

## SECTION III: STRUCTURING OF THE PROJECT PORTFOLIO BY INTEGRATION AND DEVELOPMENT HUB

### III.1. Andean Hub

#### III.1.1. Hub's Location and Area of Influence

The Andean Hub was defined by delimiting an area of influence that contains the connection of the main articulation nodes of Bolivia, Colombia, Ecuador, Peru, and Venezuela. This area of influence is relatively dynamic, since it also relates to the physical location of the projects included in the groups into which the Hub has been divided. The map below shows the current area of the Andean Hub:

Map 3 - Location and Area of Influence of the Andean Hub



The area of influence highlighted includes the two big North-South road corridors that connect the main cities of the countries within the area: the Pan-American Highway, that runs along the Andes in Venezuela, Colombia, and Ecuador, and along the Peruvian coast (connecting farther South with Chile); and the Marginal Highway of the Jungle, which skirts the Andes across the Plains of Venezuela and the Amazon rainforest in Colombia, Ecuador, and Peru, then enters Bolivia through the Desaguadero Border Crossing on the Peruvian Southern Longitudinal Highland Highway, and reaches the Argentine border through Bolivian Road 1 (Villazón - La Quiaca). These longitudinal corridors are crossed by various transversal corridors (roads and rivers) that connect them with the Guianese Shield, Amazon, Peru - Brazil - Bolivia, and Central Interoceanic Hubs.

The area of influence defined for the Andean Hub covers 2,417,278 km<sup>2</sup>, accounting for 51.45% of the total area of the countries that make up the Hub. Its main cities, ports and border crossings are listed in the table below:

Table 13 - Area, Population, Main Cities, Border Crossings, and Maritime and River Ports within the Hub

<b>Countries - Territorial Units</b>	<b>Area km<sup>2</sup></b>	<b>Population 2008</b>	<b>Main Cities</b>	<b>Border Crossings</b>	<b>Maritime and River Ports</b>
<b>BOLIVIA</b>	<b>1,098,581</b>	<b>10,027,643</b>			
Chuquisaca	51,524	631,062	Sucre	Charaña	
La Paz	133,985	2,756,989	La Paz, El Alto	Desaguadero	Matarani, Ilo
Potosí	118,218	780,392	Potosí	Est. Abaroa	Arica, Iquique
Oruro	53,588	444,093	Oruro	Tambo Quemado	
Tarija	37,623	496,088	Tarija	Villazón, Yacuiba	
<i>Area of Influence</i>	<i>394,938</i>	<i>5,108,624</i>		<i>Pisiga</i>	
<b>COLOMBIA</b>	<b>1,141,748</b>	<b>44,450,260</b>	Bucaramanga	Saravena	
Bogotá (Capital District)	1,605	7,155,052	Bogotá	San Miguel	Santa Marta
Andean area <sup>1</sup>	285,671	20,925,725	Calí, Popayán	Paraguachón	Puerto Bolívar
Amazon area <sup>2</sup>	321,403	2,146,173	Manizales	Cúcuta, Arauca	Barranquilla
<i>Area of Influence</i>	<i>608,679</i>	<i>30,226,950</i>		<i>Rumichaca</i>	
<b>ECUADOR</b>	<b>256,370</b>	<b>13,805,045</b>			
Sierra Region <sup>3</sup>	63,192	6,202,753	Quito, Ambato	Tulcán	Esmeraldas
Littoral or Coastal Region <sup>4</sup>	49,111	5,478,806	Guayaquil	Huaquillas	Manta, S. Lorenzo
Eastern Region <sup>5</sup>	115,741	679,498	Loja, Zamora	Macará	Guayaquil
<i>Area of Influence</i>	<i>228,044</i>	<i>12,361,057</i>		<i>Mataje</i>	<i>Puerto Bolívar</i>

Countries - Territorial Units	Area km <sup>2</sup>	Population 2008	Main Cities	Border Crossings	Maritime and River Ports
<b>PERU</b>	<b>1,285,234</b>	<b>28,214,000</b>		Namballe	
Coast <sup>6</sup>	267,619	17,393,073	Lima, Trujillo	Aguas Verdes	Callao, Paita
Sierra <sup>7</sup>	370,667	7,788,628	Cusco, Tacna	Desaguadero	Salaverry
Rainforest <sup>8</sup>	90,502	1,137,118	Arequipa, Puno	La Concordia	Matarani, Ilo
<i>Area of Influence</i>	<i>728,788</i>	<i>26,738,819</i>			
<b>VENEZUELA</b>	<b>916,666</b>	<b>27,934,783</b>			
Capital Region <sup>9</sup>	9,879	5,329,055	Caracas		La Guaira
Central Region <sup>10</sup>	26,464	4,257,399	Maracay, Valencia		Puerto Cabello
Northeastern Region <sup>11</sup>	84,000	3,306,182	Ciudad Bolívar	Puerto Carreño	
Zuliana Region <sup>12</sup>	63,100	3,687,332	Maracaibo	Paraguachón	Maracaibo
Los Llanos Region <sup>13</sup>	128,666	1,133,919			
Los Andes Region <sup>14</sup>	77,820	3,667,448	San Cristóbal	San Antonio	
Central-Western Region <sup>15</sup>	66,900	4,242,147	Barquisimeto		
<i>Area of Influence</i>	<i>456,829</i>	<i>25,623,482</i>			
<b>Total Countries in the Hub</b>	<b>4,698,599</b>	<b>124,431,731</b>			
<b>Total Area of Influence</b>	<b>2,417,278</b>	<b>99,638,932</b>			

Notes:

<sup>1</sup> Includes the departments of La Guajira, Magdalena, Boyacá, Caldas, Cauca, Cundinamarca, Huila, Nariño, Norte del Santander, Quindío, Risaralda, Santander, Tolima, and Valle del Cauca.

<sup>2</sup> Includes the departments of Arauca, Caquetá, Casanare, Guaviare, Meta, and Putumayo.

<sup>3</sup> Includes the provinces of Azuay, Bolívar, Cañar, Carchi, Cotopaxi, Chimborazo, Imbabura, Loja, Tungurahua, and Pichincha.

<sup>4</sup> Includes the provinces of Esmeraldas, El Oro, Guayas, and Los Ríos.

<sup>5</sup> Includes the provinces of Morona, Santiago, Napo, Orellana, Pastaza, Sucumbíos, and Zamora Chinchipe.

<sup>6</sup> Includes the departments of Ancash, Arequipa, Ica, La Libertad, Lambayeque, Lima, Moquegua, Piura, Tacna, and Tumbes.

<sup>7</sup> Includes the departments of Apurímac, Ayacucho, Cajamarca, Cusco, Huancavelica, Huanuco, Junín, Pasco, and Puno.

<sup>8</sup> Includes the departments of Amazonas and San Martín.

<sup>9</sup> Capital Region, comprising the states of Miranda, Vargas, and the Capital District.

<sup>10</sup> Central Region, comprising the states of Aragua, Carabobo, and Cojedes.

<sup>11</sup> North-Eastern Region, comprising the states of Anzoátegui, Monagas, and Sucre.

<sup>12</sup> Zuliana Region, comprising the state of Zulia.

<sup>13</sup> Los Llanos Region, comprising the states of Guárico and Apure, with the exception of the Páez municipality.

<sup>14</sup> Los Andes Region, comprising the states of Barinas, Mérida, Táchira, Trujillo, and the Páez municipality in the state of Apure.

<sup>15</sup> Central-Western Region, comprising the states of Falcón, Lara, Portuguesa, and Yaracuy.

### *III.1.2. Hub's Basic Characterization*

#### Demography

The total population of the area of influence defined for the Andean Hub was estimated at 99,638,932 inhabitants in 2008, accounting for 80.08% of the total population of the countries that make up the Hub. Furthermore, the Hub's area of influence reached an average population density of 41.39 inhabitants per km<sup>2</sup>. This indicator ranges from a maximum 4,458 inhabitants per km<sup>2</sup> in the Capital District of Bogotá to a minimum 5.9 inhabitants per km<sup>2</sup> in the territory of the Eastern Region of Ecuador.

#### Economic Aspects

The gross domestic product (GDP) for the Andean Hub's area of influence was estimated at US\$ 340,637 million at constant 2000 market prices, based on the 2007 statistics prepared by ECLAC for each country and on the GDP share as estimated by each national statistics institute for the territorial units of each country that makes up the Hub. This amount accounts for 85.24% of the total GDP, for the same year, of the countries within the Hub.

The GDP resulting from adding the GDPs of the countries that make up the Hub at constant 2000 values has changed positively between 2000 and 2007 by 38.34%, i.e. an annual average growth rate of 4.75%. The economy of the Hub's countries is characterized by a strong commodity and industrial sector, oriented to the extraction of primary products and their processing, and a services sector that has experienced a more dynamic growth than the other sectors in the last twenty years.

The Hub is characterized by its horizontal production and trade networks, particularly of commodities based on the processing of natural resources.

Exports from the Andean Hub's area of influence amounted to US\$ 169,685.9 million in 2008,<sup>2</sup> which, compared to the annual figure in 2000 (US\$ 56,259.3 million), represents a 201.63% growth in eight years. Furthermore, if the value of exports from the Hub in 2008 is compared to the annual figure of all the exports from the countries that make up the Hub, the former accounts for 87.37% of the latter (US\$ 194,234.3 million).

In terms of value, 90.59% of the exports from the countries that make up the Andean Hub were extra-regional in 2008, while the exports to the countries of the Hub (i.e. intra-regional) represented 9.41% (US\$ 18,271.7 million), whereas in 2000 intra-regional exports were 9.08% of total exports (US\$ 5,208.1 million/US\$ 57,329.7 million).

Crude oil is the most important among the five leading products exported from the countries in the Andean Hub, accounting for about 59.34% of the total value of exports in 2008, followed by copper ores (3.94%). Petroleum derivatives, gold, and natural gas in gaseous state rank third, fourth and fifth, respectively. In 2008, the sum of the five leading products exported from each country accounted for 79.16% of the total value of exports from the countries that make up the Andean Hub.

The transportation means used for exports from the CAN (Bolivia, Colombia, Ecuador, and Peru)<sup>3</sup> in terms of volume in 2007 were as follows: by sea, 82.34%; by railway, 0.37%; by road, 3.96%; by air, 0.60%, and by "other means," 12.73%.

By comparison, in 2000 exports from the CAN (Bolivia, Colombia, Ecuador, Peru and Venezuela)<sup>4</sup> in terms of volume were as follows: by sea, 88.24%; by railway, 0.62%; by road, 2.77%; by air, 0.40%; and by "other means," 7.97%.

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<sup>2</sup> This figure includes total exports from Venezuela and Ecuador, as no data were available for exports from these two countries' individual states and provinces.

<sup>3</sup> "Tráfico portuario en los Países Andinos y en España." CAN. December, 2008.

Regarding the main economic activities carried out within the Hub's area of influence, the following sectors represent opportunities for the productive development of the region:

- **Agriculture and agro-industry:** The main products cultivated in the different countries are: corn, rice, wheat, barley, quinoa, sorghum, coffee, bananas, plantain, oranges, peaches, tangerines, pineapples, grapes, tropical fruit, beans, peas, onions, garlic, soybean, sunflower, sugarcane, cotton, peanuts, potatoes, cassava, barley grass, alfalfa, garden flowers, palm oil, palm hearts, asparagus, and native crops.
- **Farming:** Dairy products and beef, poultry, forestry, swine breeding.
- **Fisheries:** Fresh- and salt-water fish (at both artisan and industrial level), shellfish and mollusks, aquaculture and fishmeal.
- **Forestry:** Natural and sown forests and related industries: pulp, cardboard, paper, and furniture and wood products.
- **Mining:** Coal, gold, silver, platinum, antimony, copper, zinc, lead, tin, nickel, sulfur, potassium, lithium, borates, semi-precious and precious stones, iron, bauxite, pumice, lime, clay, radioactive minerals, limestone, marble, granite, graphite.
- **Hydrocarbons:** Natural gas and oil.
- **Textiles and garments:** Production of fiber (cotton, alpaca and llama), spinning mills (cotton, alpaca, llama), knitwear and flat-knitted fabric and other garments.
- **Leather and footwear:** Footwear and accessories, leather goods.
- **Tourism:** Supported by the variety of existing ecosystems: beaches, ski resorts, and rainforest.
- **Metalworking:** Machinery and vehicle components.
- **Iron and steel industry:** Iron and steel products.
- **Chemistry:** Mainly products related to gas and hydrocarbon processing.

Traditionally, investment in the region focuses on hydrocarbons and mining, which are attractive to investors. As far as the energy sector is concerned, oil, gas, and coal reserves in the five countries of the Hub rank among the highest in the world. Proved oil reserves in 2008 accounted for 8.40% of the world's proved reserves,<sup>5</sup> while gas reserves accounted for 3.24% of the world's proved reserves (no information on Bolivia's oil reserves and on Ecuador's gas reserves is included). This is a traditional primary exploitation sector that will continue to capture foreign investment due to the projects' high profitability expectations.

Other sectors that offer comparative advantages are telecommunications, water supply and sanitation services, transportation, financial markets, consulting services, and training services.

#### Current Infrastructure

- The entire road network of the Andean Hub covers 442,100 km, only 15.5% of which is paved. Bolivia's road network accounts for 61,521 km, 7.77% of which was paved by the end of 2008. In the case of Colombia, its road network reaches 164,183 km, 6.06% of which is paved, while Ecuador has 43,167 km of roads, 18.84% of which is paved. Peru's road network covers 78,186 km, 14.02% of which was paved as of 2007. Lastly, Venezuela's road network covers 96,656 km, 36.09% of which was paved by the end of 2006.

<sup>4</sup> "Comercio Exterior e Intracomunitario de los Países Andinos por modo de Transporte." CAN. October, 2001.

<sup>5</sup> Data from "BP Statistical Review of World Energy," 2009, [www.bp.com](http://www.bp.com).

- **Railway transport:** The railway network of the Andean Hub's countries totals 10,523 km, 78.47% of which are active lines. Generally speaking, the network is quite deteriorated, which is a limitation for operating big trains that would allow the tapping of railway-dependent economies. In the last decade, there has been a trend toward the private operation of services, but the new operators find it very difficult to face the significant investments required to overcome infrastructure deficiencies. The main problems brought about by the poor conditions of the networks are limitations on the loading capacity of the trains, speed limitations, the difference in rail gauges and loading gauges among the countries, and the lack of multimodal links.
- **Most major ports of the Hub's maritime port system** are located on the Pacific ocean, except for those in Venezuela, and the ports of Santa Marta, Barranquilla, and Cartagena, in Colombia. The Andean Hub's ports still have problems. Many cannot handle big ships or a large number of containers and, therefore, delays are commonplace. Poor maintenance of infrastructure is also a cause for congestion, and the fact that ports are often located in urban areas makes it impossible for them to be expanded.
- **Airport infrastructure for passenger transport** is appropriate but calls for adjustment/optimization. The same cannot be said about air cargo since, both for imports and exports, some terminals show insufficient capacity and lack the necessary equipment to guarantee safety and reliability.

### *III.1.3. The Hub's Development Potential*

The area of influence of the Andean Hub represents a market of about 100 million inhabitants along its 2.41 million km<sup>2</sup>, with a value added of approximately US\$ 340,625 million (94% of which is contributed by Colombia, Peru, and Venezuela). Institutionally speaking, this area is undergoing a 40-year long integration process (the CAN) that has set up a clear pattern of gradual regulatory convergence and coordination of investments in transport, energy, and telecommunications interconnection infrastructure.

The region abounds in mining resources (iron, bauxite, copper, bronze, silicon, gold, silver, and precious stones, among others) in the Andean area, since the tectonic-magmatic unit of the Andean geosyncline gives rise to one of the most mineralized areas in the world.

The Hub's countries have significant oil, gas, and hydroelectricity surpluses that set a competitive basis for energy-intensive industries: aluminum, steel, and metalworking. Such abundance suggests a potential for developing energy-related services and technologies. The electricity sector (generation, transmission, and marketing) is open to private investors and operators, which is promoting a process of streamlining, optimization, and interconnection of the national electricity systems. This process offers business opportunities for investors and, at the same time, guarantees major benefits for consumers in terms of the quality, reliability, and price of the electricity supply.

Biological diversity is another aspect of the Hub that offers exceptional characteristics and potential. The Andean Hub's countries as a whole are home to 25% of the world's biodiversity and are ranked first regarding the variety and endemism of plants, birds, and amphibians. The Andean-Amazon centers of origin of phytogenetic resources provide 35% of the world's agrifood production. The pluri-ethnic and multicultural nature of society within Andean countries results in the existence of a significant and strategic traditional knowledge regarding the use and conservation of biodiversity. This biological and cultural diversity combines with the diversity of ecological strata generated by the interaction of maritime coasts with the Andes and the lower Amazon rainforest area to offer favorable conditions for growing diverse and exotic products given the changes in weather and seasons. All of the above results in a macro region that provides a great number of environmental services at the global level, whose appraisal through market instruments is increasing, thus representing a prospective development area with enormous potential for the region's inhabitants.

There are some applications of the great potential offered by Andean biodiversity that represent specific business opportunities currently available to investors and businesspersons. The development of pharmaceutical and other biotechnological products, and high-quality, sustainable forest exploitation are

two specific areas that foster economic growth and social wellbeing, while preserving the enormous amount of natural resources and developing human capital through specialization and the social organization that these activities require. Moreover, sensible, sustainable forest exploitation enables the development of wood byproducts in the region's big urban centers.

Finally, the combination of the different aspects described above generates an enormous potential for the development of cultural, historical, ecological, and adventure tourism that incorporates the rich heritage from pre-Columbian civilizations, the contributions of the colonial period, the majesty of the natural world, large stretches of tropical and equatorial coastline, the cultural diversity and folklore of the different peoples, and the challenge of exploring virgin territories of unparalleled ecological value. Such combination, together with the availability of convenient flights to Miami and other major centers of international and regional air traffic from the Andean capital cities, turn the region into an attractive destination for professional conventions and business meetings.

### III.1.4. The Hub's Groups

The countries have agreed on redefining ten project groups for the Andean Hub. Eight of them are limited from a territorial perspective, and the remaining two cover the whole of the Andean Hub's area of influence ("Energy Integration Systems," and "Communication Systems and Connectivity").

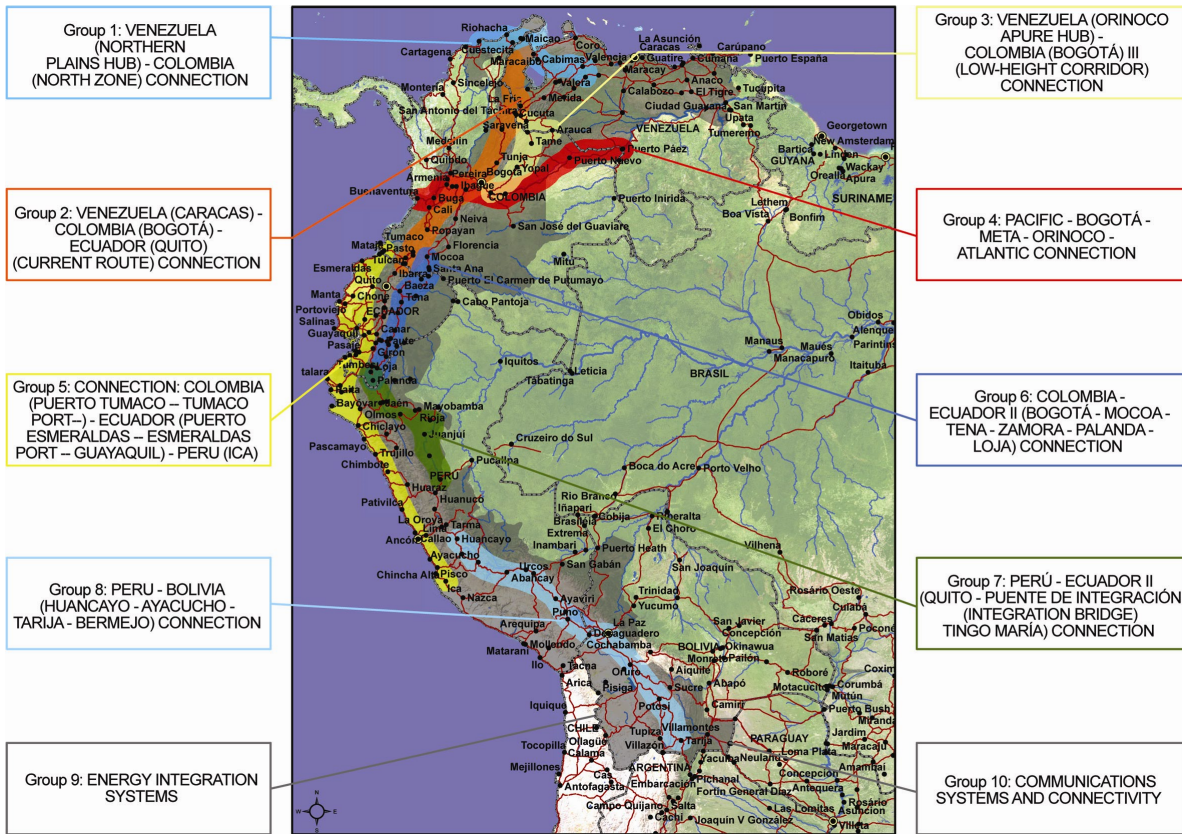
Table 14 - Groups Identified in the Andean Hub

Groups	Countries involved
<b>Group 1:</b> Venezuela (Northern Plains Hub) - Colombia (North Zone) Connection	Colombia - Venezuela
<b>Group 2:</b> Venezuela (Caracas) - Colombia (Bogotá) - Ecuador (Quito) (Current Route) Connection	Colombia - Ecuador - Venezuela
<b>Group 3:</b> Venezuela (Orinoco Apure Hub) - Colombia (Bogotá) III (Low-Height Corridor) Connection	Colombia - Venezuela
<b>Group 4:</b> Pacific - Bogotá - Meta - Orinoco - Atlantic Connection	Colombia - Venezuela
<b>Group 5:</b> Connection: Colombia (Puerto Tumaco - Tumaco Port) - Ecuador (Puerto Esmeraldas - Esmeraldas Port - Guayaquil) - Peru (Ica)	Colombia - Ecuador - Peru
<b>Group 6:</b> Colombia - Ecuador II (Bogotá - Mocoa - Tena - Zamora - Palanda - Loja) Connection	Colombia - Ecuador
<b>Group 7:</b> Peru - Ecuador II (Quito - Puente de Integración (Integration Bridge) - Tingo María) Connection	Ecuador - Peru
<b>Group 8:</b> Peru-Bolivia (Huancayo - Ayacucho - Tarija - Bermejo) Connection	Bolivia - Peru
<b>Group 9:</b> Energy Integration Systems	All
<b>Group 10:</b> Communications Systems and Connectivity	All

The map below shows the geographic location of the Andean Hub's ten project groups:



Map 4 - Andean Hub's Groups



III.1.5. Project Groups and Strategic Functions

Group 1: Venezuela (Northern Plains Hub) - Colombia (North Zone) Connection

STRATEGIC FUNCTION

- Consolidate the economic integration of Colombia’s Northern Atlantic area and Venezuela’s Northern Plains through an existing paved route.

Map 5 - Andean Hub - Group 1

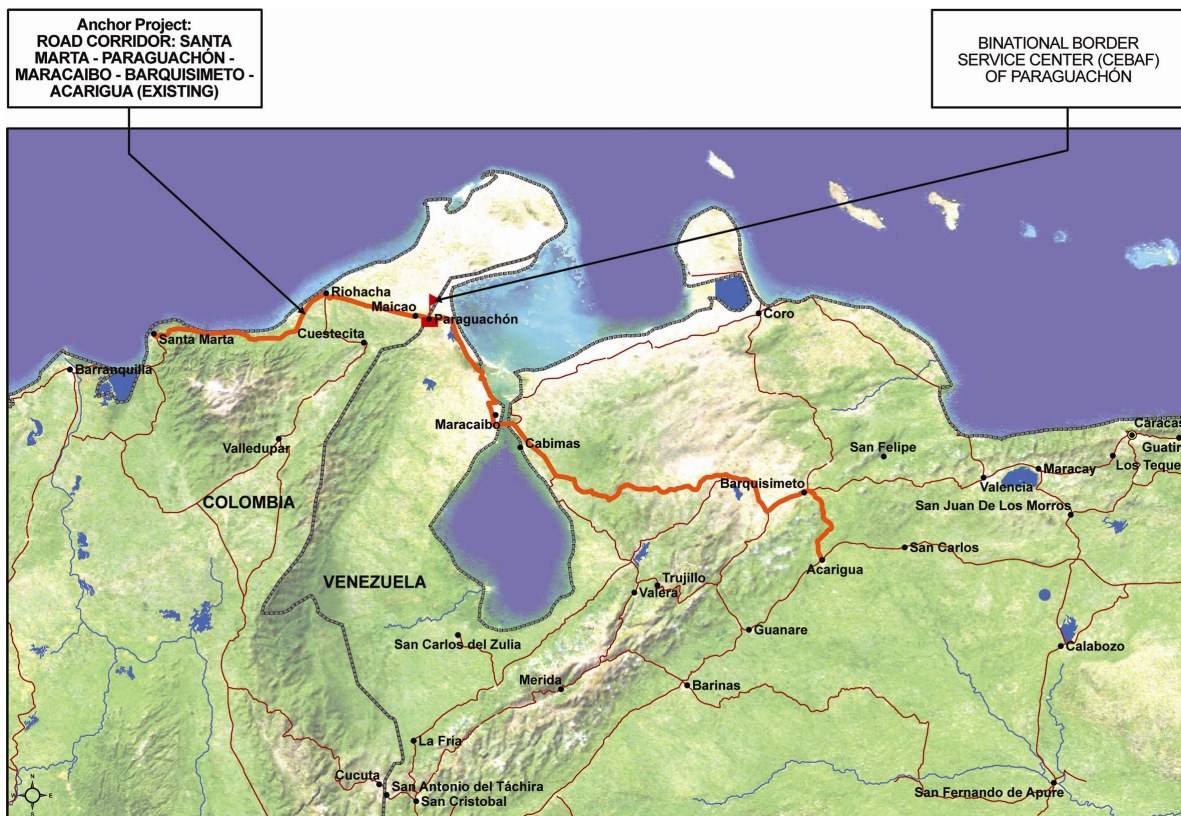


Table 15 - Andean Hub - Group 1: Related Investments

Andean Hub: Group 1	Estimated Investment (US\$ million)
Road Corridor: Santa Marta - Paraguachón - Maracaibo - Barquisimeto - Acarigua (Existing) <sup>(*)</sup>	474.7
Binational Border Service Center (CEBAF) of Paraguachón	2.0
<b>TOTAL</b>	<b>2.0</b>

Note: <sup>(\*)</sup> As this existing project’s investments were mostly made before the creation of IIRSA, they are not included in the total amount.

Group 2: Venezuela (Caracas) - Colombia (Bogotá) - Ecuador (Quito)  
(Current Route) Connection

STRATEGIC FUNCTION

- Reinforce economic relations between the most dynamic urban centers of Ecuador, Colombia, and Venezuela through existing paved routes, which entails improving their border crossings and finding solutions to specific bottlenecks.

Map 6 - Andean Hub - Group 2

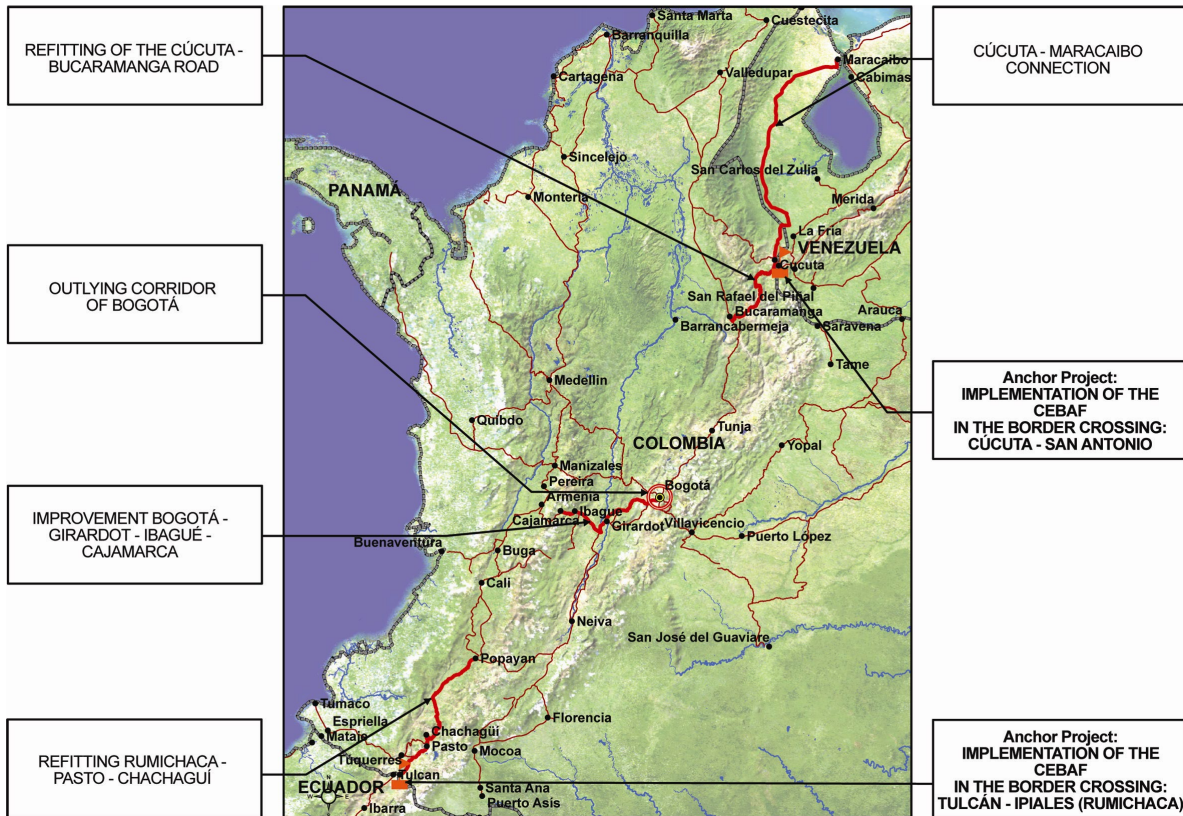


Table 16 - Andean Hub - Group 2: Related Investments

Andean Hub: Group 2	Estimated Investment (US\$ million)
Implementation of the CEBAF in the Border Crossing: Tulcán - Ipiales (Rumichaca)	0.2
Cúcuta - Maracaibo Connection	20.0
Refitting of the Cúcuta - Bucaramanga Road	192.0
Outlying Corridor of Bogotá	30.0
Improvement Bogotá - Girardot - Ibagué - Cajamarca	681.0
Refitting Rumichaca - Pasto - Chachagú	174.0
Implementation of the CEBAF in the Border Crossing: Cúcuta - San Antonio	2.0
<b>TOTAL</b>	<b>1,099.2</b>

Group 3: Venezuela (Orinoco Apure Hub) - Colombia (Bogotá) III  
(Low-Height Corridor) Connection

STRATEGIC FUNCTION

- Develop an international corridor for long-distance cargo transport with significantly lower operating costs and traveling times than the current Caracas-Bogotá corridor. This corridor will allow the participation in international trade of new regions in Colombia (Arauca) and Venezuela (Barinas).

Map 7 - Andean Hub - Group 3

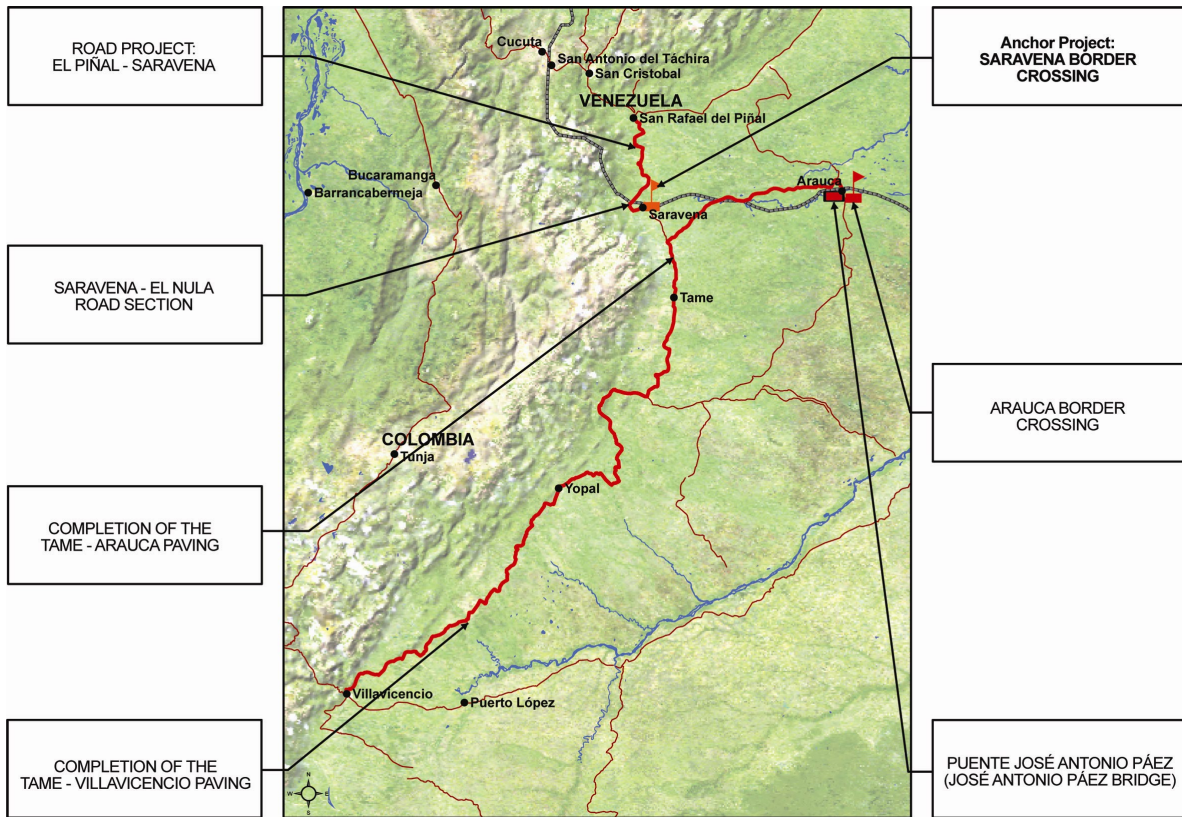


Table 17 - Andean Hub - Group 3: Related Investments

Andean Hub: Group 3	Estimated Investment (US\$ million)
Saravena Border Crossing	3.3
Saravena - El Nula Road Section	16.0
Completion of the Tame - Villavicencio Paving	9.9
Puente José Antonio Páez (José Antonio Páez Bridge)	1.5
Completion of the Tame - Arauca Paving	80.0
Arauca Border Crossing	2.0
Road Project: El Piñal - Saravena	6.8
<b>TOTAL</b>	<b>119.5</b>

Group 4: Pacific - Bogotá - Meta - Orinoco - Atlantic Connection

STRATEGIC FUNCTION

- Develop a Pacific - Bogotá - Meta - Orinoco - Atlantic bioceanic corridor for fostering trade between regions in Colombia (Orinoquía, Andina, and Pacífico) and Venezuela (the Plains, including the states of Anzoátegui and Monagas, Guayana, Delta del Orinoco) and for opening up these regions to international markets.

Map 8 - Andean Hub - Group 4

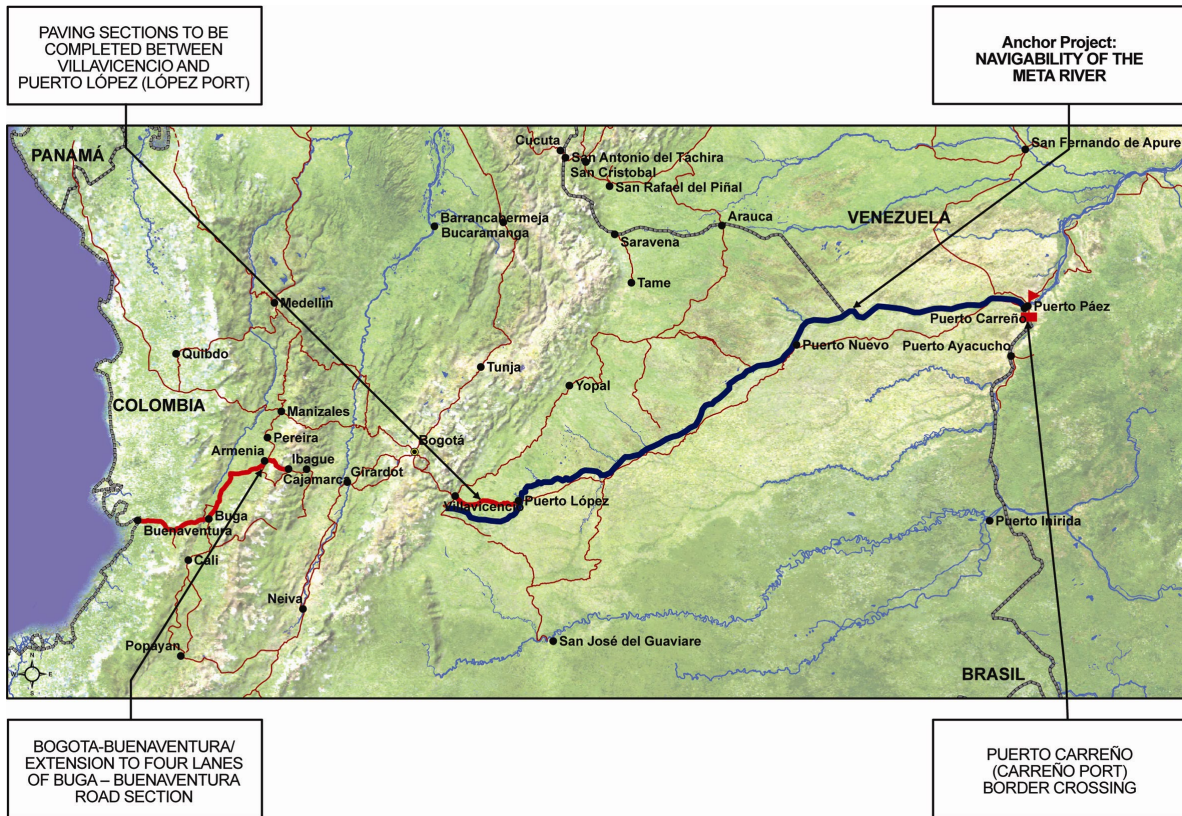


Table 18 - Andean Hub - Group 4: Related Investments

Andean Hub: Group 4	Estimated Investment (US\$ million)
Navigability of the Meta River	108.0
Paving Sections to be Completed Between Villavicencio and Puerto López (López Port)	26.0
Puerto Carreño (Carreño Port) Border Crossing	1.0
Bogotá - Buenaventura/Extension of Road Section: Buga - Buenaventura	552.0
<b>TOTAL</b>	<b>687.0</b>

Group 5: Connection: Colombia (Puerto Tumaco - Tumaco Port) - Ecuador (Puerto Esmeraldas - Esmeraldas Port - Guayaquil) - Peru (Ica)

STRATEGIC FUNCTION

- Reinforce trade and tourism relations (beaches and ecotourism) of major coastal areas in Northern Peru, Ecuador, and the Southern Pacific Colombian areas.

Map 9 - Andean Hub - Group 5

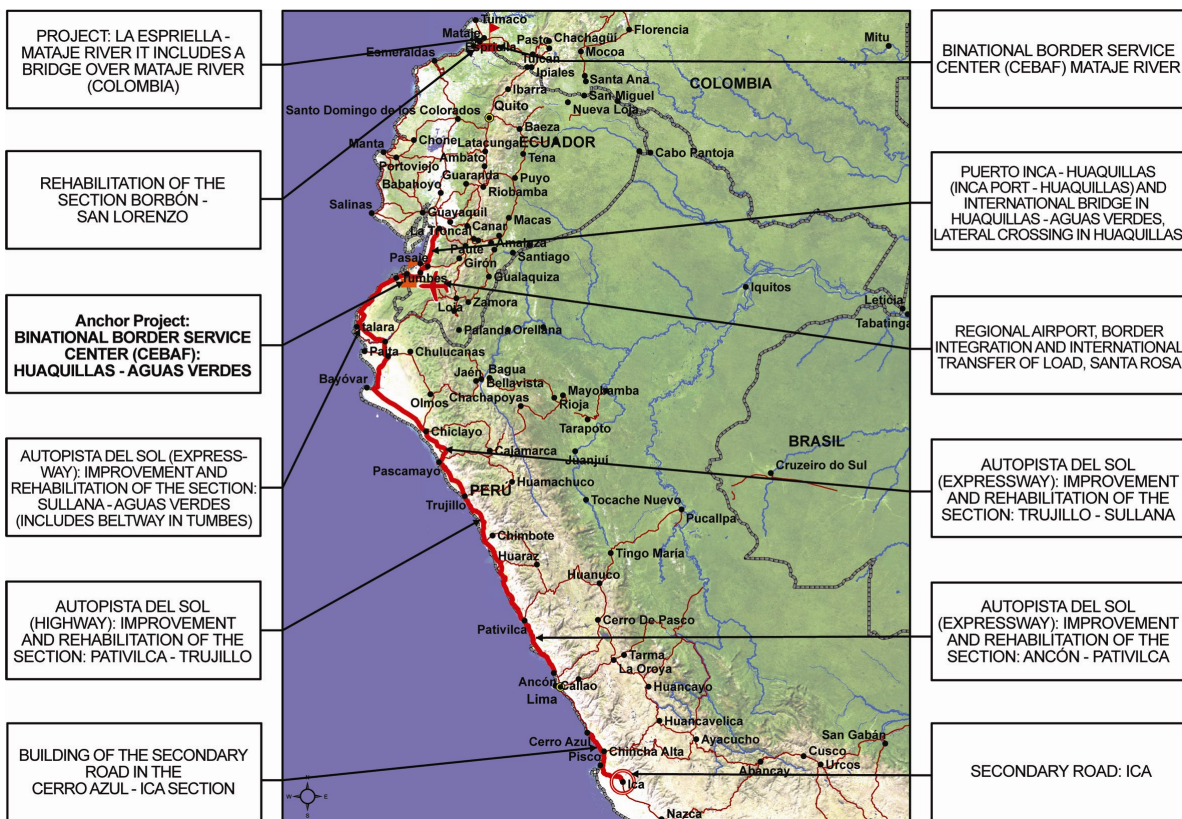


Table 19 - Andean Hub - Group 5: Related Investments

<b>Andean Hub: Group 5</b>	<b>Estimated Investment (US\$ million)</b>
Binational Border Service Center (CEBAF): Huaquillas - Aguas Verdes	5.1
Binational Border Service Center (CEBAF) Mataje River	3.0
Project: La Espriella - Mataje River. It Includes a Bridge over the Mataje River (Colombia)	25.0
Rehabilitation of the Section Borbón - San Lorenzo	7.0
Regional Airport, Border Integration and International Transfer of Load, Santa Rosa	26.2
Puerto Inca - Huaquillas (Inca - Huaquillas Port) and International Bridge in Huaquillas - Aguas Verdes, Lateral Crossing in Huaquillas	39.6
Autopista del Sol (Expressway): Improvement and Rehabilitation of the Section: Trujillo - Sullana	360.0
Autopista del Sol (Expressway): Improvement and Rehabilitation of the Section: Ancón - Pativilca	73.1
Autopista del Sol (Expressway): Improvement and Rehabilitation of the Section: Sullana - Aguas Verdes (Includes Beltway in Tumbes)	83.2
Autopista del Sol (Expressway): Improvement and Rehabilitation of the Section: Pativilca - Trujillo	210.0
Building of the Secondary Road in the Cerro Azul - Ica Section	228.6
Secondary Road: Ica	15.0
<b>TOTAL</b>	<b>1,075.8</b>

Group 6: Colombia - Ecuador II (Bogotá - Mocoa - Tena -  
Zamora - Palanda - Loja) Connection

STRATEGIC FUNCTION

- Develop a corridor that would articulate international trade between areas in Central and Southern Colombia and Amazon provinces of Northern and Central Ecuador (Tena, Puyo) and areas of Southern Ecuador (Loja).

Map 10 - Andean Hub - Group 6

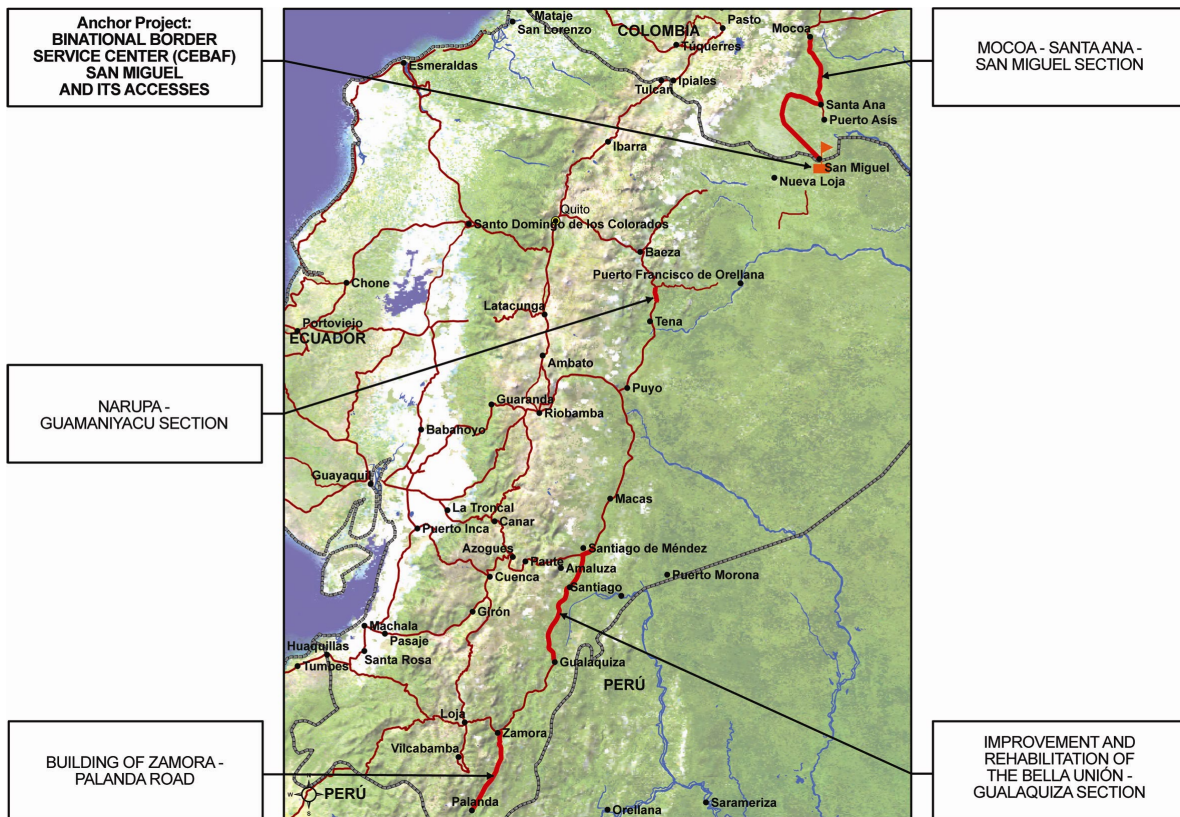


Table 20 - Andean Hub - Group 6: Related Investments

Andean Hub: Group 6	Estimated Investment (US\$ million)
Binational Border Service Center (CEBAF) San Miguel and its accesses	2.0
Mocoa - Santa Ana - San Miguel Section	104.0
Improvement and Rehabilitation of the Bella Unión - Gualaquiza Section	23.2
Building of Zamora - Palanda Road	145.6
Narupa - Guamaniyacu Section	23.5
<b>TOTAL</b>	<b>298.3</b>



Group 7: Peru - Ecuador II (Quito - Puente de Integración (Integration Bridge) - Tingo María) Connection

STRATEGIC FUNCTION

- Develop a new international trade corridor by improving the routes that connect the cities of Loja, Tarapoto, and Tingo María. This corridor would join the Southern Andean region of Ecuador (Loja and Cuenca) and the Northern and Central rainforest of Peru (San Ignacio, Moyobamba, Rioja, Tarapoto, and Tingo María).

Map 11 - Andean Hub - Group 7

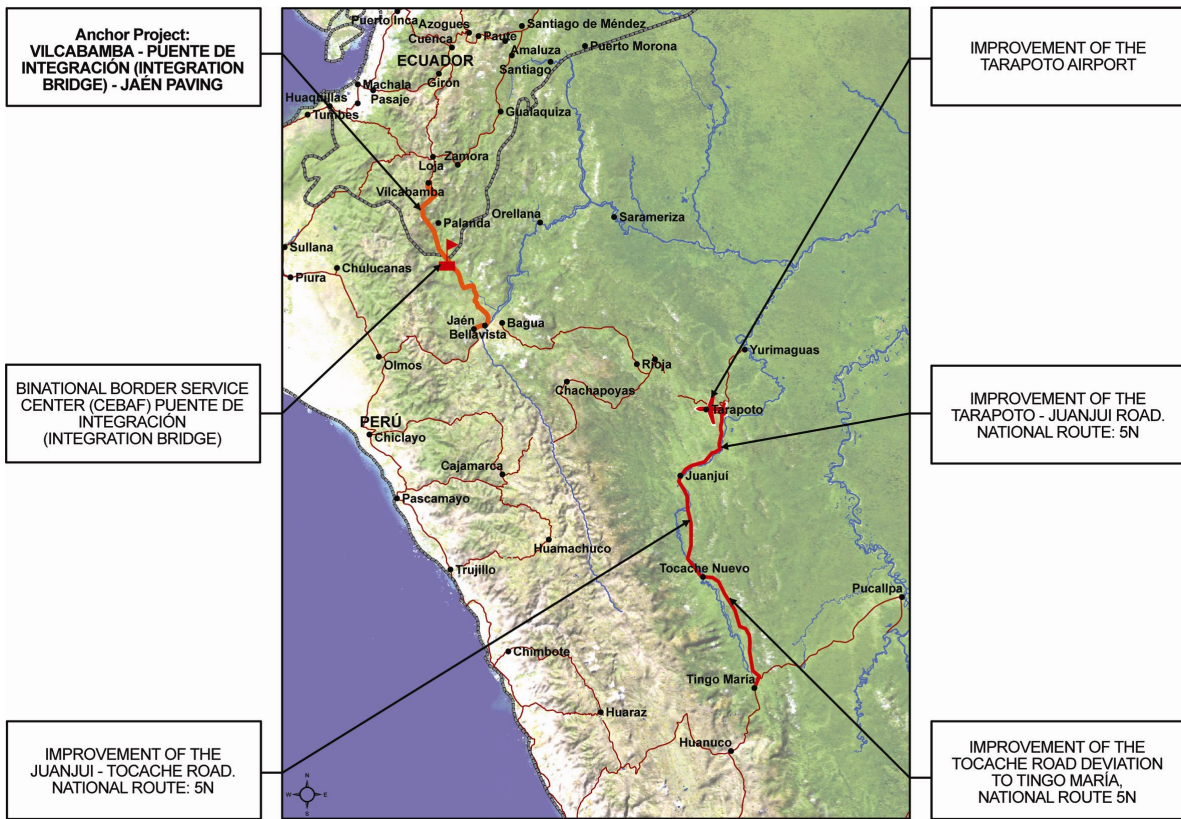


Table 21 - Andean Hub - Group 7: Related Investments

Andean Hub: Group 7	Estimated Investment (US\$ million)
Vilcabamba - Puente de Integración (Integration Bridge) - Jaén Paving	38.8
Improvement of the Tocache Road Deviation to Tingo María, National Route 5N	94.0
Improvement of the Juanjui - Tocache Road. National Route: 5N	76.3
Improvement of the Tarapoto - Juanjui Road. National Route: 5N	115.5
Binational Border Service Center (CEBAF) Puente de Integración (Integration Bridge)	2.5
Improvement of the Tarapoto Airport	6.9
<b>TOTAL</b>	<b>334.0</b>

Group 8: Peru - Bolivia (Huancayo - Ayacucho - Tarija - Bermejo) Connection

STRATEGIC FUNCTION

- Reinforce tourism and economic relations between the Andean cities of Peru and Bolivia through existing paved routes, and extend these to the Central Andean area of Peru and Northwestern Argentina.

Map 12 - Andean Hub - Group 8

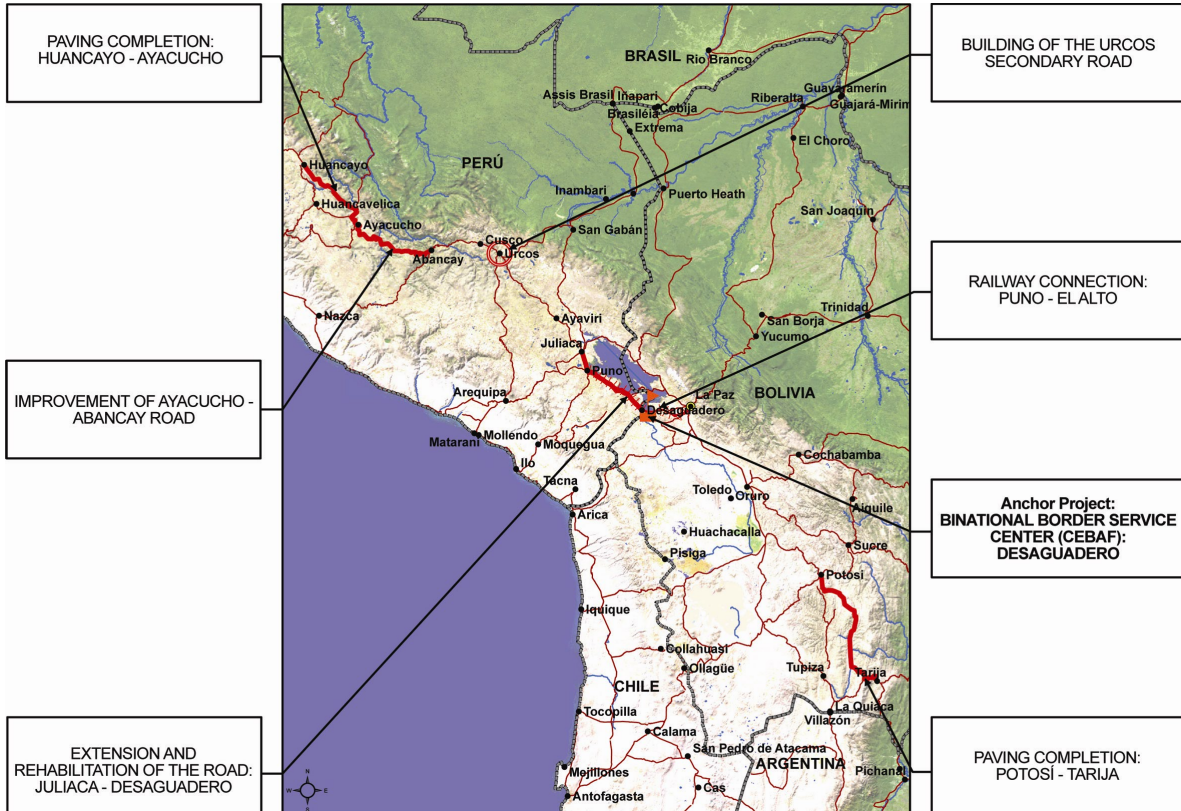


Table 22 - Andean Hub - Group 8: Related Investments

Andean Hub: Group 8	Estimated Investment (US\$ million)
Binational Border Service Center (CEBAF): Desaguadero	7.5
Paving Completion: Potosí - Tarija	156.0
Improvement of Ayacucho - Abancay Road	313.5
Paving Completion: Huancayo - Ayacucho	35.6
Extension and Rehabilitation of the Road: Juliaca - Desaguadero	94.8
Building of the Urcos Secondary Road - Urcos	2.5
Railway Connection: Puno - El Alto	198.0
<b>TOTAL</b>	<b>807.9</b>

# Group 9: Energy Integration Systems

## STRATEGIC FUNCTION

- Integrate energy systems to improve the efficiency of energy generation, transmission and distribution in order to promote the development of high value-added sectors.

Map 13 - Andean Hub - Group 9

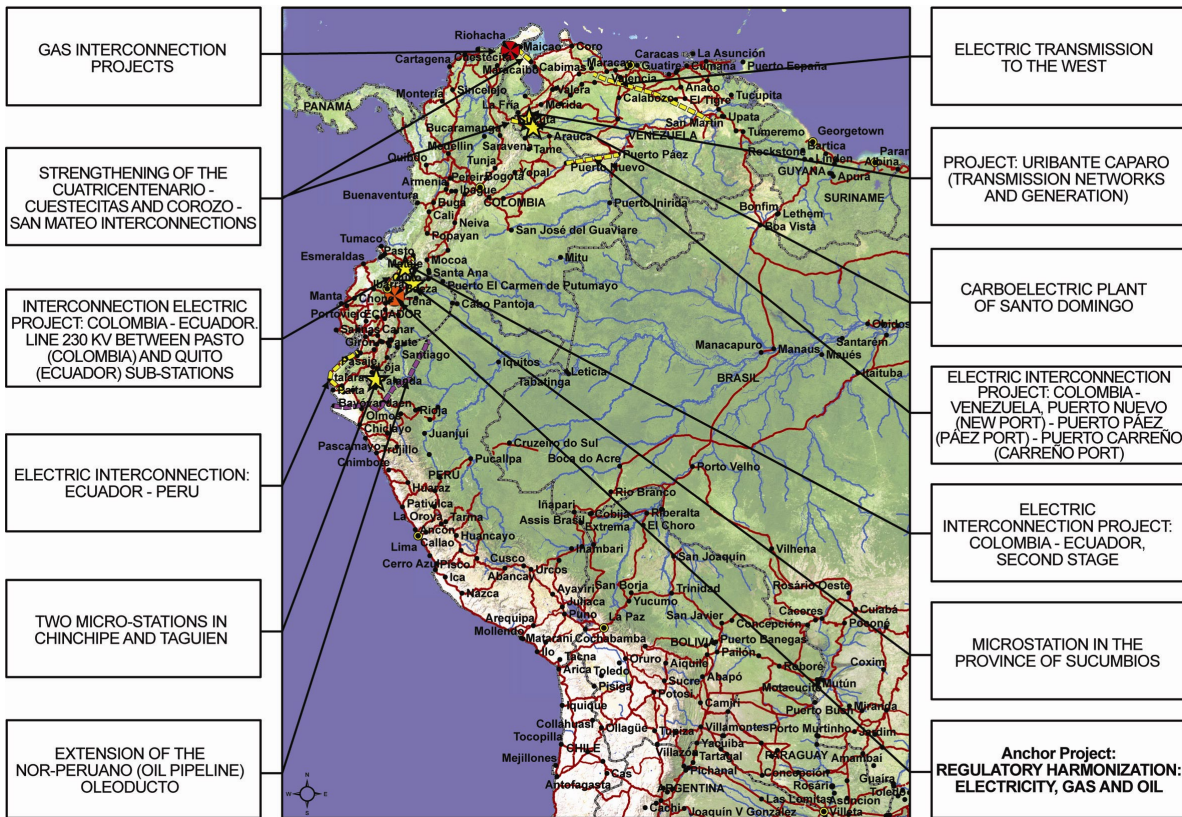


Table 23 - Andean Hub - Group 9: Related Investments

<b>Andean Hub: Group 9</b>	<b>Estimated Investment (US\$ million)</b>
Regulatory Harmonization: Electricity, Gas and Oil	0.0
Strengthening of the Cuatricentenario - Cuestecitas and El Corozo - San Mateo Interconnections	125.0
Interconnection Electric Project: Colombia - Ecuador. Line 230 kV between Pasto (Colombia) and Quito (Ecuador) Sub-stations	56.0
Two Micro-stations in Chinchipe and Taguien	5.0
Micro-station in the Province of Sucumbios	0.0
Extension of the Nor-peruano (Oil Pipeline) Oleoducto	800.0
Gas Interconnection Projects	335.0
Carboelectric Plant of Santo Domingo	625.0
Project: Uribante Caparo (Transmission Networks and Generation)	0.0
Electric Interconnection Project: Colombia - Venezuela, Puerto Nuevo (New Port) - Puerto Páez (Páez Port) - Puerto Carreño (Carreño Port)	14.0
Electric Interconnection Ecuador - Peru	76.3
Electric Interconnection Project: Colombia - Ecuador, Second Stage	0.0
Electric Transmission to the West	590.0
<b>TOTAL</b>	<b>2,626.3</b>

## Group 10: Communication Systems and Connectivity

### STRATEGIC FUNCTION

- Incorporate urban and rural populated areas into the telecommunications system, eliminating the deficit in telephone coverage and allowing the expansion of value-added services (e-government, distance learning, remote health care, and so on) as a tool to develop isolated areas, and improve living standards and cultural integration. Furthermore, expand the use of communication services to foster development, trade, and regional integration.

Map 14 - Andean Hub - Group 10



Table 24 - Andean Hub - Group 10: Related Investments

Andean Hub: Group 10	Estimated Investment (US\$ million)
The existing infrastructure and the new connections are used to enhance the communications infrastructure	0.1
Optical Fiber Cable for Telecommunications in Transmission Networks	0.0
<b>TOTAL</b>	<b>0.1</b>

### III.1.6. The Andean Hub's Project Portfolio

#### General Aspects

The countries have agreed to include sixty-five projects in the Andean Hub, accounting for an estimated investment of US\$ 7,050.1 million, as summarized below:

Table 25 - General Aspects of the Andean Hub's Portfolio

Andean Hub	Name	Number of Projects	Estimated Investment (US\$ million)
Group 1	Venezuela (Northern Plains Hub) - Colombia (North Zone) Connection	2	2.0
Group 2	Venezuela (Caracas) - Colombia (Bogotá) - Ecuador (Quito) (Current Route) Connection	7	1,099.2
Group 3	Venezuela (Orinoco Apure Hub) - Colombia (Bogotá) III (Low-Height Corridor) Connection	7	119.5
Group 4	Pacific - Bogotá - Meta - Orinoco - Atlantic Connection	4	687.0
Group 5	Connection: Colombia (Puerto Tumaco - Tumaco Port) - Ecuador (Puerto Esmeraldas - Esmeraldas Port - Guayaquil) - Peru (Ica)	12	1,075.8
Group 6	Colombia - Ecuador II (Bogotá - Mocoa - Tena - Zamora - Palanda - Loja) Connection	5	298.3
Group 7	Peru - Ecuador II (Quito - Puente de Integración (Integration Bridge) - Tingo María) Connection	6	334.0
Group 8	Peru - Bolivia (Huancayo - Ayacucho - Tarija - Bermejo) Connection	7	807.9
Group 9	Energy Integration Systems	13	2,626.3
Group 10	Communications Systems and Connectivity	2	0.1
TOTAL		65	7,050.1

## Sector-based Breakdown

The following is a sector-based breakdown of the Hub's projects:

Table 26 - Sector-based Breakdown of the Andean Hub's Portfolio

Sector / Subsector	Transport		Energy		Communications	
	Number of Projects	Estimated Investment (US\$ million)	Number of Projects	Estimated Investment (US\$ million)	Number of Projects	Estimated Investment (US\$ million)
Road	35	4,054.0				
Railway	1	198.0				
River	1	108.0				
Air	2	33.2				
Border Crossing	11	30.5				
Energy Regulatory Harmonization			1	0.0		
Energy interconnection			9	1,996.3		
Energy generation			3	630.0		
Communications interconnection					2	0.1
<b>TOTAL</b>	<b>50</b>	<b>4,423.7</b>	<b>13</b>	<b>2,626.3</b>	<b>2</b>	<b>0.1</b>

It can be observed that projects in the transport sector, particularly road projects, are predominant, although investments are more evenly distributed vis-à-vis the energy sector.

## Project Typology

The Hub's project typology is summarized in the following table:

Table 27 - Road Transport Project Typology in the Andean Hub

Project Typology	Number of Projects	Estimated Investment (US\$ million)
Enlargement of road capacity	6	1,847.6
Rehabilitation of roads and structures	14	1,420.0
Bridges (new and rehabilitation)	1	1.5
Paving (new works)	11	737.3
Bypasses and city accesses	3	47.5
<b>TOTAL</b>	<b>35</b>	<b>4,053.9</b>

Table 28 - Railway Transport Project Typology in the Andean Hub

Project Typology	Number of Projects	Estimated Investment (US\$ million)
Building of railways	1	198.0
TOTAL	1	198.0

Table 29 - River Transport Project Typology in the Andean Hub

Project Typology	Number of Projects	Estimated Investment (US\$ million)
Improvement of river navigability	1	108.0
TOTAL	1	108.0

Table 30 - Air Transport Project Typology in the Andean Hub

Project Typology	Number of Projects	Estimated Investment (US\$ million)
Refitting of airports	1	6.9
New airports	1	26.3
TOTAL	2	33.2

Table 31 - Border Crossing Project Typology in the Andean Hub

Project Typology	Number of Projects	Estimated Investment (US\$ million)
Infrastructure for new border control centers	11	30.5
TOTAL	11	30.5

Table 32 - Energy Project Typology in the Andean Hub

Project Typology	Number of Projects	Estimated Investment (US\$ million)
Energy regulatory harmonization	1	0.0
Energy generation	3	630.0
Energy interconnection	9	1,996.3
TOTAL	13	2,626.3



Table 33 - Communications Project Typology in the Andean Hub

Project Typology	Number of Projects	Estimated Investment (US\$ million)
Communications interconnection	2	0.1
TOTAL	2	0.1

### Anchor Projects

The countries identified eleven anchor projects in the Hub, totaling an estimated investment of US\$ 167 million, according to the following detail:

Table 34 - Andean Hub's Anchor Projects

Group	Anchor Projects	Estimated Investment (US\$ million)	Financing Source	Scope	Project Stage
1	Road Corridor: Santa Marta - Paraguachón - Maracaibo - Barquisimeto - Acarigua (Existing) <sup>(*)</sup>	474.7	Public / Private	National	Execution
2	Implementation of the CEBAF in the Border Crossing: Cúcuta - San Antonio	2.0	Public	Binational	Pre-execution
	Implementation of the CEBAF in the Border Crossing: Tulcán - Ipiales (Rumichaca)	0.2	Public	Binational	Pre-execution
3	Saravena Border Crossing	3.3	Public	National	Profiling
4	Navigability of the Meta River	108.0	Public	National	Execution
5	Binational Border Service Center (CEBAF): Huaquillas - Aguas Verdes	5.1	Public	Binational	Execution
6	Binational Border Service Center (CEBAF): San Miguel and its accesses	2.0	Public	National	Execution
7	Vilcabamba - Puente de Integración (Integration Bridge) - Jaén Paving	38.8	Public	Binational	Execution
8	Binational Border Service Center (CEBAF): Desaguadero	7.5	Public	Binational	Execution
9	Regulatory Harmonization: Electricity, Gas and Oil	0.0	Public	Multinational	Execution
10	The existing infrastructure and the new connections are used to enhance the communications infrastructure	0.1	Public	Multinational	Profiling
	TOTAL	167.0			

Note: <sup>(\*)</sup> As the investments in this existing project were mostly made before the creation of IIRSA, they are not included in the total amount.

