

**RIO GRANDE DO SUL STATE
PLAN OF LOGISTICS AND TRANSPORTS
(*PLANO ESTADUAL DE LOGÍSTICA DE TRANSPORTES
DO RIO GRANDE DO SUL*) – PELT-RS**

2012-2037

TERM OF REFERENCE

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1 TRANSPORTS IN RIO GRANDE DO SUL STATE

Modal networks are, together with their connecting links, formed by railway, road, port and airport terminals, the main elements of physical infrastructure of logistics systems. The adequacy of such infrastructure to the needs of transportation of goods is important for the proper functioning of economy. This aspect is specially significant in the case of Rio Grande do Sul State, because its geographic location far from the main consumer markets in Brazil and abroad makes transportation and logistics costs fundamental in keeping the State competitiveness.

Rio Grande do Sul is located both in Southern Brazil and in the center of MERCOSUL. The boundary position causes the State transport network to have pivot points both with Brazil and abroad. Thus, besides the flows of goods produced and consumed in the State, its infrastructure serves to the transport of the great majority of the flows of goods among the rest of Brazil, Uruguay and Argentina.

Rio Grande do Sul is linked to other Brazilian states by two main highways: BR-116 and BR-101. By BR-101 travel cargoes originated from or destined to Porto Alegre Metropolitan Region and the State southern region. By BR-116 travel cargoes from *Serra* (Mountain) and *Nordeste* (Northeast) State Regions. Both highways present intense flows, but the main problems are concentrated in BR-101, which presents low capacity, since it's a two lane highway in some places and even unpaved in others.

The main terrestrial pivot point between the State and abroad is located in Uruguaiana municipality. Through this municipality flows most of the inland traffic with Argentina and Chile and part of the inland traffic with Uruguay. The rail link with Argentina is also located in Uruguaiana, the only international connection of this type that is active in the State.

Nowadays Rio Grande do Sul has a cargo transportation network formed by five different transport modes: road, railway, water, pipeline and air.

At present, the State Transports Modal Matrix is¹:

- Road: 85.30%;
- Railway: 8.80%;
- Water: 3.60%;
- Pipeline: 2.10%; and
- Air: 0.20%.

1.1 Road transport

Main transport mode is by road. Although the State road network covers almost its entire territory, the headquarters of some municipalities still lack paved access, since the distribution is not homogeneous. *Sul* (South), *Fronteira Oeste* (Western Frontier) and *Campanha* (South Western) Regions have road densities significantly lower than the rest of the State. Nevertheless, since in these regions the population is predominantly urban, accessibility conditions are good. In *Fronteira Oeste* 90% of the population resides less than 5 km from a paved road. The region of the state more poorly served in terms of road network is *Centro-Sul* (Mid-South), which has the lowest road density of the state and nearly 40% of its population living more than 5 km from a paved road.

1.2 Railway transport

Railway transport is the second in importance within the State. The railway system of Rio Grande do Sul is part of the *Malha Ferroviária Sul* (Southern Railway Network) that was granted in 1997 to *América Latina Logística* (Latin America Logistics – ALL). Like other Brazilian railways, RS's railways have undergone a decline in importance from the 1950s on. When delivered to private operation, both the infrastructure as much of the wagons and locomotives had maintenance problems.

¹ State Secretariat of Coordination and Planning. *Rumos 2015: estudo sobre desenvolvimento regional e logística de transportes no Rio Grande do Sul* (Study on Regional Development and Transport Logistics in Rio Grande do Sul), 2006.

ALL has acted in order to reclaim the space occupied by railways in the past. Concentrating its operations in the transport of agricultural bulk from the State northwest to Rio Grande Port for export, it also performs cargo transportation between Sao Paulo and Buenos Aires. The difference between the gauges of Brazilian, Argentinean and Uruguayan railways is the main bottleneck for the integration among the railway systems, since it forces the need for load transfer between compositions.

Along with the conservation conditions, the configuration of the rail network has deficiencies that limit its use. The layout of the railways in Rio Grande do Sul was built in the past due to the geopolitical characteristics of the state. Historically, topography and hydrography caused the state railway center to be near the town of Santa Maria, and there was not a direct link by rail between Porto Alegre and the Port of Rio Grande. Thus, the link between Porto Alegre and this port by rail has a length of 896 km, opposed to the 321 km of the road link and 315 km of the waterway link.

Despite the deficiencies of route there are good possibilities for the use of railways, since 80% of RS industrial activity and 52% of agricultural and livestock activities in terms of added value are located less than 1 hour away by road from a rail terminal. Virtually all industrial activity and 93% of agricultural and livestock activities are less than 2 hours from a rail terminal.

1.3 Water transport

Just as railway transport, water transport had its importance in the State reduced in recent years.

The State main waterway is *Bacia Sudeste* (Southeastern Basin) formed by Patos Lagoon, Guaíba Lake and Jacuí and Taquari rivers. In the past this waterway was the main form of access to cities as Pelotas, Porto Alegre, Rio Pardo and Estrela, located along its banks. Inland ports of the State Southeastern Basin have access to Rio Grande Port and the ocean by Patos Lagoon.

The economic importance of these ports, specially the one in Porto Alegre, was reduced from the second half of XX century on due to the lack of investments, competition with road transport and increased dimensions of marine vessels.

At present inland ports are being used mainly for transport of bulk in private terminals or of industrial cargoes of great dimension. Although the waterway draught prevents operation of large oceangoing vessels, there is a potential for using these ports mainly for transportation of industrial goods, since about 70% of RS industrial activity is located less than 60 minutes from these ports.

1.4 Pipeline transport

Rio Grande do Sul's pipeline network is responsible for a great part of the transport of crude oil and oil products that supply the oil refinery and the *Polo Petroquímico do Sul* (South Petrochemical Complex). The pipeline network is also responsible for transporting natural gas for power generation, industrial supplies and supply of vehicles and households.

The current pipeline network of Rio Grande do Sul is basically formed by 14 pipelines, eight of them operating with crude oil and derivatives and six pipelines operating with natural gas. Five natural gas pipelines are derived from Brazil-Bolivia pipeline, and a single one comes from Brazil-Argentina pipeline.

1.5 Air transport

Rio Grande do Sul has a total of 52 airports in operation. The airport with a longer runway is the one in Santa Maria; however, it has no cargo terminals, and is mainly used for military purposes. The airports of Porto Alegre, Pelotas, Caxias do Sul, Passo Fundo and Santo Ângelo have runway sizes capable of enabling the use of larger aircrafts to transport cargo. These five terminals are the airports with greatest cargo movement in the State, except the airport of

Caxias do Sul, which has small movement of goods, due to the limited space of its cargo terminal, although it has a significant passenger movement.

2 STUDY BACKGROUND

In 2003, due to the bottlenecks in national transports logistics, the Ministry of Transport began the studies that culminated, in the mid-2007, in the dissemination of the National Plan of Logistics and Transports (*Plano Nacional de Logística de Transportes* – PNLT). Such Plan guides Federal Government actions for all transport modals in the Country. From the dissemination of the Growth Acceleration Program (*Programa de Aceleração do Crescimento* – PAC), PNLT became a part of it.

PNLT envisages the change from the present transport matrix, strongly based on the road modal, giving a higher percentage of participation to other modals, namely, air transport, railways, pipeline and water transport. Also, it indicates all actions that the Federal Government intends to adopt, in the different modals for each one of the seven macro-regions called Logistics Vectors: Amazon, Center-North, Northern Northeast, Southern Northeast, East, Center-Southeast and South.

Therefore, the elaboration of Rio Grande do Sul State Plan of Logistics and Transports (*Plano Estadual de Logística e Transportes do Rio Grande do Sul*- PELT-RS) should enable that the State planning of logistics and transports be integrated to the Federal Government's PNLT, without, however, address the specificities and features of the State transport system. In this sense, Rio Grande do Sul State Plan of Logistics and Transports should not be configured as an appendix to the Federal Plan, but must take into account its purposes, projects and federal investments planned for the State and for Logistics Vector South in a broader way and also to be aligned with the methodologies adopted by it. Indeed, the purpose of the Ministry of Transport is that such alignment be established, which is a recommendation of the Council of State Secretaries of Transportation (*Conselho dos Secretários Estaduais de Transportes* – CONSETRANS), a collegiate coordinated by Secretariat of National Transport

Policy (*Secretaria de Política Nacional de Transportes – SPNT*) of the Ministry of Transport.

It is worth recalling that among the main objectives that motivated the conception of PNLT, which began in 2007, with its promulgation, is the resumption of the process of transport sector planning, at the federal level. Some basic premises guided its design. The first was that it was not a government plan, but a proposal by the Brazilian government, intended to support the development of the four following Pluriannual Plans (*Planos Pulrianuais – PPAs*), regarding the Transportation Sector, i.e. in a horizon from 2007 to 2023. The implementation of a scientific planning method, based on a system of georeferenced data, based, on one side, on a comprehensive and consistent macroeconomic analysis and, on the other, on using simulation models and projection of transports suitable to the objectives of the plan are also other grounds of PNLT

The consideration of logistical issues, integration with territorial planning, respect for the environment, approach of projects of sociopolitical nature, aimed at the reduction of regional inequalities, induction of development, continental integration and national security are factors that represent innovation in relation to previous cases.

The participation of stakeholders was considered fundamental in a transparent and participatory process for the preparation of PNLT. State governments, with their areas of planning and transport, productive sectors – agriculture, industry, trade, tourism – transport operators, manufacturers and users, were all invited to collaborate.

In 2009, the first updating of the goals established two years earlier was made, representing the continuity of this process (PNLT 2009).

The second revision of the Plan, called PNLT 2011, is newly completed and not yet disclosed by the Ministry of Transport. In order to update the goals of the Plan, the temporal horizon was extended to 2031, thus covering other two PPAs (2024-2027 and 2028-2031).

For its character of permanence, at each new release studies of revaluation of estimates and goals of the National Plan of Logistics and Transports arise, what is not merely a periodical data updating, but also the introduction of new enhancements of methodological approach, that evidence the effects of macroeconomic order stemming from recent global crisis and subsequent recovery.

The core of PNLT is in its Action Plan, characterized by its Projects Portfolio. By understanding PNLT as a dynamic element of the sector planning process, this current reassessment of the Plan's goals has improved and applied reevaluation methods of estimates of cargo and passenger transportation demand, as well as of their goals and projects. Thereby, the current progression of PAC projects, the inclusion of new projects of interest to the Federated States and the repercussions of the recent international economic crisis, as well as its repercussions in new estimates of PNLT's projects portfolio were taken into consideration. PNLT Portfolio is organized by transport modal and inserted into the Logistics Vectors, as mentioned before.

To obtain an alignment between PELT-RS and Federal Government's PNLT, it is necessary that the providers of consulting services for the development of the State Plan undertake the revision and complementation of the Federal Plan guidelines, envisaging to adapt them to the existing state reality. Such actions should allow the State to offer – in the time horizon of 25 years (2012-2037) – good logistics conditions for local production flow and efficiency increase, as well as contribute to its competitiveness in the market, directing the State economic development to sectors with higher added value, without neglecting, however, the sociopolitical character of development of geographical areas or the poorer sectors.

3 OBJECTIVE

Rio Grande do Sul State presents this Term of Reference in order to establish the parameters for hiring a Consulting Firm aimed at providing specialized technical services for the elaboration and perpetuation of Rio

Grande do Sul State Plan of Logistics and Transports. PELT-RS should set the future vision and strategies of public and private intervention in the sector of transports and logistics, to foster, during the next 25 years, the growth of the state economy. PELT-RS should also supply the planning tools in this sector to the State, envisaging to make it self-sufficient in the assessment of its demands and in planning its own logistics system

PELT-RS should adopt the following guiding principles of its design:

- It is a long term strategic Plan;
- It is a State Plan, not a government one;
- It is inserted in a permanent planning process;
- It is continually monitored and reevaluated;
- It has a dynamic and participatory character;
- It perpetuates planning tools in transports logistics in the State;
- It is aligned with PNLT.

4 STUDY SCOPE

The study scope should be cargo transport and logistics, although the growth of passenger traffic should be included in the analysis of transport modals capacity. The study horizon should be 25 years (2012-2037).

The study should follow the framework described below, and the methodology for the development of each activity should be explained in the proposal by the Consulting Firm. Recommendations to improve the quality and effectiveness of the study should be made provided that within its present scope and without additional costs (time or resources).

The study will be based on the development of prospective scenarios, whose effects will be modeled in terms of transport and multimodal traffic demand. This model is a product *per se* of the study.

4.1 Activity 1 – Work Plan

The initial task of the Consulting Firm will be the description of the Work Plan including, among others, the following aspects:

- Detailed description of the methodological approach;
- Methodology and procedures for field data collection;
- Presentation of detailed schedule and workflow of activities.

4.2 Activity 2 – Socioeconomic Studies

This activity aims to systematize the existing information on the current socioeconomic situation of Rio Grande do Sul. Therefore, the Consulting Firm shall prepare an assessment including the following:

- Historical, geographical, socioeconomic perspective of the State so that PELT-RS may translate the interests of society and the economy of Rio Grande do Sul, since transportation is not an end in itself, but a means for society to achieve its economic and social objectives;
- State Production (quantity and value), types of production (agriculture, industry and services), main regions of production and consumption, determining the internal and external market to characterize the local economy and the external market influences on it;
- Population and urban and regional development, with a focus on poverty and inequalities in Rio Grande do Sul State, and the statistics of employment and income: to qualify the internal consumer market to the State and show the possibilities of reducing inequalities from the implantation of PELT-RS on.

The assessment should present the findings on these socioeconomic aspects *vis a vis* the object of PELT-RS, not limited to compile data, but aiming at linking the studies to the logistics and transports issue.

4.3 Activity 3 – Analysis of Current Logistics System

In this Activity the Consulting Firm should prepare an assessment of the current situation of the logistics system of Rio Grande do Sul and of its potential for development including, among others, the following aspects:

- Description and evaluation of the provision of logistics and transport infrastructure (all modes of transportation, as well as the equipment of modal integration and storage, such as cargo terminals, logistic platforms and inland customs facilities) in Rio Grande do Sul and in the neighbor states and countries (those recognized as having an impact on the transportation and logistics of the State): characterization of current logistics and transport supply;

- Analysis of cargo transportation services in Rio Grande do Sul including: types of businesses, services offered, times of travel, fleet, stakeholders in logistics chains, prices and efficiency indicators. The Consulting Firm should perform a survey of transport companies, logistics operators and autonomous service providers to: (i) describe the regular services of cargo transportation; (ii) identify bottlenecks and inefficiencies in logistics chains and transportation system. The Consulting Firm will detail in its proposal the methodology of this research, but it will include at least 50 companies representative of the area of study: representativity in terms of (i) transported products, and (ii) variety of logistics chains, including various modes of transport. Since in Brazil, and particularly in the area of interest of this study, there is a large share of independent providers of logistics and transport services, the Consulting Firm should explain in the proposal how the analysis of such stakeholders will be made.

- The analysis should indicate the general profile of transporters, modes and, in particular, where logistical or local bottlenecks may be observed, with emphasis on production losses, accidents, delays, increased costs of transport and loss of logistics efficiency and statewide competitiveness.

- Analysis of institutional and regulatory frameworks that significantly interfere with performance (costs, time, reliability) of logistics and transports in Brazil, Rio Grande do Sul and neighboring countries. The

description should include: transportation sector, customs and taxes, business associated with the sector of logistics and production.

4.4 Activity 4 – Initial assessment of inputs and products flows

4.4.1 Secondary sources survey

The Consulting Firm will research secondary data sources (as state/federal administrations, logistics and transports operators) in the following scopes:

- Traffic data: Counts of road, railway, water, air and pipeline traffic. Particularly, the State Road Department (*Departamento Autônomo de Estradas e Rodagens* – DAER) will provide all available information.

- Fiscal data: Fiscal data obtained from the State Secretariat of Finance should be analyzed to supplement the information about cargo handling in Rio Grande do Sul. These data should be part of the database that should be structured to the achievement of PELT-RS. If the data of the Secretariat of Finance cannot be used directly, the Bidder, in the Proposal, should explain how the adjustments of the information obtained from that Secretariat will be made.

4.4.2 Carriers survey

The Consulting Firm will design and implement a comprehensive survey of approximately 50 stakeholders of the sector, including carriers, transporters (road, railway, air, waterway), infrastructure managers (as airports, ports and logistic platform operators), representatives of civil society (as associations and unions) and other logistics stakeholders (as logistics agents) to capture the origins/destinations of cargo: (i) within RS; (ii) that enters/exits RS; and (iii) that travels through RS. This research will help to define the types, volumes, amounts and origins/destinations of cargo using logistics systems of Rio Grande do Sul State. In the proposal, the Consulting Firm will detail the methodology of this research, which should be discussed and approved by NUPELT (described in Item 6 of this document).

4.4.3 Definition of main inputs and products

The Consultant will define the main inputs and products to be considered within the Study. This definition is based on an analysis of cargo handled in Rio Grande do Sul State. The inputs and products selected should cover at least 80% of the handled quantity and 80% of the handled amount in the State.

4.4.4 First definition of traffic zoning

The Consulting Firm will identify the regions related to each of these handled cargoes (production, domestic consumer market in Rio Grande do Sul, in the rest of Brazil, in the neighboring countries to Rio Grande do Sul, and far abroad). A first zoning of origins/destinations of logistics flows will be elaborated; this zoning will be aligned within Activity 6, Traffic Zoning.

4.5 Activity 5 – Database Structuring

Based on the surveys of previous activities, a database should be created and fed with demand and supply data. The database should be structured to be georeferenced, so as to enable its use in simulation software. Data, studies and state and federal projects should be considered, particularly the existing georeferenced database in PNLT. The State Secretariat of Infrastructure and Logistics (*Secretaria de Estado de Infraestrutura e Logística* – SEINFRA) will arrange access to PNLT's database with the Ministry of Transport.

The detail structure of georeferenced database should present a thematic division for transport modal: road, railway, air, waterway, pipeline and multimodal and by subject (as agricultural production, demography, political division, industry and services). Terminals or places of consolidation/deconsolidation of cargoes should be explained with its operational characteristics.

In structuring this database, the Consulting Firm should take into consideration the existing databases in public entities, such as DAER, so that there is a maximum use of available information and facilities for migration.

It is important to notice that Rio Grande do Sul State is in the process of acquiring and developing a unique database of georeferenced data. However, as the process of PELT-RS should be concomitant to this, the Consulting Firm should consider, in its budget and schedule, that the State database is not yet available and that in the future PELT-RS database should migrate to it. If the State database is available for feeding during the term of the PELT-RS contract, the Consulting Firm of PELT-RS will be responsible for migrating the data developed in this activity to the state database within the contract period.

4.6 Activity 6 – Traffic Zoning

Traffic zones should represent spatial aggregations of the several origins and destinations of the movements of interest to the study made in the transport system, consistent with the level of aggregation and analysis desired. The criteria adopted for the definition of zoning should consider:

- Identification of the main poles of generation and attraction of cargoes for current and future situations;
- Origins and destinations located abroad of interest for the study;
- Transportation or development projects that have an impact on the State infrastructure network.

The traffic zones internal to the State should be aligned with municipal boundaries and their aggregation by micro-regions. The external traffic zones in the neighboring states or countries should be defined at least at micro-regional level. For other states and countries, higher degrees of disaggregation may be proposed, but notable points for the analysis of the transport network will need to be specifically identified an area for adjustments of analyzes of routing, allocation, intervention proposals, and so forth (as factory in Caxias do Sul x

shipping terminal in Rio Grande – concern to differentiate a final destination of a system output gate).

4.7 Activity 7 – Road surveys

The Consulting Firm will conduct the following road surveys and will describe in its proposal the detailed implementation methodologies.

- Traffic volume counts;
- Surveys of road origin and destination (O/D).

The stations of research, both volumetric and origin and destination, should be located in the main roads of the State. SEINFRA will intercede with concessionaires and Highway Polices to provide police support for carrying out the research of origin and destination.

4.7.1 Traffic volume counts

It is anticipated the installation of 250 posts of volumetric and qualifying counts in State highways for obtainment/updating of existing traffic data, which shall remain at the disposal of SEINFRA integrating its assets after the contract execution. The process of feeding the data collected in PELT database should be done in an automated way in order to provide information for various SEINFRA's analysis and studies.

Volumetric counts should be classificatory, held for 7 consecutive days, 24 hours a day, and will serve as a basic input for calibration of current and future travel matrixes. There should be a mandatory volumetric and qualifying count in sections where research of origin and destination will be made.

4.7.2 Origin and destination (O/D) road surveys

To consolidate knowledge of road traffic flows using the transport network of Rio Grande do Sul State, traffic surveys of interseasonal movements should be conducted in 60 stations of origin and destination (O/D), even in the more detailed configuration zoning. The 60 survey stations should be positioned

to form an external contour around the planning macro-regions and should be located at the mandatory passages of the main flows between these regions.

Surveys of origin and destination should be held for 3 working days (Tuesday, Wednesday and Thursday) for 12 hours, in daytime. Only cargo vehicles should be surveyed. For roads with traffic volume greater than 2,000 vehicles per day, at least 500 trucks should be surveyed daily. For roads with traffic of less than 2,000 vehicles per day, all trucks should be surveyed during the hours of the survey.

It is critical that programming of road survey is performed considering the times of movement of key inputs/products selected in Activity 4, so that all these cargoes may have their origin and destination (O/D) matrixes prepared.

4.8 Activity 8 – Present Situation: Conclusion

The following tasks should be performed in this Activity:

- Elaboration of Origin/Destination matrixes in Rio Grande do Sul: cargo transport flows (i) intrastate; (ii) with origin or destination in the State; (iii) in transit. Origin/Destination matrixes should be elaborated: by physical units of key inputs/products transported (as tons and units), whichever the means of transportation; by vehicle, by road transport. The Consulting Firm will explain how O/D matrixes vary taking into consideration the seasonality of demand: the analysis should be detailed by periods of the year, since the inputs/products flows have distinct seasonality and directions throughout the months. Since commodities are an important cargo for the State and the Country, and their consumers are basically external, it is important to understand the main regions where cargoes (by type) are destined and how to complement their movements. Sections or facilities outside the State that cause inefficiencies to its competitiveness and efficiency should be clearly explained.
- Comparison between current offer and demand. Identification of possible system bottlenecks and/limitations – infrastructure, services, regulation. Identification of strengths and opportunities.

- Analysis of the State positioning relating neighboring states and countries, concerning competitiveness/attractiveness of Rio Grande do Sul's logistics in Brazilian/regional context.

4.9 Activity 9 – Prospective Scenarios

Growth trends of Brazilian and State socioeconomics should be estimated for the period 2012 to 2037, highlighting the demand for transportation and logistics.

The proposal should detail the methodology that will be used to structure regional and national growth scenarios for the projection of socioeconomic variables, which will, in turn, be used to estimate future cargo flows.

The study will identify the factors that will influence the growth and spatial distribution of economic activities in the State as well as its impact on the demand for transport services, throughout the period under consideration.

Analyzes of transport demand for relevant products considered in PNLT should be taken into account, as well as studies on existing state and federal agencies.

In this regard, the State is committed to provide access to the following documents:

- *Plano Nacional de Logística de Transportes* (PNLT – National Plan of Logistics and Transports), 2007.
- *Rumos 2015: estudo sobre desenvolvimento regional e logística de transportes no Rio Grande do Sul* (Study on Regional Development and Transport Logistics in Rio Grande do Sul), 2006.
- *Master Plan Prático: Plano Holanda* (Practical Master Plan: Holland Plan), 2008.
- *Plano Aeroviário do Estado do Rio Grande do Sul* (Rio Grande do Sul State Airway Plan), 2003.

Other managerial information may be obtained directly with the companies and departments related to SEINFRA, such as:

- Daily average traffic volume;
- Cargo movement in ports;
- Passenger and cargo movements in airports;
- Pipeline distribution volumes.

It is noteworthy that the main products in the State are still commodities subject to international trends. Thus, the considered international scenarios need to be objectively explained (even if they are secondary sources, the relevance of the aspects analyzed for Rio Grande do Sul's products should be clear).

4.9.1 Definition of Reference Hypotheses

The following should be developed and presented:

- Macroeconomic growth hypotheses (Rio Grande do Sul State, Brazil, neighboring states and countries): GDP, income, future quantities of inputs and outputs; emergence of new inputs and products among the main ones for Rio Grande do Sul; assessment of possible impact of environmental constraints in Rio Grande do Sul in changing the production matrix; changes in consumer markets (as emergence of new key stakeholders, disappearance of others and the increasing importance of the far international market);
- Infrastructure networks hypotheses (Rio Grande do Sul State, Brazil, neighboring states and countries), including their levels of services: survey of infrastructure projects in the state and in the federal government in transportation and logistics areas, including priority levels maybe already defined, existence of executive project, financing and other relevant information for the intended analysis;

- Hypothesis of regulatory framework evolution (Rio Grande do Sul State, Brazil, macro): transportation, business associated with logistics and production sector, fiscal, customs, private sector participation;
- Hypothesis of land use (maintenance, reduction or increase of production area - including new frontiers);
- Detailing of the methodology to be applied for the elaboration of prospective scenarios, specially: (i) relation between economic growth and traffic increase (elasticities) and (ii) determining factors for the choice of modal/logistics chains.

4.9.2 Scenarios Elaboration

The following should be created: a reference scenario (most likely scenario, without much political/economic inflection driven by Rio Grande do Sul State, based on reference hypotheses), three scenarios with different hypotheses, in terms of transport network, spatial distribution of activities, and socioeconomics. Each scenario will be determined by a set of hypotheses, these scenarios will be defined and monitored by the monitoring structure of PELT-RS, namely NUPELT and CAPELT defined in Item 8 of this Term of Reference.

4.10 Activity 10 – Modeling

4.10.1 Definition

Through interviews with carriers and other logistics operators, the Consulting Firm will assess the determinant factors of the modal choice, from the point of view of logistics operators. The findings of this survey, to be implemented with at least 50 logistics operators, will enable the adjustment with local data of the module of modal choice modeling, described below.

Information to be collected include the various product categories, elements of comparison of transportation/logistics cost, travel time, flexibility in the organization of logistics and logistics chain reliability.

4.10.2 Modeling

From the scenarios defined in the previous Activities the projection of transport flows matrixes should be performed for the period 2012 to 2037 (5, 10, 15 and 25 years), by product type and time of year.

The methodology to be used to obtain O/D matrixes referring to the current (2012) and future situation, including all the stages of generation and distribution of transport flows, should be detailed in the proposal.

The flows obtained through O/D matrixes for the base year of 2012 should be allocated to the simulation base network to verify its calibration and validation. The comparison between counted and allocated flows should be shown by report for proof of adjustments.

From the allocation on, service levels, trafficability conditions and transportation costs presented by the current network of simulation should be examined. These should be the basis for the initial identification of alternative investments in the system.

The composition of investment alternatives should also take into account the needs of transport logistics for production flows considered strategic for the State in economic studies developed.

Flows obtained from future transportation matrixes should be allocated to multimodal simulation networks in defined levels. Networks should simulate the physical and operational conditions that should exist at the time, to allow the identification of alternative actions to be analyzed. In road transport, estimates of growth in passenger traffic should be made, and they should be included in the analyzes to verify the system's capacity.

Loads made with matrixes designed for the several years should allow reviews to verify if the proposed interventions are sufficient and adequate to eliminate the problems identified.

The study proposal should detail the methodology and models to be used in this stage of the work.

The modeling should always compare demand with capacity. Since there is seasonality and directionality, analyses should indicate saturations in sections, terminals or transshipments by type or set of products that require transport at some time of the year in a future horizon.

4.11 Activity 11 – Scenarios Evaluation

The following tasks should be developed:

- Multi-criteria assessment of scenarios, from the point of view of sustainability, notably including investment costs and cost-benefit analysis of proposed investments (with externalities). For multi-criteria evaluation, the Consulting Firm should explain in the proposal the set of variables to be used, units of measurement, quantification criteria and relative importance of each one (weight or weighting);
 - Sensitivity analysis of scenarios;
 - Choice of a scenario as logistics development strategy for the State, which must be approved by CAPELT (described in Item 6 of this document);
 - Analysis of the scenario impact, not only at the state level, but also in regional context: opportunities for the state to become a regional center.

4.12 Activity 12 – Action Plan

This activity aims to examine what actions the State can take to better seize opportunities to increase competitiveness and create defenses against threats to their full development, either through investment in infrastructure,

articulation with Federal Government to request investments, changes in regulation, or induction of economic potentialities, i.e.:

- Define, for the term of 5 years, the priority projects of investment in logistics infrastructure of the State (functional definition, major physical characteristics with first cost estimate), and for the terms of 10 and 15 years, the principal axes that must have projects developed;
- Indicate, based on vocations of certain regions, what can be done to increase its competitiveness regarding competitors outside the State, in order to maximize the generation of income and employment in Rio Grande do Sul;
- Guidelines for development of the regulatory framework (indicate aspects of State regulation that can be modified to generate gains to society);
- Consider synergies with investments already made or planned in other Brazilian states bordering Rio Grande do Sul, or that are part of the same supply chain, so that the increased efficiency is transformed into added value of products or cost reduction;
- Identification and assessment of investment sources.

The methodology proposed by the Consulting Firm should enable simulations to identify actions that foster not only efficiency gains in terms of quality of transport, but also meet the economic and social development policy objectives set for the State, such as economic growth, competitiveness of production, mitigation of regional inequalities, poverty reduction and employment generation, among others and that, in principle, appear to be realistically implementable in the planning horizon of 2037.

The assembly of the final portfolio of projects, called Project Portfolio of PELT-RS, should consider the full range of interventions in roads, railways, waterways, ports, airports, pipelines and inland terminals whose need was identified and evaluated through simulations of network performance and measurement of the impacts of several projects considered in the various time horizons specified for the analysis period.

For each project included in the Project Portfolio, its impacts should be individually identified and assessed, through a set of relevant socioeconomic indicators that allows the analysis of the relevance of each intervention in relation to the assessment criteria and policy objectives set forth.

The indicators selected should reflect not only the efficiency gains in terms of the transport system considered (reduction of operating costs and travel time, for example), but also the impacts of the projects in terms of economic growth, reduction of regional disparities, increased generation of jobs and increase in the competitiveness of State production.

The several selected investments should compose a "project portfolio", which will be structured according to its jurisdiction – federal and state – and its potential for implementation by the State or private sector.

For projects of state jurisdiction, the financial capacity of the State must be taken into account in the implementation of recommended intervention projects, as discussed in the Economic Studies performed. SEINFRA will provide information on resources available for investment in logistics and transport infrastructure, to support this analysis.

In evaluating the various forms of project execution by the State or private sector, the study should analyze and propose ways of managing and procuring to ensure the expected results in terms of quality and economy in the performance of the proposed investment for Rio Grande do Sul State.

The proposal should specify the methodology and parameters that will be considered for elaborating the Project Portfolio, including the proposition of its forms of management and procuring.

Even if they are not internal to Rio Grande do Sul, the aggregate value, income, etc. of necessary interventions in neighboring states or countries or in specific locations (iGates) to increase the State competitiveness should be explained. If it is not feasible to quantify the proposals, they should be explained to the most in order to direct measures to be taken by the State Government along with other governments or sectors.

4.13 Activity 13 –PELT-RS model and software

4.13.1 PELT-RS Model

The software tool ("Model") that enabled the development of a modeling and a product *per se* of the study, to be delivered to the Client. The planning tools are the main legacy that PELT will leave for the State. The perpetuation of planning mechanisms is crucial for the validation of the plan. PELT-RS is intended not only to gather data and perform modeling, but also to provide the tools of data collection and modeling necessary for the public power to continue to updating the plan, through analysis of data and models actively generated over time. This makes PELT-RS a dynamic tool that can be updated according to necessity, being renewed and establishing a qualified and perennial state planning. For this it is essential that the Consulting Firm provides the tools of information technology to enable the collection and analysis of such data.

Among the services provided by the Consulting Firm the following should be provided: 01 (one) license of database management server software – automated data extract, transform and load; and 01 (one) license of the simulation software used in modeling and training of SEINFRA's team. Such licenses will become part of SEINFRA's assets. All data load process should be automated to minimize the effort of periodic review and updating of PELT. When the collection of field data is automated this should be integrated into the loading process.

The software solutions should have the following basic characteristics:

- **Simulation Software for Modeling and Training**

Software solution for estimation and projection of multimodal transport demand (freight and passengers), for long-term planning of the needs for infrastructures and transport and logistics services. The model will include modules necessary to accomplish the modeling of the transport system, typically: (i) databases infrastructure, operating costs of the different transport modals; (ii) O/D matrixes management module; (iii) projection of transport

demand module, on the basis of defined socioeconomic scenarios; (iv) multimodal affectation module of transport demand; and (iv) analyzes and presentation of reports module. The model is supplied adjusted and tested on the basis of transport conditions in Rio Grande do Sul State, with a manual of practical use.

- **Server software for automation of data extract, transform and load**

Open and integrated solution for operational and analytical environments in order to combine all elements of data integration – real time and mass movement of data, transformation, synchronization, data quality, data management and data services – to ensure that the information is timely, accurate and consistent in heterogeneous systems. It should provide data integration in real-time at corporate level, with tighter integration with applications and technology, support additional heterogeneous systems and improve performance.

4.13.2 DAER's SISPLAN Model

DAER-RS, responsible for the road modal, promoted in 2003 and 2004 the development of a Road Planning System called SISPLAN. The System's mission is to enable the characterization of Rio Grande do Sul's road modal and the analysis of its road network and, from this analysis, establish and monitor investment programs, for better applying the available resources, and thereby provide better technical/economical balance with regard to the operation of the network and the conservation of State investments in the road area. At present SISPLAN is not being fully used, neither has been updated to software systems currently on the market, which would allow greater flexibility of demand studies and analysis of the road network.

The Consulting Firm:

- Will conduct an assessment of SISPLAN regarding its design, development and operations and evaluate the benefits, risks and feasibility of SISPLAN insertion into PELT-RS model;
- Will elaborate terms of reference to adjust SISPLAN.

DAER will provide explanatory documentation relating to the operation and characteristics of SISPLAN.

4.14 Activity 14. Training

A training program should be developed and implemented, with a minimum of 120 hours, for the staff nominated by the Client. The program will be taught for a class of 10 graduated technicians, involving each of the activities previously described, aiming at technical qualification for the operation and perpetuation of the modeling exercise, data collection and other activities necessary for the maintenance of PELT. The training should include theoretical modules with the conceptual aspects of a logistics study, a Monitoring plan, including conception of a method for selecting and prioritizing projects. This training will involve the preparation of documentation material of the systems, educational material, support material for classes and training.

For the course, the Consulting Firm should indicate the prerequisites in terms of technical expertise of the contractor's staff necessary for the effective use of the training, considering the necessity to fill all classes. The training will be conducted in Portuguese, in Porto Alegre (or another location of convenient access by participants indicated by the Client), with dates to be agreed with the Contractor. It must have at least two teachers, who should be part of the Key Technical Team. Logistics costs of the party hired for carrying out the courses must be borne by it. The place for the realization of the course will be provided by SEINFRA. Participation certificates should be issued to those who attend at least 85% of the training program.

4.15 Activity 15 - Monitoring

The Consulting Firm will support the Client in the internal and external communication about the development of the logistics plan. Such monitoring activity will include:

4.15.1 Internal Communication

- Participation of the General Coordinator in monthly meetings, with NUPELT in Porto Alegre, for the project monitoring;
- Organization of quarterly meetings, with participation of the General Coordinator, and participation of CAPELT, for presentation of the report of studies progress;
- Preparation of internal notes and/or memos for the Client.

4.15.2 Social Communication

The Consulting Firm should structure an effective communication channel with meetings and seminars among technical teams, public leaders and other civil society stakeholders with two specific objectives: (i) present the development and progress of the studies; and (ii) receive society feedback regarding the implementation and progress of studies. These items aim to expand the relationship between society and the technical team that will develop PELT-RS so as to make it as participatory as possible.

Various communication channels should be established between PELT-RS and society, through:

- Meeting with transport management and planning entities;
- At least three seminars with civil organized society;

- Structuring of a communication and dissemination channel of PELT-RS via website, social networks, physical material for dissemination, and others;
- Ombudsman channel for receipt of society's expressions.

Contributions received should be evaluated and pre-selected before being sent to PELT-RS technical team.

Criteria for pre-selection and screening of alternatives should be established to include what is relevant in PELT-RS, and items that are not will be forwarded to the responsible sectors (as other government agencies).

For purposes of formal communication monitoring, the Consulting Firm will prepare Quarterly Reports (in a total of five reports) showing the progress of PELT, as well as the events carried out, each Quarterly Report must be approved by SEINFRA.

4.14.3 Final Report

The Consultant should prepare a Final Report at the end of the consultancy, which will be a separate product, and should be submitted in the last month of consultancy, presenting the evolution of the entire work, as well as assessments, prognostics, actions and strategies for the future, organized into digital (one copy in pdf format) and printed copies (100 copies) for distribution to society.

5 EXPECTED PRODUCTS

The Final Report of the study should follow the works framework previously set forth. The Consulting Firm, however, may suggest a new structure, which should be approved by SEINFRA.

The Final Report should contain all analysis required to the perfect understanding and execution of foreseen tasks and objectives for the performed works, with the detailing of methodologies applied.

In the case the Consulting Firm uses its own models for performing the foreseen tasks, it should indicate in its proposal the ones that will be transferred to SEINFRA.

Following are listed all products expected for the carrying out of the studies, according to the framework previously elaborated.

PRODUCTS	
Activity 1	P 1: Work Plan Report
Activity 2	P 2: Socioeconomic Studies Report
Activity 3	P 3: Report of Current Logistics System Analysis
Activity 4	P 4: Report of Initial Assessment of Main Inputs and Products Flows
Activity 5	P 5: Georeferenced Database aligned with the State one
Activity 6	P 6.1: Shape type file of zoning for inclusion in the State GIS database P 6.2: Repost of Traffic Zoning
Activity 7	P 7.1: Report of surveys planning P 7.2: Report of surveys results P 7.3: Surveys Report
Activity 8	P 8: Present Situation Report: Conclusion
Activity 9	P 9.1: Partial Report with reference hypotheses P 9.2: Report of Prospective Scenarios
Activity 10	P 10.1: Modeling Report P 10.2: State multimodal simulation network (present and future), with the characterization of the attributes required for the intended assessment.
Activity 11	P 11: Scenario Evaluation Report
Activity 12	P 12: Action Plan Report
Activity 13	P 13: Supply of Model and software
Activity 14	P14: Capacity building for follow up and monitoring
Activity 15	P 15.1: Quarterly Reports P 15.2: Final Report

6 WORKS MONITORING FRAMEWORK

In order that PELT-RS succeeds, it requires the assistance and the involvement of different social segments that will be affected by the Action Plan to be recommended. For this reason, it is important to include representatives of these segments in its monitoring and discussions on future strategies.

Therefore, within the Secretariat (SEINFRA) there will be a Center for Monitoring PELT (*Núcleo de Acompanhamento do PELT – NUPELT*) composed of representatives of its related entities that deal with the State various transport modals and that will be assigned to effect technical monitoring of ongoing services.

This internal structure, however, is not enough. The scope of PELT-RS and public and private institutions that will be affected by its recommendations require that they be involved and participate in strategic decisions to be proposed. The non-involvement of these institutions may lead to the rejection of PELT-RS, its abandonment and non-effectiveness. So it is necessary to involve all of these key stakeholders in monitoring the vision that will be built in PELT-RS.

In the Secretariat a Committee for PELT-RS Strategic Monitoring (*Comissão de Acompanhamento Estratégico de PELT-RS – CAEPELT*) will be formed – where representatives of the productive classes and associations representing logistics and transport operators of the State may have a seat.

Both structures must be designed. The first to technically monitor the studies carried out by the Consulting Firm (NUPELT) and the second one as a forum to carry out debates about great strategic lines recommended (CAEPELT).

The members of each structure will have a distinct profile. The Center is essentially technical and should have representatives of each modality. Such Center will monitor the activities to be developed step by step and will debate their conclusions.

The Committee should be formed by senior executives of the main public and private stakeholders and will debate the recommended strategic guidelines.

7 TECHNICAL TEAM

7.1 Key team

The technical team should be formed, at least, by the following professionals (key team):

Key-Team		
Formation	Formation/Experience	Function/Activity
Economist or Engineer with minimum qualification of Master's degree	Minimum of 10 years experience as coordinator or leader of team of transports and/or logistics planning services.	General Coordinator
Senior Economist, with minimum qualification of Master's degree	Minimum of 10 years experience in socioeconomic analysis or assembly of prospective scenarios related to projects planning of transportation systems and studies of demand forecast.	Transports Economist
Engineer, Economist or Administrator, with minimum qualification of Master's degree	Minimum of 10 years experience in Transport Planning, Mathematical Modeling and Studies of Demand Forecast.	Expert in planning and modeling of transport systems
Transports Engineer	Minimum of 10 years experience in technical studies of transport projects and in the infrastructure aspects.	Expert in Transports
Engineer, Economist or Administrator with minimum qualification of Master's degree	Minimum of 10 years experience in logistics studies and/or planning.	Expert in Logistics
Economist or Engineer with minimum qualification of Master's degree	Minimum of 10 years experience in surveys in the transport sector, including: surveys of origin/destination, stated preference, volume counts.	Person in Charge of the Surveys

7.2 Support team

The support team may include:

Support team		
Formation	Formation/Experience	Function/Activity
Engineer	Engineer with minimum of 5 years experience in railway transport.	Expert in Railway projects
Engineer	Engineer with minimum of 5 years experience in road transport.	Expert in Road Projects
Engineer	Engineer with minimum of 5 years experience in port planning.	Expert in Port Planning
Engineer	Engineer with minimum of 5 years experience in airway planning.	Expert in Airway Projects
Engineer	Engineer with minimum of 5 years experience in pipeline planning.	Expert in Pipeline Projects
Traffic Engineer	Minimum of 10 years experience in traffic surveys.	Expert in Traffic
Systems Analyst, Computer Engineer or Computer Scientist	Minimum of 5 years experience in Servers, Systems and Software for generation of analytical reports, automation, transformation, load and data management.	Expert in IT

Besides this team, there are other professionals who should provide support to the works development, such as: Secondary education technicians, Digitizer, Driver, Geoprocessing operator, Field inspector, Traffic counting monitor, technical auxiliaries and programmer. Such professionals should be employed according to the needs in the realization of works by the Consulting Firm and counted on consultancy costs.

8 SCHEDULE

The term foreseen for the execution of services is 16 months. The main stages of the work will be the following:

	M1	M2	M3	M4	M5	M6	M7	M8	M9	M10	M11	M12	M13	M14	M15	M16
Activity 1 – Work Plan	■															
Activity 2 – Socioeconomic Studies		■	■	■												
Activity 3 – Analysis of Current Logistics System		■	■	■	■											
Activity 4 – Initial assessment of inputs and products flows		■	■	■	■	■	■	■								
Activity 5 – Database organization	■	■	■	■												
Activity 6 – Traffic Zoning		■	■													
Activity 7 – Surveys			■	■	■	■	■	■								
Activity 8 – Present Situation: Conclusion						■	■	■	■							
Activity 9 – Prospective Scenarios						■	■	■	■	■						
Activity 10 - Modeling							■	■	■	■	■					
Activity 11 – Scenarios Evaluation											■	■	■			
Activity 12 – Action Plan												■	■	■	■	■
Activity 13 –PELT-RS model and software														■		
Activity 14 - Training								■						■		■
Activity 15 - Monitoring			■			■			■			■			■	■

In its work methodology the Consulting Firm will propose a detailed timetable of activities and sub-activities with product delivery. Monthly reports of progress will be submitted. At the end of each activity shown above a specific report will be made, detailing the implementation methodology and products achieved. The reports will be subject to review by the Contractor, and the Consulting Firm will make all corrections indicated. The Final Report will bring together the reports of the various activities, already corrected.