

Economic and social impacts of 4G roads in Colombia

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Motto:

"Never consider study as an obligation, but as an opportunity to penetrate the beautiful and wonderful world of knowledge." Albert Einstein.

Gratitude

This important project would not have been possible without the direct and indirect influence of many people whom we would like to thank deeply for being present throughout the whole process and stages of the development of this degree project.

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Abstract

The 4G roads or fourth generation roads are composed of 15 concessions or road projects that aim to improve mobility in Colombia and promote the competitiveness and development of the country.

The present project consists of giving solution to the following problematic:
¿How will economic and social impact the execution of the 4G roads to Colombia?
In order to answer the problem, the following references were taken as academic references: contributions from different sources such as newspapers, magazines from the world of economics, academic theses that contributed great value to research, as well as indexed publications as well as expert voices from public entities and private, that provided a greater vision and clarity of the subject to investigate.

It is worth noting that one of the most important findings during the entire development of the project has to do with the state of Colombia's roads, as a result of which Colombian competitiveness has been seriously affected. According to surveys conducted by experts, 9 of the 11 respondents consider that all social classes will benefit greatly from the 4G pathway project. It was also found that 66% of the respondents believe that Colombia will be among the 3 most competitive countries in Latin America in the field of international logistics after finalizing the construction of these important works.

The main objective of the 4G roads is to update the Colombian road system, as well as to promote the creation of new roads that will unite the main regions of the Colombian territory, with the entry into construction of more than 8,000 kilometers that will have an average value of 50 Millions of dollars according to the report prepared by the ANIF for the Colombian Chamber of Infrastructure (ANI, 2016).

Keywords: 4G Roads, Infrastructure, Competitiveness, Mobility, Development, Investment, Economic and Social Development.

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List of Symbols and abbreviations

List of symbols

%. Indicates percentage

List of abbreviations

4G: Fourth Generation Roads

NCESP: National Council for Economic and Social Policy

NAFI: National Association of Financial Institutions

NIA: National Infrastructure Agency

OHL: Obrascón Huarte Lain

SPSUN: Studies and Projects of the Sun

OIE: Organization of International Engineering

GDP: Gross Domestic Product

NIROADS: National Institute of Roads

EAFIT: School of Administration, Finance and Technological Institute

NPD: National Planning Department

IMF: International Monetary Fund

UNDP: United Nations Development Programs

DANE: National Administrative Department of Statistics

MINENVIRONMENT: Ministry of Environment

Introduction

In recent years, Colombia has been presenting countless shortcomings that can be considered as a limitation for the optimum development of the national industry, economic growth and increase in the quality of life of all its inhabitants. This deterioration is linked directly to the country's road transport, these shortcomings have led to measures taken by the National Government, national public entities, private and foreign. These organizations have allied themselves with a new purpose: to develop the most ambitious infrastructure project in the country called 4G or fourth generation roads (Universidad Nacional de Colombia, 2009).

The present degree project seeks to show the reader the economic and social impacts that will bring with it the improvement of the road infrastructure of Colombia through the execution of the 4G or fourth generation roads. To achieve the desired objective, economic, political, social and environmental information was taken into account.

In order to provide an important source of information for the reader to know the impacts of the execution of these works (4G tracks), surveys and semi-structured interviews were conducted, providing an important source of data that provides a quantitative and qualitative view of the present Work, reinforced on a statistical basis, newspaper articles, magazines, theses, official pages of entities responsible for promoting projects, for example NCESP.

In this way, the reader has the necessary information that allows him to know the impacts that will lead to the execution of the 4G roads to all Colombia in the social and economic area.

1. Formulation of the Project

1.1 Background

The 4G roads, also called fourth generation roads, are dual carriageways linked to tunnels and bridges that are part of a megaproject driven by public and private entities such as the National Infrastructure Agency (ANI), the Colombian National Government, The Colombian Chamber of Infrastructure, national and international banks, among them the World Bank (Andrade M, 2015).

The project of the 4G will be carried out through 4 waves, the execution of these will be carried out by the award of contracts by means of a tender in which public and private entities of national and foreign origin will participate, these measures were taken by part of the state in the absence of resources to invest in the improvement of the road network of Colombia.

With these tenders, it is intended by private capital to finance the maintenance and construction of new roads. These works are going to be realized in the center south, center west, center east and north of the Country. According to the ANI Infrastructure Transport newsletter, each of these waves seeks to improve the country's main mobility artery. During the execution of these works, concessions will be made with national and international companies such as: Spsun of Colombia, Iridium of Spain, Odinsa of Colombia, Mincivil, El Cóndor, Termotécnica, Mota Engil

Engenharia de Portugal, Mario Huertas and Meco, Kma, Grodco And OHL; These companies will contribute all their knowledge and capital for the benefit of the economic and social development of the Country. (National Agency of Infrastructure, 2015).

According to the report prepared by the ANIF for the Colombian Chamber of Infrastructure, it states that:

The intervention will not only serve to update the current system of roads in Colombia, but will also help meet the needs of creating new routes that will approach all regions of the country. This project involves the construction and entry into operation of more than 8,000 km of last generation road and more than a hundred tunnels, this project has an average investment of 50 million dollars (National Association of Financial Institutions, 2016).

According to Benavides Velandia:

Colombia is currently experiencing a high deficiency in its road infrastructure, poor planning and execution of infrastructure works currently owned by the country gives us a score of 2.64, with 5 being the highest score. For example, Haiti with a score of (2.27) occupies the last box as the worst qualified country in Latin America (Benavides, 2015).

According to the newspaper El Tiempo; "The National Government made the sale of ISAGEN in order to leverage the mega project of the 4G Roads, which has an approximate cost of 50 billion pesos" (El Tiempo, 2016).

As stated by the magazine Carreteras;

Mobility and logistics are at the center of the economy, the development of road infrastructure is a necessity to the demand for mobility in the country, all these improvements in infrastructure seek to streamline logistics processes and have as main aim to increase the Competitiveness and development of the economy (Revista Carreteras, 2015).

The World Bank notes the following:

Improving infrastructure in developing countries is seen as increasingly important for reducing poverty, increasing growth and achieving the Millennium Development Goals (MDGs): eradicate poverty, hunger, increase health and well-being, Quality education, gender equality, clean water, affordable and clean energy, decent work and economic growth (World Bank, 2004).

For Colombia, the improvement not only of roads but also of infrastructure in general is an urgency that must be addressed immediately, in this way it will increase the generation of employment, investment, increase of competitiveness, reduction of

costs and Increase the quality of life of its inhabitants.

Colombia has the challenge of working for the development of its infrastructure with a view to becoming a more competitive country within the region. This development will serve as an impetus not only for sectors such as construction, commerce and agriculture, but will benefit the entire economy as a whole, and contribute to the well-being of the population (La Republica, 2015).

According to Roda, Perdomo and Sánchez:

The competitiveness of the economic sectors and regions of the country is another positive aspect with the implementation of 4G roads in Colombia. These works will allow the land transportation to be much faster and efficient, reduce costs and provide a greater flow of Products, facilitate the entry and exit of these goods from places difficult to access. These events will have a positive effect on the final price of the product, which will benefit all consumers (Roda, Perdomo, & Sánchez, 2015).

As Sanchez Rojas mentions, "Road interventions in Colombia will have a very positive impact on rural areas of the country, as they will generate an increase in the income and annual consumption of households." The implementation of these fourth generation projects will facilitate the distribution of all products in most of the regions of the country. In addition, with these concessions, hard-to-reach regions located in the Pacific, Orinoquía, and the Caribbean, struck by violence and inequality, will be

able to obtain vital services such as health, security and education (Sánchez Rojas, 2016).

Currently, the construction of the following 4G roads is being carried out "Autopista de las Américas, la Ruta del Sol, Bogotá-Villavicencio Double Lane, Conexiones Pacífico 1, 2 and 3, Bogotá-Buenaventura and Route To the Sea, Cartagena-Barranquilla and Circunvalar de la Prosperidad ". These Megaprojects seek to integrate all the productive sectors of the different regions of our Country allowing sustainable and sustainable economic and social development "(Revista de Logística, 2015).

According to Ramirez and Villar, the investment in the road infrastructure of our country has increased since 2010, this investment is expected to reach a record 1.8% of Colombia's GDP. These investments are aimed at improving road transport, which has been the main obstacle to improving productivity and growth in Colombia. These works will reduce the gap between the more and less developed regions of the Colombian territory (Ramirez & Villar, 2015).

According to the National Competitiveness Report:

In Colombia, for example, the transportation sector requires more than eight workers to produce what a worker produces in the United States. As a result, the country records the highest domestic transportation costs of both exports and imports

in the region. According to the latest Doing Business report, Colombia ranked 18 and 17, respectively, among 18 countries in the region. Due to the above, companies in Colombia spend \$ 15 on logistics for every \$ 100 sold, which is uncompetitive in the international context. Of these \$ 15, 37% correspond to transportation and distribution, 20% to storage and 17% to purchases and suppliers (National Competitiveness Report, 2013).

Economies need infrastructure networks in communications, energy and transport developed to grow their domestic market and thus be able to compete more efficiently in international markets, not only the amount of infrastructure that counts the country, but also the (Rozas and Sánchez, 2004). In this context, the role of infrastructure in the development of the infrastructure is its contribution to the articulation of the economic structure of a country (Rozas & Sánchez, 2004).

Transportation time is important to minimize costs. In Colombia, the process happens in reverse, costs are increased by lack of roads in optimal conditions that allow the passage, resist the weight of trucks and expedite transit times. Some roads, due to their poor condition, generate losses in fragile or perishable products, besides presenting safety problems that affect the conveyors, increasing the cost for their services; This is why the National Government has decided, together with the National Planning Department (DNP) to launch a Logistic Master Plan for Colombia, where it is expected with the construction of 4G roads, and overcome this problem that affects all its inhabitants (The World, 2016).

1.1.1 State of Art

As well identified within the antecedents previously exposed, the subject of research has been approached from different points of view, some of these data are based on the deficiency road that has Colombia; These low competitiveness rates affect logistics during transportation, which generates hidden costs that have an impact on the final value of the products, directly affecting competition in the domestic and international markets.

These drawbacks slow economic growth and reduce the competitiveness that emerges as an emerging economy. For this reason, it was decided to join government, public and private entities to raise and carry out this ambitious project. With this important improvement of the road system of the Country is intended to solve the problems of infrastructure that today affect internally the communication of much of the Colombian territory. (Rojas, M., 2016).

1.2 Conceptual framework

Competitiveness

The concept of competitive advantage is based on "productivity" and the factors that determine it. Productivity is the relationship between the output obtained through a

system of production of goods / services and the resources used to obtain it, ie its efficient use or the relationship between the results obtained with respect to the resources used and the time it takes to obtain them (D'alessio, 2002).

Road infrastructure

The road infrastructure is the means through which terrestrial connectivity is granted to a country for the transportation of people and cargo, allowing productive, service, distraction and tourist activities. These axes constitute a key and indispensable for the development of the economy and its productive development. In this way, it provides the terrestrial accessibility and interconnectivity necessary for the system of populated centers, rural areas and territories as a whole and integrity, empowering and planning under a model of territorial development that is projected towards sustainable improvement and in harmony with the environment "(EMB Magazine, 2010).

4G roads or also called fourth generation routes

They are dual carriageways linked with tunnels and bridges that are part of a megaproject promoted by public and private entities such as the National Infrastructure Agency (ANI), the Colombian National Government, the Colombian Chamber of Infrastructure, national and international banks, including the World Bank (Andrade M, 2015).

1.3 Theoretical framework

The quality of the road infrastructure is part of the problems that Colombia is currently undergoing, and its current situation hinders the economic and social development of rural areas, municipalities and regions. The main source of livelihoods are livestock, agriculture, mining, fishing, energy production, industrial production, construction and manufacturing (DANE, 2012).

Prolonged transit times, corruption, violence, inequality and lack of opportunities mean that Colombia is faced with taking corrective measures to help mitigate these impacts (Cortés, 2016).

The improvement of the road network of countries such as Mexico, Chile, Panama, the United States, China, Senegal, France, Saudi Arabia, Singapore, among others, has generated countless economic and social benefits, Economies. Many of these advantages are directly linked to cost savings and transportation times, as well as increasing connectivity with the rest of the regions and improving the capacity of the country's industry as well as the quality of life of its inhabitants. One of the most representative cases is the improvement of Senegal's road system. This project is being financed by international financial institutions such as the World Bank, the European Union, the African Development Bank and resources of the Senegalese state. This ambitious development plan has brought multiple benefits such as reduced time, transportation costs, connectivity in the country, local industry competitiveness,

poverty reduction and a 4.6% increase in Senegal's GDP (Cortés, 2016).

1.3.1 Formulation of the problem

¿How will the implementation of the 4G roads impact Colombia economically and socially?

1.3.2 Consequences of the problem

Land transportation is the main means of freight and passenger transportation in Colombia, as mentioned by Rodas and Sánchez.

For most economists, the absence of adequate infrastructure and inefficient provision of infrastructure services are major obstacles to the effective implementation of development policies and the attainment of rates of economic growth that exceed international averages (Rodas & Sánchez, 2004).

The 4G roads project seeks to improve deficiencies in Colombia's road infrastructure, these works will help to solve and improve many of the problems presented in road development, since this insufficiency prevents being competitive and not only this but also affects The development and growth of the economy, according to the national competitiveness report, "the bad condition of the road network causes delays in delivery times to ports generating costs that can reach 35% increase in product cost." These shortcomings in infrastructure make Colombia less

efficient versus other economies that have an optimal road system that optimizes time and reduces operating costs. (Private Competitiveness Council, 2013).

1.4 Problem Approach

Land transport is the most widely used means of mobility within the territory; this means of transportation has a 75% participation, followed by air, sea and river transportation "(Perez, 2005).

According to information from INVIAS, the country's road network has about 203,338 km, of which 17,143 km correspond to the primary network, 55,458 km to the secondary road network, 135,679 km to the tertiary road network and 12,251 km belong to a private road network. In particular, the 135,679 km of the tertiary network are distributed as follows: 27,577 km by the National Institute of Roads - INVIAS, 21,469 km administered by 21 departments and 86,633 km by the municipalities of the Country (Zamora, 2012).

According to the report made by the Ministry of Transport:

Colombia's current road infrastructure does not meet the economic, political and social needs of the national government, for this reason, 4G routes seek not only to solve this problem; But also increase the efficiency and growth of the economy. This road project commits a total of 10 thousand kilometers of roads, including 1,370 dual carriageways and 159 tunnels (Mintransporte, 2017).

As mentioned Portfolio:

The 4G works have a multiplier effect of approximately 1.5% of the Gross Domestic Product (GDP), combined with the growth of all productive sectors during the years of its construction (2014-2021), these improvements can bring potential growth Of GDP from 4.5% to 5.3% in the long term and a reduction in the unemployment rate of 1%. (Portfolio, 2016).

The NCESP states:

The investment will be carried out by the public and private sector, the flow of execution of investments in infrastructure is concentrated in the period 2014-2020. However, the greatest execution of the program begins in 2015, when it reaches 1.1% of GDP, and increases to 1.6% and 1.5% of GDP in 2016 and 2017. In 2017 and 2018, these investments will be 1.0% and 0.8% of GDP respectively (NCESP, 2013).

Because of the importance of this issue for the economy, it was decided to carry out this research work, since it will detect the impacts of the implementation of the 4G routes for the country in the economic and social spheres.

1.5 Justification

1.5.1 Theoretical Justification

Land transport is an important part of the value chain and competitiveness of a country and its industry. For this reason, speeding up the arrival and departure times of the merchandise is directly related to the quality of the country's roads. It is also important to take into account public passenger transport vehicles; this mode is the means of transport preferred by tourists for their low prices as reported by a study conducted by MOVE in support of EAFIT University. In this survey carried out in 13 cities, the following results were obtained: 47% of the tourist trips are made through private land transport, 43% in public land transport and 9% by air (MOVE, 2013).

It is possible to affirm then that the trips to the interior of the Country are made through the terrestrial transport, this means of transport is the most used by the inhabitants, therefore, a project like the 4G roads in Colombia will have a great impact at social level and economic, reflected directly in the logistics and transport of goods as well as people who transit through the national territory. As mentioned in this project, the 4G roads will be one of the largest investments launched in recent years for the development and economic growth of the country. Reasons why this project will serve as information and fundamental basis to identify all possible impacts that this event will have on economic and social development.

1.5.2 Social Justification

The 4G roads or fourth generation project that is already underway by the Colombian government will have major impacts at the social level, it is predicted that many of these impacts will be beneficial, as Portfolio states:

Colombia has a world-class infrastructure, the impact will be felt strongly on several fronts: increase its competitiveness, increase foreign investment, generate more labor, reduce logistical costs (some of the highest in the world) and increase The quality of life of the Colombians, who will be able to mobilize more quickly (Portfolio, 2016).

With this, it is possible to see some of the factors that helped to promote this project and to give life to it, since great benefits are forecast of paramount importance for the Colombian economy as it is the generation of new jobs and the increase of the foreign investment.

1.6 Objectives

1.6.1 General objective

To identify the economic and social impacts that will be generated in Colombia from the execution of the 4G roads.

1.6.2 Specific objectives

- Highlight the most important works of the 4G tracks to determine the political and social impact that will lead to the implementation of these.
- Identify the impacts on the national economy due to the construction of 4G roads.
- Recognize the advantages of having 4G routes that will boost Colombia's competitiveness and economic growth.
- Know the regions that will benefit most from the construction of 4G tracks.

1.7 Methodological framework

1.7.1 Method

The type of research that will be used in this project will be the explanatory, and deductive starting from the general to the specific, through the quantitative and qualitative method. This major project will address key factors such as: social and economic impacts that will lead to the implementation of 4G routes, cost and time reduction, and we will also emphasize how this project will increase competitiveness and boost the growth of Colombian economy, seeking to have a greater view on the

impact of these important works.

Semi-structured surveys and interviews will be developed that seek to collect, analyze and conclude what a specific group of people thinks directly related to this important topic.

1.7.2 Methodology

The present research project will have contributions from different sources of information such as private and public entities, which will help to possess the necessary resources to proceed with the development of research work. Information will be taken from grade papers, articles, journals, newspapers and academic sources.

During this project, national and international statistics and indicators will also be taken to help determine the economic and social impacts of the countries that have developed this type of road infrastructure, since this will allow a broader and more specific view of the issue. At the same time, a field work will be carried out based on a semi-structured interview and a closed survey that will be carried out to 11 people with extensive knowledge and experience in the logistic and road sector of the country. There will be 16 basic questions for the interview and 5 closed questions in the survey, this work will be done between April 1 and 15, 2017, in this way seeks to obtain a much clearer and broader view of the situation in which it goes Focused work.

1.8 Scopes

This work intends to identify the impacts that the 4G pathway will have on the economic and social environment of Colombia, taking into account the advantages, benefits and regions most benefited by this megaproject that seeks to increase the competitiveness and quality of Life of its inhabitants.

2. Project execution

In order to carry out the present investigative work, different sources of information are taken into account, such as newspaper publications: El Tiempo and El Colombiano, in turn, in statistical data of Revista Dinero. Also from important sources of information such as the World Bank, ANI data, and academic sources (indexed journals and experts in the field) that help directly to elucidate what is happening with 4G pathways and what are their Economic and social trends.

2.1 Regions benefited and representative works

The execution of the 4G or fourth generation roads is composed of 46 projects focused as follows: creation of new routes and highways, construction of tunnels and bridges, reconstruction and improvement of the current road network. These works will be developed throughout the Colombian territory and it is proposed to terminate most of these by the year 2021. These works will directly and indirectly benefit all regions of the country, some of the most determining aspects of these works will be

the reduction of time and freight (ANIF, 2014).

According to the newspaper Portafolio "On average, the routes in the fourth generation routes present a reduction of time of 30% when the construction of the roads is completed". These works will also help contribute to the reduction of transportation costs by 20% "(Portfolio, 2016).

With the development of the 4G or fourth generation roads, there will be a large number of departments, regions and highly benefited areas of which stand out:

Antioquia is the department most benefited with the 4G routes, with a concentration of 27.6% of the total investment. According to Legiscomex; Five of the First Wave projects and two more of the Second Wave. Currently, they are developed in municipalities of the department and reach an investment close to 15 billion pesos (Legiscomex, 2014).

According to the Vice Presidency of Colombia, in this department will take important works such as:

Pacific Connection 1 (Bolombolo - Ancón Sur): With an investment of 1.79 trillion pesos, 49 kilometers of dual carriageway will be built, 42 bridges and two double tube tunnels that will save more than 25% in transport time and Pacific Connection 2 (La Pintada - Bolombolo): Vargas Lleras indicated that it will have an extension of 98

kilometers, with 69 bridges and a double tube tunnel in Mulatos, Another of the projects that will be concreted and that will be of great benefit for the department of Cesar Will be the Ruta del sol concession, between Puerto Salgar and San Roque, this is a parallel road to the right bank of the Magdalena River, which will also link the departments of the center and south of the country, starting in the municipality of Flanders and ending in Puerto Salgar (Cundinamarca). The project plans to build two large bridges over the Magdalena, one between Girardot and Flanders and another between La Dorada and Puerto Salgar. (Vice-Presidency of the Republic of Colombia, 2014).

The new 4G road will contribute to improve trade and transportation between Cundinamarca, Caldas and Tolima and, by connecting with the Sol routes, may serve to move more conveniently to the ports of Cartagena and Barranquilla. Therefore, these cities will be interconnected through the 4G routes. Mulato-Lobo Guerrero is located in the Valle del Cauca, to be more specific is developed between the city of Cali and Buenaventura. Mulato-Lobo guerrero will be composed of 32 kilometers of track (4.1 kilometers in double carriageway and 27.7 kilometers in single carriageway), which will be an important alternative to connect the port of Buenaventura with the rest of the country, as well as nine tunnels with a total length of 12.2 kilometers, the largest of which is 5.4 kilometers, as well as 31 bridges and viaducts totaling approximately 2.5 kilometers. For example, between Bogotá and Cartagena, a vehicle can actually take up to 25 hours, in 2021 with the entry into force of these roads, the route would only take 15 hours. (Vice-Presidency of the Republic of Colombia, 2014).

Illustration 1 Current concessions and road concessions 4G



Fuente: (ANI, 2013)

2.2 Economic impacts for the construction of 4G roads

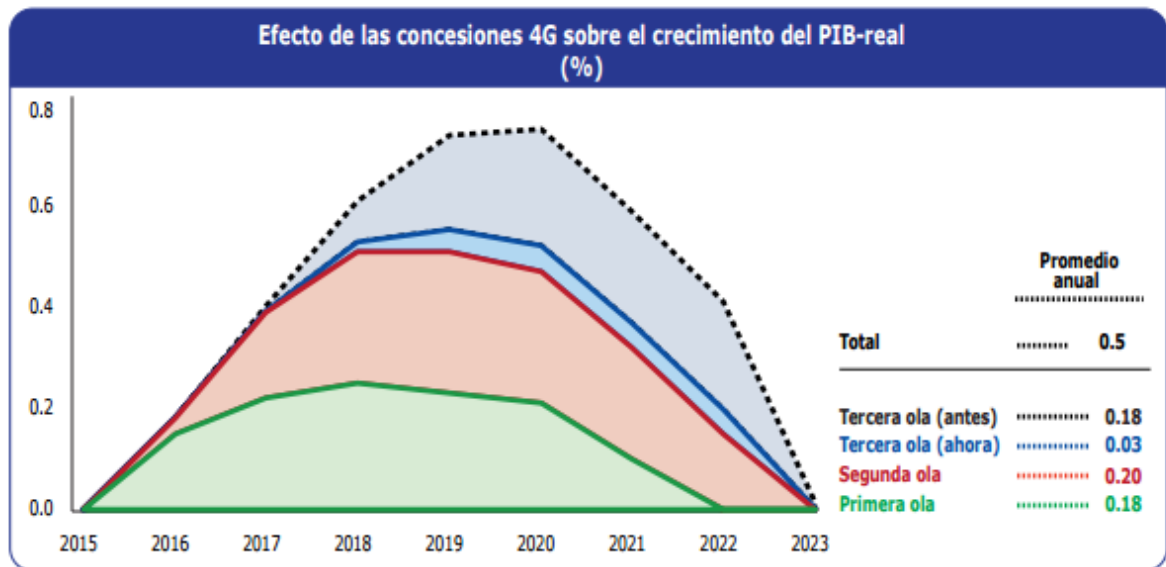
According to ANIF calculations, the construction of the first wave of works would be generating additional real GDP growth of close to 0.2% during the years 2016-2020. This implies that the construction of the second and third wave of 4G or fourth generation roads will bring real GDP acceleration by 0.5% per year, emphasizing that

development of the first wave would be responsible for 40% of such economic acceleration Despite the deceleration of a digit of our real GDP due to the energy crisis (ANI, 2016).

According to the report of infrastructure and capital markets published by the ANI:

The sequel to the first wave of real GDP (+ 0.2%) would be divided into a 0.12% direct effect (that derived from the execution of investment in civil works, with an impact of 2.97% on the growth of this subsector) and A 0.06% indirect effect (via productive chains). The latter would be at the head of: i) trade (with additional growth of + 0.26%); (+ 0.3%), machinery (+ 0.54%) and non-metallic minerals (+ 0.96%); lii) financial intermediation (+ 0.13%); and (iv) business services (+ 0.26%), capturing all complementary engineering-consulting and machinery rental activities (ANI, 2016).

Illustration 1



Fuente: cálculos Anif con base en ANI, Corficolombiana, Banco de Bogotá y Asobancaria.

The improvement of the country's road network will directly affect the increase of GDP, which means that the economy will grow considerably due to the policies of restructuring the Colombian infrastructure, therefore, businesses will produce and sell more products or services inside and outside the country. These events will help to reduce the percentage of unemployment, inequity, social and security problems that a large part of the Colombian population is experiencing.

2.3 Interview

For the present research project one of the methods is the semi-structured interview to 11 expert people who have relation with the subject to be treated or that are related in one way or another with this same one. The following are the profiles of the interviewees:

- 1) Kennis Navarro, International Negotiator. Head of Logistics, LyD Logística de Distribución S.A.
- 2) Juan Carlos Calle Muñoz, Economist. Professor of the University Institution ESUMER and also Head of Logistics of the company Diabonos.
- 3) Fabián Córdoba, International Logistics. Head of Logistics at Pronalce.
- 4) Víctor Hugo Botero, Technologist in International Trade. Assistant Operations in Cargo Agency at Marex Cargo.
- 5) Reinel Pulgarín, truck driver, works for AMX Logística.
- 6) Carlos Ramírez, Specialist in International Logistics Management. Manager of Logistics and Foreign Trade at Avianca.
- 7) Andrés Triviño, Industrial Engineer. Specialist in Logistics Management, professor at the Universidad Sergio Arboleda.
- 8) Carlos Fernando Gómez, Master in International Business. Logistics Director at Plastilene.
- 9) Sandra Chávez, Specialist in International Logistics Management. Coordinator Merchandising and Wineries Trade in Comercial Nutresa.
- 10) Rafael Pérez, Administrative Engineer. General Manager at Pronalce.

11) Viviana Espinosa, International Negotiator. Head of Purchasing EMTELCO.

Here is the detail of the interview:

**Interview: ¿How will 4G pathways impact
Colombia economically and socially?**

1) What do you consider will be the economic impact of 4G roads in Colombia? Justify your answer.

2) What do you consider will be the social impact of the 4G pathways in Colombia?

Your answer

3) What criticism do you have about the 4G roads project?

4) Do you agree with the sale of ISAGEN for the financing and execution of 4G roads in Colombia?

5) Of the 15 works that are going to make for the construction of 4G roads, in your opinion, which are the most important?

6) Do you think that the delivery times of the project will be fulfilled? Justify your answer.

7) Do you think that the budgeted to carry out the project will be sufficient or will it be necessary to look for a much greater financing to carry it out?

8) Do you think that this project will boost the country's economy and attract foreign investment?

9) Do you think that after the completion of this project, Colombia will be among the top 3 competitive positions in Latin America?

10) What other region do you consider that might have been taken into account in the development of the 4G pathways?

11) What other method of financing do you consider that could have been taken into account?

12) Do you believe that the environmental measures proposed by the entities responsible for the development of 4G roads will be fully implemented?

13) Do you consider that the best investment in the country were the 4G routes or do you believe that these resources could be used for the improvement or development of other types of infrastructure?

14) Do you consider that public and private entities are 100% reliable for the development and correct execution of 4G roads?

15) Do you consider that the development of these works will facilitate the entry and exit to the less accessible areas of the Country?

16) The number of tolls for 4G tracks will be 50 in total, do you agree with this amount?
Do you think there should be less tolls?

2.4 Surveys

Another method used is the survey of 11 experts in the area of international logistics:

Kennis Navarro, International Negotiator. Head of Logistics, LyD Logística de Distribución S.A.

Juan Carlos Calle Muñoz, Economist. Professor of the University Institution ESUMER and also Head of Logistics of the company Diabonos.

Fabián Córdoba, International Logistics. Head of Logistics at Pronalce.

Víctor Hugo Botero, Technologist in International Trade. Assistant Operations Cargo Agency at Marex Cargo.

Reinel Pulgarín, truck driver, works for AMX Logística.

Carlos Ramírez, Specialist in International Logistics Management. Manager of Logistics and Foreign Trade at Avianca.

Andrés Triviño, Industrial Engineer. Specialist in Logistics Management, professor at

the Universidad Sergio Arboleda.

Carlos Fernando Gómez, Master in International Business. Logistics Director at Plastilene.

Sandra Chávez, Specialist in International Logistics Management. Coordinator Merchandising and Wineries Trade in Comercial Nutresa.

Rafael Pérez, Administrative Engineer. General Manager at Pronalce.

Viviana Espinosa, International Negotiator. Head of Purchasing EMTELCO.

The following is the detail of the survey:

**Survey: ¿How will 4G pathways impact
Colombia economically and socially?**

1) How do you rate the road infrastructure in Colombia?

Good

Normal

Deficient

2) Which sector of the population do you think will benefit most from this megaproject?

Middle class

The upper class

Low class

All social classes

Any

Other:

3) What do you think will be the sector most benefited by the development of 4G roads?

Primary sector

Secondary sector

Third sector

Everybody

4) How do you rate the delivery times of most of the 4G roadway concessions by 2021?

Good

Regular

Deficient

5) How do you consider the maintenance of the 4G tracks by the competent authorities, after the end of their execution?

Good

Bad

Normal

The results that are presented through statistical data are based on the responses of 11 respondents who have a broad knowledge of the subject and who were asked questions that are directly related to the research topic. It is worth clarifying that there were some questions that were not answered 100%, this is because some of the

respondents did not have a clear answer or knowledge about what was being asked, and for this reason they decided not to answer them.

2.5 Interview result

1) What do you consider will be the economic impact of 4G roads in Colombia?

Justify your answer.

- 1) Savings in travel times, and negatively increase in tolls and fuel
- 2) Important, although I feel that it will be much the collection for the state entities and will not have social compensations
- 3) Will be very important as an adequate road infrastructure will reduce times and therefore costs within the logistics chain
- 4) Freight and reduced times in 30%
- 5) High, in tourism there will be more displacements therefore more money circulating
- 6) The impact will be a positive impact as long as the funds raised are fully delivered, and as long as the times are met, you will see a saving benefit in travel times, there will be a very positive impact for logistics in Colombia in international trade will have its benefits as well.
- 7) The impact of the completion of these works will be positive, reducing the time during transportation, reducing the cost of their operations and improving access routes to productive places difficult to access or exit; Promote the growth of all regions of the country and support the economic and social

development of the country.

8) Commercial competitiveness

9) It would improve the fall in the unemployment rate, attract foreign investment in the country, it is expected to bring growth to GDP

10) It will streamline the logistics of delivering goods and services in the country, decreasing considerably.

11) Great as this will improve circulation and agility within the roads

2) What do you consider will be the social impact of the 4G pathways in Colombia?

Justify your answer.

1) A good social impact in terms of the ecological part because there will be less time, less fuel and less pollution facilitating their measurement.

2) It is important to generate proximity to international levels and supply new markets

3) I think it will be very important to allow access to vulnerable populations that can increase trade, generate new jobs and bring about some more development

4) More progress

5) There will be more equality

6) As for the social impact, it will be seen as long as the international logistics are benefited as this will generate a positive trade balance, I think that it will be a benefit as long as the country's resources are well distributed on all social

scales, Of the good faith of the leaders.

- 7) Increase in the quality of life of the inhabitants, thanks to the decrease in the price of consumer goods; Reduction of the unemployment rate, access to education, health and safety.
- 8) Dynamism in the economy, increase in exports
- 9) Colombia will be more competitive, it will gain more labor, reduce logistical costs on a large scale, increase the quality of life of the inhabitants which allows them to move faster and more comfortable.
- 10) It will connect more to the regions with its main axes in the Country.
- 11) Very good, because that stimulates not only the economy but society to have growth and stability to be more attractive to the world.

3) What criticism do you have about the 4G roads project?

- 1) The late start of the project has had a negative effect on Colombia's logistical development, deficiencies in construction, financing conditions, and problems of mismanagement with organizations that are news today, another criticism could be the one that is not taken Out the whole project on dual carriageway, because it would be disadvantageous for vehicular flow and prevention in road safety.
- 2) What could generate a lot of corruption
- 3) Lack of planning, cost overruns in projects and poor control
- 4) Very late

- 5) Time
- 6) The times that are being taken to finish the project, since personally I consider that these will not be fulfilled in the agreed time and this will generate high overcharges.
- 7) Deficiencies in the structuring, term and financing conditions, these problems encouraged the "lack of supply" and "absence of large international engineering firms during all bidding processes of the works.
- 8) The delay in the beginning of the works
- 9) The evolution and the constant growth is something that urges over time, I think it is an important added value for the development of the country from which you can expect very positive situations.
- 10)The delay in the execution of projects and that there is no more embellishment of spaces Aledaños
- 11)Its delay to be built and get start working.

4) Do you agree with the sale of ISAGEN for the financing and execution of 4G roads in Colombia?

- 1) I do not agree, existing resources and local banks can subsidize the project is also obligation of dealers among others ...
- 2) I do not think that they could have established other financing methods
- 3) The truth is no, because I consider that if they control the money efficiently and stop stealing taxes would reach to finance these types of projects and many others

- 4) do not
- 5) No, I consider that there are already enough taxes, one would have gone perfectly
- 6) I do not agree as I personally think that the sale of ISAGEN was more a smokescreen so that senior leaders will take the slice there, rather than for the financing of this megaproject. I think that there are entities that could have financed the project without having to sell a company that generated profitability to the country.
- 7) I disagree with the sale of ISAGEN to leverage the construction of 4G roads, I believe that the national government should continue as owner of this heritage belonging to all Colombians.
- 8) No, how is it possible for such an emblematic, solid and profitable company to be sold to build roads, that is like selling the house to buy furniture
- 9) I find positive and negative aspects. Positives such as infrastructure, obviously foreign trade will be highly benefited by interregional transport, increased passenger traffic, increased exports; The unemployment rate may also decline. As negative, increasingly capitalist government, where the privatization of public sectors can be evidenced, the State would not be responsible for the prices on this service, but also causes the State to stop receiving dividends produced by this company Guaranteeing national coverage. Another great disadvantage is that already depends on this service, will reflect the lack of income over the nation's finances, among others.
- 10) He concluded by the above and more reasons, was not a wise decision or

smart.

11) No, I consider that the country invests more in Politiquería and maintenance of the corrupt ones.

12) That only made it as an excuse but that is not reality

5) Of the 15 works that are going to make for the construction of 4G roads, in your opinion, which are the most important?

- 1) Double road Bogota-el Sol, La Costa-Cúcuta, Pamplona-Buenaventura-Media-Canoa, Bogota-Cali (La Línea) -Medellín-La Costa, Ruta Occidente
- 2) The one in Cartagena - Bogotá
- 3) For my doubtless the way to Buenaventura
- 4) The Way to Buenaventura
- 5) The tunnel of the Toyo
- 6) Via Buenaventura and Cartagena de Bogotá.
- 7) In my opinion the most important works of these works are: Bogotá-Bucaramanga-Pamplona, Santander de Quilichao-Chachagüí-Pasto-Rumichaca, Villavicencio-Aguaclara-Yopal-Tame-Arauca and the highways of prosperity.
- 8) Peaceful connection and muffin connection
- 9) The connection with the Pacific, important the connection with ports, especially for us that is the means of foreign trade, the connection with Magdalena, since maritime transport is one of the most economic, Medellín with the Port of Urabá,

between others.

10) Rutas Pacífico 1 and 2, Ruta del Sol, Toyo tunnel.

11) Those that arrive at the ports.

6) Do you think that the delivery times of the project will be fulfilled? Justify your answer.

- 1) No, because of several factors, deficiency in planning, resources, unemployment, climate and others ...
- 2) I think not, structural reforms are often very complex to develop in stipulated times
- 3) In no way with all the problems that have had some ways in its schedule will delay some of the other contracted works
- 4) They are not late
- 5) No, because of the lived experience
- 6) No, there are even forecasts that show delays in project delivery times.
- 7) Due to the latent problem of corruption facing our country, in my view it is difficult for these works to be completed at the agreed time, it will be a challenge for the current and future government; Take measures that control this issue and do not allow increases to be generated in some of these works or in all of them.
- 8) No, the experience with these megaprojects is very bad
- 9) It is probable

10)No, I think that the bureaucracy delays the processing of works.

11)No, the Colombian construction companies are a bit relaxed in that

7) Do you think that the budgeted to carry out the project will be sufficient or will it be necessary to look for a much greater financing to carry it out?

1) Yes, every project is well budgeted with competent staff

2) This project at the time of bidding and bidding must have the budget that each requires.

3) Budgeting will not be enough

4) I think they need more for the FARC issue

5) I do not think it will be enough, since as mentioned earlier it is already seen that they will take longer than estimated, which will certainly generate some important overcharges.

6) I do not think it's enough because of our corruption problems.

7) No, by experience this type of projects ends up costing double or triple the budgeted

8) It is likely to be predicted, although I do not think there is anything left to the government as it is believed.

9) It will not be enough, because as a result of the unjustified losses that the current government has had, many monies have gone astray.

10)With illegality and jams, even if there is funding or budget, this is delayed.

8) Do you think that this project will boost the country's economy and attract foreign investment?

- 1) Yes, because it increases the level of competitiveness in logistics performance.
- 2) Surely if, because the only companies that can build these projects are foreign in Colombia there is no company able to develop this type of projects
- 3) If, for the lower costs and transit times of goods
- 4) Yes, it will be more efficient logistics, therefore, more economic inputs, due to reduced transportation
- 5) If I believe it, as I said before, as long as the projects of the 4G routes are done as planned, surrender at the estimated times and give the treatment to the roads they need for proper maintenance.
- 6) Yes, improving our road infrastructure will increase our competitiveness and this will help us increase our economic and social indicators, making our country much more attractive to investors.
- 7) Yes, one of the main problems of Colombia is the costs in freight transport, this is due to the number of intermediaries and the lack of infrastructure (at least one would be solved)
- 8) The dynamization is still to be seen, investment can attract
- 9) If it will boost the economy since it will generate more
- 10) Totally, since other companies abroad will see investing and even bringing their companies to Colombia by encouraging the economy and national employment

9) Do you think that after the completion of this project, Colombia will be among the top 3 competitive positions in Latin America?

- 1) Yes, within what the big analysts say that will be one of the important effects.
- 2) Would have many possibilities
- 3) No, it will be better Chile, Argentina and Brazil
- 4) Yes, but more projects are needed to generate employment
- 5) If I believe it, since it is a great opportunity, because even Colombia is located geographically in a highly strategic point at the level of international logistics.
- 6) Yes, the reduction of transport transit costs and times will leverage our competitiveness and help us to be once again one of the most important economies in our hemisphere.
- 7) No, because the problem of Colombia is not only the lack of road and believes that to build roads will solve the rest is naive
- 8) Yes, the initiative is totally innovative
- 9) No to Colombia it still lacks much for that
- 10)(No Answer)
- 11)(No Answer)

10) What other region do you consider that might have been taken into account in the development of the 4G pathways?

- 1) Do not
- 2) Cali could have more participation
- 3) The coast and the roads to and from ports

- 4) The project is well structured
- 5) Chocó
- 6) The Amazon, without having to properly touch the Amazon jungle.
- 7) Cauca's Valley
- 8) Pasto connection with Ecuador, given that it is one of the countries towards which we have great commercial flow and is one of the ways that is unemployed state
- 9) The connection between pasture and Ecuador, since there is only one access road and is very deteriorated
- 10) Guajira, because he is a sloppy runner in all areas.
- 11) (No Answer)

11) What other method of financing do you consider that could have been taken into account?

- 1) Royalties, as it is an exercise that can have benefits
- 2) International loans and grants
- 3) No other
- 4) Current taxes
- 5) Find more private funds.
- 6) Royalties
- 7) N / A
- 8) They finance the World Bank as this generates development for the country.
- 9) (No Answer)

10)(No Answer)

11)(No Answer)

12) Do you believe that the environmental measures proposed by the entities responsible for the development of 4G tracks will be fully implemented?

- 1) Yes, failure to do so leads to sanctions actions with the entities that regulate it.
- 2) No, I think that more risks should be applied that can harm the environment
- 3) So strictly not and something with some control
- 4) They are fine
- 5) No, from the experience
- 6) I do not know, but he does not carry these actions, he will generate high monetary penalties, then at first sight he would believe one that will be fulfilled.
- 7) No, because of the lack of experience and why we unfortunately do not have strong laws that punish companies that attack the environment.
- 8) No, because unfortunately when confronted with the economic and the environmental, they tend to give more importance to the economic
- 9) Do not give anything for sure, it is better to wait until the results speak for themselves.
- 10)No, as they have neglected important factors such as the care of rivers, maintenance of tertiary pathways soil studies.
- 11)Yes, because they seek a balance

13) Do you consider that the best investment in the country were the 4G routes or do you believe that these resources could be used for the improvement or development of other types of infrastructure?

- 1) It is one of the best projects, although it was very late since there should be other projects more advanced to reflect the economic improvement of the country.
- 2) I think the 4G is the correct route since Colombia has a precarious infrastructure
- 3) This issue is important for globalization
- 4) Investment is necessary for the development of the economy and the Country
- 5) I think it's the best, because you can compete
- 6) I think it was the best investment since Colombia's current roads are terrible.
- 7) I think it was the best choice, although if they had been implemented much earlier we should be improving a much more efficient means of transport, such as iron transport, for example.
- 8) It is not the best investment (in the personal best the investment will be education, health and employment), however they are things that have to be done Colombia is a country that has a road delay of more than 10 years, they are thing that must necessarily be done if Colombia wants to subsist on more than its non-renewable resources
- 9) I think it's a good investment
- 10)It was the 4G roads since our country is still logistically delayed.
- 11)No, it is a good investment and it is a necessity that requires the country to grow

economically.

14) Do you consider that public and private entities are 100% reliable for the development and correct execution of 4G roads?

- 1) I consider they don't, corruption in the works is not made to wait
- 2) At this time that Colombia lives with corruption very hard
- 3) No, there is corruption
- 4) No, for corruption
- 5) They are not 100% reliable thanks to the news of corruption that in the country come to light every day.
- 6) No, there is a lot of corruption.
- 7) Not all, and less than with antecedents such as those of the Nule and Obredecht
- 8) For no one is a secret that we live in the midst of corrupt, unscrupulous people who lack values. I would not put such a high percentage.
- 9) They should, through transparent and effective management, guarantee the operability and sound administration of this megaproject.
- 10) No, because there is a lot of corruption
- 11) (No Answer)

15) Do you consider that the development of these works will facilitate the entry and exit to the less accessible areas of the Country?

- 1) No, they are not complemented, I think they are working in phases
- 2) I consider that the 4G so far go to the main cities and do not activate so much the economy of other places with little accessibility in the country
- 3) Of course, it will be possible to have greater access to very retired populations
- 4) Yes it's normal
- 5) Yes, certain places or routes are no longer a luxury
- 6) No, since the 4G roads will be easily accessible to the main or more developed cities.
- 7) Yes, these works are mainly designed to connect the
- 8) Yes, it is that entering departments like Antioquia and Nariño is a crazy thing, and additional very expensive
- 9) Of course, among better routes we have, better access, decrease in accident levels, efficiency in logistics channels, among others.
- 10) If because it will connect the zones of greater development of the Country with zones that required an impact of economic development to be strengthened.
- 11) Yes, since there will be several entrances and exits, greatly facilitating trade.

16) The number of tolls for 4G tracks will be 50 in total, Do you agree with this amount? Do you think there should be less tolls?

- 1) Could be the same, but assessing the high cost of these is important to evaluate them again
- 2) Well I think it is the solution to so much investment that has to be generated, only that you should not go hand in hand with taxes as this would be an additional burden that impacts on national logistics and foreign trade
- 3) This will depend on the maintenance that these roads need, especially those with more vehicle flow
- 4) Fewer tolls
- 5) I do not agree, by law they should already be covered, it should not be for citizens.
- 6) I am not sure of the quantity as such, it would have to evaluate the price of these for each vehicle and thus enter to see if they are optimal or if they are required less or more, this will enter to evaluate entities like the ANI, in addition it will have to enter To see that this money is not stolen either, and the leaders will have to be trusted.
- 7) I think that if the resources that are collected are going to be invested for the optimal maintenance of these roads and to increase the level of development of the region there should be no problem.
- 8) No, it is known that the financing of these roads has a high cost, however, it is necessary to look at the value of each one, obviously see that its cost justifies

its use because it is useless to build roads if the cost of its use Greater than we already have

9) If they should be less, the fact of having this development so important, the country can benefit from the issues discussed above.

10) Less tolls because this increases logistics operability.

11) Yes, as long as you use those gains in the right way.

2.6 Explanatory Table made to the 11 interviewees

Table 1

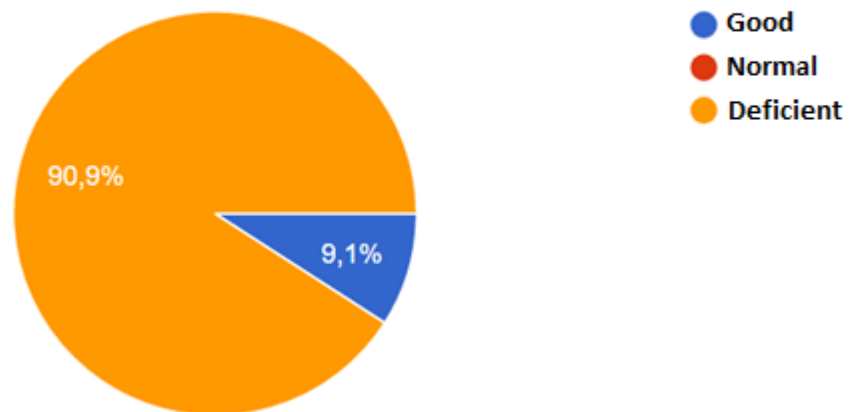
	Kennis Navarro	Juan Carlos Calle Muñoz	Fabián Córdoba	Víctor Hugo Botero	Reinel Pulgarín	Carlos Ramírez	Andres Triviño	Carlos Fernando Gómez	Sandra Chávez	Rafael Pérez	Viviana Espinosa
¿Cuál considera usted que será el impacto económico de las vías 4G en Colombia?	Ahorro en tiempos	no habrán retribuciones sociales	Ahorro en tiempos	Ahorro en tiempos	Mas dinero circulante	Aumento en el turismo	Competitividad comercial	Ahorro en tiempos	Ahorro en tiempos	Mejora en índice de desempleo	Dinamizara la logística
¿Cuál considera usted que será el impacto social de las vías 4G en Colombia?	menos contaminación	cercanía a niveles internacionales	mayor desarrollo	progreso	igualdad	balanza comercial positiva	Aumento en la calidad de vida	balanza comercial positiva	balanza comercial positiva	Conectara mas a las regiones	balanza comercial positiva
¿Qué crítica tiene usted sobre el proyecto de las vías 4G?	Tiempos de entrega del proyecto	corrupción	Tiempos de entrega del proyecto	Tiempos de entrega del proyecto	Tiempos de entrega del proyecto	Tiempos de entrega del proyecto	Tiempos de entrega del proyecto	Tiempos de entrega del proyecto	Tiempos de entrega del proyecto	Tiempos de entrega del proyecto	Tiempos de entrega del proyecto
¿Está usted de acuerdo con la venta de la Isagen para la financiación y ejecución de las vías 4G en Colombia?	En total desacuerdo	En total desacuerdo	En total desacuerdo	En total desacuerdo	En total desacuerdo	Aspectos positivos y negativos	En total desacuerdo	En total desacuerdo	En total desacuerdo	En total desacuerdo	En total desacuerdo
De las 15 obras que se van a realizar para la construcción de las vías 4G, en su opinión, ¿Cuáles son las más importantes?	Bogota-Cali	Cartagena Bogotá	via a buenaventura	via a buenaventura	tunel del toyo	via a buenaventura	Bogota-Cali	via a buenaventura	magdalena	Ruta Pacifico	Tunel del Toyo
¿Cree usted que se cumplirán los tiempos de entrega del proyecto?	No, por mala planeación	No, por las reformas	No, por planeación	No, por lo ya visto	No, por planeación	No, por la corrupción	No, por planeación	Es probable	No, por burocracia	No, por negligencia	No, por planeación
¿Cree usted que lo presupuestado para llevar a cabo el proyecto sera suficiente o habrá que buscar una financiación mucho mayor para llevarlo a cabalidad?	Si, con personal competente	Allicitar deben contar con presupuesto	No sera suficiente	No sera suficiente	No, por proyectos similares	No sera suficiente	No sabe No responde	No, por la corrupción	No sera suficiente	Si hay buena planeación si	Si no se roban la plata si
¿Cree usted que este proyecto dinamizará la economía del país y atraerá la inversión extranjera?	Si, aumentara el nivel de competitividad	Si, hay empresas extranjeras	Si, sera mas eficiente la logística	Si, reduccion de costos	Si, aumentara el nivel de competitividad	Si, reduccion de costos	esta por verse	Generara mas ingresos	No sabe No responde	Extranjeros buscaran invertir	Si, aumentara el nivel de competitividad
¿Cree usted que luego de la finalización de este proyecto, Colombia podrá estar entre los 3	Si, dentro de lo que los analistas	Tendria muchas	No, sera mejor Chile, Argentina	Si, pero faltan mas proyectos para generar	Si, incluso gracias a la ubicación de	Si, la reduccion de costos	No, ya que el problema en colombia no	No, a colombia le falta	No sabe No responde	Si, la iniciativa es totalmente	No sabe No responde
¿Considera usted que la mejor inversión del país fueron las vías 4G o cree que estos recursos pudieron destinarse para el mejoramiento o desarrollo de otro tipo de infraestructura?	Es uno de los mejores proyectos	Si, ya que la infraestructura de colombia es precaria	Importante para la globalización	La inversión es necesaria para el desarrollo de la economía	Es la mejor, porque se podra competir	Considero que fue la mejor inversión	Considero que fue la mejor inversión	Considero que fue la mejor elección	No es la mejor inversión	Opino que es una buena inversión	No es una buena inversión, es una necesidad
¿Considera usted que las entidades públicas y privadas son 100% confiables para el desarrollo y la ejecución correcta de las vías 4G?	No, por la corrupción	No, por la corrupción	No, por la corrupcion	No, por la corrupcion	No, por la corrupcion	No, por la corrupcion	No, por la corrupcion	No sabe No responde	No, por la corrupcion	No, por la corrupcion	Dar garantías
¿Considera usted que el desarrollo de estas obras facilitará el ingreso y salida a las zonas de menos accesibilidad del País?	No, falta complementación	Solo a ciudades principales	Si	Si	No	Si, vías diseñadas para conectar	Si	Si, entre mejores vías, mejor acceso	Si, habra mas entradas y salidas	Si, porque conectara mas zonas	Si
La cantidad de peajes para las vías 4G sera de 50 en total, ¿Está usted de acuerdo con que sea esta cantidad?, ¿Cree que debería ser menos peajes?	Alto costo	Comercio exterior	En desacuerdo	En desacuerdo	No esta seguro	Recursos bien invertidos	Alto costo	Deberia ser menos	Deberia ser menos	Deberia ser menos	Si, siempre que sean bien utilizados

Source: self made

2.7 Graphics Survey results

Table 2

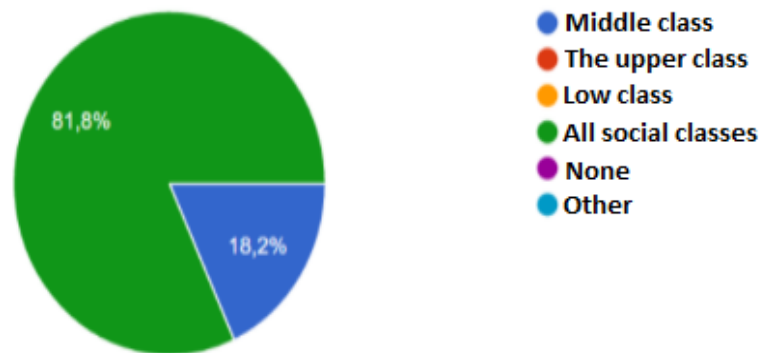
1) How do you rate the road infrastructure in Colombia?



Of the total of the 11 people surveyed, 90.9% consider that the road infrastructure in Colombia is deficient, this is due to the structural problems that the national territory has. Only one person equivalent to the remaining 9.1 considers that Colombia has a good road infrastructure.

Table 3

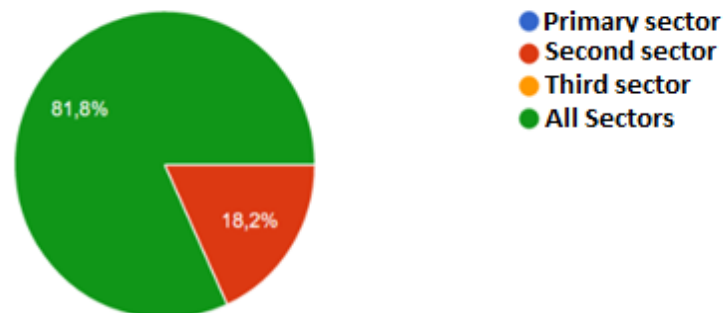
Which sector of the population do you think will benefit most from this mega project?



In this graph we can see how 9 of the 11 respondents, which correspond to 81.8%, considers that all social classes will benefit from the 4G pathway project, while 2 of the respondents, which correspond to 18; 2% believe that the middle class will benefit most from this megaproject.

Table 4

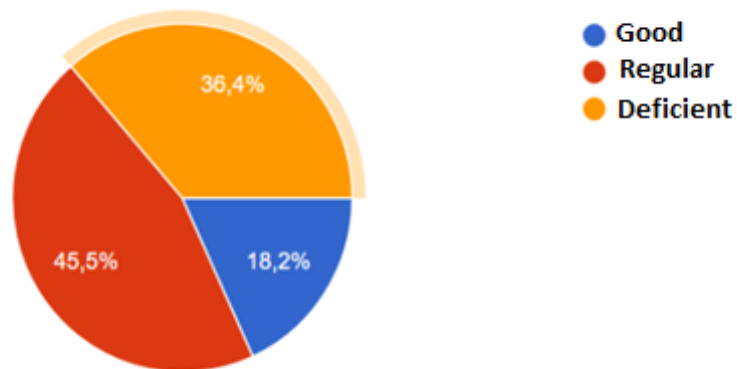
What do you think will be the sector most benefited from the development of 4G roads?



First of all it should be remembered that the primary sector is the sector that includes productive activities of extraction and obtaining of raw materials, the secondary is dedicated to the transformation of these same, and the tertiary is that of services. That said, we can see that 9 of the 11 respondents, which correspond to 81.8%, believe that all sectors of the economy will clearly benefit from the 4G project, while only 2 respondents, which correspond to 18.2% say that the secondary sector will be the sector most benefited by these works.

Tabla 5

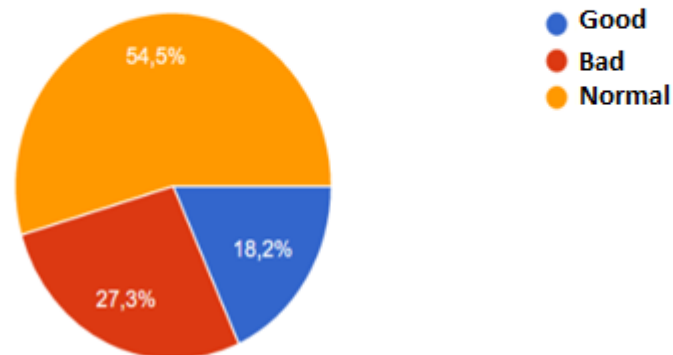
How do you rate the delivery times of most of the 4G roads concessions by 2021?



Of the total of the 11 respondents, 4 of them, equivalent to 36.4%, consider that the delivery times of most of the concessions are deficient, 5 of the respondents who correspond to 45.5% qualify delivery times As regular, and only 2 respondents who correspond to 18.2% of the respondents rated delivery times as "good".

Table 6

How do you consider the maintenance of the 4G roads by the competent authorities, after the end of their execution?



The previous graph shows how 54.5% of the respondents consider that the entities in charge of maintenance of the 4G routes are carried out with normality, 27.3% of the respondents consider that the maintenance of these works will be bad, and the remaining 18.2% consider that maintenance by the competent entities will be good.

3. Findings Interviews

It was found through various sources such as the World Bank, that the roads are in poor condition, even this same entity states that: "Colombia ranked 94 out of 160 countries in the logistic performance index", which leaves between Said the poor state of the country's tracks vs. the rest of the world (The World Bank, 2014).

Most of the interviewees consider that the economic impacts of the construction of 4G roads in Colombia will be positive. The most relevant item was "saving in time", however, some respondents also mentioned important issues as they are; The increase of tourism and the dynamization of logistics as a result of the construction of roads.

Another point identified, thanks to the interview conducted, was that after the execution of the 4G tracks, the social impact will be; A positive trade balance, in addition to one respondent mentioned that there will be more "equality" in the country.

Within the findings, the "criticisms" that have about the megaproyecto, lies in a fundamental subject, and is the delay in the times of delivery. However, corruption is also a factor to take into account since it was mentioned by one of the interviewees.

Most of the interviewees disagree completely with the sale of ISAGEN, they consider that there were many other ways of financing the execution of the project,

some argued that this sale was made solely and exclusively for the executors of this sale to have personal benefits And that had nothing to do with the financing of roads, as our interviewee Sandra Chávez states when she demonstrates her disagreement with the improper sale of this heritage belonging to all Colombians ISAGEN to leverage the construction of 4G roads..

Part of the interviewees believed that the construction of the work; "Via Buenaventura" is the most important, without neglecting the work; "Bogotá - Cali" that was also mentioned by the interviewees, referring to that was also one of the most important.

All the interviewees consider that the delivery times of the project will not be fulfilled, some think that this is due to the reforms being carried out, others take as an example what happened with other projects, however, the predominant reason why They will carry out the delivery times thanks to the bad "planning".

Most interviewees believe that what is budgeted for the 4G road project will not be "sufficient," many claiming that this is due to corruption that has been seen internally.

Part of the interviewees agree that the implementation of this megaproject will result in the dynamization of the economy, and also affirm that Colombia's level of competitiveness will increase and foreign investment will increase in the country (10

of the 11 respondents answered).

Do you think that after the completion of this project, Colombia could be among the top 3 competitiveness posts in Latin America ?, for this question the answers were too divided, since 4 of the respondents said yes, and the remaining 5 They think the opposite (9 of the 11 respondents answered).

Some of the interviewees think that the Chocó was another of the regions that should have been taken into account when building the fourth generation routes, and another part of the interviewees considered that Pasto was another city to take into account (10 out of 11 respondents answered).

One of the methods of financing that proposes part of the interviewees is; To look for a way to obtain "Royalty", in addition to "Loans" by entities that finance the project, without the need to sell important companies of the country (answered 8 of the 11 interviewed).

Regarding compliance with environmental standards, a large number of experts consider that they will not be fulfilled due to the regulatory shortcomings contained in the legislation, in addition to the cases that have been presented and that have attacked the Environment and the health of people in general.

Almost all of the interviewees believe that the best investment in the country was to have carried out the 4G routes, while only one of the interviewees believes otherwise.

Most of the experts interviewed agree that public and private entities are not 100% reliable to carry out this project, arguing that there is a lot of "Corruption" (10 of the 11 respondents answered).

Most of the interviewees agree that the development of the fourth generation routes will facilitate the entry and exit to the less accessible areas of the country.

Part of the interviewees believe that the amount of tolls that will be in the country thanks to the development of the megaproject of the 4G tracks "should be smaller".

3.1 Findings Surveys

In the survey carried out during the project, it was detected that the majority of respondents saw deficiencies along all roads in the country, 90.9% of the respondents rated the road infrastructure in Colombia as "Deficient" while 9.1 Remaining% rated it as "Good."

According to the respondents, 81.8% of these consider that all social classes will benefit from this megaproject, since they affirm that the 4G or fourth generation

routes will be a project that drives the economy and this will generate more foreign investment , Economic security and an increase in GDP, while only 18.2% believe that the middle class will be the most favored, and believe that on the contrary the 4G roads will generate more inequality.

81.8% of all respondents consider that all sectors of the economy (Primary, Secondary and Tertiary) will benefit greatly, while 18.2% of the respondents think that the secondary sector will benefit most from The construction of the megaproject.

As for the delivery times of the project, the opinions are too divided, since 45.5% of the respondents rate the delivery times of the megaproject as; "Regular", 36.4% qualify as; "Poor" while the remaining 18.2% consider that the delivery times of the project are; "Good ones".

It is found that 18.2% of the respondents consider that maintenance of the 4G roads by the competent entities after being executed will be good, 27.3% say that it will be bad, and 54.5% agree on That the maintenance will be "normal" since they expect that the conceptions use adequately the collection of the tolls to realize adequate maintenance to the tracks.

4. Conclusions

After carrying out the investigative work, it was possible to collect visions, arguments, perspectives, experiences, objections and positive cases that led to the following conclusions:

The roads in Colombia are currently in a bad state, this problem generates delays in the delivery times of goods, overcharges, in addition, causes us to be less competitive internationally, which will be mitigated with the construction of 4G roads. According to Portfolio;

Colombia retained its place in the ranking of the IMD Business School's Global Competitiveness Center each year (Centrumaldia, 2016). In fact, for the third consecutive year it occupies the 51st place in the 61 countries ranking, which is led by Hong Kong, Switzerland and the United States (Portfolio, 2016).

It is also concluded that the Colombian economy is not the best at the moment, the indices are declining, as affirmed Portafolio (Portfolio, 2016); "The Colombian economy has lost nine positions in the world ranking according to the International Monetary Fund figure. However, with the construction of 4G or fourth generation tracks will enter a new cycle, the economy of our country will be energized because we will be a much more competitive country in the international logistics level and being a

more competitive country Greater security for foreign investment.

Colombia currently has inequality, to be more specific there are: lack of opportunities and employment, as demonstrated by UNDP data (UNDP, 2015), El Tiempo "Colombia occupies the 12th place in the highest inequality of income among 168 countries in the world" (El Tiempo, 2016). However a work like this, where it will attract foreign investment, and where the same project will take care of making the Colombian trade balance positive, as the improved roads will be easier to transport goods, will generate reduction Of costs with which there will be an increase in exports, and increasing the country's exports will generate a positive trade balance and there will be an increase in GDP (Ramirez & Villar, 2015).

Investment in our country's road infrastructure has increased since 2010, and this investment is expected to reach a record 1.8% of Colombia's GDP. " These investments seek to improve transportation, which has been the main obstacle to improving productivity and growth in Colombia; Which will reduce the gap between the more and less developed regions (Ramirez & Villar, 2015).

Thanks to the development and promotion of the 4G or fourth generation roads, all of Colombia will benefit, to be more specific, all its social classes will be directly benefited without discrimination of each other, since as we mentioned earlier this project will be an impeller Of the Colombian economy, improvements in the roads will provide greater ease and agility in the transport of goods, resources and people,

reducing transportation times and costs are among the most important points of this research. This reduction in times and costs will allow us to increase our level of competence at national, regional and international level.

This way, it is hoped to make a jump in the ranking of global competitiveness, this improvement will boost economic growth, greater employment opportunities and a more stable and secure economy, which will attract even more foreign investment, allowing a much better Infrastructure if one continues with the idea of modernizing and increasing competitiveness for the benefit of all the inhabitants of Colombia (Portfolio, 2016).

The tolls that will be part of these works are an important factor to maintain the roads in optimal conditions and to fulfill the main objective of these, increasing the confidence in the citizens with the appropriate management of these resources will help to increase the credibility of these entities before the Citizens.

As for the budget allocated for this project, it is believed that these works will cost much more than budgeted by the national government and its ministries, with precedents such as constant strikes, protests, climatic conditions and terrain, accompanied by internal problems such as corruption That crosses the country, we consider that the budgeted will not be enough to execute the project in its entirety.

The construction of the 4G roads will boost the competitiveness of all Colombian productive sectors thanks to the reduction of time and costs during transportation, this positive impact will help to improve the ranking of competitiveness in the region and boost the GDP growth of Colombia and The improvement of the quality of life of its inhabitants, according to the newspaper Portafolio (Portfolio, 2015):

Portfolio states that studies by the National Infrastructure Agency indicate that 4G works have a multiplier effect of approximately 1.5% of the Gross Domestic Product (GDP), if we add the growth of all productive sectors during the years of its construction; Can bring potential GDP growth from 4.5% to 5.3% in the long term and a reduction in the unemployment rate of 1% (Portfolio, 2016).

It should be noted that the only regions that will benefit from these works are those that cross the country from the center to the Caribbean region, there are regions rich in natural resources and important industries that contribute significantly to the GDP of Colombia that were not taken into account for Such as Santander, which contributed 7.9% to the national GDP in 2015, Valle del Cauca with 9.6%, Chocó with 0.4% and Nariño with 1.6%, according to data from DANE (DANE, 2016) .

Due to the great diversity in flora, fauna and water sources, it is important that those responsible for carrying out these works fully comply with each of the risk control mechanisms, in addition to the regulatory and sanctioning entities in enforcing the rules, it is ideal that both Parties work hand in hand for the care of the environment

and well-being of citizens, this important issue is led by the Ministry of environment and sustainable development. This ministry is the director of the management of the environment and renewable natural resources, in charge of guiding and regulating the environmental order of the territory and of defining the policies and regulations that will be subject to recovery, conservation, protection, management, use And sustainable use of renewable natural resources and the environment (Minenvironment, 2017).

The planning of this project was carried out by the national government, ANI, COMPEL, Ministries and other parties involved and to promote and endorse the improvement of the main means of transport of the Country, although this measure was taken a little late and at this moment The infrastructure of ports, airports or rail systems should be improving. This challenge would be a good start, and starting from these works, a strong internal improvement process will be initiated if the objectives of economic growth and social development of the Colombian people are to be achieved.

It is important that each and every one of the Colombians starting from the highest social position to the lowest, as well as public and private entities in becoming aware of what corruption means and what it can cause throughout society.

The Comptroller General of the Republic, Edgardo Maya, says that the bloodshed of corruption can reach \$ 50 billion a year. A figure that would serve to pay for two years the allowances of pensioners of the Country. It is estimated that in Colombia, companies pay on average 17% of the value of the contract to win a bid.

Taking into account, for example, the investment of royalties \$ 21 billion at the end of December 2016 and investment in Fourth Generation channels - \$ 29 billion between 2014 and 2016, it could be said that only in these two big bets Country would be going more \$ 5 billion at the hands of the corrupt (El País, 2017).

The corruption that has infected the great majority of our leaders, public and private companies, has generated within Colombian society that the trust is significantly affected and that it is considered that whenever there is a project involving all these parties involved In the planning, execution, control, and surveillance are used to steal money and somehow leave unfinished works or with a considerable financial increase at the end of these works (El País, 2017).

5. Recomendations

Taking into account the economic and social impacts analyzed in this research, it is recommended that the 4G roads continue their construction process as stipulated by the national government and the agencies that accompany it, since despite differences between the Different sources (such as funding sources), their impact will be primarily positive and the construction of the public and private entities that developed this project will yield invaluable benefits such as the following:

With the concessions of the fourth generation (4G roads) there will be concrete influences for the Colombian economy, since the economy will be dynamized from all

points of view, without leaving aside the obstacles will have to face as it is the corruption, for that reason , It is proposed to evaluate the possibility that for this project more regulators of the money that are being handled for the execution of the project as such participate, as indicated by El País; "The General Audit of the Republic, in its most recent report on recruitment, indicates that 83% of the contracts in the regions are delivered by hand" (El País, 2017).

It is suggested, therefore, that penalties for crimes such as corruption be severely punished without leaving any margin, with these measures seeks to raise awareness and prevent situations such as these continue to bleed the country and generating economic problems affecting the entire society in particular. Attacking this problem of internal corruption will benefit our economy in the short, medium and long term.

One of the proposals offered is that there be an international planning and control committee to ensure optimum use of resources and delivery times. In addition, the planning factor is not the only one that causes delays, but also the lack of Scarcity of economic resources due to embezzlement by those who are carrying out the project, therefore it is advisable to change the regulatory entity, so as to ensure optimum management of the public and private monies used during the development of the project.

One of the big problems that this megaproject presents was the little search of entities that will finance this project, because of this decision the national government put in sale the most important asset of the country and where it owned 57.6% of the shares, ISAGEN was Sold for 6.48 million pesos to the Canadian fund Brookfield in order to leverage this megaproject of infrastructure, our recommendation for future works is that the government, look for new forms of financing that do not risk the sovereignty of the country by selling assets irregularly And that belong to all Colombians.

It is considered that the environmental measures that will be carried out for the development of the megaproject will not be fully implemented, due to the lack of experience in these projects, our constitution does not currently have a strong sanctioning system, together with the negligence of some Those responsible for ensuring compliance with these standards. For this reason, from the same government it is proposed to create laws or regulations in order to enforce all parameters already established that seek to protect the environment, through severe and irrevocable sanctions that achieve a stop along the way for those who want to circumvent the norm.

After the completion of the 4G roads it is proposed to start with the construction of new projects that include upgrading the tracks of the regions that were not taken into account in this project, also to emphasize the construction of new ports and improvement Of the existing ones, this is due to the fact that maritime transport is the

most used international means of transport in the world and where there are great shortcomings that deserve to be attended and solved.

Initiating projects that seek to improve the road system in other regions of the country that were not taken into account for the implementation of the 4G roads, with these measures seeks to unify all regions so that all citizens and productive sectors have the same opportunities and Enabling them to improve the productive capacity of their industries to the benefit of the local and national economy and that of all its inhabitants.

It is advisable to promote the creation of entities that audit and regulate all the steps that will be carried out during and after the execution of these works, this will allow resources to be used correctly and in this way avoid delays, reprocesses, and robberies that considerably increase the costs of the project which directly affect the pockets of citizens.

Thanks to the statistical and productivity data of each of these regions of the country, it is recommended that all works regardless of the other are of equal importance to the country, these improvements contribute together to the improvement of the quality of life of its inhabitants, performance and competitiveness in the national and international market as well as helping to boost the economy in a positive way.

With the fourth generation concessions, all regions of the country will benefit, these works will serve to improve the vehicular flow and connectivity in general of the Country.

Although all projects will be of great benefit and development for the country, personally, I think that the most important concession that our country will have will be the highways of prosperity that connected Antioquia with much of the center and north of the country.

These routes are of paramount importance not only for the transportation of passengers but also for the transport of goods and for connectivity between ports, this will generate a reduction in the internal freights which is what makes the logistic processes of Colombia more expensive, which will end For being triggered in a better logistics performance for the country.

Investing in education, food, health and welfare is a right that each Colombian has according to the constitution, so it is important that a large part of the economic benefits of these works are reflected in the construction of schools, hospitals, Parks, education and security.

6. References

- National Infrastructure Agency. (November 25, 2015). Obtained from the <https://www.ani.gov.co/article/la-cadena-productiva-el-impacto-economico-de-las-de-cuarta-generacion-21831>
- Andrade M, L. (August 16, 2015). Fourth Generation of Concessions in Colombia. Obtained from https://www.ani.gov.co/sites/default/files/cuarta_generacion_de_concesiones_luis_fernando_andrade_moreno.pdf
- ANI. (2013). Fourth Generation of Concessions. Obtained from https://www.slideshare.net/ANI_Colombia/presentacin-del-presidente-de-la-ani-en-el-dcimo-congreso
- ANI. (26 of 9 of 2016). Infrastructure and Capital Markets Report. Obtained from the <https://ani.gov.co/article/la-cadena-productiva-el-impacto-economico-de-las-de-cuarta-generacion-21831>
- ANIF. (December 2014). Transport costs, multimodalism and competitiveness in Colombia. Obtained from http://www.anif.co/sites/default/files/publicaciones/libro_multimodalismo_anif-cci_1_0.pdf
- National Association of Financial Institutions. (November 29, 2016). Obtained from http://anif.co/sites/default/files/archivosgenerales/anif_en_baja_digital.pdf
- World Bank. (2004). Infrastructure Overview. Obtained from <http://www.bancomundial.org/temas/resenas/infraestructura.htm>
- Benavides, V. L. (2015). The Incidence of the Sale of Isagen in the Economic Development of the country. Bogotá, Cundinamarca, Colombia. Obtained from <http://repository.unimilitar.edu.co/bitstream/10654/7806/1/BENAVIDESVELANDIALEONARDOFELIPE2016.pdf>
- Bohorquez, L., & Camacho, M. (2002). The concession agreement. Obtained from <http://www.javeriana.edu.co/biblos/tesis/derecho/dere5/TESIS17.pdf>
- Centrumaldia. (2016). Ranking of World Competitiveness. Obtained from "http://www.centrumaldia.com/Docs/files/resultados_imd_2016.pdf"
- CONPES. (August 20, 2013). National Council of Economic and Social Policy. Obtained from <https://colaboracion.dnp.gov.co/CDT/Conpes/Econ%C3%B3micos/3760.pdf>
- Private Competitiveness Council. (2013). Graduates Colombia. Obtained from National Competitiveness Report 2013-2014: http://www.graduadoscolombia.edu.co/html/1732/articles-142266_Informe_Nacional_de_Competitividad_2013_2014.pdf
- Cortes, N. (2016). Social Impact of 4G Road Counties on Colombian Business Activity. Bogota Colombia. Obtained from <http://repository.unimilitar.edu.co/bitstream/10654/14468/3/CORTESMALDONADONELSON2016.pdf>
- D'alessio, F. (2002). Management and Production Management. Obtained from <https://en.slideshare.net/AlJoseEstradaRojas/administracion-y-direccion-de-la->

- produccion-fernando-d-alessio
- DANE. (March 2012). International Standard Industrial Classification of All Economic Activities. Obtained from https://www.dane.gov.co/files/nomenclatures/CIIU_Rev4ac.pdf
- DANE. (2016). National Tax and Customs Office. Obtained from <https://www.dane.gov.co/index.php/estadisticas-por-tema/cuentas-nacional/cuentas-nacional-departamentales>
- National Planning Department. (2013). Road projects under the scheme of public private partnerships. Obtained from <https://colaboracion.dnp.gov.co/CDT/Conpes>
- The World Bank. (April 09, 2014). Transport: Results of the Sector. Obtained from <http://www.bancomundial.org/en/results/2013/04/14/transport-results-profile>
- The world. (5 of 07 of 2016). The logistics cost in Colombia remains high. Obtained from http://elmundo.com/porta/noticias/economia/el_costo_logistico_en_colombia_sigue_siendo_alto.php#.WUQwn2g182w
- The country. (January 22, 2017). Every year, corruption robs Colombians \$ 50 billion. Obtained from <http://www.elpais.com.co/colombia/cada-ano-la-corrupcion-les-roba-50-billones-a-los-nos.html>
- Time. (January 13, 2016). Government sells 57% of Isagen to Canadians at \$ 6.48 trillion. Time.
- National Competitiveness Report. (2013). National Competitiveness Report. Obtained from "http://en.wikipedia.org/wiki/Category:Application_of_Competitiveness_2013_2014.pdf"
- The Republic. (07 of 06 of 2015). The Republic. Obtained from "http://www.larepublica.co/las-4g-impulsar%C3%A1n-la-infraestructura_273401"
- Legiscomex. (May 07, 2014). 4G project, national connectivity and competitiveness in international trade. Obtained from <http://www.legiscomex.com/BancoConcimiento/P/proyecto-4g-conectividad-nacional-competitividad-comercio-internacional-actualizacion-legiscomex/proyecto-4g-conectividad-nacional-competitividad-comercio-internacional-actualizacion-Legiscomex.asp> • CodSubsecci
- Minambiente. (2017). Ministry of Environment and Sustainable Development. Obtained from <http://www.minambiente.gov.co/index.php/ministerio/objetivos-y-funciones>
- Mintransporte. (January 2017). Ministry of Transport. Obtained from https://www.mintransporte.gov.co/ANSEMITRA/Documentos/documentos_del_ministerio/Estadisticas
- MOVE. (October 2013). Eph. Obtained from Measurement of Internal Tourism in Colombia, Experience and Challenges: <http://www.eafit.edu.co/cec/congresos/move2013/papers/Medici%C3%B3n%20del%20turismo%20interno%20en%20Colombia%20experiences%20y%20retos.pdf>
- Perez, J. (October 2005). The Road Transport Infrastructure and Mobilization in Colombia. Obtained from http://www.banrep.gov.co/docum/Lectura_finanzas/pdf/DTSER-64.pdf

- UNDP. (2015). Work at the Service of Human Development. Obtained from <http://www.co.undp.org/content/dam/colombia/docs/DesumrolloHumano/undp-co-expcol-2015.pdf>
- Portfolio. (June 23, 2015). 4G Colombia projects will be competitive. Obtained from <http://www.portfolio.co/economy/finanzas/proyectos-4g-colombia-sera-competitiva-34346>
- Portfolio. (May 30, 2016). Colombia Maintained Rank 51 in the World Competitiveness Ranking. Obtained from <http://www.portfolio.co/economia/gobierno/colombia-maintained-puesto-51-escalafon-competitividad-496589>
- Portfolio. (October 03, 2016). Everything you need to know about the 4G routes that will modernize the country's roads. Obtained from ["http://www.portafolio.co/economia/infraestructura/advantages-of-tener-vias-4g-en-el-pais-500367](http://www.portafolio.co/economia/infraestructura/advantages-of-tener-vias-4g-en-el-pais-500367)
- Portfolio. (January 3, 2016). Everything you need to know about 4G roads that will modernize the country's roads. Portfolio, pp. 2-3.
- Ramirez, & Villar. (March 2015). Macroeconomics of the Concessions. Obtained from http://www.repository.fedesarrollo.org.co/bitstream/11445/3172/1/Repor_Marzo_2015_Ramirez_y_Villar.pdf
- Home (2015). The Roads of the Autonomous Communities. Roads. Journal of Logistics. (2015). 10 Works that will change the Infrastructure of Colombia. Journal of Logistics, 21-26.
- EMB Magazine. (2010). Pavements and Road Infrastructure, advances and challenges. Roda, P., Perdomo, F., & Sánchez, J. (March 26, 2015). Impact of Transport Infrastructure on Economic Performance. Obtained from <https://colaboracion.dnp.gov.co/CDT/Estudios%20Economicos/424.pdf>
- Rodas, P., & Sánchez, R. (2004). Natural Resources and Infrastructure. Development of Infrastructure and Economic Growth. Obtained from http://repositorio.cepal.org/bitstream/handle/11362/6441/S048642_en.pdf?sequence=1&isAllo
- Rojas.M. (September 2016). VIAL DEVELOPMENT IN COLOMBIA AND THE IMPACT OF THE FOURTH GENERATION ROADS. Obtained from <http://repositorio.unimilitar.edu.co/bitstream/10654/14893/3/RojasArdilaDianaMarcela2016.pdf>
- Rozas, P., & Sánchez, R. (October 2004). Development of Infrastructure and Economic Growth. Obtained from http://repositorio.cepal.org/bitstream/handle/11362/6441/S048642_en.pdf?sequence=1&isAllowed=y
- Sánchez Rojas, F. (January 2016). The Impact of Road Infrastructure on Rural Homes. Obtained from https://economia.uniandes.edu.co/components/com_booklibrary/ebooks/dcede2016-02.pdf
- National university of Colombia. (October 24, 2009). National University. Obtained from ["http://www.unperiodico.unal.edu.co/dper/article/infraestructura-en-colombia-hay-](http://www.unperiodico.unal.edu.co/dper/article/infraestructura-en-colombia-hay-)

recursos-pero-no-vision.html"

Vice-Presidency of the Republic of Colombia. (November 2014). "Antioquia is the most benefited department with 4G road concessions": Vargas Lleras. Obtained from <http://www.vicepresidencia.gov.co/prensa/2014/Paginas/Antioquia-es-el-departamento-s-beneficiado-con-concesiones-viales-4G-141210.aspx>

Zamora, N. (2012). DIAGNOSIS OF THE CURRENT VIAL INFRASTRUCTURE IN COLOMBIA. Obtained from <http://repository.ean.edu.co/bitstream/handle/10882/3405/ZamoraNelida2012.pdf?sequence=5&isAllowed=>