I . I . R . S . A

ANALYSIS OF THE INCORPORATION OF THE NORTHEASTERN AND CENTRAL-WESTERN TERRITORIES OF BRAZIL INTO IIRSA INTEGRATION AND DEVELOPMENT HUBS

FINAL REPORT

October 2012

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Executive Summary

This report presents the process of analysis to incorporate Brazilian territories into IIRSA Integration and Development Hubs according to the Indicative Planning Methodology.

The report deals with the following topics that show the discussions held on the best way to incorporate the Brazilian territories into the Integration and Development Hubs:

- The initial proposal was to expand the area of influence of the Peru-Brazil-Bolivia Hub to the east, thus covering also the Brazilian states of Goiás and Mato Grosso (in the central-western region), Tocantins (in the Amazon region), and the nine states of the northeastern region.

  The Project Group to be potentially implemented in this enlarged area consisted in a rail network, the general characteristics of which are described in this report.

- This proposal was analyzed at the meetings of the Executive Technical Groups on the update of IIRSA Project Portfolio (Bogotá, June 14 though 16, 2011) as well as at the GTE meeting on the Peru-Brazil-Bolivia Hub (Lima, October 6 and 7, 2011).

  During the latter, it was concluded that there were not enough reasons to uphold the decision to expand the Peru-Brazil-Bolivia Hub and that it was necessary to conduct a new study that, keeping the original idea of a rail network, should explore different alternatives for the incorporation of the already-mentioned Brazilian states into one or more Integration and Development Hubs.

- The new study analyzed the different alternative connections of the rail network with other Hubs and suggested that the Brazilian states form part of the Central Interoceanic Hub. A large section of the rail network would be included in this redesigned Hub, and new opportunities would open up for rail connections with other countries, mainly Bolivia and Peru.

- This study was submitted to the Planning Ministry at a meeting attended by the Brazilian delegate to the COSIPLAN as well as by directors and technical staff members of the Brazilian Planning and Transport Ministries (Brasilia, July 10, 2012). At the meeting, it was deemed better to incorporate the Brazilian territories into the Amazon Hub, which would be expanded to the east, thus covering the nine northeastern states and the state of Tocantins, and to the south over territories covered by the Peru-Brazil-Bolivia Hub. This area, provisionally known in this report as “expanded Amazon Hub,” contains the entire rail network proposed.

The report also analyzes the international connections of the rail network with ports on the Pacific ocean. It shows that there are potential transportation routes to connect the rail network, from Porto Velho, with ports on the Pacific (Arica, Callao and Matarani). These routes would represent the opening of new doors for Brazilian exports. Transportation costs between Porto Velho and these ports reveal that, once investments are made to complete these potential routes, the ports are adapted so as to receive the new transportation flows, and new and adequate services are provided along the routes, these corridors will gradually

become well-established, efficient and safe, and may grow into sizable transportation infrastructure facilities serving Bolivia, Brazil and Peru.

Final Report on the Analysis of the Incorporation of the Northeastern and Central-Western Territories of Brazil into IIRSA Integration and Development Hubs

1. Background

During the meetings of the Executive Technical Groups (GTEs) on the update of IIRSA Project Portfolio, held on June 14 through 16, 2011, in the city of Bogotá, Colombia, the Brazilian delegates submitted a proposal to enlarge the Peru-Brazil-Bolivia Hub. The objective consisted in the incorporation of the northeastern and central-western regions of Brazil, which were so far excluded from the South American infrastructure planning, into such Hub. The proposal, presented below, was approved by the Peruvian and Bolivian National Coordinators.

The Initial Proposal

The expansion of the Peru-Brazil-Bolivia Hub would add to its current territory (the Peruvian departments of Tacna, Moquegua, Arequipa, Apurimac, Cusco, Madre de Dios, and Puno; the Bolivian departments of Pando, Beni, and La Paz; and the Brazilian states of Acre and Rondônia) the states of Mato Grosso and Goiás (in the central-western region), the state of Tocantins (in the Amazon region), and the nine states of the northeastern region (Maranhão, Piauí, Ceará, Rio Grande do Norte, Paraíba, Pernambuco, Alagoas, Sergipe, and Bahia).

As shown in Map 1, a project group proposed for this territory was a rail network made up of a railway running north-south of Brazil, known as North-South Railway (*Ferrovia Norte-Sul*) and of railroads running to the east and to the west of such railway. The stretch of the North-South Railway involved in this new project group would reach the city of Açailândia in the north and the city of Figueirópolis, in the south.

To the east of the North-South Railway, there are two broad-gauge railroads. One is known as the New Cross-northeastern Railway (*Ferrovia Nova Transnordestina*), with a northern section (between Salgueiro and Pecém) that runs across the states of Pernambuco and Ceará, and a west-east section (from Suape to Eliseu Martins, connecting Eliseu Martins with the North-South Railway) that runs across Pernambuco, Piauí, Maranhão, and Tocantins. The other railroad is the one known as West-East Integration Railway (*Ferrovia de Integração Oeste-Leste* - FIOL), which runs from Ilhéus to Barreira and is planned to connect with the North-South Railway in the states of Bahia and Tocantins.

To the east of the North-South Railway there are also two meter-gauge railroads. One runs south-north through the capital cities of the states of Alagoas, Pernambuco and Paraíba. The other one is a branch that cuts across, from the east to the west, the state of Paraíba and connects with the New Cross-northeastern Railway in Missão Velha.

There is another meter-gauge railroad to the east of the North-South Railway, connecting to the northern section of the New Cross-northeastern Railway, linking Fortaleza and São Luís, the capital cities of Ceará and Maranhão, and running through the capital city of Piauí. To the south of the New Cross-northeastern Railway, there is a short broad-gauge section, which

starts off in Salgueiro and connects the New Cross-northeastern Railway with the cities of Petrolina (Pernambuco) and Juazeiro (Bahia).

To the west and connected with the North-South Railway in Figueirópolis, there is a long section of the Center-West Integration Railway (*Ferrovia de Integração Centro-Oeste* - FICO) that runs into the central-western region (Goiás and Mato Grosso) and cuts across Rondônia and Acre, up to Boqueirão da Esperança, on the Peruvian border.

Map 1 - Proposal to Expand the Peru-Brazil-Bolivia Hub

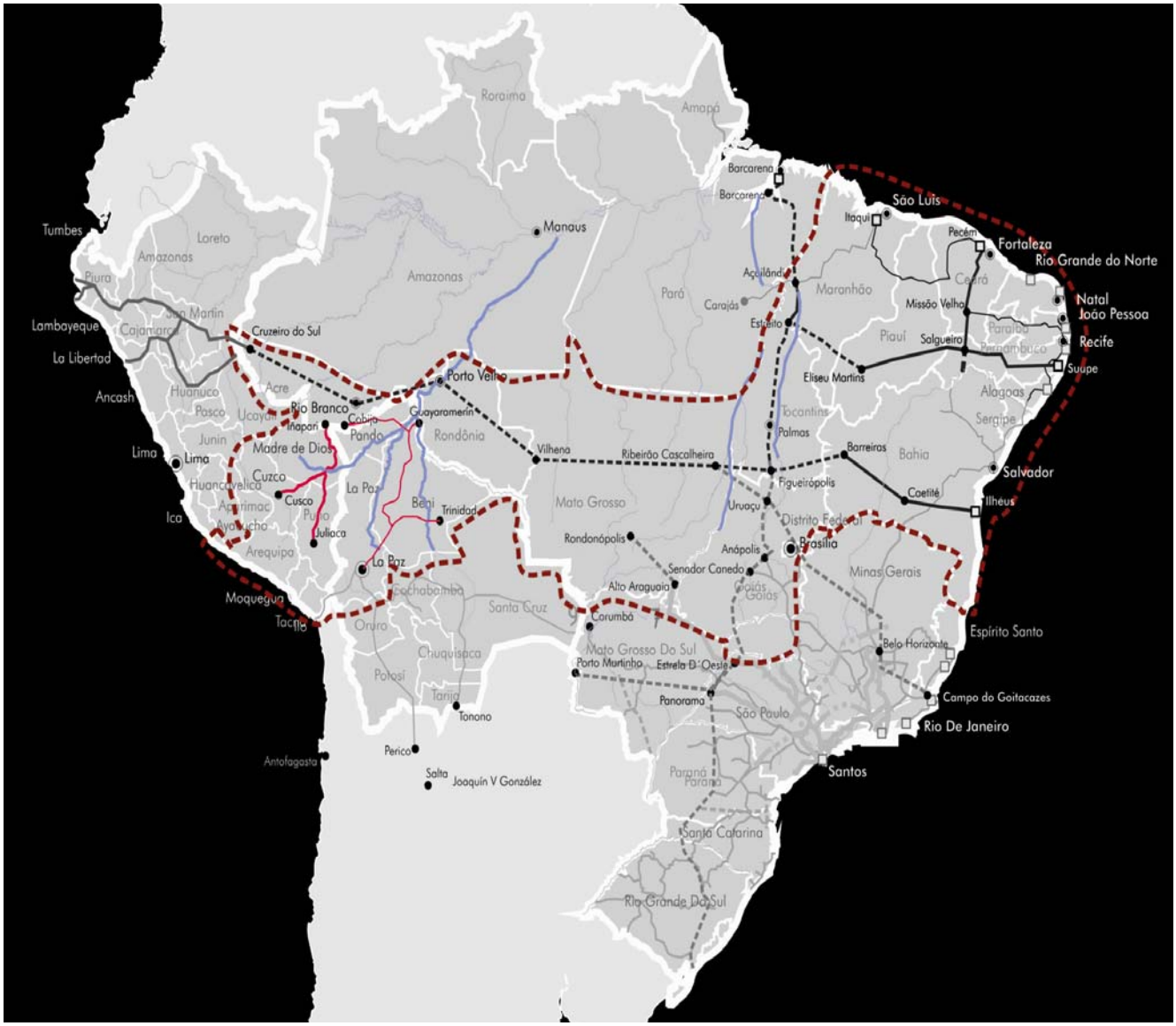


Table 1 - Current Status of the Rail Network

RAILWAY	CURRENT STATUS	PPA	PAC	PNLT
North-South Railway (Belém (PA) to Uruaçu (GO))				
Açailândia (MA)-Aguiarnópolis (MA)	Existing			
Aguiarnópolis (MA)-Palmas (TO)	Completed		x	
Palmas (TO)-Uruaçu (GO)	In execution		x	
Extension of the North-South Railway - Açailândia (MA)-Barcarena (PA)	Projects and studies		x	
Center-West Integration Railway (Northern Littoral of Rio de Janeiro (RJ)) to Boqueirão da Esperança (AC))				
Uruaçu (GO)-Vilhena (RO)	Projects and studies	x	x	
Vilhena (RO)-Porto Velho (RO), Porto Velho (RO)-Rio Branco (AC)	Planning			x
and Rio Branco (AC)-Boqueirão da Esperança (AC)	Planning			x
West-East Integration Railway (FIOL)				
Ilhéus (BA)-Caetité (BA)	In execution		x	
Caetité (BA)-Barreiras (BA)	Out to tender		x	
Connection with the North-South Railway (Barreiras (BA) to Figueirópolis (TO))	Projects and studies	x	x	
Transnordestina Logistica S/A Railways				
Zona da Mata Corridor - João Pessoa Railway-Connection with New Cross-Northeastern Railway	Planning*			x
Northern Corridor - Fortaleza Railway and Pecem-Teresina-São Luis Port	Planning*			x
Coastal (*Litorânea*), from Propriá (AL) to João Pessoa (PB)	w/o data			
New Cross-Northeastern Railway				
Missão Velha (CE)-Salgueiro (PE)	In execution		x	
Salgueiro-Trindade (PE)	In execution		x	
Trindade (PE)-Eliseu Martins (PI)	In execution		x	
Salgueiro (PE)-Suape (PE)	In execution		x	
Pecém (CE)-Missão Velha (CE)	In execution		x	
Connection of the New Cross-Northeastern Railway with the North-South Railway (Eliseu Martins (PE)-Estreito (MA))	Projects and studies		x	
Connection of the New Cross-Northeastern Railway of Salgueiro (PE) with Petrolina (PE) and Juazeiro (BA)	Planning			x

* The National Plan for Logistics and Transport (PNLT) determines what stretches should be considered. In the Zona da Mata Corridor, the PNLT has proposed rehabilitating the 170-km stretch between Campina Grande (PB)-Cabedelo (PB) and Cabedelo Port (PB). In the Northern Corridor, its proposals include the recovery/rehabilitation of the 300-km stretch between Altos (PI) and Luis Correia (PI) and the construction/repair of 163 km between Codó (MA) and Teresina (PI).

As shown in Table 1, some sections of the rail network are already in place, others are in execution and some others are at different stages of the planning process. The table also shows that all of these proposed sections are included in at least one of the three major infrastructure planning and financing programs of Brazil: the Pluriannual Plan - PPA; the Growth Acceleration Program - PAC; and the National Plan for Logistics and Transport - PNLT.[1]

From the regional standpoint, the rail network would be linked to Peru through the Iñapari-Porto Velho road connection. This network would also enable Brazilian goods to reach Porto Velho by rail and continue by truck to the Ilo and Matarani ports. In the case of Bolivia, the connection with Porto Velho would be by road up to Guayaramerín and then by waterway to Porto Velho, or directly to Porto Velho along the Madre de Dios, Beni and Mamoré waterways.

Making Headway

At the above-mentioned meeting of June 2011, apart from approving the proposal for expanding the Peru-Brazil-Bolivia Hub, it was decided that this issue also had to be discussed within the framework of IIRSA Indicative Territorial Planning Methodology. In this regard, the Technical Coordination Committee (CCT) hired a consulting firm to broaden the Business Vision of the Hub with the purpose of incorporating the northeastern and central-western states of Brazil.

A preliminary version of the Business Vision of the expanded Peru-Brazil-Bolivia Hub was submitted at the GTE meeting on this Hub held on October 6 and 7, 2011, in the city of Lima, Peru. After a thorough discussion among the delegates, it was concluded that the results submitted were not enough to uphold the countries' decision to incorporate the above-mentioned regions into the Peru-Brazil-Bolivia Hub. For this reason, it was agreed that the Brazilian delegation would ask the CCT to conduct a new study that, keeping the idea of a rail network, would analyze alternatives for the incorporation of these regions into one or more IIRSA Integration and Development Hubs.

[1] The PNLT is an indicative plan of investments in logistics and transport for the 2007-2022 period based on the economic prospects for the different regions of the country and on the expectations about an increase in freight transport demand on the Brazilian transport network in different transportation modes. The PAC is an executive investment program for 2007-2010. Its goal is to create macro-sectoral conditions for the country's growth in this period, underpinned by incentives to increase public investment in infrastructure. In 2010, a new stage of the program was launched for the 2011-2014 period, known as PAC 2. The PPA organizes the general objectives and the expenditure of the central government throughout a four-year term. The last PPA comprises the 2012-2015 period. The government can make investments in strategic programs only when the projects have been included in the plan.

The New Study

This new study analyzed the possible physical connections of the rail network with other high-capacity transport infrastructures (railroads and waterways) that are already available in other Integration and Development Hubs. This analysis led to suggest that incorporating the nine northeastern states and the states of Tocantins and Goiás into the Central Interoceanic Hub would create an area of influence covering almost all the network, consider its connections with the Brazilian rail network located in the central-southern area of the country, and open up new perspectives for connection with other countries, mainly Bolivia and Paraguay.

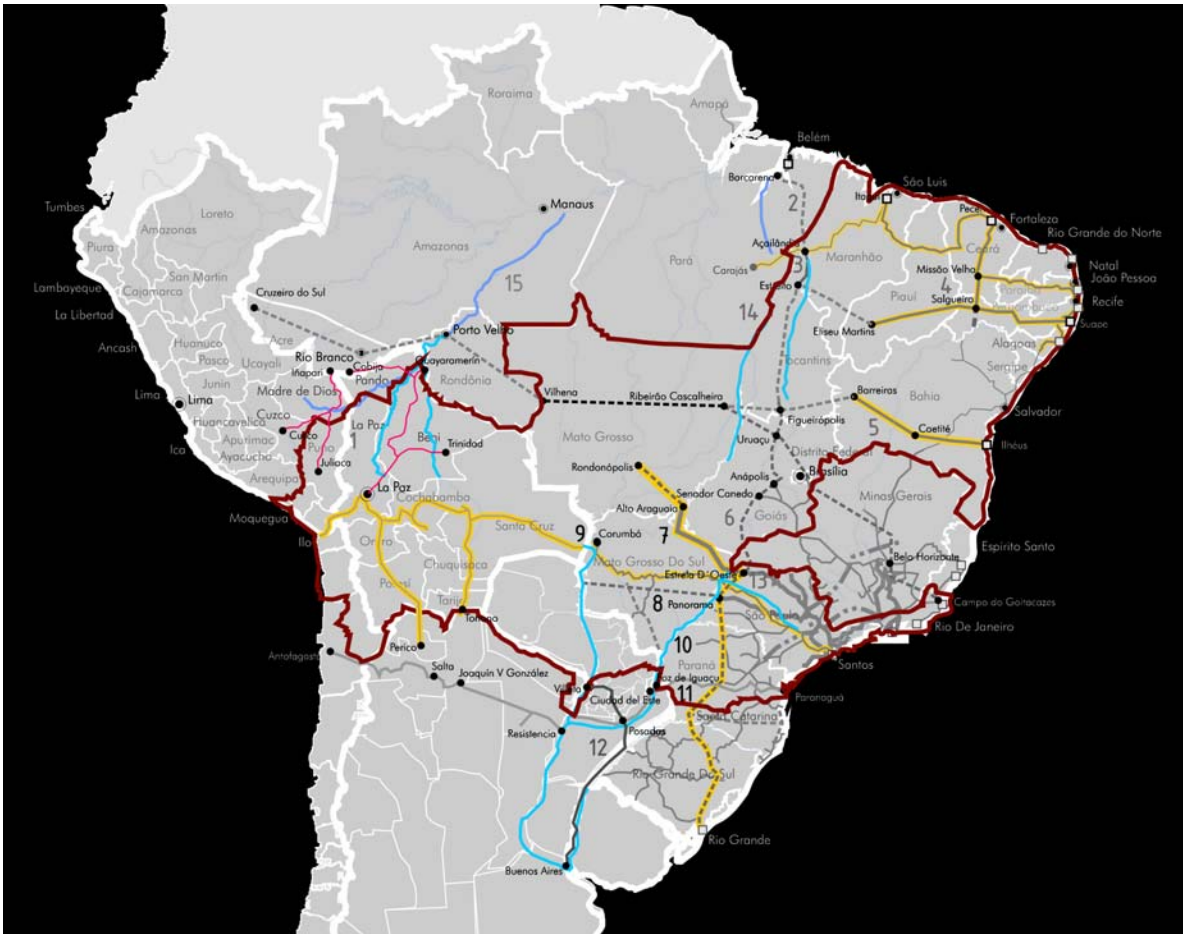
As shown in Map 2, the expansion of the Central Interoceanic Hub to the east in order to incorporate Goiás, Tocantins and the entire northeastern region (red line) would involve the extension of the North-South Railway (# 6) up to its intersection with the Paranaguá-Antofagasta Bioceanic Rail Corridor (# 11), in the Paraná state.

However, some stretches of the originally proposed network would be left outside the bounds of this new area of influence. This is the case of the section of the Center-West Integration Railway connecting Vilhena, Porto Velho, Rio Branco, and Cruzeiro do Sul, the northern extension of the North-South Railway (Açailândia-Belém) and the southern extension of the same railway from the south of Paraná.

In terms of the connection among the countries, the expanded area of influence of the Central Interoceanic Hub would comprise the entire Central Bioceanic Rail Corridor (# 9) and, therefore, would cover the rail connection with Bolivia and with a Peruvian port (Ilo). This expanded area would also include the Paranaguá-Foz de Iguaçu connection, which is the Brazilian section of the Paranaguá-Antofagasta Bioceanic Rail Corridor (# 11), to facilitate trade by rail with Paraguay. Furthermore, it would incorporate the connection with the Paraguay river in Corumbá and with the Paraná river in two locations: Estrela d'Oeste (São Paulo), via the North-South Railway, and Foz de Iguaçu, via the Paranaguá-Antofagasta Bioceanic Rail Corridor (# 11). This last link enhances the potential for connection with Paraguay.

The sections of the original network that would be left outside the new area of influence may be considered as follows. The Vilhena-Porto Velho rail stretch could be incorporated as a new project to the Peru-Brazil-Bolivia Hub. This would be important because it would ensure the rail connection of Porto Velho with the Brazilian railway system, as well as the trade perspectives of Bolivia and Peru with Brazil via Porto Velho. As for the section of the Center-West Integration Railway linking Porto Velho, Rio Branco and Cruzeiro do Sul, it could be reconsidered once the Peruvian government makes a decision regarding the Paita-Pucallpa railroad and the Pucallpa-Cruzeiro do Sul rail connection.

Map 2 - Incorporation of the Northeastern Region, Tocantins and Goiás into the Central Interoceanic Hub



Discussion about the New Study in Brasilia

The project to incorporate the northeastern region of Brazil into the Central Interoceanic Hub was presented at a meeting in Brasilia attended by the Brazilian delegate to the COSIPLAN, the directors and technical staff members of the Planning Ministry and the Secretary of National Transportation Policies, under the purview of the Transportation Ministry of Brazil.

At the meeting it was considered that, rather than incorporating the northeastern region and parts of the central-western region into the Central Interoceanic Hub, it was better to incorporate these territories into the Amazon Hub. In other words, instead of planning to connect the rail network with the central-southern region of Brazil, which would leave outside part of the network, priority was given to the rail connections with Peru and Bolivia (connections already in place in the Peru-Brazil-Bolivia Hub), opening up two other connections with the Pacific ports, farther north of Peru. Indeed, as the project involves the Amazon Hub, it is possible, as will be

seen below, to connect the network with the Callao port (the main Peruvian port) and the Paita port, in the north of Peru.

Therefore, the proposal is to expand the Amazon Hub not only to the east to incorporate the regions above mentioned, but also to the south, so that the new expanded Hub may contain the entire rail network.

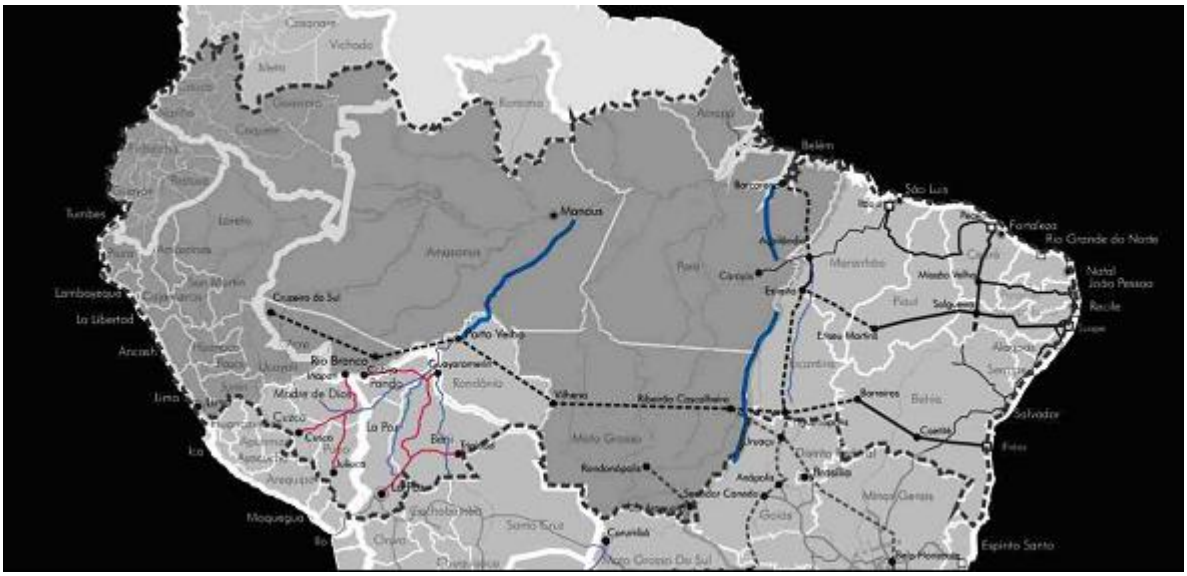
This proposal, detailed under item 2, was submitted to the consideration of IIRSA National Coordinators at a forum held in Lima on September 27, 2012, with no objections raised.

2. Expansion of the Amazon Hub to the Northeastern Region of Brazil and to the South, over Territories Covered by the Peru-Brazil-Bolivia Hub

Expansion of the Amazon Hub

Map 3 shows in ash grey the original boundary of the Amazon Hub, and in broken lines the contour of the expanded Amazon Hub.

Map 3 - Original and Expanded Amazon Hub



The original contour of the Amazon Hub incorporates all the Peruvian departments located north of Cusco, Puno, and Madre de Dios (which are located in the Peru-Brazil-Bolivia Hub), the entire Ecuadorian territory, and part of Colombia, south of Bogotá. This Hub will be expanded to the east in order to include the nine northeastern states of Brazil as well as the state of Tocantins. It will also be expanded to the south, over territories that currently fall within the Peru-Brazil-Bolivia Hub. From Peru, the Amazon Hub will incorporate the departments of

Cusco, Puno, and Madre de Dios; from Bolivia, the departments of La Paz, Pando, and Beni; and from Brazil, the state of Rondônia.

As can be seen in Map 3, the area of the expanded Amazon Hub contains the whole rail network proposed. The map also shows that the three project groups from the Peru-Brazil-Bolivia Hub will remain in this area.

Taking only road transportation into account, the main projects are: in Peru, the paving of the Iñapari-Puerto Maldonado-Inambari, Inambari-Juliaca, and Inambari-Cusco sections, the first stretch of the South Interoceanic Highway, and the bridge over the Acre river; in Bolivia, the construction of the Guayaramerín-Riberalta / Yucumo-La Paz highway, the Cobija-El Choro-Riberalta highway, the Yucumo-Trinidad road, the Cobija-Extrema road, and the bridges over the Madeira river and Igarapé Rapiran river. Also in Bolivia, the Madeira-Madre de Dios-Beni river corridor (including the navigation conditions on the Madeira river, between Porto Velho and Guajará Mirim; the Ichilo-Mamoré waterway; the navigation conditions on the Beni river; and the Madre de Dios waterway) continues within the expanded Hub. Therefore, the area covered by the expanded Amazon Hub includes the road and waterway connections of Peru and Bolivia with Porto Velho, a city that will be served in the future by the rail network and will become an important international hub.

International Connections of the Rail Network with Ports on the Pacific

From the regional perspective, as already observed, the rail network would connect with Peru and Bolivia through the infrastructures already considered in the project groups of the Peru-Brazil-Bolivia Hub.

Two of these connections were considered in a recent study developed by the National Industry Confederation of Brazil[2] as potential alternatives for joining Brazil and ports on the Pacific ocean. A first alternative is the already-existing road linking Porto Velho and Assis Brasil-Iñapari. Along this way, the Brazilian products can reach Porto Velho by rail and then get to the Ilo and Matarani ports by road, while the Peruvian products can be transported through this road up to Porto Velho and reach the Brazilian markets by rail (Map 4).

[2] *O Norte Competitivo*. Confederação Nacional da Indústria – CNI, Brasilia, 2011.

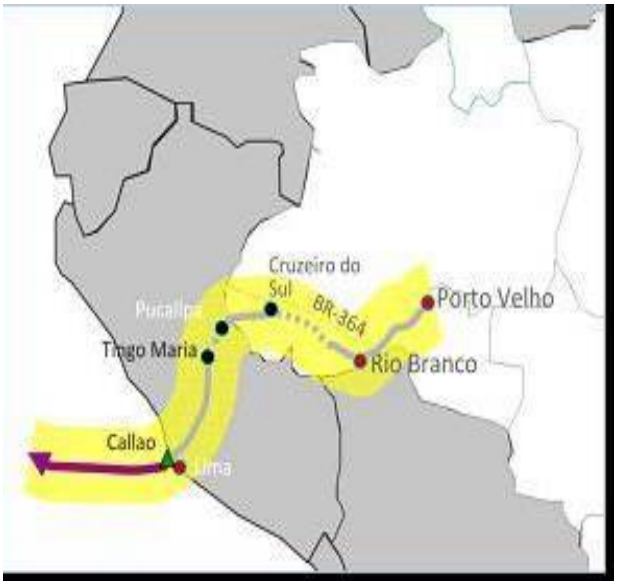
Map 4 - Porto Velho-Matarani Connection

Another possible alternative is a road connection with Bolivia, which calls for the development of part of the transportation infrastructure in the Bolivian territory. This connection would be by road from Porto Velho to Guayaramerín, and from there, again by road, up to the city of La Paz and the Arica port (Map 5).

Map 5 - Porto Velho-Arica Connection

There is a third alternative involving an Amazon Hub project currently being analyzed by the government of Peru, which consists in the construction of a road linking Pucallpa and Cruzeiro do Sul, which would open up the possibility of a road-rail connection between Brazil and Peru. This connection would facilitate the transportation of goods by road between Porto Velho (to be served by the rail network) and the Callao port (Map 6).

Map 6 - Porto Velho-Callao Connection



A fourth alternative for regional connection with the rail network would be the road between Pucallpa and Cruzeiro do Sul. Pucallpa may be served by the Paita-Pucallpa railway, a project under consideration by the government of Peru. The rail connection between Pucallpa and Cruzeiro do Sul would create a rail axis between the Pacific (Paita port) and the Atlantic (Porto Sul, in Ilhéus, Bahia) oceans. The road between Pucallpa and Cruzeiro do Sul would be an alternative to the previously presented rail line between these two cities.

Potential Routes and Transportation Costs

It is interesting and important to point out that the mere existence of potential routes does not necessarily mean that they would turn out to be efficient transportation alternatives to connect Brazil and Peru or Brazil and Bolivia. Their efficiency will depend, in the future, on whether the investments required to complete the projects are made; on whether different services are developed and supplied along the routes, rendering them safe and reliable alternatives for international traffic flows; and, primarily, on the comparison between their transportation costs against alternative routes.

The above-mentioned study carried out by the National Industry Confederation of Brazil compares the transportation costs of the routes currently used in Brazil for exporting cereals to the port of Shanghai against the transportation costs of the potential routes on maps 4, 5 and 6 to reach the same Chinese port.

Table 2 - Total Logistics Costs of Existing and Potential Roads: Agricultural Products Exported from Porto Velho

Existing Routes	Total Cost to Shanghai (R$/ton)
Road up to Santos	310
Road-rail connection up to Santos (via Alto Araguaia)	277
Road-waterway connection up to Itacoatiara (via Porto Velho)	125
Road up to Paranaguá	324
Potential Routes	
Road up to Arica (via Guayaramerín) (Map 4)	228
Road up to Maratani (via Assis Brasil) (Map 5)	261
Road up to Callao (via Cruzeiro do Sul) (Map 6)	264

Source: Confederação Nacional da Indústria, *O Norte Competitivo*, Brasilia (2011).

Table 2 shows that, although transportation costs in the potential export routes to the Arica, Callao or Matarani ports may be higher than the cheapest route currently used (R$125/ton by road up to Porto Velho and by the Madeira river waterway up to Itacoatiara), they are not higher than those in other more costly Brazilian routes.

Conclusion

The expansion of the Amazon Hub to the east and south and the presence of the rail network increase the chances for Brazil to gain access to ports on the Pacific ocean, and reinforce how important investments are to construct routes in Bolivia and Brazil —undoubtedly, an enormous contribution to this. Indeed, the data on transportation costs analyzed in this report show that once the investments to construct the potential routes are made, the adaptation of the ports to the new transportation flows is completed, and adequate services along the way become available, these routes will acquire the status of well-established, efficient and safe corridors and will become important transportation routes linking Brazil with Bolivia and Peru.

Next Steps

To develop the following steps of the Indicative Planning Methodology, it will be required to:

1. Decide on a new name for what has been called so far the expanded Amazon Hub;
2. Determine and describe the area of influence of the new Hub;

3. Identify and delimit the Project Groups of the expanded Amazon Hub, considering the existing Project Groups in both the Amazon and the Peru-Brazil-Bolivia Hubs and, particularly, the new area to be added to the indicative planning (the nine northeastern states and the state of Tocantins, in Brazil), which were not included in any Hub;
4. Create a new Business Vision for the area of influence of the expanded Amazon Hub.