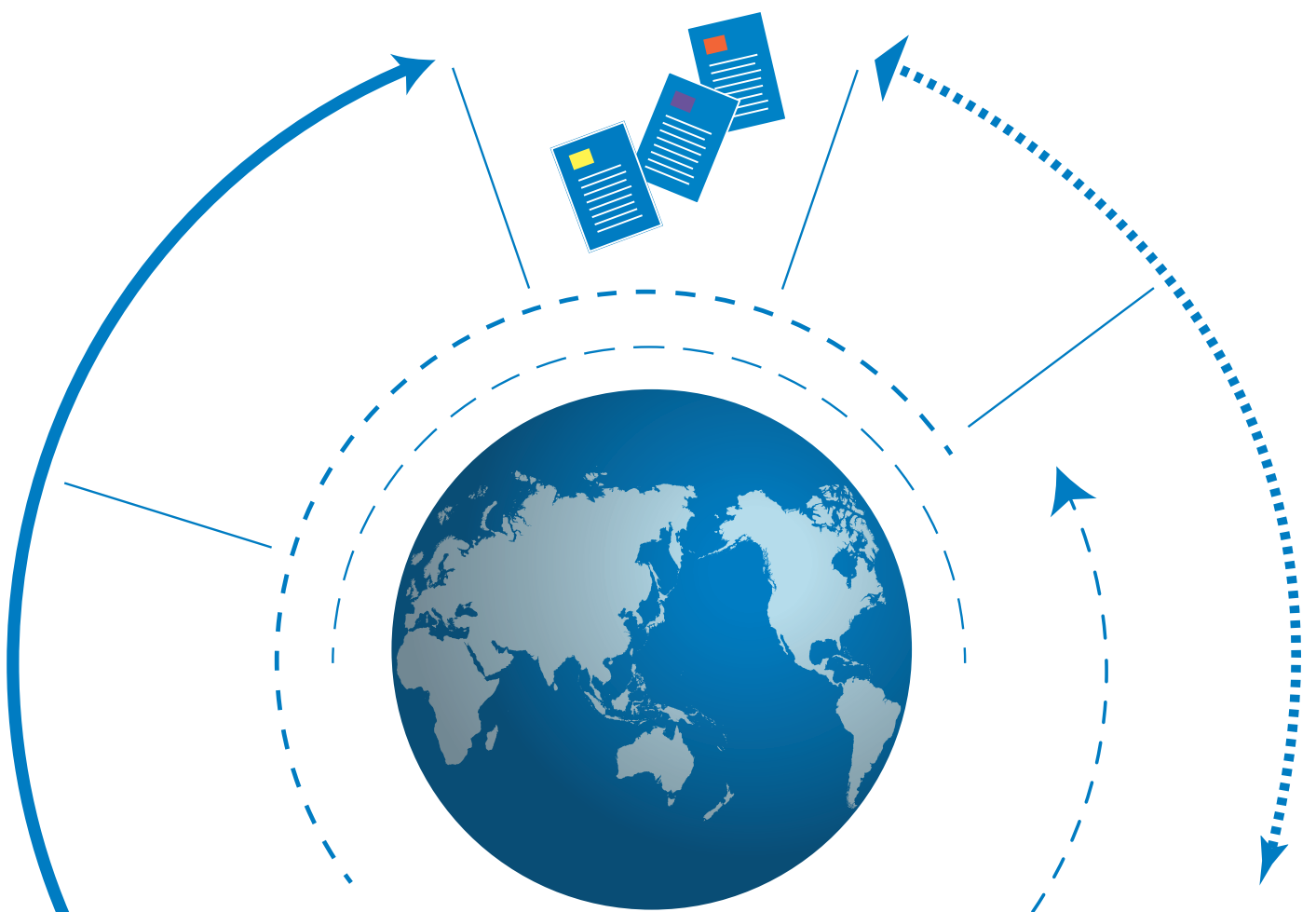




The politics of transport infrastructure policies in Colombia

Sebastián Nieto-Parra, Mauricio Olivera and Anamaría Tibocho



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Sebastián Nieto-Parra is economist at the OECD Development Centre. Mauricio Olivera is Deputy Minister of Employment and Pensions in Colombia; this paper was written while he was research associate at Fedesarrollo. Anamaría Tibocho is consultant at the Ministry of Employment and Pensions; this paper was written while she was research assistant at Fedesarrollo. Corresponding author's e-mail address: sebastian.nietoparra@oecd.org.

PREFACE

Effective transport infrastructure is fundamental to boost economic growth. Well interconnected countries with low transport costs are able to better allocate resources, take advantage of economies of scale and fully exploit its comparative advantages in international trade. In Colombia, as in other Latin American countries, roads constitute the most important component of transport infrastructure network and thus represent an important piece in their development puzzle. Moreover, the region's and in particular Colombia's road infrastructure lags well behind OECD countries and other emerging regions such as Asia.

This paper shows that beyond increasing investment in transport infrastructure, the challenge in Colombia is to invest more effectively. Colombia's transport infrastructure gap has increased with respect to the other main countries in the region despite investing, on average, slightly more on roads and railways as a share of GDP. This suggests that policy efforts should focus on ensuring that investment translates more effectively into better infrastructure, which is particularly relevant now that planned private and public investment in road infrastructure over the next two years will represent 5% of GDP.

This joint work by the OECD Development Centre and Fedesarrollo focuses on the policy making process of transport infrastructure in Colombia for the period 2002-10. It identifies the main bottlenecks to be improved in the implementation of public policies in the main phases of the transport infrastructure policy cycle, namely planning, budgeting, execution (*i.e.* new investment and maintenance), and monitoring and evaluation. Based on quantitative data and on a survey conducted at Development Centre to policy-makers in developing countries, this research shows there is room for improvement in the preliminary analyses and assessments of future public works, in the information systems to monitor and evaluate transport infrastructure and in the co-ordination of infrastructure public policies at national and regional level.

This paper contributes to research on the policy-making process in Latin America and has been prepared for the OECD Colombia Economic Assessment and the OECD Development Centre work on infrastructure in developing countries.

Mario Pezzini
Director
OECD Development Centre
April 2013

RÉSUMÉ

Cet article analyse le processus de formulation des politiques de mise en place de projets d'infrastructure de transport en Colombie pour la période 2002-10. Il identifie les principaux obstacles qui doivent être traités afin d'améliorer la mise en œuvre des politiques publiques dans les principales phases du cycle de l'infrastructure de transport, à savoir la planification, la budgétisation, l'exécution, le suivi et l'évaluation. Les principaux résultats conduisent à trois conclusions. Tout d'abord, il est nécessaire d'améliorer la planification et la priorisation de la construction du réseau des voies. Deuxièmement, les problèmes d'information affectent le suivi et l'évaluation. Enfin, la défaillance institutionnelle dans le secteur des transports provoque des échecs dans la coordination entre les différents modes de transport (niveau horizontal) ainsi que dans la séparation insuffisante des responsabilités et de la gestion des ressources entre les gouvernements nationaux et sous-nationaux (niveau vertical). Ce document contribue aux travaux de recherche sur le processus de formulation des politiques des pays latino-américains.

Classification JEL: D78, H11, H54, O18, P16.

Mots-clés: économie politique, infrastructure, politiques de transport, processus de formulation des politiques, théorie des jeux.

ABSTRACT

This paper analyses the Policy-Making Process (PMP) of transport infrastructure projects in Colombia for the period 2002-10. It aims to identify the main bottlenecks to improve the implementation of public policies in the main phases of the transport infrastructure policy cycle, namely planning, budgeting, execution, and monitoring and evaluation. The main results draw three conclusions. Firstly, there is a need to improve the planning and prioritisation stages of roads construction. Secondly, information problems affect monitoring and evaluation. Finally, the institutional weakness in the transport sector causes co-ordination failures between different transport modes (horizontal level) as well as inadequate separation of responsibilities and management of resources between national and sub-national governments (vertical level). This paper contributes to the research studying the PMP in Latin American economies.

JEL classification: D78, H11, H54, O18, P16.

Keywords: game theory, infrastructure, policy-making process, political economy, transport policies.

I. INTRODUCTION

This paper studies the Policy-Making Process (PMP) of transport infrastructure projects, and in particular of road investments in Colombia, for the period 2002-10. It aims to identify the main bottlenecks to be improved in the implementation of public policies in the main phases of the transport infrastructure policy cycle, namely planning, budgeting, execution (*i.e.* new investment and maintenance), and monitoring and evaluation. This paper contributes to the research studying the PMP in Latin American economies.¹

The main results of this paper draw three main messages. Firstly, there is a need to improve further the planning and prioritisation stages of roads construction. In that context, preliminary analyses and assessments (*i.e.* pre-feasibility, social feasibility and, value for money studies) of future public works as well as basic procedures before starting works (*e.g.* environmental and social assessments) should be taken into account. Secondly, information problems affect monitoring and evaluation. In particular, lack of information or inconsistency related to the secondary and tertiary roads, and unfeasibility to compare data on the quality of roads across-time makes difficult to perform cost-benefit analyses and to choose between the construction of new roads or the maintenance of old ones. Finally, this paper shows that the institutional weakness in the transport sector causes co-ordination failures between different transport modes (horizontal level), as well as inadequate separation of responsibilities and management of resources between national and sub-national governments (vertical level).

In order to analyse the PMP of the transport infrastructure sector we study the main stages of the process that infrastructure projects go through. It begins with the National Development Plan, goes through the annual public infrastructure investment budget, then through the execution of public works and ends at the monitoring and evaluation stage. We identify the interactions between the actors and the institutions that participate in each stage of the PMP and their particular interests. The group of actors includes the executive, the legislative, the sub-national governments and private actors (*i.e.* associations, private councils and concessionary conglomerates).

From a theoretical point of view, the lens used in this research is the common agency model. Different principals look for their interests on transport infrastructure policies

1. See IDB (2006), Stein and Tommasi (2008), Ardanaz *et al.*, (2010), Scartascini *et al.* (2010) and Dayton-Johnson *et al.* (2011) for extensive analyses studying the interactions between agents and institutions in the arenas of public policies in Latin America. In particular for the case of infrastructure transport in other countries in Latin America, see Mesalles Jorba (2010) for the case of Costa Rica. For extensive studies of the PMP in Colombia, and in particular the impact of politics on economic policies, see Lora and Scartascini (2010).

(e.g. presidency and sub-national actors - such as governors or mayors) that should be executed by one or several agents (e.g. public works office, private concessionaries). The information, incentives and enforcement problems generate different transaction costs that affect political relations and outputs of public policies. Under this framework, we identify actors, interests, incentives and rules to analyse the PMP in the transport sector. Annex 1 presents a simple theoretical model that summarises information and co-ordination problems in the transport infrastructure sector in Colombia. This common agency model is composed of two principals (central and sub-national governments) and one agent (actor in charge of the execution of public works).

Our analysis is based on the official data available and technical documents provided by official entities, such as the National Planning Department (DNP), the Ministry of Transport, the National Roads Agency (INVIAS), and the former National Concessions Agency (INCO) today called the National Infrastructure Agency (ANI). Complementarily, we interviewed former policy makers who have participated in the stages of the PMP, as officials of the entities involved, advisers, researchers and analysts.²

The paper is organised in six sections including this introduction. Section II explains the motivation of this case study: the infrastructure transport (with emphasis on roads) in Colombia. Section III presents the main actors and institutions in this PMP. Section IV describes the main stages of this PMP and the rules of the game (*i.e.* legal framework that regulates infrastructure PMP in Colombia). Section V, the core of this paper, analyses how the PMP works by showing the interactions between agents and institutions at each stage of the PMP. It also identifies the main bottlenecks affecting the effectiveness of transport infrastructure public policies in Colombia. Section VI concludes and provides policy recommendations.

2. The acronyms refer to the name of the *Departamento Nacional de Planeación* (DNP), *Instituto Nacional de Vías* (INVIAS), *Instituto Nacional de Concesiones* (INCO) and *Agencia Nacional de Infraestructura* (ANI).

II. WHY THE TRANSPORT INFRASTRUCTURE SECTOR? WHY COLOMBIA?

Infrastructure matters since it affects economic growth and income inequality (Calderón and Servén, 2004 and 2010). Moreover, the potential effect of infrastructure on economic growth depends, among others, on institutional characteristics (Esfahani and Ramírez, 2002).

This is in particular relevant for Latin America, given its important gaps in infrastructure. After controlling for economic development, gaps in terms of quality and quantity of infrastructure between Latin America and other emerging economies are considerable (Calderón and Servén, 2004 and 2010; Perrotti and Sánchez, 2011).

Among the different components of productive infrastructure sectors (*i.e.* electricity telecommunications, transport and water), the most important gap is in the transport sector. In particular, there is a large gap between industrial and developing regions in terms of roads (Calderón and Servén, 2010). The quality and quantity gaps in roads are considerable and it implies high infrastructure investments in the future (Perrotti and Sánchez, 2011).

Colombia has one of the biggest gaps in the transport infrastructure sector in the region. In particular, the quantity of roads and railways is small with respect to its per-capita GDP when compared to other Latin American countries. This result contrasts with other infrastructure sectors, in which Colombia is well placed given its GDP per capita (see Annex 2a). We observe similar results for the quality of the transport infrastructure sector. Colombia is ranked well below OECD economies and other emerging economies according to the business executives interviewed. Again, this is in particular evident in the quality of roads (see Annex 2b).

Two hypotheses can explain this transport infrastructure gap in Colombia. First, it could be due to a small investment in transport infrastructure in the last decades. Second, infrastructure investment in the transport sector might have lacked effectiveness. This second hypothesis is closely related to the need of identifying and solving the main bottlenecks affecting the PMP of the transport infrastructure sector.

The first hypothesis does not seem to hold, as we observe that transport infrastructure investment was similar in comparison to the main countries in the region. During the period 1981-2006, total infrastructure investment in roads and railways was 0.75% of GDP in Colombia, a relatively higher percentage than the average of the main countries in the region (0.7% of GDP) and even higher than some countries in the region (*i.e.* 0.6% in Argentina, 0.4% in Brazil and 0.3% in Peru). When only public investment is considered, investment in Colombia is much higher than the average of the other Latin American economies (0.7% vs. 0.5% of GDP, respectively).

Only Chile invested more than Colombia during that period.³ Moreover, recent trends in Colombia show an increase in both public and private transport infrastructure investment (170% and 250% between 2004 and 2010, respectively).⁴

In order to explore the second hypothesis, we study how the transport infrastructure process works in Colombia and compare it to those in other Latin American countries. In that context, analyses of the regulatory and institutional frameworks as well as of the PMP are crucial to determine possible bottlenecks within this sector.

From a survey to policy makers conducted in Latin America, we can compare the perception of Colombians' policy makers on the PMP of transport infrastructure projects in comparison to other policy makers in the region. Based on a survey conducted by the OECD Development Centre, this analysis attempts to identify the main bottlenecks hindering effective infrastructure service delivery throughout the policy-making process. Derived from the OECD Survey on Water Governance (OECD, 2011), it was directed at policy makers in the infrastructure and transport sectors at national level: at the ministries of finance, planning or infrastructure or at the national development and planning agencies for general infrastructure questions and at the ministry of transport for transport-specific questions. Respondents first completed the survey online and then complemented their answers by bilateral discussions. The survey was carried out in 2011-12 in 11 Latin American countries (*i.e.* Brazil, Chile, Colombia, Costa Rica, Dominican Republic, Ecuador, El Salvador, Mexico, Paraguay, Peru and Uruguay). This survey can be considered as a key input into the analysis of the effectiveness of public policies in infrastructure that complements existing quantitative surveys. However, because it is based on stated, and not on revealed, preferences, it is subject to possible biases.⁵

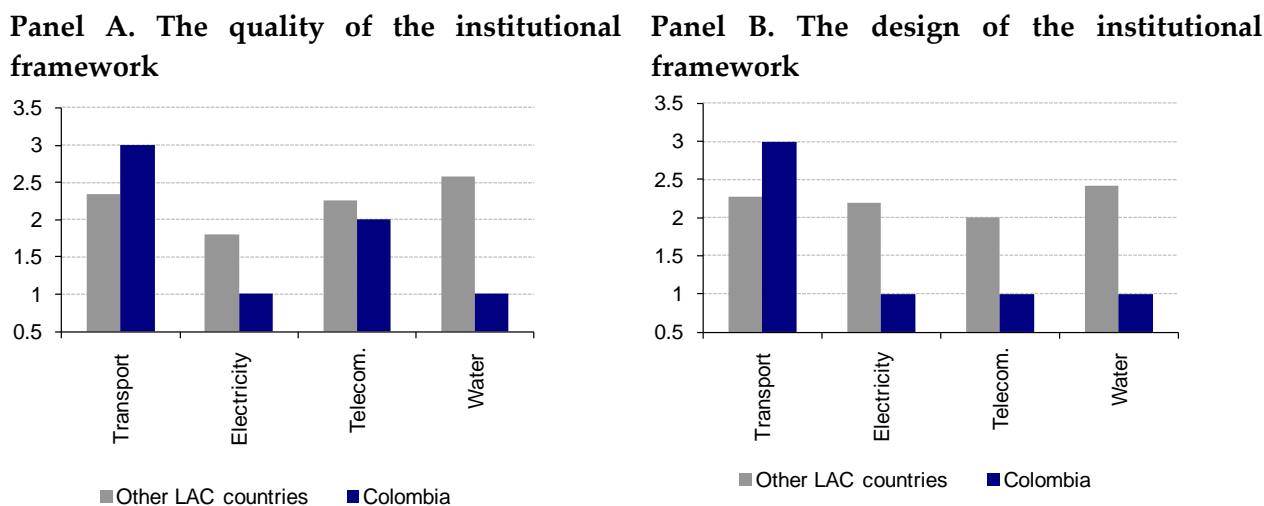
This survey shows that Colombians' policy makers perceive a higher weakness in the quality and design of the institutional framework of the transport infrastructure sector with respect to their Latin American peers. In contrast, other infrastructure sectors (*i.e.* electricity, telecommunications and water) are well perceived in comparison to other Latin American economies (see Figure 1).

3. According to World Bank data produced by Calderón and Servén (2010).

4. According to DNP data for Colombia. Countries in Latin America include Argentina, Brazil, Chile, Colombia, Mexico and Peru. Data on transport investment in Colombia in the last years is based on Ministry of Finance and National Planning Department databases.

5. A complete version of this survey is available upon request.

Figure 1. Weakness in the institutional framework in infrastructure sectors

Colombia *vis-à-vis* other Latin American economies

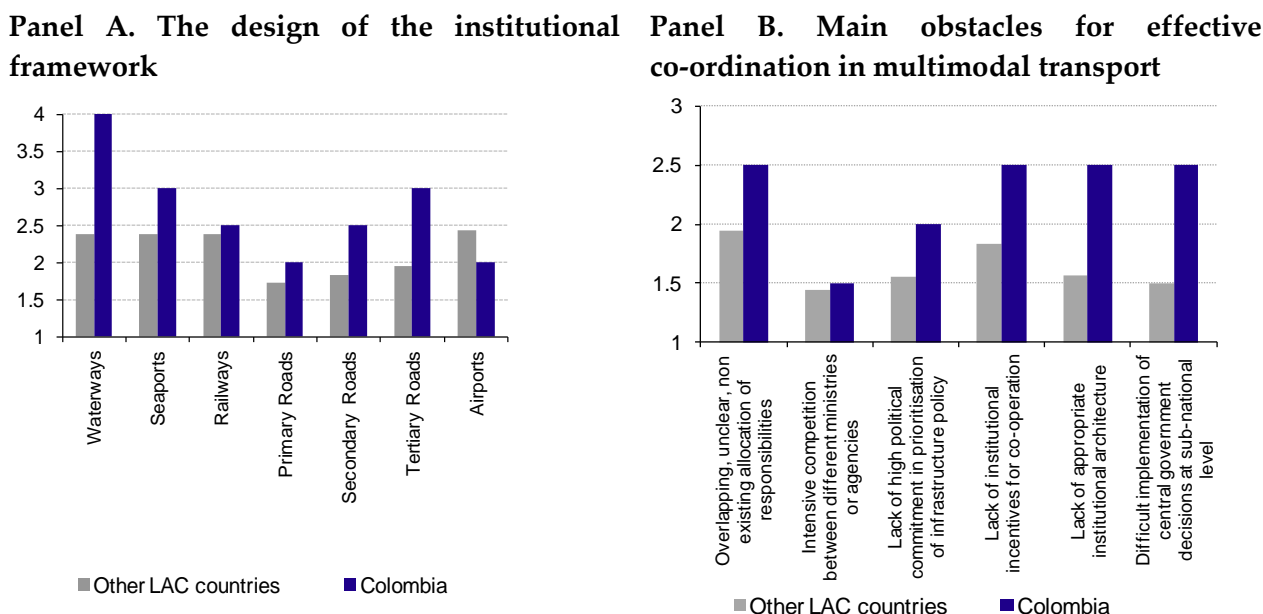
Notes: Scale from 1 to 4, where a higher value indicates higher weakness in the institutional framework. Policy makers answer the following questions: How would you rate the quality of the institutional framework in the main infrastructure sectors? Please tick the appropriate box (1=good (the institutional design clearly establishes responsibilities, incorporates checks and balances and incentivises accountability, 2= somewhat good, 3=somewhat bad, 4=bad (responsibilities are defined ad-hoc, lack of institutional transparency and independence). How would you rate the design of the institutional framework in the main infrastructure sectors? Please tick the appropriate box (1=simple (few actors and/or steps involved at each of the Prioritisation and Planning, Execution, Maintenance, and Monitoring and Evaluation stages), 2= somewhat simple, 3=somewhat complex, 4=complex (too many actors and step involved at each of the stage levels).

Source: Authors' calculations based on a survey carried out in 2011 in Brazil, Chile, Colombia, Costa Rica, Ecuador, El Salvador, Mexico, Paraguay, Peru, the Dominican Republic and Uruguay to policy makers in the transport and infrastructure planning sectors.

Similar results are obtained when the design of the institutional framework of different components of the transport sector is studied. In particular, according to policy makers, Colombia fails in the design of the institutional framework at each step of the PMP for primary, secondary and tertiary roads (See Figure 2, Panel A). Additionally, when policy makers are requested to identify the main obstacles for effective co-ordination of multimodal transport, the main gap with respect to other Latin American countries concerns the difficult implementation of central government decisions at sub-national level (See Figure 2, Panel B). Indeed, lack of vertical co-ordinations considerably affects incentive and execution policies, as well as outcomes (see Annex 1 for a simple model studying the interactions between national and sub-national governments acting as principals in a common agency model).

Figure 2. Weakness in the institutional framework in the transport infrastructure

Colombia *vis-à-vis* other Latin American economies

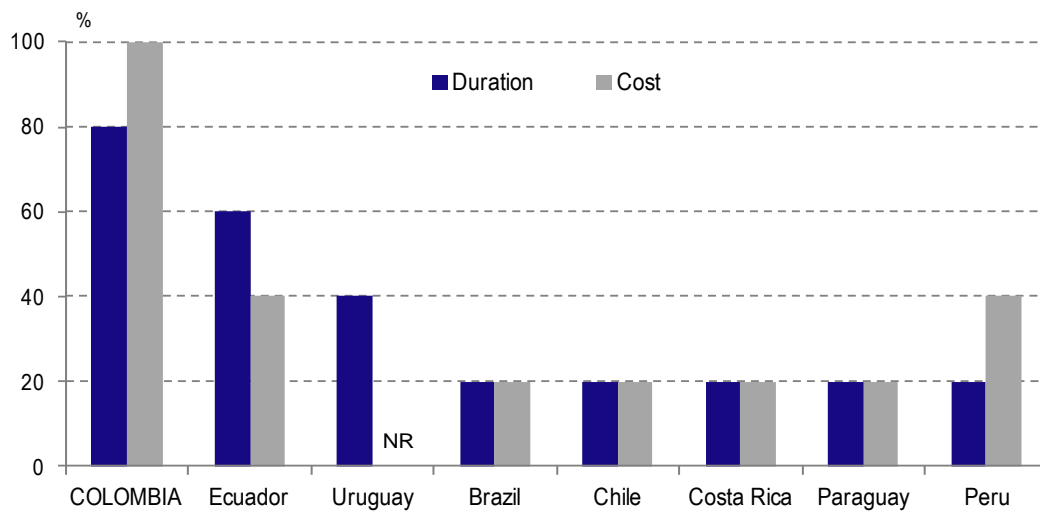


Notes: See Figure 1 for the question and scale regarding the design of the institutional framework in the transport infrastructure sectors. Policy makers evaluated the obstacles for effective co-ordination of multimodal transport (combined transport) policies according to the following options: 1= not important obstacles, 2= somewhat important obstacles, 3= very important obstacles.

Source: Authors' calculations based on a survey carried out in 2011 in Brazil, Chile, Colombia, Costa Rica, Ecuador, El Salvador, Mexico, Paraguay, Peru, the Dominican Republic and Uruguay to policy makers in the transport and infrastructure planning sectors.

Policy makers were also asked about possible problems in the different procedures and phases of the transport infrastructure cycle (*i.e.* prioritisation and planning, execution, maintenance and operation, monitoring and evaluation). They pointed out that Colombia's cycle as in many other Latin American countries, follows a coherent process, starting with the elaboration of a national development programme which determines multi-year investment plans. However, they highlight important deficiencies. To begin with, some ex-ante evaluations are not carried out, such as clearly setting priorities in Public-Private Partnerships (PPPs) projects or performing a public vs. private public works comparator. This affects the execution of policies evidenced, among other things, by high levels of renegotiation of PPP contracts with respect to other Latin American economies (Figure 3). In addition, the lack of an independent supervision and a transport maintenance evaluation programme have an impact on the execution and maintenance of transport policies. Finally, ex-post inaccurate evaluations at the executive level affect the accountability of transport infrastructure policies.

Figure 3. Renegotiation incidence of concession contracts in Latin America



Notes: The percentage refers to the proportion of contracts renegotiated, either for the duration or the cost of the project, out of the total number of concession contracts. NR stands for no response.

Source: Authors' calculations based on a survey carried out in 2011 in Latin America to policy makers in the transport and infrastructure planning sectors.

Since the survey presented above only covers policy makers' perception, it should be complemented with other surveys or analyses regarding the effectiveness of transport infrastructure policies. Economist Intelligence Unit (2010) analyses the PPP project cycle (*i.e.* project conception and spanning contract design, enforcement, supervision, termination and financing) in order to determine the capacity of governments to implement successful PPPs projects. Results from quantitative data and expert surveys show that Colombia ranked below Chile, Peru, Brazil, Mexico and Guatemala in the regulatory framework of PPPs (*i.e.* consistency and quality of PPPs, effective PPP selection and decision making, fairness and openness of bids, contract changes and dispute resolution mechanism). In terms of the institutional framework (*i.e.* institutional design, PPP contract, hold-up and expropriation risk), Colombia ranked below Brazil, Chile, Peru and Mexico. Finally, regarding the operational maturity (*i.e.* public capacity to plan and oversee PPPs, methods and criteria for awarding projects, regulators' risk allocation record, experience and quality of PPPs projects) Colombia ranked below Brazil, Chile, Mexico and Peru. In sum, the regulatory, institutional and operational aspects of Colombia's PPP programme compared rather inadequately with the PPP framework of most of the largest countries in the region.

Although the regulatory framework for PPPs has been enhanced recently, it is still early to test whether these changes have been successful in improving the outcome of road concessions. A new law dealing exclusively with PPPs was approved in December 2011, establishing clear limitations in both value and term of renegotiations and requiring value-for-money analysis to justify executing projects through a PPP instead of regular public procurement. In line with improvements in the regulatory framework, Colombian authorities recently improved the institutional framework of PPPs. The National Infrastructure Agency (*Agencia Nacional de Infraestructura*, ANI) was created to replace the National Institute for

Concessions (INCO), with greater administrative capacity and technical expertise in the design and monitoring of contracts. However, it is still too early to test whether these changes have been successful in reducing renegotiation and other inefficiencies of road concessions.

Given that the second hypothesis seems to explain the gaps in terms of quantity and quality of transport infrastructure in Colombia, this paper analyses the PMP of the transport infrastructure sector. Although there is already a rich and useful literature on Colombia's transport infrastructure sector, most of this research analyses specific issues of transport policies. This literature describes the institutional architecture and looks in particular at concessions. It presents how concessions work and points the major institutional and regulatory deficiencies (see Benavides and Fainboim, 2002; Engel *et al.*, 2003; Cárdenas *et al.*, 2006; Acosta *et al.*, 2008; Benavides, 2010; Econometría consultores, 2010; García Morales, 2010). The contribution of this paper is to analyse the transport infrastructure sector from a different angle: it studies the interactions between agents and institutions at each of the main steps of the transport infrastructure cycle.

The period studied (2000-2010) is relevant for at least four reasons. Firstly, it covers the last two government administrations (*i.e.* 2002-06 and 2006-10), which is also the period when the first presidential re-election took place in Colombia (The Constitution was changed in 2006, looking for policy continuity). Secondly, 2002 is the recovery year after the economic crisis that Colombia suffered in 1999, when annual GDP growth declined by more than 4.0%, the worst performance since the 1930 economic crisis. Thirdly, although the 1991 Constitutional reform was the biggest change in the rules of the game, we consider that the last decade represent a good period to analyse investment in roads. It was the largest period with only one Transport Minister and it was the period when the gap in roads infrastructure facing a Free Trade Agreement with the United States began to be considered for the design of public policy. Finally, this period is associated with an institutional reform that created the INCO and is when more than a half of the concessions have taken place.

In sum, within the context of transport PMP, the case of Colombia is an interesting one not only because there is a large infrastructure gap, given its GDP per capita, compared to other regions of the world (even more so than other Latin American countries), but also because that gap is not due to low levels of investment but rather due to bottlenecks in the PMP that makes transport infrastructure investment ineffective.

III. ACTORS AND INSTITUTIONS

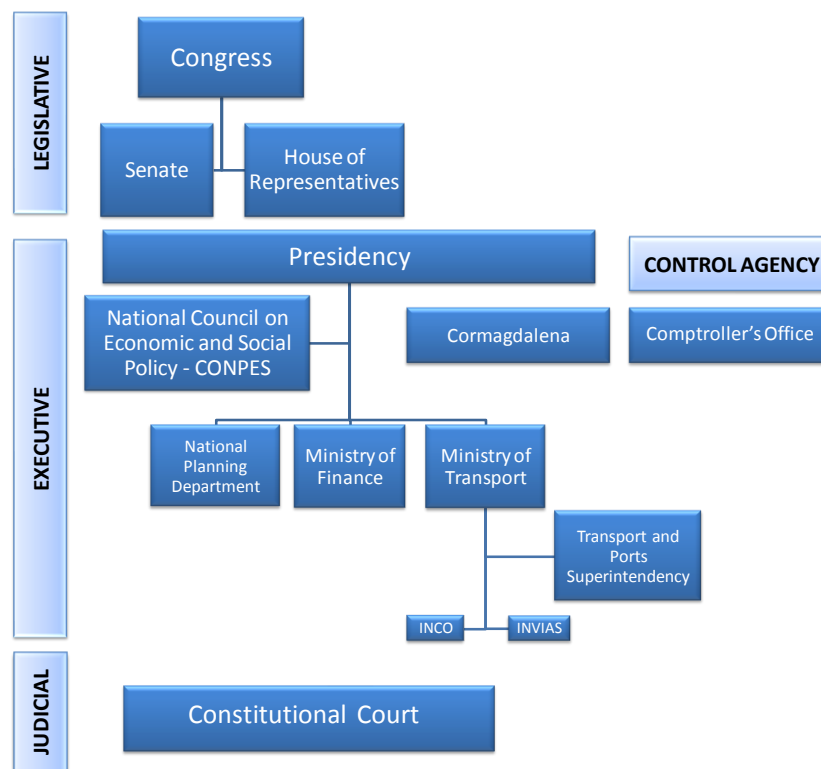
The political and economic decentralisation process in Colombia started at the end of eighties and beginning of the nineties. Today, regional governments (*i.e.* 32 departments and more than 1100 municipalities) have autonomy to manage their own public resources in coordination with national policies. In addition, sub-national governments receive, by constitution, transfers earmarked for education, health, and water and sanitation from central government.

The PMP of transport infrastructure involves the three levels of government in Colombia: central, departmental and municipal. Each level of government has the responsibility of construction and maintenance of their roads (Article 19 of the Constitution) and to fulfil their responsibility, each level of government is autonomous. Central government is in charge of investment in primary roads, including construction, expansion and maintenance; departments are in charge of investment in secondary roads and investments in tertiary roads are in hands of municipal governments.⁶

At each level of government, the institutional framework is similar. At the central level, the executive power prepares the budget; discuss it with the legislative power and a control agency -Controller Office- monitors fiscal policy performance. Within the executive power, as will be described below, different agencies are in charge of allocating and executing public resources for roads. The regional level – either departmental or municipal – has the same structure. A governor or a mayor, with secretaries (*i.e.* the equivalent to ministries at the national level) designs and executes regional roads policies and an assembly – at the departmental level – or a council – at the municipal level – approves the budget. A regional controller monitors fiscal policy performance. Figure 4 shows the different actors at the central government level.

6. Law 105/1993 establishes transport sector decentralisation and defines primary, secondary and tertiary roads as it follows: Primary roads integrate the major areas of production and consumption in the country, and from there to other countries. They include roads with traffic volumes higher than those serving up to 80% of the total road network; roads with predominantly north-south direction (called trunks), roads starting its course across international borders and end at Atlantic ports or international borders; roads that link trunks with each other, whose traffic volume is justified according to international trade; roads linking the capital of department with the national network; and roads related to national government commitments in response to agreements with foreign governments or international agreements. Secondary roads provide transport between two municipalities and the territorial roads between departments that are not part of the national network. Tertiary roads are urban, suburban roads and those owned by the municipalities.

Figure 4. PMP. Actors in road infrastructure policies at the central government level



Note: INCO refers to the National Concessions Agency (i.e. the acronym of *Instituto Nacional de Concesiones*), today the *Agencia Nacional de Infraestructura -ANI-*. INVIAS refers to the National Roads Agency (i.e. the acronym of *Instituto Nacional de Vías*).

Next sub-sections describe roles and responsibilities of national and sub-national government actors as well as private actors in the transport infrastructure sector.

III.1. National actors

The executive

The President

The Colombian government system is characterised as a constitutional presidency, with the concentration of power in the executive. The president is elected for a period of four years, and since 2006 he can be re-elected for a second immediate period.⁷ The President is the main agenda setter. He and his cabinet are responsible for defining public policy guidelines and to prioritise programmes and projects. These guidelines and priority programmes are partially defined in the government plan that each candidate for president must submit at the moment to

7. The case of Colombia is not isolated in Latin America. Latin American countries have experienced significant changes in the electoral rules over recent decades. Today, approximately two-thirds of Latin American political regimes allow a president to run for a second term, either immediately following the first one or after a set period of time (see Dayton-Johnson *et al.*, 2011).

register his candidacy. The most important issues of the government plan are developed in the National Development Plan (NDP), a technical document that includes programmes, projects and targets for the entire administration period (*i.e.* four years), and which by law must be presented to be discussed and approved by Congress during the first semester of each new administration.

The Department of National Planning (DNP)

The Department of National Planning (DNP) is the central government agency that co-ordinates with line-item ministries all activities related to formulation of national policies and public investment. By presidential delegation DNP must design the National Development Plan (NDP), which is, as mentioned above, the most important planning instrument. Related to the annual budget, DNP is in charge of allocating investment resources (*i.e.* capital expenditures) and of monitoring physical target performance.

- CONPES

The Economic and Social Policy National Council (*Consejo Nacional de Política Económica y Social – CONPES*) analyses and approves at the executive level economic and social policies, and co-ordinates agencies in charge of their implementation. It was created in 1958 (Law 19 of that year). This council is directed by the president and includes the full Cabinet of ministers and directors of DNP, Science, Technology and Innovation Administrative Department (Colciencias), National Statistics Administrative Department (DANE) and the Presidency Administration Department. The DNP Deputy Director is the Technical Secretary in charge of co-ordinating with all line-item agencies the design of economic and social policies.⁸

CONPES is considered to be one of the most important institutions regarding governmental planning, since it is in charge of co-ordinating and presenting written documents (*inter alia* about public investment) to be discussed by the central government.⁹ Nevertheless, its influence finally depends “on the relevance the President in turn grants, and on the political grip of the DNP director” (see Eslava and Meléndez, 2009).

The Ministry of Finance

The Ministry of Finance prepares an annual operational budget (generally estimated in an accrual basis), and adding to this operational budget the investment budget prepared by DNP, consolidates the central government annual budget and presents it to the Congress. The Ministry of Finance has also a Fiscal Support Direction (*Dirección de Apoyo Fiscal-DAF*), a department inside the Ministry that gives support to departments and municipalities on fiscal policy.

8. See Decree 2148/2009.

9. www.dnp.gov.co/PortalWeb/CONPES.aspx

- CONFIS

The National Council for Fiscal Policy (*Consejo Nacional de Política Fiscal* - CONFIS) is an agency under Ministry of Finance Direction, created in 1991 as a stage to co-ordinate fiscal policy making between DNP (in charge of capital expenditures allocation) and Ministry of Finance (in charge of operational expenditures allocation, consolidation of the annual budget and presentation and discussion with the Congress). It is presided by the Minister of Finance, the DNP director, the President Economic Advisor, the finance Deputy Minister, and directors of the General Direction of Treasury, Public Credit and Tax and Customs Direction. CONFIS also supervises public entities expenditures and approve multi annual expenditures (called "*vigencias futuras*") for infrastructure -for this study, roads- public projects.¹⁰ At the beginning, CONFIS had two advisors termed by the president. Today, CONFIS is part of macroeconomic policy department at the technical vice-ministry in the Ministry of Finance.

In sum, the Ministry of Finance and DNP are the two agencies in charge of resource allocation, the former for current expenditures and the latter for capital expenditures. In addition, the Ministry of Finance must consolidate, present and discuss the annual budget with the Congress, and monitors expenditures, while DNP designs and co-ordinates the National Development Plan, allocate investment resources to accomplish plan goals and monitors advances towards these goals. Two institutions inside these two agencies -CONPES and CONFIS- are in charge of co-ordination and design of public and fiscal policies.

The Ministry of Transport

The Ministry of Transport is in charge of the design and the implementation of transport policies, plans, programmes, projects, and technical regulation of transit and transport among road, sea, river and rail modes.¹¹ It also has an important role in co-ordinating transport policies and projects among different entities and levels of government. According to its mission statement, the Colombian Ministry of Transport is responsible for developing and improving transport, transit and infrastructure systems in an integral, competitive and secure manner and therefore integrating regions. Under guidance of the Ministry of Transport, for road policy implementation *Instituto Nacional de Concesiones -INCO-* (today the *Agencia Nacional de Infraestructura -ANI-*) and *Instituto Nacional de Vías -INVIAS-* are in charge of concessions and public roads construction, respectively.¹² In addition, for Magdalena river, the most important river that crosses Colombia along more than 1 500 km, there exists *Cormagdalena*. Finally, for air transport, there is *Aerocivil*.

INVIAS

National Roads Institute -INVIAS- is in charge of construction, extension and maintenance of the non-concessional transport infrastructure. This agency was founded in 1992

10. See Decree 111/1996 or Organic Budget Law.

11. See Decree 2053/2003.

12. www.mintransporte.gov.co/portal/page/portal/mintransporte/ministerio/presentacion

(Decree 2171), restructuring the National Road Fund (*Fondo Nacional de Vías*), and was created for the elaboration of national projects and programmes for the construction of a road network; execution of national road infrastructure policies and projects. Ten years later, INVIAS was reformed. The National Development Plan 2002-2006 included within its tasks the implementation of canals to sea ports, fluvial and railroad transport policies. In 2003, the National Fund of Local Tracks (*Fondo Nacional de Caminos Vecinales*, in charge of tertiary roads) was eliminated and its tasks were transferred to INVIAS (Decree 1790). In sum, while each INVIAS restructuring has created new responsibilities, it has not included the changes in its administrative structure, the increases in its budget and staff, or the improvements in the technical qualification of their officials that such added responsibility calls for.

INCO and ANI

The National Agency for Concessions -INCO- was created in 2003 (Decree 1800) and it was a national agency in charge of planning, structuring, contracting, executing and managing transport infrastructure financed with private capital participation.¹³ The INCO identified and suggested projects for private capital initiatives in order to develop national infrastructure and related services. Moreover, it designed technical, legal and financial structure plans, and prepared, evaluated and negotiated investment projects, in accordance with the Ministry of Transport's guidelines and performed studies regarding the profitability of the concessions.¹⁴

Since its creation, the institutional design of INCO was strongly questioned (Benavides, 2010; García Morales 2010; Econometría consultores, 2010), as it performed at the same time functions related to projects structure, allocation and monitoring, producing an overlapping of responsibilities and conflict of interests, or, at least, perverse incentives. Since its creation, this agency had 18 directors, of which 8 were acting directors. These later stayed in total close to 20 months from the INCO creation. In sum, INCO had more than two directors per year since its creation. This is a signal of low stability in an agency that was often confronted by corruption scandals.¹⁵

Colombian authorities recently improved the institutional framework of PPPs. The National Infrastructure Agency (*Agencia Nacional de Infraestructura*, ANI) was created to replace the INCO, with greater administrative capacity and technical expertise in the design and monitoring of contracts.

Cormagdalena

The *Corporación Autónoma Regional del Río Grande del Magdalena – Cormagdalena* is a national agency restricted on the Magdalena River and *Canal del Dique* that engages itself with four main issues. Its objectives are to recover port activity and navigation on the Magdalena River, the adequate use of land, energy generation and distribution and the sustainable use and

13. Even though INCO was created in 2003, road concessions began to be implemented in Colombia in 1994.

14. www.inco.gov.co/CMS/Acerca-de-Nosotros-INCO.page.

15. In fact, nine directors were under investigation, although none of them has been found guilty.

preservation of Colombian natural resources (environment, fish, renewable natural resources). Moreover, it has administrative, budget and financial autonomy in the neighbouring departments of the Magdalena River and *Canal del Dique*.¹⁶ The Constitution defines *Cormagdalena* mandate, in which it is an autonomous public corporation independent of the Ministry of Transport. Its executive board consists of policy authorities neighbouring this river (*i.e.* 6 majors, 3 governors), staff of the executive sector (*i.e.* president delegate, deputy-ministers or ministers of Agriculture, Energy, Environment, Trade and Transport, and Ecopetrol – Oil national company- president), and one representative of the private waterway transport sector.¹⁷

Ports and transport superintendency

Ports and Transport Superintendency is an agency subordinated to the Ministry of Transport, in charge of monitoring, inspection and control of transport infrastructure. It was created first as Ports Superintendence in 1991 (Law 1) when the government began port concessions, and since 2000 it was converted into Ports and Transport Superintendency with an extension of its scope to all types of transport in public services (*i.e.* air, land, rail, sea and river concessions). However, the Superintendency only monitors the financial solvency of concessionaries, rather than the concessionaries' execution of the projects or their compliance to their goals and commitments.

The legislative power

The legislative branch is a bicameral organ consisting of the Senate and the House of Representatives with 102 and 166 members, respectively. Senators and Representatives are elected every four years in a direct election and have the possibility to be re-elected.¹⁸ There have to be at least two members from each department in the House of Representatives that are directly determined in a popular election at the departmental level and correspond to 161 representatives. The remainder are representative of Afro-colombian and indigenous communities, citizens residing abroad and political minorities.¹⁹ The Congress elaborates laws (in a cycle of four debates), monitors and restricts the executive branch in its decision making power. Furthermore it reforms the Constitution (in a cycle of eight debates) and chooses the representative of the General Comptroller's office (*Contralor General de la República*), among others.²⁰

The overall work of the Congress is divided in two steps: In the first phase, ideas are elaborated in the commissions, for the second phase all members of Congress come together to discuss in a plenary. For a law to be ratified an absolute majority is needed if the law relates to the Constitution; for decrees and laws that grant amnesties a qualified majority of two thirds is mandatory; only simple majority is required in all the other decisions of the Congress

16. www.cormagdalena.com.co/.

17. See Article 331 of the Constitution and Law 161 of 1994.

18. Colombian Constitution, Article 114 (1991).

19. Title VI of the Constitution and Law 5 of 1992.

20. www.camara.gov.co/.

(Universidad de Los Andes, 2005). Although it is stated in the law that the President and his cabinet are leading in policy making initiatives, Congress plays an important role in the process of implementation where “presidential decree is not sufficient” (Eslava and Meléndez, 2009).

Out of the seven permanent commissions, the Sixth Commission is responsible for transport (amongst other areas of responsibility). It consists of 18 members who discuss bills such as the promotion and implementation of an electric traction transport technology provided through the Law 23/2010 (act 11/2010), legislation modifications such as destination of fines collected on national roads in Law 769/2002 (act 7/2010) or regulations regarding concessions (Devinorte, Zipaquirá- Ubate and BTS in acts 12/2010, 13/2010 and 14/2010 respectively).²¹

The judicial power

The principal court related with the PMP of transport sector is the Constitutional Court. It includes nine judges, who are appointed for individual terms of eight years by the Senate, the President, the Supreme Court of Justice and the State Council and cannot be re-elected. No other branch of the government has the right to appeal the Court’s decision; hence it is the ultimate instance in questions regarding the Constitution. Constitutional court must check new legislation consistency with the Constitution, including NDP (that becomes a law after discussion with Congress) and Annual Public Budget. One of the most criticised decisions made by the Constitutional Court in the transport sector regards the scope given to *Cormagdalena*.

Comptroller’s Office

The General Comptroller’s Office overviews public spending and performs ex-post control of agencies that execute policies, looking for efficient use of public resources. It is one of the most independent and autonomous agencies in the central government. The agency delivers technical support to the National Congress in terms of political control and the development of the legislative function. Its aims are micro- and macroeconomic control, fiscal responsibility and civil participation.²²

III.2. Sub-national actors

Regional institutions that prepare and implement sub-national (*i.e.* departments and municipalities) policies have a similar structure.

Colombia is divided administratively and geographically in 32 departments; a Governor is elected for a four-year period (three before 2004), with no possibility of re-election.²³ After elected, she chooses a cabinet equivalent to the central government that includes a Secretary of Planning, in charge of designing the Departmental Development Plan and allocating capital expenditures; a Secretary of Finance, equivalent to the Minister of Finance at the national level, and the Secretary of Infrastructure (or transport) in charge of designing and implementing transport policies. The Departmental Assembly (*Asamblea Departamental*) is similar to the legislative power at the national level. This assembly is elected on the basis of a public voting, it

21. http://camara.gov.co/camara/site/artic/20080811/asocfile/actas_2010.htm.

22. See Colombian Constitution (Articles 119 and 267 of 1991) and Decree 267 of 2000 (Article 35).

23. See Constitution, Articles 298-310, 1991.

has administrative autonomy and its own budget. There can be no less than 11 and no more than 31 deputies in the assembly who are each elected for a period of four years in regional elections, with the possibility to be re-elected. The Departmental Assembly approves the Departmental Development Plan proposed by the Governor and then investment projects and their budget are discussed and approved in an annual basis.

On the second level, each of the 32 departments in Colombia is administratively subdivided into various municipalities. Colombia has more than 1 100 municipalities, classified in 7 groups (Law 617 of 2000) depending on population and non-earmarked current income.²⁴ At the municipal level, a mayor is elected for a four year period and he can also convene a cabinet of secretaries. The equivalent for the departmental assembly on the city level is the municipality council (Concejo Municipal). Municipalities must have also a Development Plan.

By Law, Departmental and Municipal Development Plans must be co-ordinated with the National Development Plan. According to Law 152 of 1994, or Organic Planning Law, Departmental and Municipal Plans should be coherent with national policies defined in the national development plan (Article 32). The purpose of this co-ordination in the infrastructure transport sector is to have a comprehensive approach of transport policies. For instance, in the case of roads, primary (defined mainly by the National Development Plan), secondary (defined mainly by the Departmental Development Plan) and tertiary (defined mainly by the Municipal Development Plan) roads should be articulated.

III.3. Private actors

Private sector is involved in the execution and maintenance infrastructure stages, both in concessions and in public infrastructure, although under a different framework. The most important actors are Concessionary Conglomerates and the Infrastructure Association (*CCI* or *Cámara Colombiana de Infraestructura*).

The Colombian Chamber of Infrastructure is an industrial association looking to play a role in transport and roads public policies design. This union is also engaged in the surveillance of correct use of public resources for infrastructure investment. It was created in 2003 as a merge of the Colombian Association of Construction Engineers (ACIC), the Colombian Association of Engineering and Consulting Firms (AICO), the Association of Consultants of Colombia (ASCOL) and the Colombian Association of Infrastructure and Service Concessionaries (CONCESIA). The CCI has three Committees (General, Constructors and Providers, Consultants and Providers, and Concessionaries).

Most of the road concessionaries are local firms. The participation of the three most important stakeholders per concessionary is in average 85% of the total stakeholders. In particular, the leading firms are *Concay S.A.*, *Concreto S.A.*, *Mincivil S.A.*, *ODINSA S.A.* and *Solarte S.A.*; each one of these firms has participated in at least four concessions.

In sum, a variety of actors interact in the transport PMP. At the national level, in the executive power the Ministry of Finance and the Department of National Planning are the agencies in charge of resource allocation. The Ministry of Transport designs transport policies,

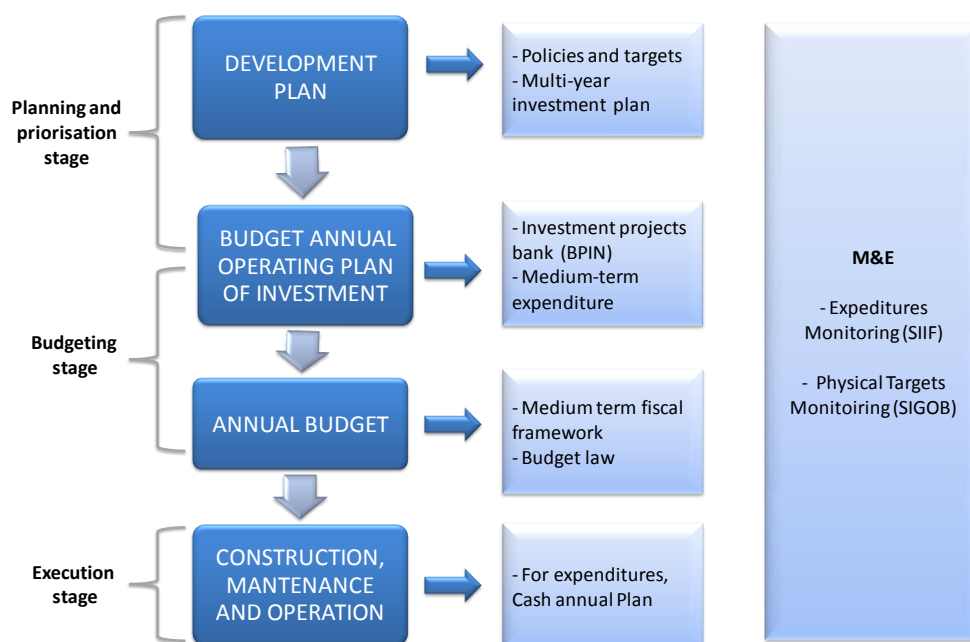
24. 917 municipalities are in the sixth group, municipalities with less than 10 000 inhabitants.

and INVIAS and INCO (today ANI) implement them for public roads and for concessions, respectively. In addition, ports and transport superintendence is in charge of monitoring financial solvency of concessionaries and compliance with good service for users. At the legislative level, Senate and House of Representatives approve planning and budgeting stages, the first one through the National Development Plan, the second through the annual budget. In addition, legislative plays an accountability role to the executive. A similar process happens at the regional levels, at the departmental level with a governor, her cabinet and the assembly, and at the municipal level with a mayor, his cabinet and the municipal council. Accountability agency – *Contraloría* – controls fiscal policy performance. Finally, several private actors, the majority of organised in the *Cámara Colombiana de la Infraestructura*, participate in construction and maintenance of transport infrastructure.

IV. PMP. STAGES AND RULES OF THE GAME

We divide the cycle of this public policy in four phases: *i*) planning and prioritisation; *ii*) budgeting; *iii*) execution; and *iv*) monitoring and evaluation. This last phase goes along the three initial phases, beginning with the definition of targets in the planning and prioritisation stage and closing the cycle by generating performance information for a new cycle. Figure 5 exhibits the main stages and tools in the transport infrastructure sector.

Figure 5. PMP. Stages and tools



Note: BPIN refers to the Investment Projects Bank (*i.e.* the acronym of *Banco de Programas y Proyectos de Inversión Nacional*), SIIF refers to the Ministry of Finance's resource monitor tool (*i.e.* the acronym of *Sistema Integrado de Información Financiera*) and SIGOB refers to the DNP monitoring development plan targets performance (*i.e.* the acronym of *Sistema de Gestión y Seguimiento a las Metas del Gobierno*).

In Colombia the planning stage begins for each new administration with the National Development Plan. The Development plan includes policies and targets for each administration period (*i.e.* four years) and public resources are included in the multi annual investment plan. The National Development Plan is regulated by Law 152/1994 or development plan organic law. Since the 1991 constitutional reform, the National Development Plan must be presented and discussed with the Congress and is approved as a Law. This implies two different political economy stages, one technical, inside the executive, between the Department of National

Planning (DNP) as co-ordinator of the Plan, the Ministry of Finance and line-item ministries. A second is political, when the Plan is discussed in the Congress.²⁵

To execute development plan targets, public budget must be prepared in an annual budget process. In the NDP, central government targets are consistent with resource allocations and with macroeconomic variables in the Multiannual Investment Plan. The NDP is executed based on annual allocations through the annual budget process. Capital expenditures are prepared based on ex-ante evaluated projects that must be included in the Investment Projects Bank (*-Banco de Programas y Proyectos de Inversión Nacional- BPIN*) by each line-item Ministry. The BPIN is the DNP tool to prioritise in an annual basis investment projects. Projects must be consistent with the NDP goals. Since 2006, a multi-annual tool was designed: the Medium Term Expenditure Framework.²⁶ This tool distributes by functional sectors macroeconomic consistent investment resources that are forecasted in the Medium Term Fiscal Framework for the following four years and is revised each year in a roll-over basis.²⁷ Medium Term Expenditure Framework is the DNP tool to ask line-item ministries to prioritise on a four-year basis. Using these tools, DNP prepares the Annual Operating Plan of Investment (POAI), document that the Ministry of Finance uses for the making of the annual central government budget and which it is consistent with fiscal stance and macroeconomic consistency estimated by Ministry of Finance macroeconomic models.²⁸

The Ministry of Finance prepares operational budget and debt service, consolidates the budget proposal adding capital expenditures prepared by DNP and presents it to Congress. In Congress, the Third and Fourth commissions receive the proposal, and in sequence approve first the total amount and then the distribution between sectors and regions. Then, the budget proposal goes to plenary and is approved. If it is not approved, the president can approve it by decree. This gives to the president a *de jure* agenda power.

In terms of legislation, the main law that regulates the budget process is the Organic Budget Law, or Decree 111/1996.²⁹ However, some additional rules have been added to the budget process: *i*) the Fiscal responsibility Law, which among other issues includes the Medium Term Fiscal Framework and *ii*) the Decree 4730/2005 that includes, among other issues, the Medium Term Expenditures Framework. Also, it is important to highlight that the planning stage of the development plan is regulated by another law, the organic development plan law.

Then, the budget is executed in an annual basis by line-item Ministries (such as the Ministry of Transport) and decentralised agencies (such as INVIAS). In this stage, the Ministry of

25. During its design, DNP presents and discusses the plan to different actors at both national and regional levels. The Plan must be discussed with the National Plan Council that includes regional and union's representatives before it is presented to Congress.

26. Decree 4730/2005.

27. Medium Term Fiscal Framework (MTFF) is a multiannual tool included in the Fiscal Responsibility Law, or Law 819/2003. MRFF is prepared by the Ministry of Finance.

28. The Ministry of Finance has another important tool for the budget process: the Financial Plan. This document is based on a static macroeconomic model and is the basis for the annual budget consistency with macroeconomic goals.

29. Decree 111 of 1996 consolidates Laws 38/1989, 179/1994 and 225/1995.

Finance monitors resource-use with a financial tool called *-Sistema Integrado de Información Financiera* or *SIIF*- and the DNP monitors development plan targets performance with a physical target tool called *-Sistema de Gestión y Seguimiento a las Metas del Gobierno* or *SIGOB*. The SIGOB monitors advances of NDP physical targets. Additionally, a performance document of the NDP must be presented to the Congress every six months (by Law 152 of 1994, or Organic Law of Planning).

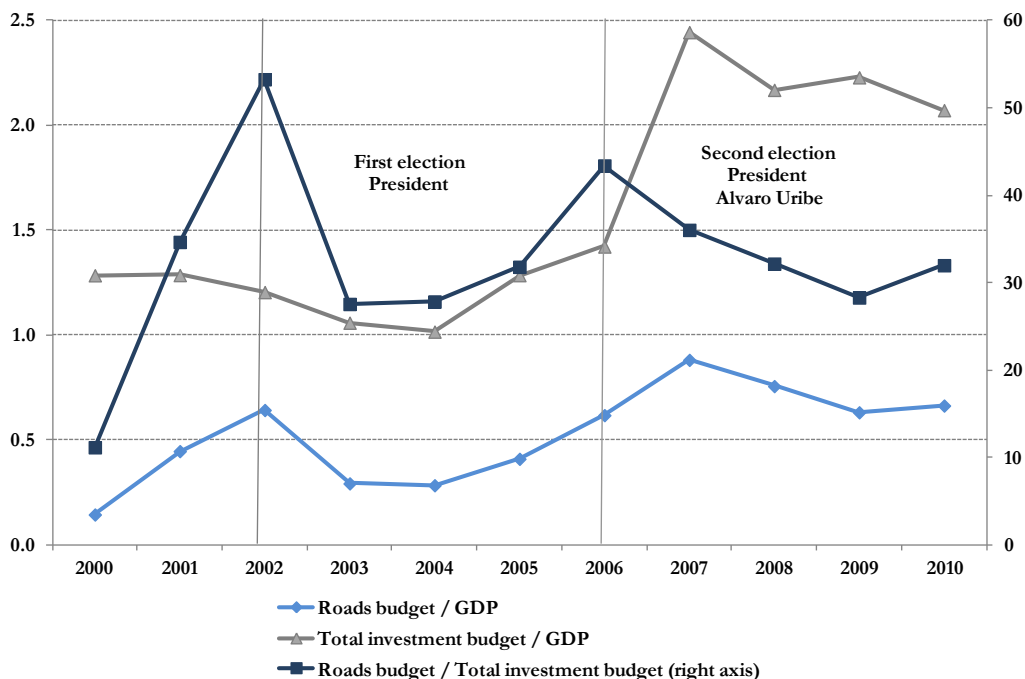
In a nutshell, PMP is designed in several stages. In particular, planning and prioritisation begins with the National Development Plan and continues with the prioritisation in the annual budget; then, a budget proposal is discussed and approved in Congress, and budget is executed by line-item agencies and monitored by the Finance Ministry and DNP. These stages are regulated by several laws.

V. THE TRANSPORT PMP IN ACTION

This section analyses transport PMP during the last decade (2000-10). The first NDP of the decade was approved in 2002, after President Alvaro Uribe was elected for the period 2002-06. The second one was approved after President Uribe was re-elected for the period 2006-10. Between these two periods a Constitutional reform included presidential re-election that was banned before. Consequently, we analyse two presidential periods that, in principle, looked for policy continuity, especially related to the “democratic security” policy to give priority to the internal conflict with guerrillas and paramilitaries.

Figure 6 shows total public investment over GDP, public roads investment over total public investment and public roads investment over GDP for the period 2000-2010.

Figure 6. Roads investment 2000-10



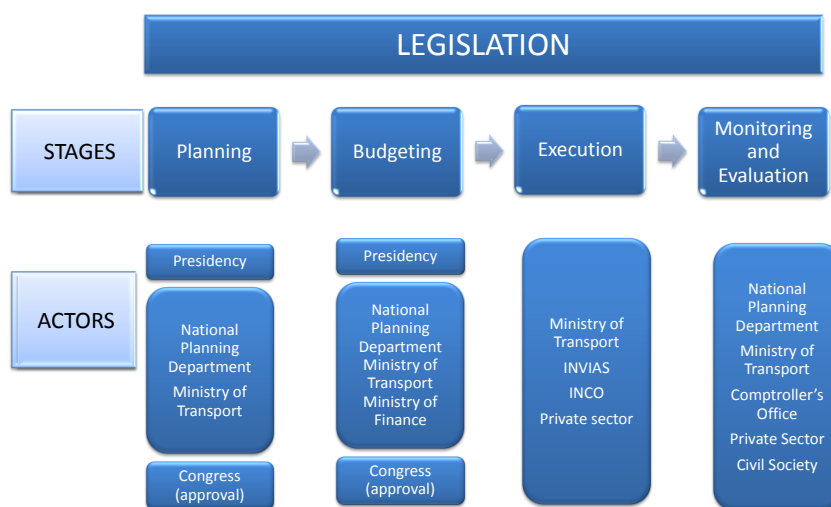
Source: Authors' calculations based on Ministry of Finance and Central Bank (*Banco de la República*) databases.

As percentage of GDP, central government investment in primary, secondary and tertiary roads increased from 0.1% in 2000 at the end of the economic crisis to hit a peak of 0.9% in 2007. Roads public investment over GDP represents 0.7% in 2010 and 0.5% is the average for the decade. It constituted, on average, 32.6% of total public investment, varying from a low of 11% in

2000 to a high 53% in 2002. In 2010, 32% of public investment is used in roads. Finally, public investment per year represented on average 1.6% of GDP during last decade, with a structural change between 2006 and 2007, after the re-election of president Alvaro Uribe. Between 2000 and 2006 public investment was on average 1.2% of GDP, and between 2007 and 2010 it was 2.2%. In a nutshell, investment in roads increased in the last two presidential terms. However, this increase was not proportional to the total increase in public investment over GDP.

Figure 7 summarises the PMP of public investment on roads. This structure helps to analyse the interactions between different actors in each of the stages.

Figure 7. PMP for public transport infrastructure policies



Note: INVIAS refers to the National Roads Agency (i.e. the acronym of *Instituto Nacional de Vías*) and INCO refers to the National Concessions Agency (i.e. the acronym of *Instituto Nacional de Concesiones*), today the ANI (*Agencia Nacional de Infraestructura*).

V.1. Planning and prioritisation stage

The period 2002-06

The National Development Plan 2002-2006 includes the impulse to strategic transport infrastructure as part of the objective of sustainable economic growth and employment. The main targets presented were: *i)* to decrease transport costs; *ii)* regional integration, especially between consumption and remote regions; and *iii)* reduction of traffic accident index. For these purposes, NDP strategies were: *i)* to increase investment; *ii)* institutional changes; *iii)* regulation strengthening; and *iv)* consolidation of private participation schemes that include maintenance and concessions, and the inclusion of institutional investors; finally, the participation of civil society in tertiary roads investments.

Close to five months passed between the NDP proposal presented to the Congress and its approval.³⁰ We classify in five groups the main changes between what the executive proposed

30. This NDP has been presented to the Congress as Law proposal 169/2003 of 6 February and approved as Law 812/2003 of 26 June.

and what Congress approved in the NDP. First, although the total amount for road investment only decreased 0.56%, regional distribution of roads investment varied significantly. The two extreme cases are Atlantic Coast and Amazonia regions. In the former indicative allocation of resources increased 15%, while in the latter resources decreased 21% (Table 1).

Table 1. Regional distribution of road investment

Investment Plan 2003-2006 (in 2002 million Colombian pesos [COP])

Region	Proposal	Law	Difference (%)
Atlantic Coast	1 387 467	1 600 014	15.32%
Western	2 549 227	2 416 296	-5.21%
Central-Eastern	3 877 862	3 780 383	-2.51%
Orinoquia	1 871 906	1 850 986	-1.12%
Amazonia	94 710	74 690	-21.14%
Bogota	711 422	702 016	-1.32%
National Level	19 885 718	19 782 665	-0.52%
Total	30 378 312	30 207 051	-0.56%

Note: The exchange rate USD-COP was on average 2507.96 in 2002.

Source: Authors' calculations based on DIFP-DNP database.

Second, Congress approved the distribution of an additional amount equivalent to close to USD 400 million.³¹ This distribution was done under equality criteria.³² In that context, we observe a positive relationship between this distribution and GDP. In terms of GDP per capita, the most important regions in the country (*i.e.* Antioquia, Bogotá and Valle del Cauca) receive a larger amount than smaller regions (*i.e.* Amazonas, Chocó, Putumayo and Vaupés), with Casanare as an outlier due to its royalties income (Figure 8).³³

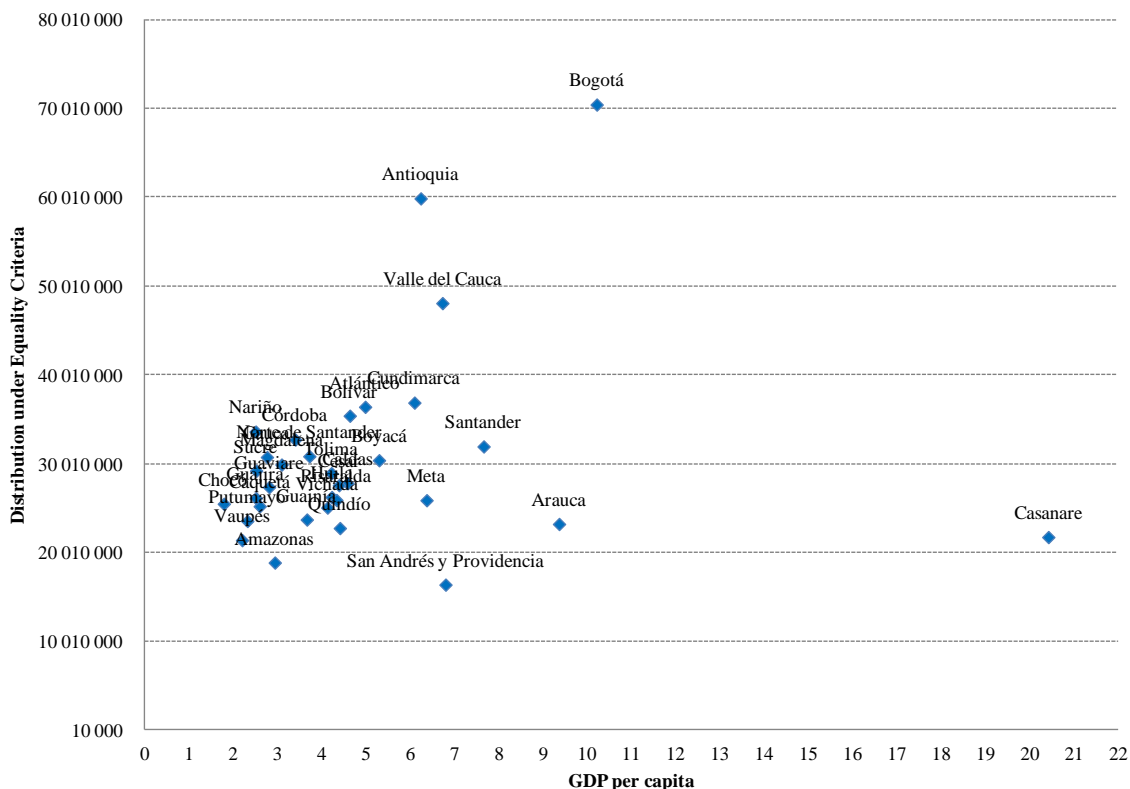
Third, Congress included specific projects such as central government support to construct, under concession, a road in Bogotá and several municipal transport systems (*i.e.* *Sistemas de Transporte Masivo*) in Cúcuta and Ibagué. Fourth, some regional projects are included, such as the construction of 5 000 kilometres of tertiary paved roads and the support to end specific projects such as the road Bolívar-La Manza-Quibdó.

31 See Article 6, Law 812/2003.

32 The logic behind equality criteria is not that the consequences are the same for any action, but that the details of the consequences are decided upon individually in proportion to the preceding action. Therefore in many civil legal systems we can find a grey zone which leaves space for discrete reasoning by the responsible authorities (as it is found in many articles regarding road infrastructure legislation of the Colombian Constitution of 1991).

33 See Perry and Olivera (2009) for the impact of royalties on regional development in Colombia.

Figure 8. Distribution under equality criteria vs GDP per capita



Note: Data is on 2002 million Colombian pesos.

Source: Authors' calculations based on Law 812/2003 and National Administrative Department of Statistics (DANE - Departamento Administrativo Nacional de Estadística -).

Finally, a list of concessions is included for primary roads (Table 2). It is important to notice that this National Development Plan was approved before INCO creation (*i.e.* the agency in charge of concessions).

Table 2. Concessions included in the NDP 2002-06

- Briceño - Tunja - Sogamoso
- Bogotá - Girardot
- Pereira - Cartago - Honda
- Concesión de Santander
- Concesión del Sur (Nariño y Sur del Cauca)
- Girardot - Ibagué
- Bogotá - Honda - La Dorada
- Extensión Valle de Aburrá - Oriente
- Concesiones menores en asocio regional
- Garantías Contingentes
- Interconexión Rutas 90 - 90A

Source: Law 812/2003.

The period 2006-10

National Development Plan 2006-2010 included transport sector development as part of the strategy for poverty reduction, employment and equality strategies, especially in the area of “friendly cities”, an urban policy scheme that included *Sistemas de Transporte Masivo*, and in the strategy of growth and sustainability, in particular for regional development. In this area, the objective of transport sector was to reduce transport time and costs between rural areas and cities, through maintenance and improvement of existing infrastructure. The NDP 2006-2010 proposed three objectives for transport sector: *i*) infrastructure improvement for competitiveness; *ii*) regional integration; and *iii*) development of transport transfer nodes (*i.e.* rails, rivers as transport alternatives, port development, and expansion of air transport, among others), and three specific programmes: *i*) development of concessions for competitiveness; *ii*) development of regional roads connection with national roads for competitiveness; and *iii*) support to regional governments for road investment.

Almost 2 months passed between the NDP proposal presented to the Congress and its approval.³⁴ We divide in two groups the differences between what the executive proposed and what Congress approved. First, there is a different distribution among regions. Table 3 shows that although the total amount remained constant, central-eastern region resources decreased and these resources were transferred to Bogota.

Table 3. Regional distribution of road investment

Investment Plan 2007 - 2010

(in 2006 million Colombian pesos - COP -)

Region	Proposal	Law	Difference (in %)
Amazonia	459 500	459 500	0%
Bogotá	545 853	1 692 054	210%
Central-Eastern	5 682 825	4 536 624	-20%
Atlantic Coast	5 509 690	5 509 690	0%
Western	4 602 814	4 602 814	0%
Orinoquia	680 854	680 854	0%
National Level	4 188 756	4 188 756	0%
Total	21 670 292	21 670 292	0%

Note: The exchange rate USD-COP was on average 2357.98 in 2006

Source: Authors' calculations based on DNP data

Second, Congress included a list of 59 strategic corridors, divided in 37 regional roads, 11 competitiveness roads and 11 dual carriageways (see Annex 3).

There are two key differences between the two development plans described above. First, the NDP 2006-2010 targets and base lines by strategy and investment project are included. During the first Uribe administration, the SIGOB tool to monitor NDP targets was designed and implemented at DNP, allowing the second NDP to include targets whose performance could be

34 This NDP was presented to the Congress as Law proposal 201/2007 in June 2 and approved as Law 1151/2007 of 24 July.

monitored. Second, the agency in charge of road concessions - INCO - was created in 2003. This could explain that in the second NDP concessions are not included. However, since the INCO was the public executor actor of concessions, its involvement in the planning stage created conflict of interests and not “value for money”.

In sum, the most relevant inefficiencies at the prioritisation and planning stage in the last decade are the following:

1. Although the transport sector decentralisation legislation defines three types of roads (primary, secondary and tertiary) and responsibilities among different level of governments (central government, departments and municipalities, respectively) for each type, NDP includes investment for the three types of roads. In order to be consistent with transport legislation, only primary roads should be included in the NDP, and secondary and tertiary roads in the Departmental Development and the Municipal Development Plans, respectively.

It shows a lack of coherence between decentralisation policies and national planning policies. The Congress has an impact on the planning of transport infrastructure regional policies without (necessarily) any involvement of local authorities. It reveals a lack of co-ordination between national actors (*i.e.* executive and legislative) and sub-national actors (*e.g.* governors, majors, departmental assembly and municipality council members) at the prioritisation stage.

2. The Congress included in the first NDP (2002-2006) road concessions that were not considered in the proposal.

There is no mention regarding the analysis carried out to determine concession roads. In that context, concessions prioritisation seems to be influenced more by the expected revenues (*i.e.* tolls in highways) or political pressure (*i.e.* Congress) than by “Value for Money” analysis which helps to decide between public and PPPs works.

3. NDPs include ambitious plans for regional roads. The NDP 2002-2006 includes a large plan for tertiary roads (*i.e.* 5 000 kilometres of tertiary paved roads) and NDP 2006-2010 includes specific projects and regional roads. The Congress has incorporated these projects once executive submitted to the Congress. Indeed, the executive has not been involved in any ex-ante evaluation or social pre-feasibility analysis in order to plan and prioritise these works.

V.2. Budget preparation, discussion and execution stages

As it is explained in Section 4, the annual budget is prepared by the DNP and the Ministry of Finance in co-ordination with line-item ministries, and the Ministry of Finance presents it and discusses it with Congress. Table 4 shows different classifications of transport budget for the three presidential periods analysed in last decade: 2000-02, 2002-06 and 2006-10. Roughly, they correspond to the second last years of president Pastrana, and first and second term of president Uribe, respectively.³⁵

35 It is worth to notice that fiscal term begins for each administration one year after the election.

Table 4. Transport sector

Budget proposal and budget law – Budget average per presidential term

	2000-02	2003-06	2007-10
Budget law/Budget proposal			
Total amount	42.9%	60.4%	31.3%
Construction	-4.5%	-0.2%	-0.9%
Maintenance	2.6%	69.4%	10.5%
Budget proposal participation			
Construction	37.9%	14.7%	24.0%
Maintenance	56.5%	72.6%	62.9%
Other	5.6%	12.6%	13.1%
Budget law participation			
Construction	33.3%	14.5%	23.1%
Maintenance	59.1%	69.4%	52.3%
Other	7.6%	16.1%	24.6%

Notes: "Other" category includes pre-investment studies.

Source: Authors' calculations based on Budget Data.

Transport budget has increased substantially between discussion and approval stages with the Congress for the three periods presented above. The largest increase took place during President Uribe first term, when roads budget increased by more than 60%. Even the lowest average increase (2007-10) was large at 31.3%.

Resources for road maintenance participate more than for construction, both in the budget proposal and in the budget law. During the period 2000-2002 maintenance participated 56.5% in the proposal and increased to 59.1% in the budget law. During the first period of president Uribe maintenance reached 72.6% in the budget proposal and 69.4% in the budget law. For its second term, maintenance participated 63% in the proposal and 52.3% in the budget law.

INVIAS is the most important agency in the transport sector. Table 5 shows that, both in the proposal and in the final budget, INVIAS participation is above 68% of the total budget. Budget law data shows also that although secondary and tertiary roads are in hands of sub-national governments, central government through INVIAS invests a high percentage in these roads. 46% of INVIAS budget is allocated for maintenance in secondary and tertiary roads during the last two years of Pastrana administration, and in the first and second term of president Uribe this figure reached 35 and 26%, respectively.

INVIAS budget confirms that more resources are allocated for roads maintenance. More than 60% is allocated to maintenance for the three periods studied. During the first term of president Uribe maintenance budget corresponded to 77% of total transport budget, while construction corresponded to 18%.

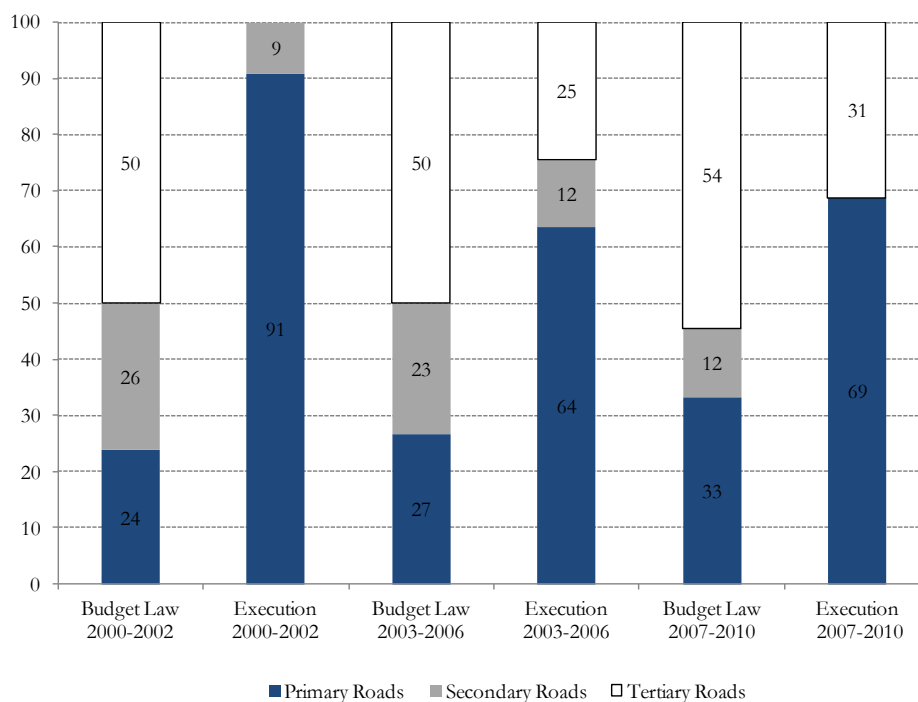
Table 5. INVIAS budget law

	2000-02	2003-06	2007-10
INVIAS budget /Transport budget	70%	81%	76%
Total construction	31%	18%	29%
Primary roads	14%	7%	11%
Secondary roads	1%	1%	0%
Tertiary roads	15%	8%	12%
Other	2%	2%	6%
Total maintenance	60%	77%	67%
Primary roads	5%	9%	10%
Secondary roads	20%	13%	7%
Tertiary roads	26%	22%	23%
Other	9%	32%	27%
Other	9%	5%	4%

Source: Authors' calculations based on Ministry of Finance (Budget Data).

We note considerable differences when we compare the budget approved to the execution done by INVIAS (Figure 9). In particular, primary roads investment increases considerably with respect to the budget approved during the three periods considered (i.e. 2000-02, 2003-06 and 2007-10). Moreover, since 2002 we observe a re-distribution among types of roads at the execution stage. Although primary roads investment continues to be the most important, from 2002 to 2004, secondary roads investment increases in comparison to previous years, and from 2005, tertiary roads investment increases their participation.

Figure 9. INVIAS budget and execution 2000-10 (%)



Source: Authors' calculations based on the Ministry of Finance.

We observe inconsistencies between concessions included in the NDP and those implemented (Table 6). In particular, we note changes in the design of concessions included in the NDP, concessions planned that were not executed or concessions executed that were not planned.

Table 6. Concessions included in NDP 2002-06 vs. Concessions executed

Concessions included in NDP 2002-2006	Concessions executed
Briceño - Tunja - Sogamoso	Briceño - Tunja - Sogamoso*
Bogotá - Girardot	Bosa - Granada - Girardot
Pereira - Cartago - Honda	Pereira- La Victoria
Consección de Santander	Zona Metropolitana de Bucaramanga
Concesión del Sur (Nariño y Sur del Cauca)	Rumichaca - Pasto - Chachagüi - Aeropuerto
Girardot - Ibagué	Girardot - Ibagué - Cajamarca**
Bogotá - Honda - La Dorada	
Extensión Valle de Aburrá - Oriente	
	Córdoba - Sucre
	Ruta Caribe**
	Área Metropolitana de Cúcuta**

Notes: * refers to a concession started before the NDP 2002-2006 (July 2002). ** refers to concessions started one month later the NDP 2006-10 (August 2007).

Source: INCO, NDP 2002-2007 and NDP 2006-2007.

Central government direct intervention in regional transport infrastructure

The period 2002-10 was characterised by a central government model based on the direct interaction with constituencies and local authorities as a planning and prioritisation mechanism based on population needs, at least for part of public budget. Two key instruments helped central government to implement regional transport infrastructure policies: Community councils (*Consejos comunales*) and 2.500 plan (*Plan 2.500*). This phenomenon occurs, even though, as showed above, by law, secondary and tertiary roads investment is in hands of sub-regional governments.

Weekly Community councils (*Consejos comunales*), preceded by president Alvaro Uribe, were the main tool to discuss communities needs and to allocate central government budget at regional transport investment (Camacho *et al.*, 2011). More than 306 Community councils helped to that policy (130 and 176 in the first and second Uribe terms, respectively). This model intended to solve an institutional problem related to infrastructure investment: while central government transfers are earmarked (and monitored) for expenditures on health, education (and since 2007 in water and sanitation), regional governments' own resources should be used for other type of expenditures, including secondary and tertiary roads. However, with the exception of the most important and solvent municipalities and departments (*e.g.* Bogotá, Cali and Medellín municipalities, and Antioquia and Valle del Cauca departments), other regions have not invested in transport infrastructure in the last decade.

Under this framework central government prioritised transport infrastructure policies at each Community council. Table 7 shows that, during the period 2003-10, 811 tasks in the transport sector were discussed using this planning and prioritisation tool. Out of these

811 tasks, 261 (*i.e.* 32%) were allocated to INVIAS and 160 (20%) to INCO. Moreover, more than a half of these tasks have been executed and more than 10% are in progress suggesting that Community councils were a crucial tool to determine the implementation of transport policies.

Table 7. Community councils and transport tasks 2003-2010

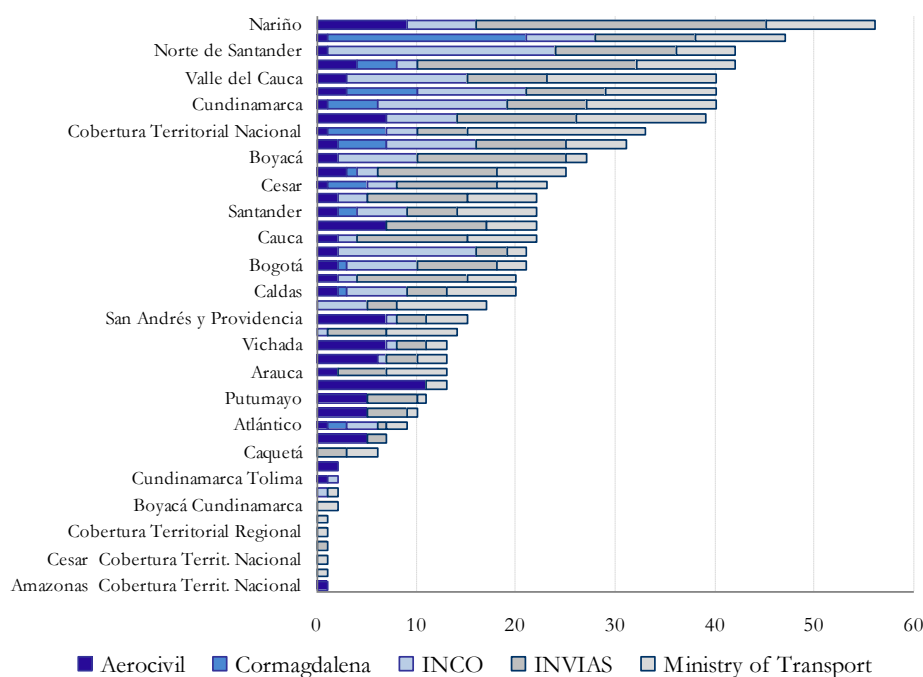
Agency	Non executed	In progress	Executed	Total	%
INCO	47	37	76	160	20%
INVIAS	84	23	154	261	32%
Ministry of Transport	80	17	122	219	27%
Aerocivil	37	7	69	113	14%
Cormagdalena	14	7	37	58	7%
Total tasks	262	91	458	811	100%

Source: Authors' calculations based on Community council data (Presidency data).

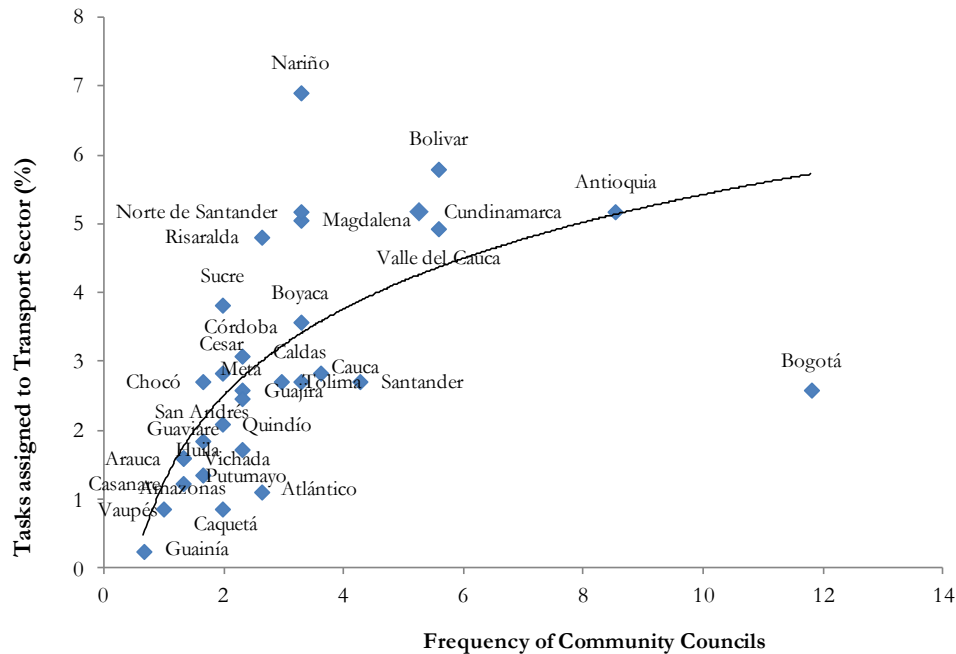
Regional distribution shows that these tasks have been scattered along all Colombian departments (Figure 10). Community council data shows that community councils' tasks for the transport sector were atomised along the 32 departments and more than 1 100 Colombian municipalities. Nariño is the department with more tasks (*i.e.* 56 tasks) and they represent only 6.9% of the total number of tasks. The following department is Bolivar, with 5.6% of tasks assigned.

Figure 10. Regional distribution of community councils

A. Tasks assigned to transport sector. 2002-10



B. Community councils vs. tasks assigned to transport sector, 2002-10 (%)



Source: Authors' calculations based on Community council data (Presidency data).

2.500 plan (*Plan 2.500*) was another crucial instrument to implement regional transport infrastructure policies. This Plan (also called Roads Programme for Regional Development - *Programa de Infraestructura Vial para el Desarrollo Regional*-) is the programme that prioritised regional investment in roads at the central government level. This plan was part of the INVIAS strategic planning, designed for the period 2007-10 and its objective was regional connectivity and integration. Initially, the programme goal was to achieve 3 159 kilometres of paved roads in 31 Colombian departments. This programme was part of a Strategic planning of the transport sector to increase competitiveness. This strategic planning includes two additional programmes that began to be implemented at the end of the second term of president Uribe: Complementary Corridors for Competitiveness, programme that includes roads that connected various departments and Bogotá-Buenaventura Corridor.³⁶ The decision making process for these programmes are documented in several CONPES documents as programmes for trade corridors consolidation, with a direct effect on competitiveness and growth.³⁷

Information until 2008 shows that 2.500 Plan implemented 227 projects under the following criteria: *i*) regions with crop substitution programmes and that would connect rural areas with consumption centres; *ii*) projects from regional development plans that will connect secondary and primary roads and in which regional governments would be in charge of maintenance; *iii*) projects that helped discussions between communities and central government.

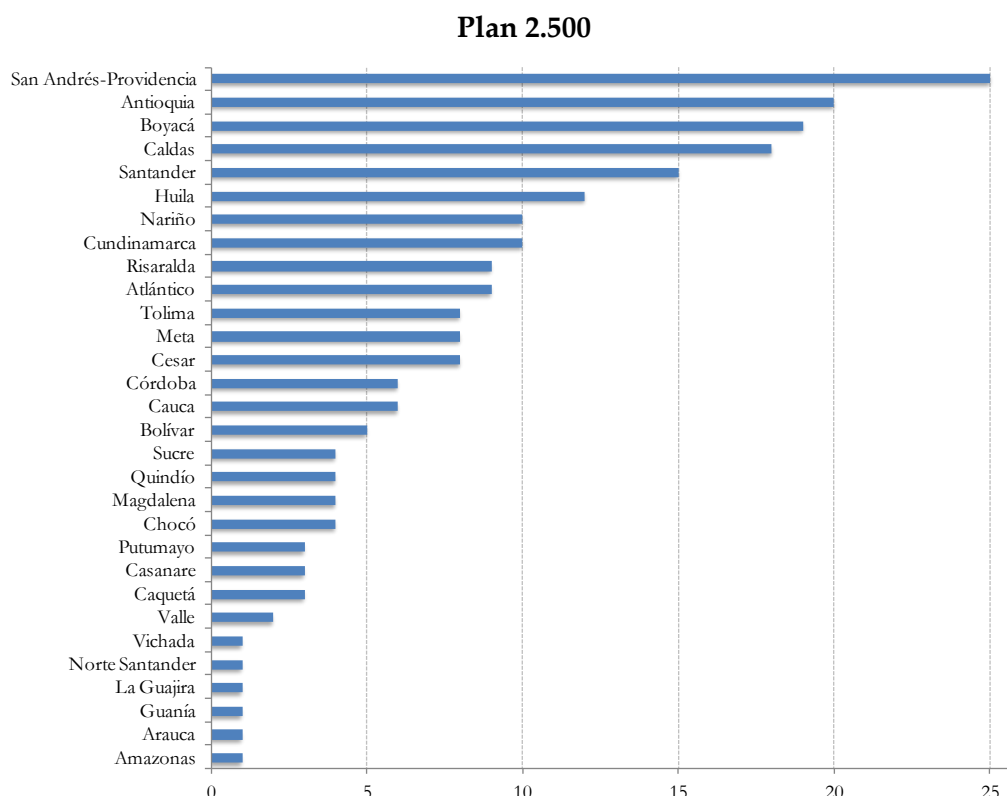
36 Buenaventura is the city where the main port in the Pacific Ocean is located.

37 See CONPES documents 3261 of 2003, 3272 and 3331 of 2004, 3352 and 3396 of 2005, 3422, 3435 and 3433 of 2006, and 3511 and 3536 of 2008.

It is worth to notice that criteria to select projects changed. Document CONPES 3272 of 2004 defined political, technical and economic criteria. Political criteria were focused on regions affected by violence and conflict, especially regions where coca crops were being substituted by legal crops and on road projects consistent with regional development plans. Additionally to secondary and primary roads, projects in execution and projects with solid technical designs were included as technical criteria. Finally, the following economic criteria are included: projects with cost-benefit analysis larger than 1, projects for regional integration in rural zones and projects in which sub-regional governments were able to be in charge of maintenance. However, since a large number of projects did not fulfil the original criteria, CONPES document 3311 of 2004 changed them.

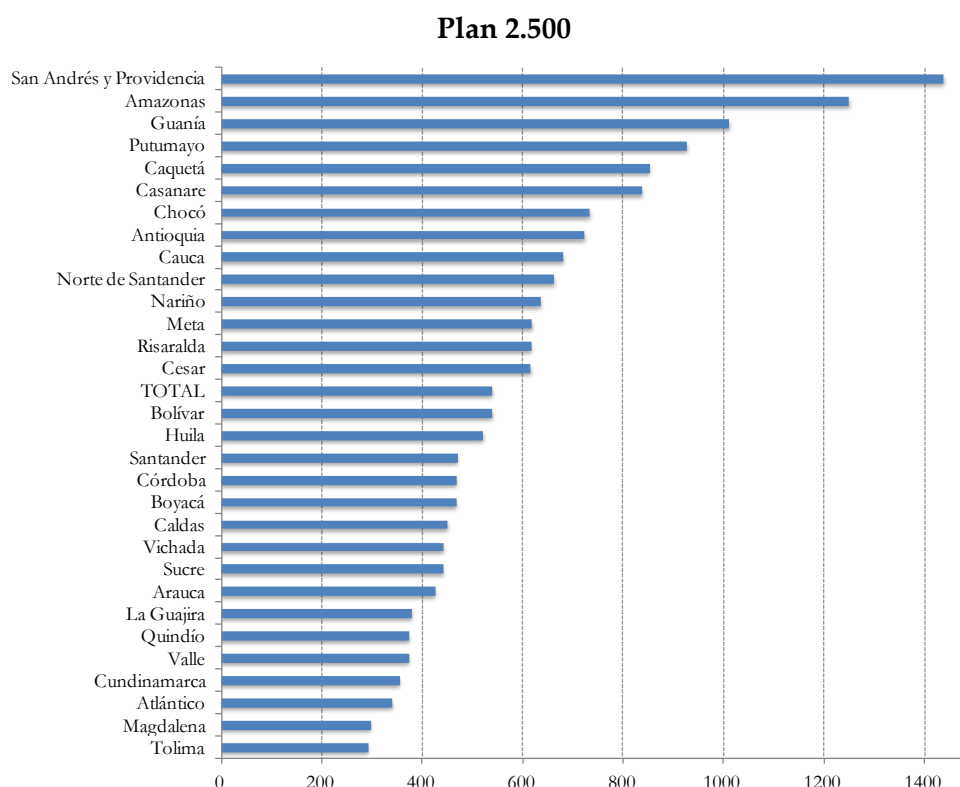
The 227 projects were implemented in 30 Colombian departments and invested COP - Colombian Pesos-1.7 billion (USD 648 million), corresponding to the total investment of INVIAS for maintenance of tertiary roads. Figure 11 and Figure 12 show the number of projects per department and the cost per kilometre, respectively. On average 7.4 projects were implemented per department (with a standard deviation of 6.4 projects). Each department was benefited on average with maintenance/improvement of 105 kilometres (with a standard deviation of 69 kilometres) and the average cost per kilometre was COP 606 million (USD 230 thousand), with a standard deviation of COP 270 million (USD 102 thousand).

Figure 11. Number of projects per department



Source: Authors' calculations based on Plan 2500 data.

Figure 12. Cost per kilometre and per department (in COP million)



Source: Authors' calculations based on Plan 2500 data.

In sum, the most important issues at the budget and execution stage in the last decade are the following:

1. Between preparation, discussion and execution, budget for roads change substantially. In the discussion stage, the budget for roads increases more than 60% and 30% for the periods 2003-06 and 2007-10, respectively. This fact shows that the decision making process during the discussion with Congress is important for the amount of resources allocated to the transport sector.
2. INVIAS budget execution shows that the composition between primary and tertiary roads investment changed in the middle of last decade. This fact is related to the importance of the 2.500 Plan, INVIAS programme designed to improve regional connectivity through improvement of tertiary roads and to the Community councils organised by the presidency.
3. Crucial instruments such as Community councils and some INVIAS programmes affected considerably the implementation of transport infrastructure policies towards departmental and municipal public works, and with respect to the initial proposal of transport infrastructure policies highlighted in the NDPs.

The bias towards investment in secondary and tertiary roads described in the planning and prioritisation stage is amplified at the budget and execution stage,

showing considerable inconsistencies between decentralisation policies and implementation of transport infrastructure policies. Indeed, although departments and municipalities are in charge of secondary and tertiary roads investment respectively, central government allocates an important amount of resources for these roads.

4. Regarding road concessions, different projects appear between the planning and prioritisation stage (for the first NDP), and execution stage. It shows that some concessions planned at the NDP have been abandoned and others have been decided at the execution stage. In particular, INCO played an important role at the Community councils. More than 100 tasks presented at the Community councils were executed by INCO.
5. Finally, we note important changes in the composition of the transport budget. First, in all stages maintenance is more important than construction of new roads. This is related to the importance of concessions for construction, especially since the second generation of concessions (for instance, see Econometría consultores, 2010 and Benavides, 2010).

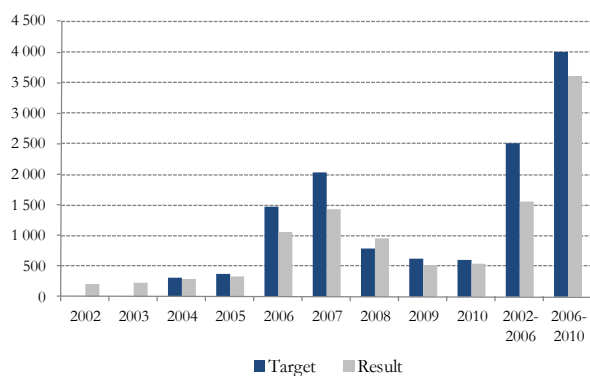
Monitoring and evaluation stage

Since 2002 new tools were implemented in the Colombian budget process to the Monitoring and Evaluation (M&E) stage. However, since 1994, with the organic planning law (Law 152/1994), these tools were mandatory. This law asked the executive power to report to Congress each semester NDP performance towards its goals. The first administration of president Uribe that began in 2002 implemented the monitor system of government goals (*i.e. Sistema de Gestión y Seguimiento a las Metas del Gobierno* or SISMEG) to fulfil this mandate. It explains why the budget performance indicators of NDP goals are only reported since 2002.

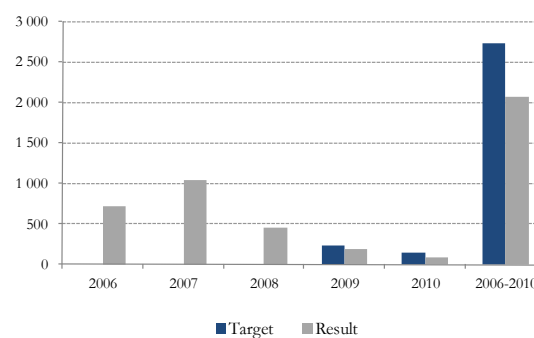
Investment in roads is monitored through indicators as the ones showed in Figure 13. According to Figure 13, panel A, during the first Uribe administration 62.5% of a target of 2500 kilometres paved was accomplished (*i.e.* 1 564 kilometres), while during its second administration, 90% of a target of 4012 kilometres was accomplished (*i.e.* 3 610 kilometres). On average, 68% of targets and 57% of results on paved roads were implemented at the regional level through the 2.500 Plan (*i.e.* 2 730 and 2 072 respectively) during the second Uribe administration (Figure 13, Panel B). Finally, Figure 13, Panel C shows roads maintenance measured in kilometres. On average, each year 13 000 kilometres of roads receive maintenance.

Figure 13. Maintenance and evaluation

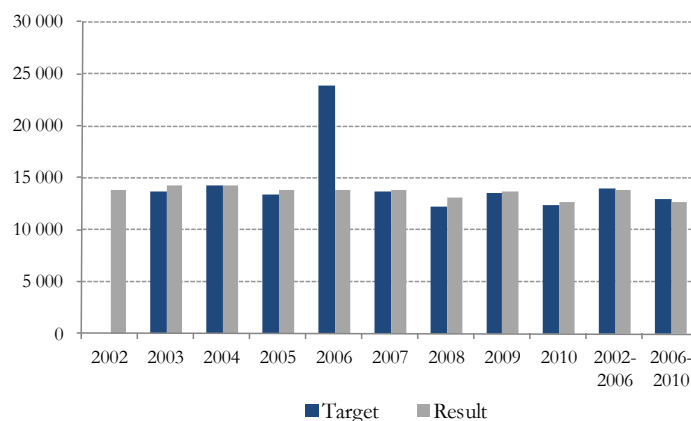
A. Inviás paved roads, 2002-10 (in km)



B. Inviás paved roads through Plan 2.500, 2006-10 (in km)



C. Inviás maintenance, 2002-10 (in km)



Source: Sigob; www.sigob.gov.co.

In sum, SISMEG monitored the performance of 9 programmes in roads, 3 for INVIAS, 3 for INCO (including paved roads, maintenance and bridges construction) and 3 for the Ministry of Transport. In addition, as a result indicator, INCO (today ANI) and INVIAS measure road traffic. However, it is important to notice that SISMEG monitors NDP goals that in general are not attached to investment projects in terms of its measurement and as in many other budgetary systems, it is very difficult to link effectively NDP and investment projects goals. In addition, goals are designed depending on funds, not on deficits. For instance, it is not possible to identify the current quality or coverage of roads using SISMEG information. Other problems are related to the fact that projects are designed without specific physical goals (*e.g.* targeted kilometres), which makes difficult to monitor the physical execution of the project (in kilometres). In addition to the lack of an inventory of existing roads, or of their current state, especially for secondary and tertiary roads, it is difficult to carry out estimates of costs per kilometre and it is an obstacle in determining the cost-benefit ratio for building new roads with respect to performing maintenance on already existing ones.

VI. CONCLUSIONS

This paper studies the PMP of transport infrastructure projects in Colombia for the period 2002-2010. As in many other Latin American countries, the PMP of transport infrastructure in Colombia follows a coherent process and is designed in several stages. The planning and prioritisation stage begins with the National Development Plan and continues with prioritisation in the annual budget; then, a budget proposal is discussed and approved in Congress, and budget is executed by line-item agencies and monitored by the Ministry of Finance and the Department of National Planning. These stages are regulated by several laws and decrees.

However, Colombia significantly lags behind other Latin American countries with similar economic characteristics in terms of road infrastructure. In particular, after controlling for GDP per capita, the quantity and quality of roads supplied are small in comparison to other countries. This result contrasts with other infrastructure sectors in which Colombia is well ranked given its GDP per capita.

This paper argues that one key reasons explaining transport infrastructure gap is the existence of several bottlenecks and institutional weakness in the PMP process. These bottlenecks are identified through the interactions between the major actors and institutions at the planning, budgeting, execution and monitoring stages of transport infrastructure cycle. This is consistent with the perception of Colombian policy makers in comparison to Latin American peers. They highlight key deficiencies in the design and implementation of transport infrastructure policies. They point out the lack of co-ordination between agencies and ministries, as well as between national and sub-national levels, because of the overlapping and unclear responsibilities, lack of institutional incentives for co-operation (*i.e.* objectives and indicators) and lack of fiscal and institutional capacity at the sub-national level.

The lack of planning and prioritisation is observed in the design process of the National Development Plans (NDPs). This paper shows key differences between the proposal by the government and the approval by Congress of NDPs. First, regional distribution of roads investment varied significantly (by more than 20% for some regions). Second, 11 concession projects have been included at the approval phase in the 2003-2006 NDP. Finally, Congress added in the NDPs ambitious plans for regional roads, such as 5 000 kilometres of tertiary paved roads and 37 specific regional roads in the 2002-2006 and 2007-2010 NDPs, respectively. The planning of these transport policies have been carried out with the lack of preliminary analyses and the design of concession contracts without the environmental and land assessments completed. Moreover, since legislation makes central government responsible of only primary roads, the inclusion of secondary and tertiary roads in the NDPs shows a lack of coherence between decentralisation policies and national planning policies.

At the budgeting phase, we observe substantial changes between preparation, discussion and definitive budget for roads. In the discussion stage (*i.e.* between the budget proposal and budget law), for the periods 2003-06 and 2007-10, the budget for roads has increased by more than 60% and 30%, respectively. The decision making process during the discussion with Congress is important both for the amount of resources allocated to the transport sector and for the distribution between primary, secondary and tertiary roads.

At the execution stage, we observe also the bias towards investment in secondary and tertiary roads described in the planning and prioritisation stage. It shows considerable inconsistencies between decentralisation policies and implementation of transport infrastructure policies. Although municipalities are in charge of the investment in tertiary roads, central government allocates more than 20% of the total amount of INVIAS resources for these roads. Moreover, two key instruments helped central government to implement regional transport infrastructure policies: Community councils (*Consejos comunales*) and 2.500 plan (*Plan 2.500*). More than a half of the 811 transport tasks discussed in the Community councils have been executed and more than 10% are in progress suggesting that Community councils were a crucial tool to determine the implementation of transport policies.

Information problems affect the implementation of the monitoring and evaluation stage. Projects are designed without specific physical goals (*e.g.* targeted kilometres), which makes difficult to monitor the physical execution of the project. Consolidated information on inventory of existing roads and their current state is non-existent, especially for secondary and tertiary roads. This lack of information makes difficult to carry out estimates of costs per kilometre and is an obstacle in determining the cost-benefit ratio for building new roads with respect to performing maintenance on already existing ones.

Finally, institutional weaknesses affect the rules of the game for the PMP of transport infrastructure policies. There are no regulations that favour the development of multimodal transport. For instance, the institutional framework of the maritime transport in *Rio Magdalena* is independent from the Ministry of Transport. Additionally, responsibilities and resources available for roads are not clearly defined and distributed among the different levels of government (*i.e.* national, departmental and municipal).

The key policy lesson from this research is to further improve the effectiveness of Colombian transport infrastructure policy. Recent policies implemented (*e.g.* new institutional and regulatory frameworks for PPPs) should enhance the effectiveness of prioritisation and planning stages but more could be done.³⁸ In particular to improve: *i*) the separation between planning and execution stages in public works; *ii*) the information systems to monitor and evaluate infrastructure projects; and *iii*) the vertical and horizontal co-ordination of transport infrastructure policies. These recommendations are consistent with the view that, in order to reduce transport gaps, an improvement in the effectiveness of transport infrastructure policies in Colombia is at least as important as higher investment in transport infrastructure, which remains similar or even higher than in other Latin American economies.

38 See Steiner (2012) for an assessment of the recent changes in the regulatory and institutional frameworks for PPPs.

ANNEX 1

A COMMON AGENCY MODEL: INFORMATION AND CO-ORDINATION PROBLEMS IN THE TRANSPORT INFRASTRUCTURE SECTOR

This annex presents a simple common agency model in which we have two principals, defined as the planners of the public policy: the central government and the sub-national government. The agent is the actor in charge of the execution of the public policy. In this model we suppose that actors involved in the planning and execution of public policies are rational: they maximise their utility functions which can differ to the maximisation of the social welfare (*i.e.* social planner). It can lead to ineffective and inefficient planning and execution of policies.

We denote the principals J ($J=N,L$), where N and L correspond to the central and sub-national planners, respectively. The common agency to both principals, denoted A , executes tasks decided by the principals: targeted public policies (π_i) maximising social welfare, π_1 , and targeted policies attracting voters, π_2 .

Following Dixit (1996), the output π_i executed depends on the efforts θ exerted by the agent and an error term ε that captures exogenous factors to the policy. In addition, μ measures the impact that the effort of task j can have on result i . Formally we have:

$$\pi_i = \theta_i + \mu\theta_j + \varepsilon_i \quad \text{with } i \neq j \text{ and } i = 1,2 \quad (1)$$

$$\mu < 1 \text{ and } \varepsilon \sim N(0, \Omega)$$

The agent receives a transfer ρ_i^J from the principal J in order to compensate the agent for task i . Following Dixit and Jensen (2003), the transfers given by national and local authorities can be monetary or not (*e.g.* visibility, political support, prospects in the civil service career, government agency's size).

We assume that the agent's utility function increases as the result of targeted policies increases. It depends on the factor ($b_i^A \geq 0$), which can be associated to the pricing of these tasks by the agent A . Then, the agent's problem is written as:

$$\max \gamma(\theta_i, \theta_j) = \sum_{\substack{i=1 \\ i \neq j}}^2 b_i^A \pi_i(\theta_i, \theta_j) + \sum_{i=1}^2 \rho_i^L + \sum_{i=1}^2 \rho_i^N - c(\theta_i, \theta_j) \quad (2)$$

where $c = c(\theta_i, \theta_j)$ is the agent's cost function and depends on the efforts exerted to achieve both policies.

The utility functions of the principals depend on the outputs realised by the agent, the transfers paid to the agent and subject to the participation constraint of the agent. Then, the principals' problem is written as:

$$\begin{aligned} \max \varphi^J(\pi_i, \pi_j, \rho_i, \rho_j) &= \sum_{i=1}^2 b_i^J \pi_i(\theta_i, \theta_j) - \sum_{i=1}^2 \rho_i^J \\ \text{subject to } \gamma(\theta_i, \theta_j) &\geq \bar{\gamma} \end{aligned} \quad (3)$$

$$\text{with } J = L, N \quad \text{and} \quad b_i^J \geq 0$$

where b_i^J is a factor associated to the result of targeted policies and represents the pricing of these outputs by principals J . $\bar{\gamma}$ denotes the agent's outside opportunity utility.

The values given to b_i^J , ρ_i^J and $\pi_i(\theta_i, \theta_j)$ depend on the interest that principals have for each of the targeted policies i . In that context, if $b_i^J = 0$, the utility function of principal J is not affected by the result π_i , and consequently she does not exert any incentive on agent A to achieve π_i .

We solve this problem in three different cases: *i*) perfect and complete information; *ii*) asymmetric information and principals are co-ordinated; (*i.e.* they act as a unique principal)³⁹; *iii*) asymmetric information and principals are not co-ordinated.

Perfect and complete information

Under this framework, there is a common knowledge of the structure and outcomes of utility functions of all participants. Additionally, efforts exerted by the agent are observed by the principals.

Let us assume that the principals act as a unique principal. Since the efforts realised by the agent A are observable by the principal, the principal problem is written as:

$$\begin{aligned} \max \varphi(\theta_i, \theta_j, \rho_i, \rho_j) &= \sum_{i=1}^2 b_i \pi_i(\theta_i, \theta_j) - \sum_{i=1}^2 \rho_i \\ \text{subject to } \sum_{i=1}^2 b_i^A \pi_i(\theta_i, \theta_j) &+ \sum_{i=1}^2 \rho_i - c(\theta_i, \theta_j) \geq \bar{\gamma} \\ \text{with } J = L, N \quad \text{and} \quad b_i &\geq 0 \end{aligned} \quad (4)$$

Following first-order conditions ($\frac{\partial L}{\partial \theta_i} = 0$ and $\frac{\partial L}{\partial \rho_i} = 0$), the maximisation problem yields:

$$\frac{\partial \pi_i}{\partial \theta_i} (b_i + b_i^A) + \frac{\partial \pi_j}{\partial \theta_i} (b_j + b_j^A) = \frac{\partial c(\theta_i, \theta_j)}{\partial \theta_i} \quad (5)$$

Equation 5 shows that the total marginal revenue from the effort θ_i equals the marginal cost of doing the effort θ_i .

39 This scenario is equivalent to a centralisation framework.

Let us assume that $c(\theta_i, \theta_j) = \sum_{i=1}^2 c_i \theta_i^2 + c_{ij} \theta_i \theta_j$. Then, from equations (1) and (5) we get:

$$b_i + b_i^A + \mu(b_j + b_j^A) = 2C_i \theta_i + C_{ij} \theta_j \quad (6)$$

and the optimum effort of the agent A is:

$$\theta_i^* = \frac{(b_i + b_i^A)(2C_j - \mu C_{ij}) - (b_j + b_j^A)(C_{ij} - 2\mu C_j)}{4C_i C_j - C_{ij}^2} \quad (7)$$

Agent's effort to achieve the task i depends on how significant is this activity to the agent and the principals. It increases as the cost to realise the inverse activity increases (C_j). Conversely, as the agent and principals price more the other task j and the cost C_j is lower, the effort to exert the policy i is reduced.

Asymmetric information and principals are co-ordinated

Under this framework the effort accomplished by the agent is not observable by the principals. Principals have the same objective and perfectly co-ordinate their preferences (*i.e.* central and local governments act as a unique principal). This supposes that principals are not in competition to force the agent to execute different tasks.

Since the effort realised by the agent is not observable, principals should design a mechanism in which transfers depend on the result produced by the agent. In that sense, following Dixit (1996), ρ is decomposed into a fixed payment β and a variable component α that depends on the result. Formally we have:

$$\rho_i = \alpha_i \pi_i + \beta_i \quad (8)$$

Then, the agent's problem is written as:

$$\max \gamma(\theta_i, \theta_j) = \sum_{\substack{i=1 \\ i \neq j}}^2 b_i^A \pi_i(\theta_i, \theta_j) + \sum_{i=1}^2 \alpha_i \pi_i + \sum_{i=1}^2 \beta_i - c(\theta_i, \theta_j) \quad (9)$$

The governments' problem, acting as a unique principal, is written as:

$$\max \varphi(\pi_i, \pi_j) = \sum_{i=1}^2 b_i \pi_i(\theta_i, \theta_j) - \sum_{i=1}^2 \alpha_i \pi_i - \sum_{i=1}^2 \beta_i \quad (10)$$

subject to

$$\gamma(\theta_i, \theta_j) \geq \bar{\gamma}$$

Under asymmetric information, agent maximizes its utility function separately from principals. This game has two steps: *i)* Principals maximise their utility and decide the payments for each result; *ii)* Then, the agent decides the efforts to achieve for each payment of the results. This game is solved under backward induction process.

Following first-order conditions in the maximisation problem of the agent ($\frac{\partial \gamma}{\partial \theta_i} = 0$ and $\frac{\partial \gamma}{\partial \theta_j} = 0$), the optimal efforts of the agent are:

$$\theta_i^* = \frac{(b_i^A + \alpha_i)(2C_j - C_{ij}\mu) - (b_j^A + \alpha_j)(C_{ij} - 2C_j\mu)}{4C_iC_j - C_{ij}^2} \quad (11)$$

The optimal efforts for the agent depend positively on the pricing of the respective task (and negatively on the pricing of the other task). In addition, the variable transfers from principals to the agent affect these efforts. Moreover, the impact of both pricing and transfers on the effort for a given task will be augmented as the cost for the other task increases. Finally, μ (*i.e.* the impact of effort in task j on the result i) amplifies the impact of costs on the efforts to achieve.

Principals include in their utility function the optimal efforts of the agent and maximise their utility with respect to the transfers. Following first-order conditions in the maximisation problem of the principal ($\frac{\partial \varphi}{\partial \alpha_i} = 0$ and $\frac{\partial \varphi}{\partial \alpha_j} = 0$) and assuming $\mu = 0$ to simply, the optimal transfer from the principals to the agent is:

$$\alpha_i = \frac{(b_i - b_i^A) - (2C_i\varepsilon_i + C_{ij}\varepsilon_j)}{2} \quad (12)$$

The optimal transfer depends on the difference between the pricing of the result by the principal and the agent. A higher pricing of the principal in comparison to the pricing of the agent of a given activity will increase the incentive of the principal to transfer more resources to the agent. In addition, an increase in the exogenous factors affecting the result will reduce the incentive of principals to transfer resources to the agent. In that context, uncertainty and existence of other factors affecting the result will reduce the transfers to the agent.

Under asymmetric information, principals do not observe the efforts realised by the agent to execute policies. Consequently, principals use a second best scenario (in contrast to the case of perfect competition) in which agents' efforts for each of the activities are include in the maximisation problem.

Asymmetric information and principals are not co-ordinated

Under this framework principals do not observe efforts achieved by the agent to execute the policy. In addition, central and local governments do not have necessarily the same preferences on policies. They define separately and simultaneously the contracts offered to the agent and consequently they can compete for different objectives.⁴⁰

40 To simplify, under this framework we suppose that μ (*i.e.* the impact of effort realised in task j on the result i) is equal to 0.

The agent's problem is written as:

$$\max \gamma(\theta_i, \theta_j) = \sum_{\substack{i=1 \\ i \neq j}}^2 b_i^A \pi_i(\theta_i, \theta_j) + \sum_{i=1}^2 \rho_i^L + \sum_{i=1}^2 \rho_i^N - c(\theta_i, \theta_j) \quad (13)$$

Each principal maximises separately its benefit, she is subject to the incentives' compatibility and she takes as given the incentive offered by the other principal. Then, the principal's problem is:

$$\begin{aligned} \max \varphi^J(\alpha_i, \alpha_j) &= \sum_{i=1}^2 b_i^J \pi_i(\theta_i, \theta_j) - \sum_{i=1}^2 \alpha_i^J \pi_i(\theta_i, \theta_j) - \sum_{i=1}^2 \beta_i^J \\ &\text{subject to } \gamma(\theta_i, \theta_j) \geq \bar{\gamma} \end{aligned} \quad (14)$$

with $J = L, N$

Backward induction allows us to break up the optimisation process into two steps. First, agent's maximisation problem is solved and second the principal J includes agent's preferences in the maximisation problem.

Following first-order conditions in the maximisation problem of the agent ($\frac{\partial \gamma}{\partial \theta_i} = 0$ and $\frac{\partial \gamma}{\partial \theta_j} = 0$), the optimal efforts of the agent are:

$$\theta_i^* = \frac{2C_j(b_i^A + \alpha_i^L + \alpha_i^N) - C_{ij}(b_j^A + \alpha_j^L + \alpha_j^N)}{4C_iC_j - C_{ij}^2} \quad (15)$$

The optimal efforts for the agent depend positively on the pricing of the respective task (and negatively on the pricing of the other task). In addition, the variable transfer from each principal (*i.e.* L and N) to the agent affects these efforts. Furthermore, the impact of both pricing and transfers on the effort for a given task will be amplified as the cost for the other task increases.

Each principal includes in the utility function the optimal efforts of the agent and the maximisation problem takes as given the transfers realised by the other principal. Following first-order conditions in the maximisation problem of the principal ($\frac{\partial \varphi}{\partial \alpha_i} = 0$ and $\frac{\partial \varphi}{\partial \alpha_j} = 0$), the optimal transfer from each principal to the agent is:

$$\alpha_i^J = \frac{2b_i^J - (b_i^A + b_i^J + 2C_i\varepsilon_i + C_{ij}\varepsilon_j)}{3} \quad (16)$$

The optimal transfer from each principal J depends positively on the pricing of the result by the principal J . In contrast, the incentive of the principal J to transfer more resources to the agent will decrease as both the pricing of the agent A and of the other principal j will increase for the same activity. In addition, an increase in the exogenous factors affecting the result will reduce the incentive of the principal J to transfer resources to the agent. As in the case studied before, uncertainty and existence of other factors affecting the result will reduce the transfers to the agent.

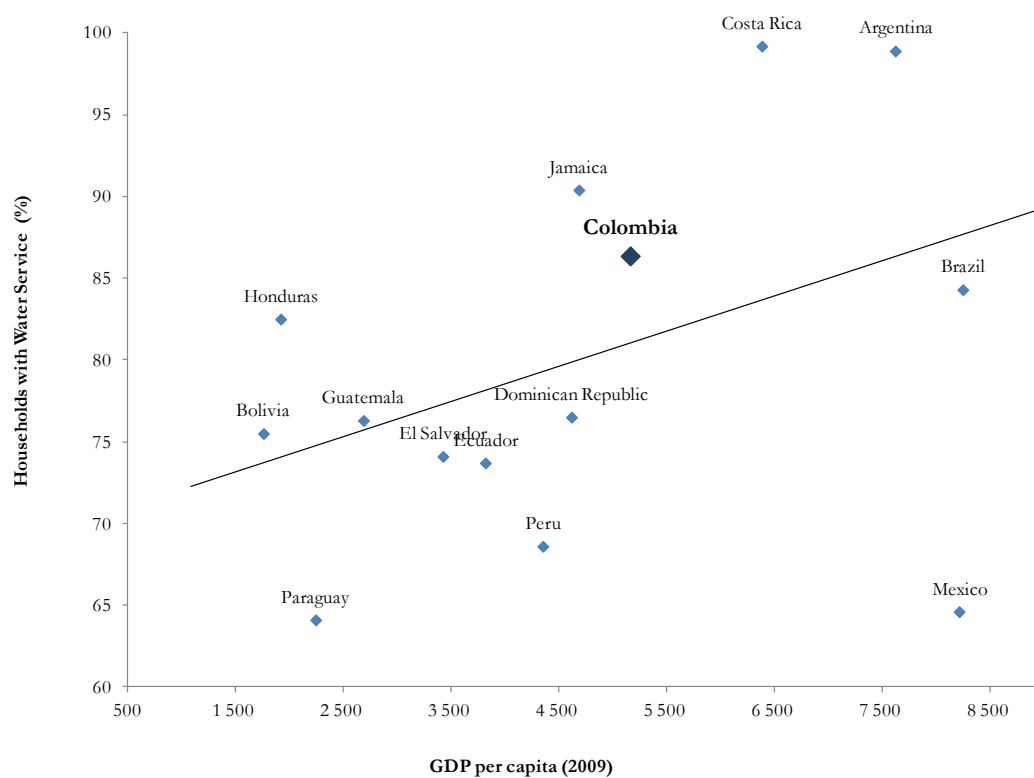
If results delegated to the agent are independent (*i.e.* the effort to generate a result does not affect the other result) and the preferences of principals N and L are different, each principal will give a transfer higher than in the previous two cases studied in order to achieve the desirable result. This reduces the incentive to produce the inverse result. In that context, principals compete among them with respect to the effort that the agent should achieve.

This simple model compares three cases depending on the information problems between principals and agent and the co-ordination of the two principals. First, it shows that under asymmetric information principals have to compensate more the agent to achieve a second best scenario in comparison to the case of perfect information. It suggests that in order to achieve the perfect competition scenario, it is necessary to generate information systems that help principals to transfer the pricing given for a task in comparison to the other task by the economic actors involved in this game. Second, the lack of co-ordination between principals leads to an inefficient equilibrium. The sum of the transfers when principals are not co-ordinated is higher than in the case of perfect co-ordination. It is necessary to develop institutional, regulatory and budgeting mechanisms that force principals to co-ordinate the policy objectives in order to reduce this distortion. Such mechanisms should incentivise also principals and agents to have a higher benefit from the targeted public policies maximising social welfare (π_1) in comparison to targeted policies attracting voters (π_2).

ANNEX 2 INFRASTRUCTURE SUPPLY

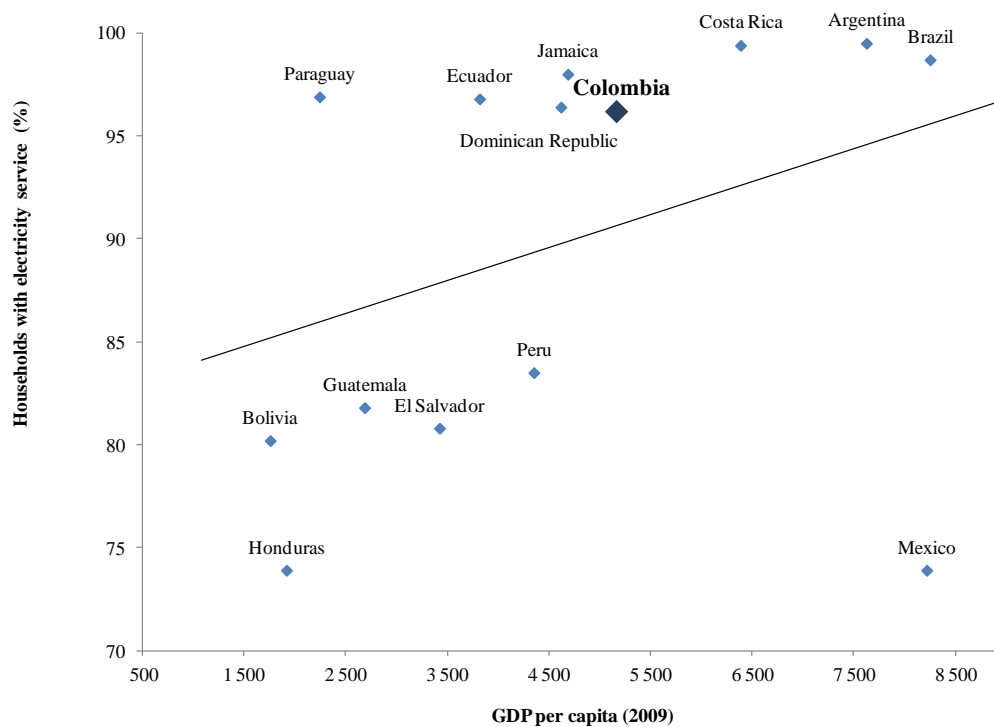
Annex 2a. Quantity of infrastructure

Figure A2.A. Households with water service



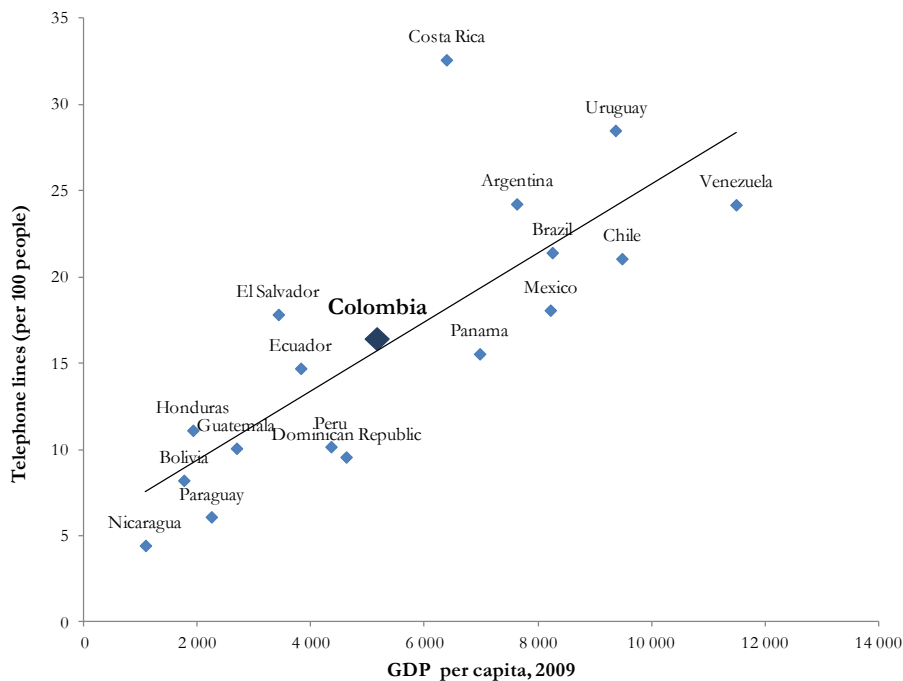
Source: ECLAC (The Economic Commission for Latin America and the Caribbean) and World Bank - World Development Indicators (WDI).

Figure A2.B. Households with electricity service



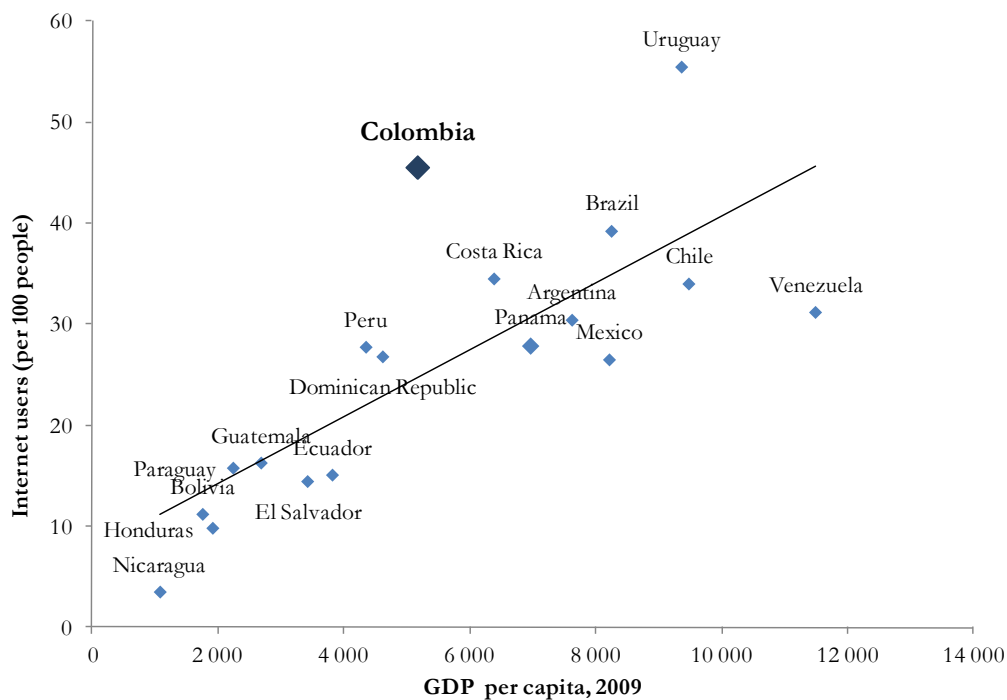
Source: ECLAC – WDI.

Figure A2.C. Telephone lines (per 100 people)



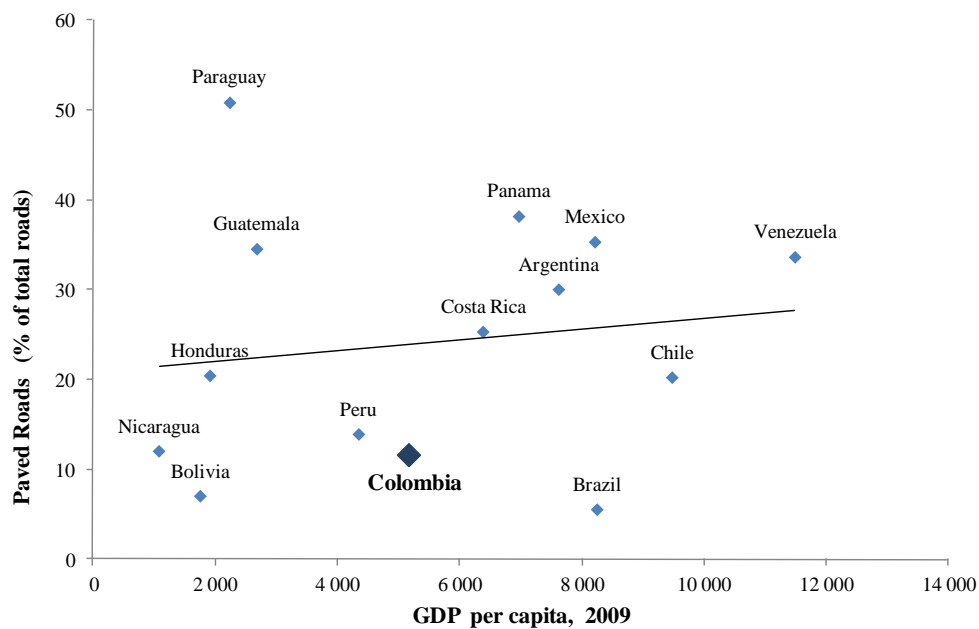
Source: WDI.

Figure A2.D. Internet users (per 100 people)



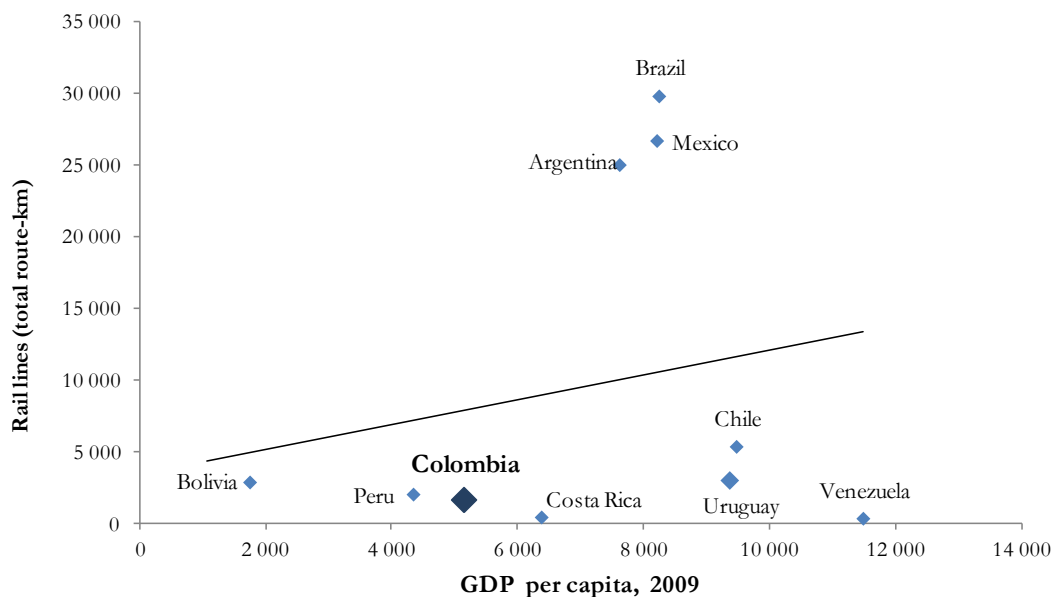
Source: WDI.

Figure A2.E. Paved roads



Source: WDI.

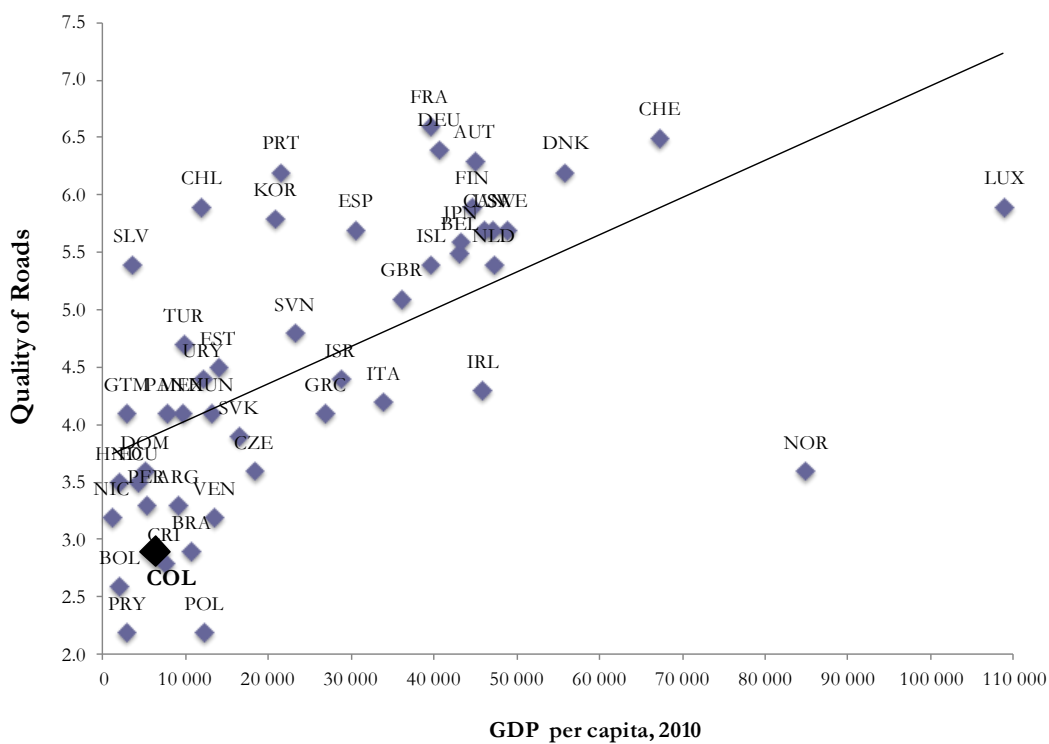
Figure A2.F. Rail lines



Source: WDI.

Annex 2b. Quality of infrastructure

Figure A2.G. Quality of roads



Source: World Economic Forum (WEF) and WDI.

ANNEX 3

STRATEGIC CORRIDORS: NATIONAL DEVELOPMENT PLAN 2006-2010

Regional roads

1. Vía Longitudinal del Oriente: Tramo el Porvenir-San José del Fragua-Florencia-San Vicente del Caguán-Neiva.
2. Vía Transversal de Boyacá: Tramo Aguazul-Toquilla- El Crucero.
3. Vía Transversal del Carare: Tramo Landázuri-Cimitarra.
4. Vía Troncal Central del Norte (Tunja-Cúcuta): Tramo La Palmera-Málaga-Presidente.
5. Vía Transversal de Boyacá: Tramo Chiquinquirá-Pauna-Borbur-Otanche-Dos y Medio-Puerto Boyacá.
6. Vía Transversal Medellín-Quibdó: Tramo C. Bolívar-La Mansa-Quibdó.
7. Vía Transversal del Sur: Tramo Popayán Totoró-Inzá-La Plata.
8. Vía Mocoa-San Miguel: Tramo Mocoa Puerto Asís-Santa Ana-San Miguel.
9. Vía Troncal del Nordeste: Tramo Vegachí-Segovia-Zaragoza
10. Vía alterna al Llano: Tramo el Sisga-Machetá-El Secreto.
11. Vía Longitudinal del Magdalena: Tramo El Burro-Tamalameque (puente en construcción) y Santa Ana-La Gloria.
12. Vía Longitudinal de Bolívar: Tramo Yondó-Cantagallo-San Pablo- Simití.
13. Vía Troncal Norte de Nariño: Tramo Buesaco-El Empate-La Unión-Higuerones.
14. Vía Corredor de La Guajira Central: Tramo Riohacha-La Florida-Tomarrazón Cuestecitas-Maicao.
15. Vía Transversal Cafetera: Tramo Honda-Manizales.
16. Vía Transversal de La Macarena: Tramos Baraya-Colombia-El Dorado y La Uribe-San Juan de Arama.
17. Vía Panamericana del Darién: Tramo Lomas Aisladas-Cacarica (incluido Puente Atrato).
18. Vía Cúcuta-La Fría (Venezuela): Tramo Agua Clara-Guaramito.
19. Vía Tumaco-Esmeraldas: Tramo K 14 + 900-Río Mataje (incluidos 5 puentes).
20. Vía Villavicencio-El Retorno: Tramo Granada-San José del Guaviare-El Retorno.
21. Vía Transversal de La Mojana: Tramo Majagual-Magangué.
22. Vía corredor Piedemonte Llanero: Tramo Yopal-Arauca.
23. Vía Marginal del Caribe: Tramo San Bernardo del Viento-Monitos-Puerto Escondido-Arboletes- Necoclí
24. Vía Transvesal del Catatumbo: Tramo Tibú-Convención-Ayacucho-La Mata.
25. Vía Troncal del Viento: Tramo Manaure-Cabo de la Vela.
26. Vía Corredor Brasil-Pacífico (Pasto-Mocoa): Tramo Pasto-Encano-Santiago-San Francisco (Variante San Francisco)-Mocoa.

27. Vía Transversal Central del Pacífico: Tramo La Virginia-Las Animas-Nuquí.
28. Vía Anillo del Macizo Colombiano: Tramo Rosas-La Sierra-La Vega-Santiago-Bolívar-La Lupa.
29. Vía Carretera de la Soberanía (Cúcuta-Arauca): Tramo La Lejía-Saravena.
30. Vía Carretera La Virginia-Irrá: Tramo La Virginia-La Miranda-Irrá.
31. Vía Transversal Sahagún-La Unión.
32. Vía Transversal Pacífico Caucano: El Plateado-Belén.
33. Vía Villavicencio-Calamar: Tramo, San José del Guaviare-Calamar.
34. Vía El Empate, San José, San Bernardo, La Cruz San Pablo (departamento de Nariño)-Flores, Iguerones (departamento del Cauca).
35. Vía Pradera-Palmira.
36. Mulalo-Loboguerrero.
37. Los Curos-Málaga-Santander.

Dual carriageways

1. Caucasia-Montería-Cereté-Lorica-La Y-Sincelejo-Cartagena-Barranquilla-Sta Marta.
2. Ruta del Sol: Bogotá-Puerto Salgar-San Roque-Bosconia-Valledupar-Y de Ciénaga.
3. Bogotá-Buenaventura: Bogotá-Ibagué-Armenia-Buga-Buenaventura.
4. Venezuela-Pacífico: Cúcuta-Bucaramanga-La Fortuna-Puerto Berrío-Valle de Aburrá-Eje Cafetero-Empalme Autopista del Valle del Cauca-Popayán.
5. Eje Llanos Orientales-Bogotá-Valle de Aburrá-Urabá-Darién.
6. Sincelejo-Tolúviejo.
7. Bucaramanga-Chiquinquirá-Zipaquirá (Comuneros).
8. Neiva-Pitalito.
9. Rumichaca-Pasto.
10. Santa Marta-Riohacha.
11. Autopistas del Llano.

Competitiveness roads

1. Caucasia-Montería – Cereté (Lorica)- La Y- Sincelejo- Cartagena- Barranquilla-Santa Marta.
2. Ruta del Sol: Bogotá-Puerto Salgar-San Roque-Bosconia-(Valledupar)-Y de Ciénaga.
3. Bogotá-Buenaventura: Bogotá-Ibagué-Armenia-Buga-Buenaventura.
4. Venezuela-Pacífico: Cúcuta-Bucaramanga-La Fortuna-Puerto Berrío-Valle de Aburrá-Eje Cafetero-empalme Autopista del Valle del Cauca-Popayán.
5. Eje Llanos Orientales-Bogotá-Valle de Aburrá-Urabá-Darién.
6. Sincelejo- Tolúviejo.
7. Bucaramanga-Chiquinquirá-Zipaquirá (Comunero).
8. Neiva-Pitalito.
9. Rumichaca-Pasto.
10. Santa Marta-Riohacha.
11. Autopista del Llano.

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