Popular and Santo Domingo. Despite the fact that, for at least one generation, these communities were suffocated by violence and exclusion arising from poverty, unemployment and the almost total control of their territory by illegal armed groups, this poverty seemed removed from the daily life of many Medellín residents. However, a decade ago, the geographical proximity of these neighbourhoods to the city centre, and yet their obvious functional disconnection from the rest of the city, somehow combined to ensure that the interventions described in this book had a political echo and were generally accepted by the population as part of an important urban project that concerned everyone.

In contrast, Soacha is a municipality lying outside of Bogotá's jurisdiction, physically removed from the centres of power and decision-making, and visible exclusively to the users of the road connecting the city with the south west of the country. Despite being an important industrial centre, in *Bogotanos'* imagination it is associated with poverty, poor public management, and pollution from its manufacturing and mining

industries. Even further from all this is Commune 4 and Altos de Cazucá neighbourhood, the object of this study, which is not even visible from the main road as it is necessary to climb a series of steep hills on an abysmal road to get there. It is a neighbourhood marked by violence and hopelessness, as were Communes 1 and 2 in Medellín during the 1980s and 1990s, but the difference lies in the fact that it is not only far from the centre of Bogotá but it falls within a different local authority. There is no doubt that the severity of its social problems and the presence of national NGOs and even international NGOs contribute to increasing its political visibility; this certainly weighed in on President Uribe's proposal to build an aerial cable-car line there. But as political priorities shifted towards the end of his presidential term, the lack of physical visibility contributed to the project losing political currency.

As a corollary to this analysis, we could point out that an important lesson from this project is that, according to our three criteria of mobility, poverty reduction and integration, a necessary first step to make an urban intervention effective is the need to consistently maintain political visibility in the intervention zone and its population. In the absence of physical visibility, political visibility can be achieved by other mechanisms such as public debates and an urban and regional vision that transcends administrative divisions. Apart from the obvious ethical and social justice considerations underpinning an intervention of the kind demanded by local residents, it must be remembered that the majority

of Soacha's labour force can be classified as low socio-economic strata, and that this labour force is crucial to Bogotá's metropolitan economy.

A second lesson arises clearly from a comparison between institutions in the two municipalities. In the previous chapters there was a clear contrast, on one hand, between Soacha's political chaos, corruption and the lack of human and financial resources, and the solidity of local institutions with strong technical and financial capacity and a political-institutional structure fostering coordination between the planning

and implementation of projects which Medellín enjoyed on the other. It is also clear that it is *public* institutions and businesses that inspired, financed and managed the *Metrocables* and complementary urban projects. Governance has not been a public-private project, but rather an openly political project in the hands of independent, imaginative and progressive local governments.

In contrast, in Soacha, the most visible characteristic of the local government is weakness (financial, institutional, administrative and political) and, as a result, the feeling of impotence



of this government in facing the problems and challenges of an extremely poor population living in informal conditions that is growing fast and is situated in far-away, hilly, geologically unstable risk zones. For such a government, an aerial cable-car project surpasses its meagre capacities, and it is far from the administration's priorities. Its eventual construction and operation will crucially depend on decisions and actions from the national government and the Bogotá administration.

Soacha's disappointing experience demonstrates a frequent problem in the development of transport projects, and one that relates to institutional capacity of those responsible for leading them. Although the Cazucá cable-car line designed by the Medellín Metro Company is technically sound, Soacha's municipal administration lacked the management capacity to undertake its construction: no technical team was created nor was there any capacity building, nor were there strategies for funding or future operation of the system.

A project conceived at national level like other transport systems such as the BRT planned for Colombia's main cities, could not, by law, be financed or developed by a territorial entity other than Soacha municipality. This local authority was bequeathed it but was neither able to integrate it within the transport system nor to promote it as part of an integrated urban development vision. In the absence of a metropolitan authority, Bogotá has not been interested in the project despite the fact that it has the necessary institutional capacity to lead the project.

A third key lesson which arises from the interventions in Medellín refers to the enormous effort (financial, institutional and technical) required to link and integrate the *Metrocables* to the surrounding neighbourhoods and the city more generally. The aerial cable-car system does not guarantee, in and of itself, a "take-off" in neighbourhood improvement; rather it constitutes an axis around which one can patiently build, over the course of time, lasting processes for improvement and urban growth. The *Metrocables'* urban development success resides in the fact that it forms part of a coherent 'city project' but also one in continuous evolution.

A fourth lesson from the Medellín experience refers to the need to work closely with communities in the area of influence of the aerial cable-car lines in all phases of the project. This means not simply passing a line above people's houses, but rather inserting the project in local daily life so that it responds to the needs and aspirations of communities and contributes to raising living standards. The differences between the J and K Lines clearly highlight the relevance of this issue. The constant presence of a local government capable of deploying a range of financial resources and highly qualified personnel, supported by local planning and participatory budgeting processes has been crucial to the success of these interventions.

Finally, the Medellín case offers a range of stimulating reflections, not fully explored in this book. These relate to the attempt by the local government to counteract the enormous

spatial fragmentation that is a feature of the city (along with many other Latin American cities). This is a product of very high levels of economic inequality and successive urban development plans and management patterns that contributed to maintaining, and even increasing, segregation. Radical reforms would be needed to eliminate the barriers and physical distances separating the inhabitants of residential neighbourhoods in different socio-economic strata, reforms that far exceed the capabilities and the four-year term of any given local administration. Attempts to homogenise social behaviour through programmes such as Medellín's 'Metro Culture' no doubt help

facilitate the management of the mass transport system. But at the same time, and pointing in an almost opposite direction, the city has gradually begun to create physical spaces to allow the interaction of very diverse social groups, and where the potential embodied in the social and cultural wealth and diversity that constitute the heritage of any city can be best appreciated. In Medellín, these spaces for social interaction are ever more apparent at different scales. They represent a crucial step towards the recognition and appreciation of cultural and individual diversity, which, over the long term, can contribute, to greater social inclusion and conviviality. ■



Medellín: K Line and España Park-Library

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Urban & mobility & poverty

Lessons from Medellín and Soacha, Colombia

Urbanisation and globalisation have brought with them a number of challenges. The world's population and productive activities are increasingly concentrated in cities. At the same time, disparities in income continue to rise around the world, especially in emerging economies where wealth is concentrated in ever-smaller groups. Add to this the challenges of climate change, and the need to sustainably plan and manage urban spaces, which are today larger, more diverse and more fragmented than ever before, becomes of paramount importance.

A small but growing number of cities in the Global South have successfully taken up the challenge of planning and managing urban spaces under principles of equity and sustainability. Medellín, Colombia's second largest city, has emerged as an example of a set of urban interventions seeking to redress deep and long-standing social and spatial imbalances. It has done so through the use of imagination, audacity and systematic, collaborative work with communities, whilst strengthening its municipal revenue base and maintaining public ownership of key assets.

This book examines the experience of Medellín in seeking to reduce poverty and integrate large marginalised areas, marked by years of severe poverty and violence, into the urban fabric. It pays particular attention to the impact of two aerial cable-cars connecting high density hilly neighbourhoods with the rest of the city, and an associated urban upgrading programme. It also contrasts Medellín's successful experience with that of Soacha, a municipality adjacent to Bogotá, Colombia's capital city, where an aerial cable-car has been proposed as a means of linking two low-income hilly neighbourhoods with a main arterial road. The contrast between a well-resourced, well-managed municipality like Medellín with a dense and homogenously poor and institutionally weak municipality like Soacha offers valuable lessons to other cities in Latin America and elsewhere.

Contributions draw from a two-year research project coordinated by the Development Planning Unit, University College London (UCL), in conjunction with Universidad Nacional de Colombia (Medellín campus) and Universidad de los Andes in Bogotá. In addition to the detailed case studies of Medellín and Soacha, the book also brings together cases in Latin America where aerial cable-cars have either been built or proposed in low-income neighbourhoods, including Caracas and Rio de Janeiro.

This book is an invaluable resource for academics, urban professionals and advisors to municipal and national governments in transport, urban development and social development. It can be downloaded free of charge from www.bartlett.ucl.ac.uk/dpu/metrocables.

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