THE SOCIO-POLITICS OF THE URBANIZATION - TRANSPORTATION NEXUS: INFRASTRUCTURAL PROJECTS IN THE DEPARTMENT OF ANTIOQUIA IN COLOMBIA THROUGH THE LENS OF TECHNOLOGICAL POLITICS AND INSTITUTIONAL DYNAMICS

Maritza Toro López^{a [1]}, Joris Scheers^b, Pieter Van den Broeck^c

- a. Research fellow Maritza Toro López, Planning and Development Research Unit, Department of Architecture, Faculty of Engineering Science, Kasteelpark Arenberg 1 box 2431, Katholieke Universiteit Leuven, 3001 Leuven, Belgium. Tel.: +57 304 669 71 98. E-mail: maritza_toro@hotmail.com; maritza.torolopez@student.kuleuven.be
- b. Prof. Joris Scheers, Architecture and Society Research Unit, Department of Architecture, Faculty of Engineering Science, Kasteelpark Arenberg 1 box 2431, Katholieke Universiteit Leuven, 3001 Leuven, Belgium. Tel.: +32 16 37 76 60. E-mail: joris.scheers@kuleuven.be
- c. Prof. Pieter Van den Broeck, Planning and Development Research Unit, Department of Architecture, Faculty of Engineering Science, Kasteelpark Arenberg 1 box 2431, Katholieke Universiteit Leuven, 3001 Leuven, Belgium. Tel.: +32 16 32 86 79. E-mail: pieter.vandenbroeck@kuleuven.be

Word count of the manuscript: 11,115 words

Acknowledgements

Funding: This work was supported by the Administrative department of science, technology and innovation COLCIENCIAS.

[1] Corresponding author: Research fellow Maritza Toro López, Planning and Development Research Unit, Department of Architecture, Faculty of Engineering Science, Kasteelpark Arenberg 1 box 2431, Katholieke Universiteit Leuven, 3001 Leuven, Belgium. Tel.: +57 304 669 71 98. E-mail: maritza_toro@hotmail.com; maritza.torolopez@student.kuleuven.be

THE SOCIO-POLITICS OF THE URBANIZATION - TRANSPORTATION NEXUS: INFRASTRUCTURAL PROJECTS IN THE DEPARTMENT OF ANTIOQUIA IN COLOMBIA THROUGH THE LENS OF TECHNOLOGICAL POLITICS AND INSTITUTIONAL DYNAMICS

Abstract

Development of transportation infrastructure has long been seen as a fundamental tool in shaping cities, and vice versa. However, moving beyond the discussion on the causalities of transportation infrastructure and urbanization, various authors have criticized large scale infrastructural projects for promoting injustice and reinforcing social and spatial polarization by supporting profit-oriented developments. Contributing to this line of thought, this study examines the wider socio-politics of the transportation - urbanization nexus in large scale infrastructural projects associated with urban development in two case studies in the department of Antioquia in the North-east of Colombia. It focuses on the relationships between these projects and urban development approaches and policies, addressing the socio-political benefits and profit-oriented interests of hegemonic population groups, and how infrastructures embody specific forms of power and authority of these groups. The analysis mobilizes a combination of the theory of technological politics and a strategic-relational institutionalist approach, which draws attention to the momentum of large-scale sociotechnical systems, and to the response of modern societies to specific technological imperatives. This paper shows through its two case studies how the causalities of transportation (infrastructure) and urbanization are embedded in wider social, political, economic and cultural dynamics. As such, the paper shifts the focus to the relationships between actors and their interests, transportation (infrastructure) and socio-politics, and the ways in which transportation infrastructures and their techno-political frames possess deeply embedded socio-political qualities, include means of power and authority, and may favour specific actors and interests.

Key words: Transportation infrastructure; Urban development; Technological politics; Institutionalism; Antioquia, Colombia

1. Introduction

Transportation plays a fundamental role in shaping cities and framing quality of life. In fact, the relation between urbanity and infrastructural design is intrinsic for the development of a territory (Graham & Marvin, 2001; Boarnet & Crane, 2001; Shannon & Smets, 2010). As such, various academics have found the close relationship between transportation infrastructure investments and the urban and economic development of a region (Aschauer, 1989; Kumar, 2002; Lall, 2007; Fan & Chan-Kang, 2008; Maparu & Mazumder, 2017). Some argue that development of transportation infrastructure promotes urban development (Barro, 1990; Romer, 1994; Barro & Sala-I-Martin, 1992, 1995; Bleaney et al., 2001). Other researchers claim that urban development leads to investment in transportation infrastructures (Wagner, 1958; Wagner & Weber, 1977; Akitoby et al., 2006; Maparu & Mazumder, 2017).

More radical authors have criticized large scale infrastructural projects for promoting injustice and reinforcing social and spatial polarization by supporting profit-oriented developments (Moulaert et al., 2003; Swyngedouw et al., 2004; Van den Broeck, 2011; Brenner & Theodore,

2003; Sassen, 2015; Tasan-Kok & Baeten, 2011; Van den Broeck, 2011). The question here is who benefits from these projects and to what extent these contemporary infrastructures are instrumental to the interests of the powerful. As such, the discussion on the causalities of transportation infrastructure and urbanization needs to go beyond the causality, focusing on wider societal dynamics. Therefore, the research engages in a deeper understanding of the socio-politics of the transportation - urbanization nexus.

To answer this question, this paper considers two case studies in the department of Antioquia in the North-East of Colombia, where various large-scale infrastructural projects have been and are developed and proposed. It focuses on the relationships between these projects and urban development approaches and policies, addressing the socio-political benefits and profit-oriented interests of certain population groups, and how infrastructures embody specific forms of power and authority of these groups. The analysis mobilizes the theory of technological politics combined with a strategic-relational institutionalist approach, which draws attention to the momentum of large-scale sociotechnical systems.

The paper has four main sections including the introduction. The second section briefly sketches the debate on the causalities of transportation infrastructure and urbanization, in order to understand the impact of socio-political and socio-economic factors in transportation planning and the various causalities of this relationship. In this section, also a framework for analysis is discussed, showing the debate in technological politics theory and connecting to strategic-relational institutionalism, leading to a framework capable of explaining how planning contemporary infrastructure normally supports a particular form of political life and how infrastructures as socio-political technologies are systems strongly compatible with specific kinds of socio-political relationships. The third section of the paper explains its methodological stance and discusses the dynamics of two large scale infrastructural projects proposed in the region of Antioquia, showing in the first case how these projects embody the socio-economics, power dynamics, conflicts and socio-politics of banana production in Colombia triggering conflictive transportation and urbanization dynamics, and in the second case how local elite coalitions try to impose a high tech mass transportation project expressing their interests. The fourth section concludes the paper by arguing that the intercausality of transportation infrastructure and urbanization is embedded in wider social, political, economic and cultural dynamics. It exhibits how the theory of technological politics combined with a strategic-relational institutionalist approach can be a guiding principle in understanding the interactions between transportation infrastructures and politics, and how infrastructures and their technological frames include means of power and authority, reproduced but sometimes contested by various actors.

2. The transportation - urbanization nexus, the theory of technological politics and a strategic-relational institutionalist approach

The relation between urbanity and transportation infrastructure is intrinsic to the development of a territory. However, the causal relations or correlations have been the object of considerable disagreements between academics and practitioners. Some claim that transportation infrastructure promotes urbanization, while others state that urbanization creates demand first, which leads to investment in transportation infrastructure (Maparu & Mazumder, 2017). To understand this correlation, it is also important to comprehend the interrelation between transportation infrastructure, economic development and urbanization, as

different transportation sub-sectors have important roles in promoting economic development and therefore urban development patterns (Maparu & Mazumder, 2017).

Transportation infrastructures (railroads and highways) play important roles in determining economic growth (Cain, 1997; Boarnet & Crane, 2001; Maparu & Mazumder, 2017). For instance, land and housing prices tend to decline with distance from important transportation nodes (Boarnet & Crane, 2001). The more expensive the land at a given location, the more likely a given site will be developed densely. Consequently, densities are also expected to decline with distance from node central locations (Boarnet & Crane, 2001). These centralities of urban activities, can be related to the spatial accumulation of economic activities or to the accessibility to the transportation system. As an example, today we are witnessing the growth of the so called “edge cities”, settlements around highways, airports and fast rail connections in the developed parts of the world, while elsewhere informal trading and spontaneous settlements spring up around bus stations and along congested road connections. Most of the time, these developments occur chaotically, after the transportation infrastructure has been put in place (Shannon & Smets, 2010). Therefore, it can be understood that easy access to economic or social activity by transportation infrastructures is a primary driver to urbanization.

On the other hand, turning the causality around, urban areas worldwide are rapidly expanding and so is the urban population. Some growth is occurring in high-density peri-urban settlements outside the range of the existing urban facilities. And much of the growth is likely to consist of urban sprawl, which opposes adequate public transportation service supply, encourages car dependence, and hence reduces accessibility to employment and to urban facilities for the poor (Gwilliam, 2002). Therefore, transportation planners looking for solutions to offer better transportation systems to the sudden rise in travel demand, have long employed estimates of trip generation rates and other travel behaviours (Mitchell & Rapkin, 1954; Boarnet & Crane, 2001). Consequently, new investments in transportation infrastructures are being done after urbanization has created demand. Based on these, some transportation planners assume that the built environment does indeed influence transportation development (Boarnet & Crane, 2001).

The direction of causality of transportation infrastructure and urbanization is then hard to tell. It can change through different factors and time periods such as socio-economic regimes, international trade policy, and major national political decisions (Maparu & Mazumder, 2017). At times, investment in infrastructure led to economic growth and urbanization (e.g. in the late 19th century during the building of railways), whereas in other periods economic development led to investment in infrastructure as well as urbanization (e.g. after independence during the development of heavy industries in India) (Maparu & Mazumder, 2017). This paper aims to go beyond the question on causality by arguing that it should be analysed as part of wider societal dynamics. As such, various factors related to socio-ecological, socio-economic, socio-political and socio-cultural arrangements can generate various causalities in the transportation - urbanization nexus. Both transportation modes and infrastructures and urbanization co-evolve and are produced and structured by respectively the actors and institutions of wider societal dynamics.

Starting-point for this further interpretation is the theory of technological politics, which appears to be an appropriate guiding principle for understanding the dynamics and impact of the relationships between transportation infrastructure and politics. It argues that technologies are

not neutral and essentially draws attention to the moment in which large- and small-scale sociotechnical systems enhance power or authority of some over others. The theory was first developed based on research in US cities by the political theorist Langdon Winner (1980) but further elaborated in science and technology studies (STS), more specifically in the literature on the social construction of technology (SCOT) by, among others, Bijker (1987), Callon (1987), Law (2000) and Hommels (2005), although rarely applied to transportation infrastructure. Some of these authors have been looking at technological developments through an evolutionary process by which a number of variations in design are created and one or more are selected and retained (Fulk & Yuan, 2017), meaning that designs are selected depending on not just technical feasibility of the design but also on the social and economic power of groups with an interest in the artifact. For example, Bijker and Pinch trace the developmental paths of the Penny Farthing and safety bicycles in the late 1800s. They identify multiple different variants that were created based on input from relevant social groups such as sport cyclists, women cyclists, people looking for basic transportation, and anti-cyclists who were against any form of bicycle (Bijker & Pinch, 1987; Fulk & Yuan, 2017). Each group had different requisites such as speed, safety, morality (e.g., should women straddle a bicycle?), and different solutions to address these requisites (e.g., relative safety features of a large front tire vs. an air tire). Over time as these groups were involved in demanding or opposing particular design features, the artifact eventually reached a degree of stabilization (Fulk & Yuan, 2017). Through social construction, the functions built into the relatively stabilized technology served the interests of some elements of society over others. However, this very nonlinear process and built-in bias of the artifact cannot be observed without looking in close detail into the social situation of the late 1880s, including religious, economic, political and social domains (Bijker & Pinch, 1987; Fulk & Yuan, 2017).

This school of thought argues that city planning and urban development have many examples of physical arrangements that contain explicit or implicit political purposes (Winner, 1980; 1986; 1992). It claims two ways in which artifacts can hold socio-political properties: first, by instances wherein the invention, design or system becomes a way of settling an issue in a particular community; and second, by cases of what can be called inherently political technologies, man-made systems that require or are strongly related with particular kinds of political affiliations (Winner, 1980; 1986; 1992). As Winner puts it:

“By offering distinctly political reasons for or against the adoption of a particular technology, arguments of this kind stand apart from more commonly employed, more easily quantifiable claims about economic costs and benefits, environmental impacts, and possible risks to public health and safety that technical systems may involve. The issue here does not concern how many pollutants added, or how many cancers produced. Rather, the issue has to do with ways in which choices about technology have important consequences for the form and quality of human associations” (Winner, 1980).

As such, academics in the field of STS have explored the interrelations between “humans” and “machines”. Annemarie Mol and Jessica Mesman (1996) for example called this relationship “politics of theory” and defined it as the consequences of the different conceptualizations for design and their political influence (Berg, 1998). Bruno Latour (1996; 2000; 2005) argues that political and social factors are constantly involved in the development

of technological projects. Marc Berg (1998) states that technologies become political agents through touching upon any other constituent in the configuration they are part of.

Some researchers in the field of the history of technology, transport history and political economics have explored the relationships between transportation infrastructure and politics. Michael Mann (1984) as a pioneer in the cross-examination of state power and infrastructure argues that state power can be characterised alongside two axes: despotic power and infrastructural power (Szabo and Fabok, 2020). Gramsci (1971) contributed to the understanding of nature and the role of politics, ideology and hegemony in historical development by showing how elite power is maintained and how hegemonic class rules by incorporating some of the interests of subordinate classes. Implicit in the notion of hegemony is the need to build alliances with other social forces and provide leadership (Woolcock, 1985; Szabo and Fabok, 2020). Other authors like Antoine Picon (2018), Tim Cresswell and Peter Merriman (2010), Thomas Zeller (2014) and Erik Swyngedouw (2003), have pointed out that infrastructure planning is highly contextual, informed by and informing geographies of power, characterized by a peculiar “mixture of professional thinking, technological utopianism, and political assessment” that significantly influence policymakers (De Block, 2011).

Echoing these different views, the paper further adopts an institutionalist perspective in order to understand how institutions interact in the making and reproduction of infrastructures and their effects in society, comprehending the reason why technology is strongly and unavoidably linked to particular institutionalized patterns of power and authority. Although institutionalism is itself a heterogeneous set of approaches consisting of various ideas, social, economic and urban understandings that can inform political and economic practices (Campbell & Pedersen, 2001), a critical institutionalist approach can be linked to the theory of technological politics, as both are essential in understanding the major political, physical and social events of specific territories (March & Olsen, 1983). As such, the paper combines Van den Broeck’s strategic-relational institutionalist approach developed in planning literature with the technological politics theory to analyze the role of transportation infrastructure in the dynamics of urbanization, their relation to politics and their societal context. The strategic-relational institutionalist approach was elaborated in previous publications (see among others Van den Broeck, 2010, 2011, 2016; Servillo and Van den Broeck 2012; Van den Broeck et al 2013; De Blust en Van den Broeck 2019). It builds on starting points for an institutionalist planning theory by among others Mandelbaum (1985), Fainstein (2000), Gualini (2001), Hajer (2003), Healey (1997, 1999, 2005), Innes (1995), Moulaert (2005) and Verma (2007), the agency-structure-institutions-discourse (ASID) approach by Moulaert, Jessop and Mehmood (2016), and especially the strategic-relational approach (SRA) by Jessop (2001). The latter is based on the need to contextualize institutionalism by stressing the structural and the strategic dimensions of institutional analysis. Jessop (2001) sees the institutional turn as ontological and as a way of suggesting a broader, more developed, and truly dialectical alternative to dual and dualist structure-agency approaches, observing its implications for the spatiotemporal moments of institutional analysis. The SRA aims to understand the spatiotemporal dimensions of institutions and their connection with power, by analysing the ‘structurally inscribed strategic selectivities’ of structure/institutions and the ‘structurally oriented strategic calculations’ of agency (Jessop, 2001; Philo and Parr, 2000). Institutional planning theory then focuses on the role of institutions in and for planning, both formal (organisations, rules of law, procedures) and informal (values, conventions, codes of conduct) in structuring action in social contexts. This perspective puts planning in a field of actors and institutions, dialectically expressed in

terms of each other, actors in terms of institutions, and institutions in terms of actors. It analyses actors' practices in processes of transformation, the configurations of these actors, how institutions as social patterns selectively structure the behaviour of actors, how actors act strategically with respect to institutions but also continuously reproduce these, and how the dialectic interaction of actors and institutions affects structural dynamics (e.g. of markets, dominant discourses, the state). Institutions are addressed through diverse dimensions, social, socio-economic, cognitive, socio-political, socio-cultural, discursive, that mediate each other mutually.

Building on these inputs, the paper sees infrastructural projects as embedded in the dialectics of actors and techno-political frames, including the institutional dimensions of economic mechanisms, infrastructure and mobility policies, decision-making procedures, knowledge systems, regulation, mobility cultures, discourses on infrastructure and mobility, etc., which all include selectivities and institutionalized patterns of power and authority that favour some infrastructure users, social classes and mobility patterns over others, and are continuously (re)produced, but sometimes contested and changed by these very users. Based on these factors, the theory of technological politics and the institutionalist perspective approach are used as the main analytical framework of the article. On the one hand, the socio-political perspective enables a more critical position in relation to the socio-political content and impact on socio-territorial dynamics of specific infrastructural projects. On the other hand, the institutionalist perspective complements the analysis by allowing to interpret transportation related actors and relevant social groups who embed their interests in the various dimensions of techno-political frames. As a result, the core concept of the research focuses on transportation infrastructures and their techno-political frames, both hegemonic and counter-hegemonic, and more specifically, in analyzing how infrastructural projects are deeply embedded in socio-political qualities, favouring specific actors and interests.

3. Understanding technological politics and institutional dynamics of two infrastructural projects in the department of Antioquia in Colombia

3.1. Methodology

The empirical part of this article studies two case studies¹, drawing on the theory of technological politics and a critical institutionalist approach, to understand the socio-politics of the transportation – urbanization nexus. The section analyzes ongoing large-scale transportation - infrastructural proposals² in two main regions in the department of Antioquia in Colombia [Fig.1], *La vía al mar*, the *Transversal de las Américas* and *Puerto Antioquia* in the region of Urabá, and the Automated People Mover (APM) in the San Nicolas Valley.

For each case study, the paper explains the infrastructural projects in their urban environments as socio-politically structured by techno-political frames, which it seeks to

¹ According to Baxter & Jack (2008) the evidence that is generated from a multiple case study is strong and reliable.

² Small scale transportation projects in the department of Antioquia are not common since infrastructures are not instrumental to the interests of the powerful. On the other hand, large scale projects in this department are common as they represent socio-political benefits and profit-oriented interests of certain population groups.

unravel in various dimensions, including local, regional and national politics, policies and conflicts, geo-political interests, socio-economic factors, socio-cultural factors, financial aspects, legal frames, property relations, etc. All these dimensions will be covered throughout both case studies, as part of their techno-political frames. Additionally, each case study will show how these frames are produced by various actors, and who is selectively favoured in the interactions of actors and techno-political frames, highlighting the momentum of (large and small scale) sociotechnical systems, and the response of modern societies to technological imperatives.

The first case study is located in the region of Urabá, situated on a gulf of the Caribbean Sea. This is a privileged location with an enormous global importance due to the high density of maritime trade along its coast. A large amount of international shipping circulates in the vicinity of the Gulf of Urabá, considering the presence of the Panama Canal less than 330 km away. The region is known for its agro-productive landscape and its port activities, mainly focused on banana fields and exports. The banana fields have been the main agricultural/economic activity of the area over the last century. They are also the principal attraction for former and new inhabitants of the region, generating a continuous population growth superior to that in other regions on the Colombian coast (Cámara de Comercio de Medellín para Antioquia, 2019). The agricultural landscape is clearly a vital component of the regional system. It has also played an important role in the evolution of infrastructure related to the transformation of the urban territory. However, despite its distinctive spatial features of agricultural lands, Urabá has suffered huge challenges related to poor infrastructure that obstructs the connection with the economic center of the country. The absence of an inclusive governmental vision of the territory's future has led to benefit specific actors on the region, selectively targeting some forms of economical and urban development (URBAM, 2014).

HERE GOES FIG.1

The second case study is located in the region of the San Nicolas Valley, a territory situated in the central mountain range of the Colombian Andes. The valley hosts the second largest airport in Colombia (José María Córdova International airport). Because of its recent rapid growth, challenging car traffic producing dynamics have been triggered, which generate questions concerning the selective benefits produced by a high-tech mass transit project's techno-political frame. While the main mobility corridors of the territory offer privileged spaces for specific actors, mobility for ecologically more sustainable modes, such as walking, cycling and collective transportation are underestimated and given little priority.

The empirical research utilises the critical case study method of Robert K. Yin (1994), in order to provide an analysis of the context and processes which illuminate the theoretical issues being studied (Yin, 1994). The main primary and secondary data was based on ten semi-structured interviews with key actors, government reports, policy documents and reports, scientific articles and books, laws and regulations, research carried out by students, minutes of meetings, press articles, websites, site visits, participant observation and involvement as a practitioner of the first author in everyday practices and debates of mobility, seminars and informal talks. This leads us to identify the relevant actors, relevant social groups (not just public ones) and techno-political frames that embody and structure the (techno-politics and institutional dynamics of the) infrastructure - urbanization nexus.

During the site visits, interviews and mapping of the stakeholders involved in the urban and transportation planning were done accordingly:

State bodies:

- Planning secretariat - Urabá
- Mobility secretariat - Urabá
- Director ASOMURA (Municipal Association of Urabá)
- Planning secretariat - Rionegro
- Mobility secretariat - Rionegro
- Habitat secretariat - Rionegro
- Director ANI (National Infrastructure Agency)

Private actors:

- General Manager - Banacol
- Logistics manager - Banacol
- Housing and infrastructure department - Corbanacol
- Marketing manager - Uniban
- Commercial manager CAMACOL (Colombian Chamber of Construction)
- Commercial manager (Aeromovel)

Academic institutions:

- Director URBAM (Urban and environmental research group EAFIT University)
- Academic coordinator URBAM
- Director of the research group on roads and transportation UNAL (National University of Colombia)

The aim of the case studies is theoretical abstraction, methodological exploration and empirical grounding. The empirical data has been used to frame a solid explanation of how the local state's urban, transportation and industrial development approaches and policies are increasing social and spatial polarization by supporting profit-oriented developments on the one hand, and how agricultural, transportation and housing actors reproduce injustice through their logistical and economical activities on the other. The previous plays out in unstable contexts of weak transportation planning policies, conflicts between various transportation modes, a huge gap between social classes and a history of violence and oppression.

3.2. First case study: *The Transversal de las Américas*

The region of Urabá has a remarkable specificity in terms of mobility. It has a very dense network of soft transportation, but an equally dense system supporting heavy traffic for regional transportation. Soft transportation systems, also called *mobilité douce*, soft mobility, or slow traffic, can be defined as all forms of non-motorized transport systems that use only the "human energy", thus mainly refer to pedestrians and cyclists as alternative systems to car use (La Rocca, 2010). Walking and cycling as a means of transportation are common in all municipalities of the region of Urabá (Turbo, Apartadó, Chigorodo and Carepa), and are mainly concentrated on local networks for short travels within urban areas. Motorcycles are also very common modes used within urban and regional connections in Urabá. Heavy traffic

serves long and regional scale connections at medium range distance and has become very important in the region. It moves along the typical networks of distribution, collection and other functions related to agriculture. Each of the three systems operates on a specific level of scale, and each system provides an inadequate service. The overlap of the local and regional scale levels became a critical component for urban development and mobility in the region.

Today, the bicycle and motorcycle, mostly used by low income groups, are the most common form of private transportation on most of the principal and secondary corridors, used by the majority of the people in urban areas in Urabá [Table 1]. The lack of formal public transportation system coverage and capacity, led to a massive growth in the use of these modes of transportation. The number of private motorcycles in Colombia (there is no specific information for the whole area of Urabá) increased from 1,269,000 in 2002 to over 6,500,000 in 2016 (ANDI, 2017), an increase of more than 500%. This was the natural consequence of the vicious circle created by the combination of a strong take on financial self-sufficiency for public transportation systems in the Colombian laws (García, 2016); the cheap loans available in the last decade to buy vehicles and motorcycles (Behrentz, 2013); and the already deficient public transportation system. Agreements between the main motorcycle companies of the country (Grupo Auteco, AKT, Incolmos Yamaha, Fanalca-Honda, Suzuki and Hero Motors) and the main financial entities (Bancolombia, BBVA, Banco de Occidente, Banco de Bogotá, Banco Santander, etc) triggered huge facilities for obtaining credits and shorter terms for approval of loans, which further benefited the acquisition of motorcycles in the country (Ojeda, 2018; ANDI, 2017). In this scenario, it became cheaper and more comfortable to buy motorcycles than to use public transportation networks. Bicycles are also a dominant transportation mode in the urban clusters of the territory. As a personal transportation system, it is a success in the region since it is affordable for people who cannot buy an automobile and the ideal mode to travel short distances more quickly and efficiently than vehicles. However, it is a mode only used by low-income populations, since there are poor infrastructures for cycling, not enough provision of parking facilities and it is not a safe way of transportation.

HERE GOES TABLE.1

The heavy transportation system in the region works mostly for freight transport and logistics related to agriculture (esp. banana companies). These inter-regional connections were historically developed addressing the demand of commercialization of agricultural actors, helping to increase the efficiency and capacity of the agro-productive landscape. Since the mid-twentieth century during the construction of *La vía al mar* or the road to the ocean around 1940 (the principal road connection of the territory) [Fig.3], the agro-productive activities in the region were principally based on banana and cotton. This infrastructure combined with the rise of agriculture during this time, catalysed great changes to the territory, providing better transportation to the region, given that Urabá was an isolated territory due to the lack of routes of land transportation. At that time in Medellín there was an economic boom related to the textile industry. Therefore, the political supporters, mainly conservative party politicians of the presidency of Miguel Abadía Méndez, of the construction of *La vía al mar* were in favour of the exploitation of cotton in the territory, as it was the infrastructure to support export oriented industries which guaranteed a major role in the economy of Medellín (Bonet, 2000; García, 2004). Consequently, from the beginning *La vía al mar* was an infrastructure used to enhance the power and authority of liberal party politicians and textile businesses in the economical centre of the country, and as such a particular political intention embodied in a physical form.

Later, during the late twentieth century, when *La vía al mar* [Fig.2] was already built, the most important land reform in the region of Urabá occurred. The banana industry was consolidated with the arrival of United Fruit Company (UFCO) from the U.S. (1960) to the region (UFCO first settled in Colombia in the year 1899 in the department of Magdalena, however in 1960 moved to the department of Antioquia specifically the region of Urabá, with the belief that the region was strategically better located within the country). The success of the banana industry in the territory brought a lot of investment and huge agro-industrial projects, constituting today a prosperous model in the economic history of Colombia (Agudelo, 2011). The UFCO quickly took control over the region of Urabá and started investing in basic technological infrastructures linked to banana production, such as ports, roads, and irrigation systems (Thomson, 2011). UFCO came to own 60,000 hectares of land, benefiting from government concessions, at the expense of violent dispossession of peasants, and the takeover of property, lost as a result of defaults on credits provided by the firm (Thomson, 2011). The company acted as the only bank in the region, granting loans to local banana producers. When these producers failed to pay, UFCO gained all rights to the properties and became the owner of the lands (Brungardt, 1995). Moreover, the government's extensive support for the company was not well accepted by the society due to the historical banana massacre of 1928³ in the department of Magdalena, in which the military opened fire to UFCO employees on strike (Thomson, 2011). The Colombian writer Gabriel García Márquez on his novel "*Cien años de soledad*" described this massacre⁴ in his magical realism⁵ as a horrendous extermination that was impregnated in the history of Colombia.

The involvement of the military was not a coincidence. By definition, the Military Forces of Colombia are the arm of the state in charge of controlling violence, maintaining control over the territory, and defending the national state from foreign enemies. However, the increasingly historical violent conflicts that took place in the country make it apparent that the military has been assuming a more active role in the exercise of violence (Ferreya and Segura 2000). This has a historical explanation, since the structure of local powers was mainly established in colonial times. The Spanish empire controlled its colonies indirectly, taking advantage of a sophisticated network of regional power networks (González, 1998; Ferreyra and Segura 2000). As Fernán González (1998) explains, the hegemonic groups were the elite owners of lands, mines, and commerce who controlled the justice system of the country and resulted in the formation of a state based not on modern institutions of an impersonal character but on a pre-existing power structure that depended on personal ties. As such, the massacre of 1928 during the presidency of Miguel Abadía Méndez was a continuation of this historical structure, where the state, and specifically the military, was on the side of UFCO as an essential ally against civil society. In addition, there is evidence that the military, which was paid very little during this time (120 pesos per month), received a large amount of money from UFCO (500 pesos) in order to take the side of the big company when necessary (Gilhodes, 1967; White, 1978; CSTC, 1978; LeGrand, 1989). The combination of specific social, political, and

³ The banana massacre occurred in the department of Magdalena in 1928, when workers stopped operating asking for better wages and working conditions. After several weeks with no agreement, the government sent the army against the strikers, resulting in the massacre.

⁴ The literary work of Gabriel Garcia Marquez has as background of his novel's key events of the economic and political history of Colombia, the banana massacre of 1928 being one of these events.

⁵ "Magic realism" is a term used by Latin American authors to describe a setting with the unique "magic and fantasy" of the real world.

economic structures and the very particular violent conflicts that have emerged in the region have strongly affected the military's role over time.

HERE GOES FIG.2

In the year 1940, when UFCO was still settled in the department of Magdalena, rural proletariat unions started to emerge asking for better wages and working conditions, since the company was attempting to extend its territorial control, expelling local peasants from their lands. UFCO initially demanded the land from peasants with the excuse they needed to construct rail lines and irrigation canals for banana production (White, 1978; CSTC, 1978). The process normally started by sending an agent from UFCO to inform local peasants that the colonized lands were private properties and that if they did not immediately abandon their lands they would be expelled. Some peasants feared the possibility of losing everything, so they sold their lands at reduced prices. For the peasants that refused, UFCO used force: by evicting them from their territory, burning their homes, and imprisoning their spokesmen. Later, these expropriated peasants did not passively accept the loss of their lands and requested the State for protection, by appealing to the colonization laws that protected land settlers (Law 61 of 1874 and 48 of 1882). However, peasants did not succeed in their fight since the national government had little influence over local authorities of the region, who condescended with UFCO (Gilhodes, 1967; White, 1978; CSTC, 1978; LeGrand, 1989). Later in the year 1980, when UFCO was already settled in the region of Urabá the unions together with local peasants formed the so-called “*autodefensas*” or self-defenders’ communities as a means of protecting themselves from landlord’s militias and the threat of expulsion from their lands (Thomson, 2011). These agrarian unions in the region had great support, as there already existed an important formation of parties opposing government such as the Socialist Revolutionary Party (1926), the Communist Party (1930), and the Leftist Revolutionary Union or UNIR (1933), which got involved in uniting and mobilizing peasants, rural day laborers and indigenous groups of Urabá (Fajardo, 1983; Thomson, 2011). This situation became worse with the presence of the guerrilla and paramilitaries in the region. These illegal groups were fighting for control of the territory of Urabá to trade arms and illegal drugs (Castilla, 2001) and settled in small clusters in the banana fields. The violence and fights amongst them forced the inhabitants of the rural areas to migrate to the main urban settlements along *La vía al mar* (Lair, 2000). Migration and violence consequently led to serious social problems in the region, which have not been completely solved to this day (PBI, 2012).

During this same period the U.S. government quickly put down roots in Colombia's political economy: the value of North American investments, mostly in agro-export projects, petroleum and gold extraction, rose from US\$4 million in 1913 to US\$250 million in 1929 (Fajardo, 1983; Thomson, 2011). It was evident then, that the revenues and benefits from the agricultural and extractive industries during this time were just for a limited group of actors, including UFCO and the U.S. government. Since UFCO came to own 90% of all the banana lands in Colombia, this resulted in a huge participation of the company and the U.S. government in the Colombian economy (Brungardt, 1995). As described above, the weakest groups of society (counter-hegemonic groups or local communities) suffered from direct abuses of power and exploitation by these specific institutions with huge consequences, allowing the influence of liberal ideologies to specific infrastructures and technologies, and affecting the relative distribution of power, authority and privilege in the community.

At present, in Duque's government, like that of his predecessors, specific laws (e.g. Law 100 - 1993) continue to favour a model designed to benefit large companies, without improving the conditions of workers (Pernett, 2018). For instance, mining companies in Colombia have received tax exemptions that have increased their profits and large financial consortiums have secured their businesses thanks to Law 100, which since 1993 has been drawn up for their benefit. On the other hand, the policy known as "investor confidence" which defends the position that the more advantages big companies are given to operate, the more investment and jobs there will be, has been applied in the actual administration (González, 2018). This economic ideology, which has never been fully tested, is not much different from the one that kept UFCO working more than half a century in Colombia with profits that exceeded what was left in taxes in the region (Pernett, 2018).

In relation to the infrastructure linked to the banana production built by the UFCO, also basic technologies were set up to improve product delivery, such as tertiary rural roads, storage facilities, dedicated banana port terminals and facilities for processing the product (Opinion Caribe, 2017). These infrastructures, however, did not have a significant impact on urban and rural development. On the contrary, the existing arterial and main connections of the region were used and are still being used by the banana companies for distribution of the product to their own port terminals. One of the most important banana industries in the territory (Banacol), which owns 34 agro-productive farms, exports and delivers more than approximately 600,000 tons of bananas per year (M. Ochoa, Banacol general manager, personal communication, November 12, 2016). All the logistical land trips of this banana industry are made along *La vía al mar*. The constant traffic of freight transportation on this main artery, apart from causing road damage, has threatened the development patterns of the urban areas, impacting negatively the public space since banana trucks transit through the congested urban centres of the region [Photo.1], which are areas with high-density of construction and mixed land use. Pedestrian movements and soft transportation systems are oppressed by the heavy traffic travels since there is not enough spatial capacity on the urban tissue for all the modes of transportation. Moreover, this overlapping of transportation modes is contributing to high risks of accidents. According to the origin-destination survey made by the National University, 450 accidents were registered in the trajectory of *La vía al mar* in Apartadó in 2017 (I. Sarmiento, Director of the research group on roads and transportation UNAL (National University of Colombia) personal communication, December 01, 2017). Also, congestion and environmental issues at the local scale are a result.

HERE GOES PHOTO.1

In the year 2010, a proposal was launched to improve *La vía al mar* and the connection of the territory to the centre of the country. The consortium *Vías de Las Américas*, consisting of different Colombian companies with extensive experience in the infrastructure sector (El Condor S.S, Grupo Odinsa S.S. and Valorcon S.A.), obtained the permission to construct the Pan-American highway or *Transversal de las Américas*. This is a huge national project that involves a concession to design, build and maintain 446.5 km of roads at National level, and expand and rehabilitate 65 km of roads in the specific region of Urabá, converting the main corridor (*La vía al mar*) into a four-lane highway (ANI, 2019). The expected journey from Turbo to Medellín will take 4 hours on average. A distance that today takes more than 6 hours. The project also involves building 133 km of new highways and bridges. The main purpose of the highway according to the Government is to connect the main settlements along the Caribbean

coast to the economic centre of the country, linking these with the future concessioned highways in the centre of the country (A. Salinas, Mobility secretariat, personal communication, April 18, 2018). The project is currently under construction since September 2012 and is expected to be finished at the end of 2019, but due to delays there is not yet an official date of culmination.

The *Transversal de las Américas*, as an ongoing national intervention, has been criticized on several occasions, since there are huge gaps in its proposal. First, within the proposal the highway is not considered to promote a sustainable community, where centralities are compact and located within mixed-use areas around quality transportation systems. Instead, it is a corridor that has no relation with any urban areas and does not bring any benefits at a local and regional level. Therefore, it is an infrastructure that has not taken into account various basic concepts related to mobility and urban planning and does not have a clear strategy for the intersections on urban areas [Fig.3]. This impedes evaluating the potential impacts generated by the crossing of a fast corridor in each municipality, and ensuring the efficiency of the corridor in terms of speed and accessibility (Jaramillo, 2018). Second, the new corridor is designed giving priority to particular vehicles (heavy traffic related to agriculture) and is not incorporating collective public transport networks and infrastructures for non-motorized transport systems (transportation modes usually used by low-income groups). As was mentioned above, most social groups in the urban areas of the region of Urabá use soft transportation systems as their main transportation mode. As such, the question ‘for whom is this infrastructure actually being constructed’, cannot be answered in favour of these groups.

HERE GOES FIG.3

From the moment the document CONPES 3612 (approved projects by the Colombian national council of economic and social policy (CONPES)) was approved (2009) during the government of President Alvaro Uribe Velez, the project triggered several controversies (Alvaran, 2010). Firstly, the indigenous communities settled near the border with Panama, were against the project. They were certainly not involved in the making of the proposal of the *Transversal de las Américas*, and were never asked what they thought about the construction of a huge highway crossing their land. They alleged that the government threatened their survival in their traditional territory, and was putting at risk the high biological diversity that inhabits the area (Alvaran, 2010). Secondly, the Panama government also refused the project, as they were afraid of the possibility that Colombian arms and illegal drugs would be transferred to their territory (Alvaran, 2010).

However, the Colombian government ignored these allegations, and when it had control of the territory⁶, immediately approved the construction (Alvaran, 2010). According to the ministry of transport of that administration, the *Transversal de las Américas* “will increase the competitiveness of Colombia”. From such cases, it is obvious how structuring decisions are made by the Colombian government based on mainly economic considerations, in which different actors are differently situated and possess unequal degrees of power as well as unequal levels of awareness. The banana industry has also played an important role in the construction of the *Transversal de las Américas*. The Colombian Banana Association (Augura)

⁶ In Colombia, guerrilla and paramilitary groups had until some years ago a prominent role on the territory of the Urabá, causing difficult access by the State to the region.

provided 86 plots (88,000 M2) in the region (La FM, 2016), to support the construction of the highway providing a better connection of this agricultural area to the centre of the country, showing how the highway would economically benefit this particular activity with differential privileges.

Conversely, another huge infrastructural project in the region has been recently approved. The Colombian government signed a 30-year concession contract with the National Infrastructure agency (ANI) for the construction of a new port area in the municipality of Turbo in the region of Urabá (Portafolio, 2019). The new port "*Puerto Antioquia*" will be linked directly with *the Transversal de las Américas* as this highway will be the main infrastructure to access the cargo to the port. The port will have a capacity of 6.6 million tons of cargo per year, its construction will last 24 months and is expected to start operations in the second half of 2020 (Alvarez, 2019). The Colombian firm PIO SAS will be in charge of its operation in partnership with the French shipping company CMA CGM S.A. The port will generate 6000 new jobs and ensures a load of 2 million tons from its first day of operation (Portafolio, 2019). Within that plan, the agro-industrial sector, especially the banana sector is the most benefited with the port, since it will have an economic impact through the provision of new port services in the region. The Colombian government has shown huge interest in supporting this new port area since it states that it will become the most important logistic centre in the country, enhancing foreign trade operations. However, just like the *Transversal de las Américas*, this new infrastructural project has not been taking into account the impact of a huge new port area in the region, in specific the consequences of future mobility dynamics and the increase of heavy traffic crossing the region.

As such, *La vía al mar*, *the Transversal de las Américas* and *Puerto Antioquia* were transportation infrastructures de facto and path-dependently expressing specific socio-economic and socio-political interests. The three of them were built to serve specific actors and their interests (hegemonic groups). Agro-industrial actors, specifically the banana companies and their broader supporting private and public as well as local, national and international networks, benefited from these infrastructures, as they were essential to guarantee getting a product efficiently from its production site to the consumers. Also, the transportation sector and specific freight transportation companies benefited, as these infrastructures provided opportunities for construction and enabled the provision of viable logistic and transportation services. Other actors however, equally affected by these two infrastructures, in particular the local communities and authorities, obtained no benefits⁷ (counter-hegemonic groups). These infrastructures, through their size, 4-lane design, targeted mode and type of transport, trajectory, materiality, required size of investment, etc., instead created huge challenges for the dynamics and spatial configurations of the urban territory, including urbanisation patterns. In all cases the local community needs and requirements were not taken into account, and the three infrastructures showed the techno-political (infrastructural, socio-economic, socio-political, geo-political, scalar, ...) relationships among various actors, that after a while became just another widely accepted part of the existing

⁷ Our claim that specific communities obtained no benefits, implies that in comparison with the Agro-industrial sector they receive less advantages in relation to the construction of large-scale infrastructures. Since small scale and local infrastructure projects are not very common in the region, the main critique is made towards large scale infrastructure projects.

reality, embodying a systematic social inequality within a hegemonic, export-oriented and pro-market environment.

3.3. Second case study: The Automated People Mover

The suburbanization of the San Nicolás Valley is characterized by a highly fragmented spatial structure where patterns and flows of mobility are diffused and individualized. Income, development and infrastructural growth are distributed unequally amongst the nine municipalities that compose the region. Rionegro and especially Llanogrande, one of its most prominent sectors, in the centre plain became the most profitable areas in the region, as they hold the international airport Jose María Cordova (JMC), the second largest airport in Colombia. Therefore, agricultural areas in this territory are being transformed into commercial and housing areas (Gaviria et al., 2008).

According to Eduardo Loaiza, Manager of the Colombian Chamber of Construction (Camacol), these two municipalities are experiencing an exponential real estate and commercial boom (Cárdenas, 2018). At the beginning of 2018, 1,169 dwellings were sold and by the end of the year the property sales reached 1,900 units, a growth of 30% compared to the previous years (Cárdenas, 2018). These territorial dynamics had a direct impact on transportation, as this growth implied an important population increase. Rionegro went from having 30,000 inhabitants in 1964 to over 126,000 by 2018 (Cárdenas, 2018). The commercial parties (specifically the largest construction company in the region Contex Constructora) are important actors in the region, whose ideals and interests gradually became embedded in the planned infrastructures and their techno-political frames. As such, a future plan for the region was designed in July 2017 by the Corporación Empresarial de Oriente (CEO) (private business corporation of the region), Corporación Autónoma Regional Rionegro-Nare (Cornare) (public corporation that looks for the environment and renewable natural resources of the region) and Contex Constructora. The plan was claimed to focus on promoting sustainable development in the region and, as mentioned by Carlos Moreno Zapata (business manager of Contex Constructora), to 'carry out permanent analyses to generate less impact on the environment in order to build residential areas more in harmony with nature' (Sí hay casa para tanta gente, 2017). However, Martín Alonso Pérez, (President of the society of Engineers of Antioquia) claims that the growth of housing in the territory has not been supported by planning at the same speed. He states that 'the private sector (commercial parties) goes at 80 km/h and the state planning (local authorities) at 20 km/h; it is clear that there is an accelerated real estate dynamic, but there is a huge delay in road infrastructures and the most serious is the lack of attention to basic public services to receive the new population' (Cárdenas, 2018).

Urban mobility is currently not a critical issue in the city centres, as trajectories are short. However, the unexpected growth in the dispersed sub-urban areas of Rionegro have been causing huge congestion problems as well as increased risk of accidents. In Rionegro, 700 fatal traffic accidents were registered between 1999 and 2014, and more than 2000 traffic injuries (Instituto Nacional de Medicina Legal y Ciencias Forenses, 2015). Based on this problem, there are two main challenges to consider in the territory.

The first challenge is the connection of Rionegro, specifically the area of the international airport, with Medellín, the capital of the region and second largest city of the country. The trips

to the Airport generate more than 90% of the daily traffic in the region, in a distance of approximately 37 km with not enough public transportation offered (Gobernación de Antioquia, 2015). This implies that around 156,000 passengers a week in high season access the airport by private vehicles and/or informal transportation systems. The collective way to currently reach the JMC airport is by shared taxis or buses (owned by private companies of the transportation sector), which generally take passengers (usually low-income groups who do not have a private vehicle) on a semi-fixed route without any timetables and no designated stops. The shared taxis are generally queuing on a gas station near a commercial hub of Medellín (C.C. San Diego), and in the airport on a designated area with police presence, in order to monitor illegal parking of private cars and help discipline the queuing of taxis. The ride is generally shared with other passengers and is operated by a driver who collects the money and shouts out the destination before departing. It only departs when all seats are filled. The drivers usually stop anywhere to drop off or pick up passengers along the route. The cost of this trajectory is between 5 or 6 US dollars for a distance of approximately 37 km. Normally, this trajectory takes 45 minutes, however, as it is not a fixed route and there is not an established frequency, this trajectory often takes more time than expected. Therefore, people prefer to take their own vehicle to the airport and pay for a parking space for the whole time of the trip (4 dollars cost per day). This dynamic is generating a huge demand for parking spaces in the area and an excessive growth of parking areas around the airport [Photo 2 – Photo 3]. As such, this regional connection does not operate as a connected, accessible and reliable transportation network for those without access to a car.

HERE GOES PHOTO.2

HERE GOES PHOTO.3

The second big challenge are the inter-regional connections between the main municipalities of the territory (El Retiro, La Ceja, EL Carmen de Viboral, Marinilla, Guarne and Rionegro), where there are fast-growing developments and continuous sub-urban expansions, which represent major challenges to daily commuting. These main municipalities of the territory have an important administrative and financial dependency to Rionegro, explaining why there are so many travels between them every day (Gobernación de Antioquia, 2015). People commonly live in one city and work or study in another one. Distance amongst these municipalities varies from 4 to 20 kilometres, so for non-motorized modes there is little chance to become the first choice of transportation. The region is thus a car-oriented territory, and motorized vehicles are the priority. As Rionegro does not have its own inter-regional transportation company, it receives the different transportation companies that operate in those municipalities [Fig.4]. Therefore, in some specific corridors there is a conflict related to the superposition of local and regional public transportation routes. Although the superposition of transportation modes can be seen as positive, as it contributes to urban vitality and the creation of urban hubs, the oversupply of bus routes in some specific areas of the territory is causing heavy traffic congestion and low quality in the service (Municipio de Rionegro, 2015). This is resulting into a fight between different public transportation actors, who mainly want to access the urban centre of Rionegro.

HERE GOES FIG.4

In 2016, seeing the great need for a public transportation network to connect Medellín with the international airport JMC, the Brazilian company Aeromovel proposed to make an Automated

People Mover (APM). This elevated infrastructure refers to a fully automated passenger transportation system on an exclusive track, which meets everything from mass urban transportation demands in typical configurations of dual elevated rails, with a fixed route (Aeromovel, 2019). This proposal in the San Nicolas Valley involves 17.56 km (single line 13.06 km and double line 4.50 km) of huge regional elevated rail infrastructure with 14 stops, with a fleet of 28 vehicles (each one with a capacity for 120 passengers) (Ortiz, 2018). The approximate speed of the vehicle is 38km/h (Ortiz, 2018).

This infrastructural project in the San Nicolas Valley has been polemic since its proposal, due to its costs, debated relevance, design and actors involved. In the first place, the systems (technology and provider) were defined by the current governmental actors of Rionegro (Secretary of Planning of Rionegro 2018), before the mobility and demand studies were even deliberated. Therefore, it was believed that the decision affected the objectivity of those studies. In the second place, commercial actors had a huge involvement in the design of this infrastructure, based on their interests the APM has to be elevated since it is easier to expand to new urban (high class) areas of Rionegro not yet constructed (Ruiz, 2019). On the other hand, it was also criticized as an infrastructure not needed for the region (Orientesé, 2019), as the proposed project does not have the connection of the JMC international airport with Medellín (the most needed connection in the region). Also, the rates of urbanization and densities required for a system of this magnitude were not yet even planned for the region. However, the POT (Plan de Ordenamiento Territorial), the land-use plan of the territory, also approved by the Secretary of Planning of Rionegro in 2018, not only prioritized a massive mobility system in the region (APM) but also a concentration of residential areas in the whole territory (Cárdenas, 2018). As mentioned by the Secretary of Planning 'we recently approved a new POT where we envisioned the territory in the next 70 years; we have done a prospective exercise to speculate where it is going, and concluded that the region specifically needs an ambitious mobility plan and a 30-year action plan for a sustainable territory' (Cárdenas, 2018).

Even with all the opposition to this elevated massive transportation system, by April 2018 the municipality council of Rionegro approved the construction and operation of the APM by the Brazilian company Aeromovel. Including the purchase of 240 plots, and the contract for 22 years with an investment of 2,2 billion Colombian Pesos (COP) (Ortiz, 2018). This APM is expected to move around 10,000 to 30,000 daily passengers (Aeromovel, 2019), and should be operating in December 2023 (Ortiz, 2018).

The proposed APM for the San Nicolas Valley consists of a six sections line [Fig.5]:

- Stage 1 (7.5 km): The first stage of the line is the crossing through the urban center of Rionegro. This is one of the most worrying stages, as there is not a plan on the intersection of an elevated infrastructure in this municipality. Making a study is actually fundamental in order to evaluate the potential impacts, and the efficiency of an APM as a massive public transportation system, that articulates with the existing public transportation networks and principal nodes of the city.
- Stage 2 (2.7 km): The second stage will cross a rural natural territory with no residential or urban node services. It is a criticized crossing, as it will have some high environmental impact in the territory. It is an area expected to have low urban density and low transportation demand in the future.

- Stage 3 (4.4 km): This stage will follow the trajectory of one of the existing regional roads of the territory, parallel to the existing regional infrastructure. The area has no urban density yet, and will probably have low transportation demand in the future.
- Stage 4 and 5 (1.6 km and 1.2 km): Both stages are basically lines that connect the projected airport parking areas with the main airport terminal. As the private vehicles and buses are forbidden to access, and are forced to drop off their passengers in this area, the APM will be the only option to access the airport. This is also a controversial issue, as this stage could motivate the expansion of parking lots in rural areas.
- Stage 6 (2.0 km): This trajectory is a connection within air terminals in the airport. The second terminal is not approved yet and is still under discussion and subject to feasibility studies.

HERE GOES FIG.5

Now, after understanding the principal mobility challenges in the San Nicolas Valley and the proposed APM for the region, huge concerns arise. It is visible how elite coalitions (housing sector, international transportation companies and governmental parties) are trying to impose a high-tech mass transportation project by creating a large land use reconfiguration and a huge urban expansion in the region. Their specific strategy is to generate a commercial boom in particular areas of the region, in order to generate the traffic demand that makes pressure on transportation development. It is highly questionable whether the APM will be solving the current transportation and mobility needs of the region. For the moment it is not clear yet which is the problem the APM will solve, as the most problematic corridor with the most demand (90% of the daily trips in the region) is not even being taken into account in the proposal. For the estimated demand for inter-regional connections, it will probably be enough to improve and re-structure the existing public transportation systems based on buses. And the connection from Medellin to the JMC airport can also be solved by a more economical public transportation system with high performance and quality, that can be built fast and provide sufficient transportation capacity to meet the expected demands. Therefore, as described in (Olesen, 2019) the APM can be characterized by an infrastructural project not being designed as a benign sustainable public transport system, but as an urban development project driven by a very explicit neoliberal economic rationality.

4. Conclusion

This paper aimed to show through two case studies in the department of Antioquia in Colombia how the causalities of transportation (infrastructure) and urbanization are embedded in wider social, political, economic and cultural dynamics. The paper turned to the theory of technological politics and a strategic-relational institutionalist approach, both rarely applied to transportation (infrastructure), as a guiding principle in understanding this embeddedness. As such, the paper shifts the focus to the relationships between actors and their interests, transportation (infrastructure) and socio-politics, and the ways in which transportation practices and infrastructures possess deeply embedded socio-political qualities, include means of power and authority, and may favour specific actors and interests. The paper therefore discussed a framework for analysis capable of explaining how transportation supports particular forms of political life and how infrastructures as political technologies are systems strongly compatible with specific kinds of socio-political relationships. This framework understands transportation practices, infrastructures and projects as embedded in techno-

political frames, which include economic mechanisms, infrastructure and mobility policies, decision-making procedures, knowledge systems, regulation, mobility cultures, discourses on infrastructure and mobility, etc., which all include selectivities and institutionalized patterns of power and authority, favouring some infrastructure users, social classes and mobility patterns over others, and are continuously (re)produced, but sometimes contested and changed, by these very users. The paper therefore exposes the main hegemonic groups as well as the emergence of counter-hegemonic forms of (class) struggle [Table 2]. The paper thus supports findings in SCOT and institutionalist literature on the contextuality of infrastructure planning, and its explanations why technology is strongly and unavoidably linked to particular institutionalized patterns of power and authority.

HERE GOES TABLE.2

By analysing historical interactions between actors, transportation and various elements of techno-political frames, the paper has argued that *La vía al mar*, *La transversal de las Américas* and *Puerto Antioquia* were and are infrastructures specifically designed to serve particular socio-political interests. They were built to favour specific hegemonic actors from the agro-industrial sector, the banana companies in particular and their broader supporting private and public as well as local, national and international networks, as expressed in interactions between banana and other powerful companies, foreign governments, local governments, unions, political parties, military and paramilitary groups, etc. This was supported throughout the history of banana production by economic, financial, property-related, geo-political, urbanisation-related, party-political, (para)military, etc. explanatory factors in the techno-political frame, as first expressed in *La vía al mar* and later consolidated/repeated in *La transversal de las Américas* and *Puerto Antioquia*. Following historically deeply rooted and path-dependent unequal power relations and power structures, techno-political frames of these transportation infrastructures represent a systematic social inequality which is again reproduced within the current neoliberal pro-market regime. Community needs and requirements were not taken into account, as these infrastructures were mainly designed and implemented for the efficiency of export-oriented agro-industries over local economic development. As such, the road infrastructures proposed in urban areas, through their size, 4-lane design, targeted mode and type of transport, trajectory, materiality, required size of investment, etc., expressed the focus on efficiency of freight fleets over pedestrians and cyclists, which is controversial in low income urban contexts where walking and cycling are important modes of transportation. This is causing huge challenges related to the overlap of transportation scales, congestion and risks of accidents within urban areas.

In the case of the Automated People Mover (APM) proposed for the region of the San Nicolas Valley, the paper has from the same perspective, analysed a technology containing implicit and unequal socio-political purposes embedded in the interactions of the involved actors and interests and their techno-political frames. In this specific case, hegemonic actors from the housing sector together with an international transportation company, have been influencing city officials to promote a new high-tech and high-investment connection in the region, aiming to induce a higher demand for transportation through urban expansion and land use reconfiguration. Instead of a public transportation based on buses to solve the inefficiencies of the existing transportation systems and address the mobility challenges in this region, a huge and inappropriate transportation system was proposed in a region lacking the necessary

amount of people to use it, again embodying the interests of specific actors through its techno-political frame.

In sum, by mobilising a theory of technological politics and a strategic-relational institutionalist approach, the paper could expose the socio-politics of various transportation systems in the department of Antioquia in Colombia and how they embody pro-market interests. As such, both are following the history of international pro-market forces and current neoliberalism in Latin America. Together, these infrastructural projects promoted transportation-related injustice by reinforcing social and spatial polarization, and aiming for profit-oriented developments. Both projects exposed power battles and position taking of key economic, political and social elites, whereas the Colombian government provided support to private big international and Colombian companies (from the agricultural, housing and transportation sector), which shaped the development trajectory of this region through their socioeconomic and political power.

The empirical data findings of both cases studies helped the paper to frame a solid interpretation of how socio-political benefits and profit-oriented interests of hegemonic population groups, specifically agricultural, transportation and housing actors, embody specific forms of power dominating transportation decisions and at the same time unsuccessful counter-hegemonic contestations through their logistical and economical activities. In this context, the local state's urban, transportation and industrial development approaches and policies are increasing social and spatial polarization by supporting profit-making developments. These dynamics have been carried out in unstable contexts of weak transportation planning policies, conflicts between transportation modes, a gap between social classes and a history of violence and oppression.

From the analytical approach used in this paper based on the combination of the technological politics theory and a strategic-relational institutionalist perspective, various consequences for the international planning community could be derived. Previous findings on the socio-politics of planning can now be expanded to transportation practices, infrastructures, projects and planning. Mobilising the framework enables explaining to what extent planning contemporary transportation (infrastructure) supports particular socio-political selectivities that favour some and exclude others, positioning (transportation) planners in these selectivities, and questioning whether alternative questions should be asked and other choices should or can be made, for example to resist the influence of international neoliberal ideologies and the predominant tendency in transportation planning to mainly address power-confirming forms of transportation. Such analysis could reactivate coalitions between (transportation) planners and communities that are able to change political agendas. Future research could lead to more critical evaluations of current (transportation) planning practices, which could support other types of community-oriented transportation planning, or, more in general, a 'social turn' in transportation analysis and planning. Better understanding the impact in transportation planning of relevant social groups and socio-political and socio-economic factors and the various causalities of these relationships, as embedded in techno-political frames, may lead to more contextual transport (infrastructure) planning, which is more just and less technologically utopian, and would explore and address the transportation needs of larger parts of the population, including underprivileged ones. Such transportation analysis and planning would benefit from additional case study explorations, including more 'positive' cases, showing for example how also win-win solutions in transportation (infrastructure)

planning are feasible that serve (compromises on) various transportation needs, exploring the confrontation of large-scale and local transportation (infrastructures) in multi-scalar dynamics, or focussing on various modes of transportation used by various parts of the population.

5. References

- Aeromovel Metro. (2019). Retrieved from <http://www.aeromovel.com.br/en/the-aeromovel/technology/>
- Agudelo, L. (2011). La industria bananera y el inicio de los conflictos sociales del siglo XX]. *Credencial*
- Akitoby, B., Clements, B., Gupta, S. & Inchauste, G. (2006) Public Spending, Voracity, and Wagner's Law in Developing Countries. *European Journal of Political Economy*, 22, 908-924. <https://doi.org/10.1016/j.ejpoleco.2005.12.001>
- Alvaran, E. (2010, October). Futuras consecuencias de la 'Transversal de las Américas'. *El Tiempo*. Retrieved from <http://blogs.eltiempo.com/la-lupa-opinion-al-detalle/2010/10/11/futuras-consecuencias-de-la-transversal-de-las-americas/>
- Alvarez, V.A. (2019, March). Puerto Antioquia y Mar 1 serán realidad en Urabá y el Occidente. *El Colombiano*. Retrieved from <https://www.elcolombiano.com/antioquia/concesion-por-30-anos-para-puerto-antioquia-y-cierre-financiero-para-mar-1-OF10409043>
- ANDI. (2017). *Las motocicletas en Colombia: aliadas del desarrollo del país*. Cámara de la Industria Automotriz de la Asociación Nacional de Empresarios de Colombia, ANDI. Retrieved from <http://www.andi.com.co/Uploads/LasMotocicletasEnColombia.pdf>
- ANI. (2019, April). *Transversal de las Américas*. Agencia Nacional de Infraestructura. Retrieved from <http://www.transversaldelasamericas.com/>
- Aschauer, D.A. (1989). Is public expenditure productive? *J. Monet. Econ.* 23, 177–200. [https://doi.org/10.1016/0304-3932\(89\)90047-0](https://doi.org/10.1016/0304-3932(89)90047-0)
- Barro, R.J. (1990). Government spending in a simple model of endogenous growth. *J. Polit. Econ.* 98, S103–S125. <https://doi.org/10.1086/261726>
- Barro, R.J. & Sala-I-Martin, X. (1992) Convergence. *Journal of Political Economy*, 100, 223-251. <https://doi.org/10.1086/261816>
- Barro, R.J. & Sala-I-Martin, X. (1995). *Economic Growth*. McGraw-Hill, New York.
- Baxter, P., & Jack, S. (2008). Qualitative Case Study Methodology: Study Design and Implementation for Novice Researchers. *The Qualitative Report*, 13(4), 544-556.
- Behrentz, E. (2013, November). Subsidios para el transporte público. *El Tiempo*. Retrieved from <https://www.eltiempo.com/archivo/documento/CMS-13181235>
- Berg, M. (1998). The Politics of Technology: On Bringing Social Theory into Technological Design. *Science*. Vol. 23. <https://doi.org/10.1177/016224399802300406>
- Bijker, W., & Pinch, T. (1987). The Social Construction of Facts and Artifacts: Or How the Sociology of Science and the Sociology of Technology Might Benefit Each Other. In *Social Studies of Science*, 14:17–50.

- Bleaney, M., Gemmell, N., & Kneller, R. (2001). Testing the endogenous growth model: public expenditure, taxation, and growth over the long run. *Canadian Journal of Economics* 34 (February): 36–57. <https://doi.org/10.1111/0008-4085.00061>
- Boarnet, M.G. & Crane, R. (2001). *Travel by Design: The Influence of Urban Form on Travel*. New York: Oxford University Press.
- Bonet, J. (2000). *Las exportaciones Colombianas de Banano, 1950 – 1998*. Centro de estudios económicos regionales. Cartagena de Indias. Banco de la República. Retrieved from <http://www.banrep.gov.co/es/contenidos/publicacion/las-exportaciones-colombianas-banano-1950-1998>
- Brenner, N. & Theodore, N. (2003). *Spaces of Neoliberalism: Urban Restructuring in North America and Western Europe*. Hoboken, NJ: Blackwell.
- Brungardt, P.M. (1995). La United Fruit Company en Colombia. *INNOVAR, revista de ciencias administrativas y sociales*, Bogotá, No. 5, pp. 107-118. Retrieved from <https://revistas.unal.edu.co/index.php/innovar/article/view/19092>
- Cain, L.P. (1997). Historical perspective on infrastructure and US economic development. *Reg. Sci. Urban Econ.* 27, 117–138.
- Callon, M. (1987). Society in the making: The study of technology as a tool for sociological analysis. In T. Huges, & T. Pinch (Eds.), *The social construction of technological systems: New directions in the sociology and history of technology* (pp. 83-103). London: MIT Press.
- Cámara de Comercio de Medellín para Antioquia. (2019). *Perfiles socioeconómicos de las subregiones de Antioquia*. Informes de estudios económicos.
- Campbell, J., & Pedersen, O. (Eds.). (2001). *The Rise of Neoliberalism and Institutional Analysis*. Princeton; Oxford: Princeton University Press. <https://doi.org/10.1353/sof.2002.0034>
- Cárdenas, S. (2018, September). La expansión urbana en Rionegro ¿estamos listos para afrontarla? *El Colombiano*. Retrived from <https://www.elcolombiano.com/antioquia/crecimiento-urbano-en-rionegro-y-oriente-de-antioquia-CD9317334>
- Castilla, C.E. (2001). El conflicto armado colombiano en los años noventa: cambios en las estrategias y efectos económicos. *Colombia Internacional*, 49, p.50. <https://doi.org/10.7440/colombiaint49-50.2000.06>
- Cresswell, T., & Merriman, P. (2010). *Geographies of Mobilities: Practices, Spaces, Subjects*. Abingdon, Oxon: Taylor and Francis.
- De Block, G. (2011). Designing the Nation, The Belgian Railway Project, 1830 - 1837. *Technology and Culture*, 52(4), 703-732. <https://doi.org/10.1353/tech.2011.0145>.
- De Blust, S. and Van den Broeck, P. (2019), From social innovation to spatial development analysis and planning, in: Van den Broeck, P., Mehmood, A., Paidakaki, A., Parra, C., *Social innovation as political transformation. Thoughts for a better world*, Cheltenham: Edward Elgar
- Fajardo, D. (1983). *Haciendas, Campesinos y Políticas Agrarias en Colombia, 1920–1980*. Bogotá: Oveja Negra. Retrieved from https://openlibrary.org/books/OL2922034M/Haciendas_campesinos_y_poli%CC%81ticas_agrarias_en_Colombia_1920-1980
- Fan, S. and Chan-Kang, C. (2008). Regional road development, rural and urban poverty: evidence from China. *Transport Policy* 15 (September): 305–14.

<https://doi.org/10.1016/j.tranpol.2008.12.012>.

- Fainstein, S. (2000) 'New directions in planning theory', *Urban affairs review*, 35:451-478.
- Ferreyra, A. and Segura, R. (2000). Examining the Military in the Local Sphere Colombia and Mexico. *Latin American Perspectives*. Issue 111. pp. 18-35.
- Fulk, J. and Yuan, YC. (2017) Social construction of communication technology. In: Scott, CR, Barker, JR, Kuhn, T, et al. (eds) *The International Encyclopedia of Organizational Communication*, pp. 1–19. Malden, MA: John Wiley & Sons.
- García, C.A. (2016, May). Crisis del Soat tiene a aseguradoras pensando en salirse del negocio. *El Tiempo*. Retrieved from <https://www.eltiempo.com/archivo/documento/CMS-16581557>
- García, J. (2004). El cultivo de algodón en Colombia entre 1953 y 1978: una evaluación de las políticas gubernamentales. Documentos de Trabajo Sobre Economía Regional y Urbana 002484, Banco de la República - Economía Regional. Retrieved from http://www.banrep.org/docum/Lectura_finanzas/pdf/DTSER03-Algodon.pdf
- Gaviria, Z., Hermelin, M., Forero, L., Restrepo, L., Pérez M., Arbeláez, L.F., Peláez, P.P., González, P., Palacios, A., Salas, Diego., Parra, J., Roldán, G., & Tobón, J. (2008). *Realidades y Prospectiva del Valle De San Nicolás*. Cámara De Comercio Del Oriente Antioqueño. Rionegro, Antioquia, Colombia.
- Gilhodes, P. (1967). La Colombie et L'United Fruit Company. *Revue Française de Science Politique*. Vol. 17. pp. 307—317.
- Gilles P., and Christelle, M.J. (2016). The Neoliberal City – Theory, Evidence, Debates, Territory, Politics, Governance, 4:2, 137-153. <https://doi.org/10.1080/21622671.2016.1166982>
- Gobernación de Antioquia. (2015). *Encuesta Origen-Destino de Carga y Pasajeros*. Medellín. Reporte de indicadores de viajes por municipio. Secretaría de Infraestructura Física. Retrieved from http://secretariainfraestructura.antioquia.gov.co/descargas/Conversatorio_Plan_infraestructura_movilidad_y_transporte/06.%20Documento_Encuesta%20Origen%20Destino%20Departamental%20de%20carga%20y%20pasajeros_Cifras%20e%20indicadores.pdf
- González, F. (1998). La violencia política y las dificultades de la construcción de lo público en Colombia: una mirada de larga duración, in Jaime Arocha et al. (eds.), *Las violencias: Inclusión creciente*. Bogotá: Facultad de Ciencias Humanas, Universidad Nacional.
- Gonzáles, C. (2018). '¿Vuelve la confianza inversionista con Duque?'. ColombiaCheck. 25 July. Available at: <https://colombiacheck.com/chequeos/vuelve-la-confianza-inversionista-con-duque>. (Accessed: 09 July 2020)
- Graham, S. and Marvin, S., (2001). *Splintering Urbanism: Networked Infrastructures, Technological Mobilities and the Urban Condition*, London: Psychology Press. <https://doi.org/10.4324/9780203452202>
- Gramsci, A. (1971). *Selections from the Prison Notebooks of Antonio Gramsci*. International Publishers.
- Gualini, E. (2001) Planning and the intelligence of institutions. Interactive approaches to territorial policy-making between institutional design and institution-building Ashgate.

- Gwilliam, K.M. (2002). *Cities on the move: A World Bank urban transport strategy review (English)*. Washington, D.C.: The World Bank. Retrieved from <http://documents.worldbank.org/curated/en/928301468762905413/Cities-on-the-move-a-World-Bank-urban-transport-strategy-review>
- Hajer, M. (2003) 'A frame in the fields. Policy-making and the reinvention of politics', in M. Hajer and H. Wagenaar (eds) *Deliberative policy analysis. Understanding governance in the network society*, 1 ed. Cambridge: Cambridge University Press.
- Harvey, D. (2005). *A brief history of neoliberalism*. Oxford: Oxford University Press.
- Harvey, D. (2007). Neoliberalism as Creative Destruction. *The ANNALS of the American Academy of Political and Social Science*, 610(1), 21–44. <https://doi.org/10.1177/0002716206296780>
- Healey, P. (1997/2006), *Collaborative Planning, Shaping places in fragmented societies*, Houndmills: MacMillan Press
- Healey, P. (1999) 'Institutionalist analysis, communicative planning and shaping places', *Journal of planning education and research*, 19:111-122.
- Healey, P. (2005) 'On the project of institutional transformation in the planning field. Commentary on the contributions', *Planning theory*, 4:301-310.
- Hommels, A. (2005). Studying Obduracy in the City: Toward a Productive Fusion between Technology Studies and Urban Studies. *Science, Technology, & Human Values*, 30(3), 323–351. <https://doi.org/10.1177/0162243904271759>
- Innes, J. (1995) 'Planning Theory's Emerging Paradigm. Communicative Action and Interactive Practice', *Journal of planning education and research*, 14:183-189.
- Instituto Nacional de Medicina Legal y Ciencias Forenses. (2015). *Forensis 2018, Datos para la vida*. Bogota. Retrieved from <http://www.medicinalegal.gov.co/documents/20143/386932/Forensis+2018.pdf/be4816a4-3da3-1ff0-2779-e7b5e3962d60>
- Jaramillo, V. W. (2018). [Blog post]. Retrieved from <https://elpregonerodeldarien.blogspot.com/>
- Jessop, B. (2001). 'Institutional (re)turns and the strategic-relational approach', *Environment and planning A*, 33:1213-1235.
- Kumar, T.R., (2002). 'The impact of regional infrastructure investment in India'. *Regional Studies* 36 (February): 194–200. <https://doi.org/10.1080/00343400120114771>.
- La FM. (2016, October). Asociación de bananeros entregará predios para construcción de Transversal de las Américas. La FM. Retrieved from <https://www.lafm.com.co/economia/augura-entregara-88-predios-la-construccion-transversal-las-americas>
- La Rocca, R.A. (2010). 'Soft Mobility and Urban Transformation'. *TeMaLab Journal of Mobility, Land Use and Environment*, Vol 3, pp. 85-90.
- Lair, E. (2000). 'Colombia: una guerra contra los civiles'. *Colombia Internacional*, 49, p.50. <https://doi.org/10.7440/colombiaint49-50.2000.07>
- Lall, S.V. (2007). 'Infrastructure and regional growth, growth dynamics and policy relevance for India'. *Ann. Reg. Sci.* 41, 581–599. <https://doi.org/10.1007/s00168-006-0112-4>
- Latour, B. (1996): *Aramis, or the Love of Technology*. Cambridge, Mass.: Harvard University Press.

- Latour, B. (2000). 'When Things Strike Back: A Possible Contribution of Science Studies'. *British Journal of Sociology - BRIT J SOCIOLOG* 51 (March): 107–23. doi:10.1111/j.1468-4446.2000.00107.x.
- Latour, B. (2005). *Reassembling the social: An introduction to actor-network-theory*. Oxford: Oxford University Press.
- Law, J., & Singleton, V. (2000). 'Performing Technology's Stories: On Social Constructivism, Performance, and Performativity'. *Technology and Culture*, 41(4), 765-775.
- LeGrand, C. (1989). El conflicto de las bananeras. NHC - Nueva Historia de Colombia: Relaciones internacionales — Movimientos sociales Vol. III. Bogotá: Editorial Planeta Colombiana, pp. 183 - 217.
- Mandelbaum, S. J. (1985) 'The Institutional Focus of Planning Theory', *Journal of planning education and research*, 5:3-9.
- Mann, M. (1984). 'The autonomous power of the state: its origins, mechanisms and results'. *Eur. J. Sociol./Arch. Eur. Sociol.* 25, 185–213. <https://doi.org/10.1017/S0003975600004239>.
- Maparu, T. S. & Mazumder, T.N. (2017). 'Transport infrastructure, economic development and urbanization in India (1990–2011): Is there any causal relationship?'. *Transportation Research Part A: Policy and Practice*. Elsevier, vol. 100(C), pages 319-336. <http://dx.doi.org/10.1016/j.tra.2017.04.033>
- March, J., & Olsen, J. (1983). 'The New Institutionalism: Organizational Factors in Political Life'. *American Political Science Review*, 78(3), 734-749. <https://doi.org/10.2307/1961840>
- Mitchell, R., & Chester R. (1954). *Urban Traffic: A function of Land Use*. New York: Columbia University Press. <https://doi.org/10.1002/ncr.4110431114>
- Mol, A., & Mesman, J. (1996). 'Neonatal Food and the Politics of Theory: Some Questions of Method'. *Social Studies of Science*, 26(2), 419–444. <https://doi.org/10.1177/030631296026002009>
- Moulaert, F., Rodrigues, A. & Swyngedouw, E. (2003). *The globalized city. Economic restructuring and social polarization in European cities*. Oxford: Oxford University Press.
- Moulaert, F. (2005) 'Institutional economics and planning theory. A partnership between ostriches', *Planning theory*, 4:21-32.
- Municipio de Rionegro. (2015). Anuario estadístico Rionegro 2015. Secretaría de planeación. Retrieved from <http://www.rionegro.gov.co/rsc/pdf/2015/planeacion/anuario-2015.pdf>
- Moulaert, F., Jessop, B., Mehmood, A. (2016). 'Agency, structure, institutions, discourse (ASID) in urban and regional development'. *International Journal of Urban Sciences*
- Ojeda, D. (2018). "En enero, ¿cuáles fueron las marcas de motos más vendidas en Colombia?". *El Espectador*. 19 February. Available at: <https://www.elespectador.com/noticias/economia/en-enero-cuales-fueron-las-marcas-de-motos-mas-vendidas-en-colombia/>. (Accessed: 06 July 2020)
- Olesen, K. (2019). 'Infrastructure imaginaries: the politics of light rail projects in the age of neoliberalism'. *Urban Studies*. Online First. doi: 10.1177/0042098019853502
- Opinion Caribe. (2017, February). United Fruit Company, un gigante industrial. *Opinion Caribe, Expresión de Región*. Retrieved from

- <https://www.opinioncaribe.com/2017/02/01/united-fruit-company-gigante-industrial/>
- Orientesé. (2019, October) Qué pasará con el Tren Ligero de Rionegro? *Orientesé.co*. Retrieved from <http://orientese.co/que-pasara-con-el-tren-ligero-de-rionegro/>
 - Ortiz, J.D. (2018, July). El tren automático de Rionegro será licitado en diciembre. *El Colombiano*. Retrieved from <https://www.elcolombiano.com/antioquia/el-tren-automatico-de-rionegro-sera-licitado-en-diciembre-YE8996111>
 - PBI. (2012). Construyendo la paz en espacios exclusivos de población civil: experiencias del Urabá. *Peace Brigades International*. Retrieved from <http://www.pbi-colombia.org/>.
 - Pernet, N. (2018). 'Las lecciones de la masacre de las bananeras en Colombia'. The New York Times. 06 December. Available at: <https://www.nytimes.com/es/2018/12/06/espanol/opinion/opinion-matanza-bananeras.html>. (Accessed: 09 July 2020)
 - Philo, C. and Parr, H. (2000). 'Institutional geographies: introductory remarks' *Geoforum*. 31. pp. 513 - 521
 - Picon, A. (2018). 'Urban Infrastructure, Imagination and Politics: From the Networked Metropolis to the Smart City'. *International Journal of Urban and Regional Research*, February. doi:10.1111/1468-2427.12527
 - Portafolio. (2019, March). Gobierno firma contrato de concesión de Puerto Antioquia. *Portafolio*. Retrieved from <https://www.portafolio.co/economia/infraestructura/gobierno-firma-contrato-de-concesion-de-puerto-antioquia-527683>
 - Romer, P.M. (1994). The origins of endogenous growth. *J. Econ. Perspect.* 8, 3–22. <https://doi.org/10.1257/jep.8.1.3>
 - Ruiz, S. (2019, Nov). El tren de Rionegro se empieza a enredar. *La Silla Vacía*. Retrieved from <https://lasillavacia.com/silla-paisa/tren-rionegro-se-empieza-enredar-68907>
 - Sassen, S. (2015). Who owns our cities – and why this urban takeover should concern us all. The Guardian. November 2015
 - Servillo L. A. & Van den Broeck P. (2012). The social construction of planning systems: a strategic relational institutionalist approach. *Planning Practice and Research* 27 41–61
 - Servillo, L. A. (2016). Strategic planning and institutional change: a karst river phenomenon, in L. Albrechts, A. Balducci and J. Hillier (eds), *Situated Practices of Strategic Planning: An International Perspective*, London, Routledge, 331–47.
 - Shannon, K. & Smets, M. (2010). *The Landscape of Contemporary Infrastructure*, Rotterdam: NAI Publishers.
 - Sí hay casa para tanta gente. (2017). *Revista Semana*. (November 27) Retrieved from: <https://www.semana.com/contenidos-editoriales/rionegro-la-vida-entre-montanas/articulo/expansion-inmobiliaria-en-rionegro/549146>. (Accessed: 09 July 2020)
 - Swyngedouw, E., & Heynen, N. (2003). Urban Political Ecology, Justice and the Politics of Scale. *Antipode* 35 (5): 898–918. <https://doi.org/10.1111/j.1467-8330.2003.00364.x>.

- Swyngedouw, E., Moulaert, F., & Rodrigues, A., (2004). Neoliberal urbanization in Europe. Large-scale urban development projects and the new urban policy. *Antidote*, 34;542-577.
- Szabo, J., and Fabok, M. (2020). Infrastructures and state-building: Comparing the energy politics of the European Commission with the governments of Hungary and Poland. *Energy Policy*. Vol 138.
- Tasan-Kok, T., and Baeten, G. (2011). Contradictions of Neoliberal Planning: Cities, Policies, and Politics. New York: Springer.
- Thomson, F. (2011). The Agrarian Question and Violence in Colombia: Conflict and Development. 11 (3): 321–56. Retrieved from <http://onlinelibrary.wiley.com/doi/10.1111/j.1471-0366.2011.00314.x/abstract>
- UNAL. (2018). *Plan integral de movilidad de Apartadó. Encuesta origen - destino 2018*. Municipio de Apartadó. Universidad Nacional de Colombia.
- URBAM, (2014). *Planes Municipales Integrales para Urabá: Proyectos y estrategias urbanas y ambientales para el polo de desarrollo Regional*, Medellín: Universidad EAFIT.
- Van den Broeck, P. (2011). Analysing social innovation through planning instruments. A strategic-relational approach. *Strategic Projects, Catalysts for Change*, pp. 52–78. London and New York: Routledge.
- Van den Broeck, P. (2010), De sociale constructie van plannings- en projectinstrumenten. Onderzoek naar de socio-technische dynamiek in het 'Eerste Kwartier' in Antwerpen, Ph.D. thesis, KU Leuven, Leuven
- Van den Broeck, P. (2011). Limits to social innovation. Shifts in Flemish strategic projects towards market oriented approaches, *Revue de Géographie Belge* (Belgeo), nr 1 - 2, p. 75 - 88
- Van den Broeck, P., Abdelwahab, M., Miciukiewicz, K., and Hillier, J. (2013), On analysing space from a strategic-relational institutionalist perspective: the Cultural Park for Children in Cairo, Special issue of *International Planning Studies*, 18(3-4), p. 321-341
- Van den Broeck, P., and Verachtert, K. (2016), Whose permits? The tenacity of permissive development control in Flanders, *European Planning Studies*, 24(2), pp 387-406
- Verma, N. ed. (2007) *Institutions and planning* Elsevier.
- Wagner, A. (1958). Three extracts on public finance. In: Musgrave, R.A., Peacock, A.T. (Eds.), *Classics in the Theory of Public Finance*. Macmillan, London. https://doi.org/10.1007/978-1-349-23426-4_1
- Wagner, R.E., & Weber, W.E. (1977). Wagner's law, fiscal institutions and the growth of government. *Nat. Tax J.* 30, 59–68.
- Winner, L. (1980). Do Artifacts Have Politics? *Daedalus*, 109(1), 121-136. <http://dx.doi.org/10.4324/9781315259697-21>
- Winner, L. (1986). *The whale and the reactor: A search for limits in an age of high technology*. Chicago: University of Chicago Press.
- Winner, L. (1992). Citizen Virtues in a Technological Order. *Inquiry* 35 (3–4). Routledge: 341–61. <https://doi.org/10.1080/00201749208602298>.
- White, J. (1978). Historia de una ignominia: la United Fruit Co. en Colombia. Bogotá, Editorial Presencia.

- Woolcock, J. (1985). Politics, Ideology and Hegemony in Gramsci's Theory. *Social and Economic Studies*. Vol. 34. No. 3. pp. 199-210
- Yin, R. K., (1994). Case Study Research Design and Methods: Applied Social Research and Methods Series. Second edn. Thousand Oaks, CA: Sage Publications Inc.
- Zeller, T. (2014). Histories of transport, mobility and environment. *The Journal of Transport History*, 35(2), 3-III,IV,V.