EXECUTIVE SUMMARY

PRELIMINARY DEMAND STUDY

PARANÁ GOVERNO DO ESTADO

DER PARANÁ

Ferroeste

EVTEA-J

Technical-Operational, Economic-Financial, Environmental and Legal Feasibility Study of Nova Ferroeste

tpf ENGENHARIA

getinsa-euroestudios

tpf INGENIERÍA

SENER

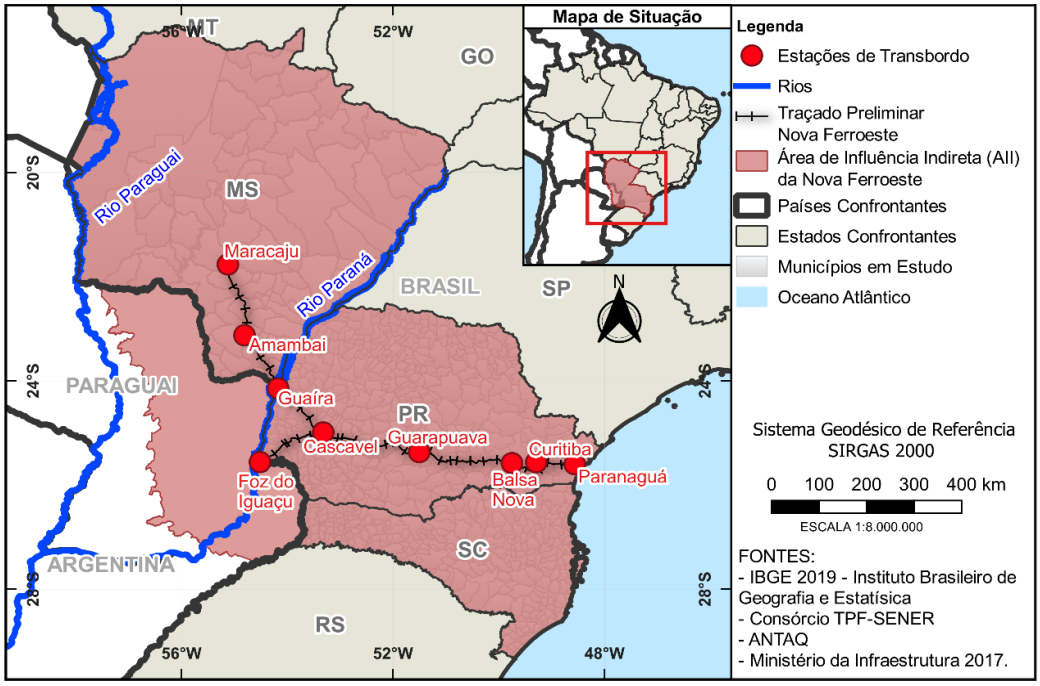
SUMMARY

1. INTRODUCTION

The Paraná Oeste S.A. Railway (EFPO), also known as Ferroeste, located in Paraná, was conceived in 1988 to drain production from the West of the State to the Port of Paranaguá, on the coast of Paraná.

The Consortium formed by the companies TPF GETINSA EUROESTUDIOS, TPF ENGENHARIA LTDA and SENER SETEPLA TECNOMETAL ENGENHARIA E SISTEMAS S.A. (Consortium TPF-SENER) was hired to develop technical, economic, environmental and legal feasibility studies for the expansion of Ferroeste.

The developing study seeks to identify the conditions for connecting the Maracaju region in Mato Grosso do Sul, the Cascavel region and the Paranaguá Port Complex in Paraná with the implementation of two railway sections: Paranaguá (PR) – Maracaju (MS), with 1,191 km; and the Cascavel Railway Extension (PR) - Foz do Iguaçu (PR), with an extension of approximately 179 km.



Nova Ferroeste's project seeks to improve the logistics conditions of Brazil, offering a robust alternative for cargo transportation, reducing transport costs and increasing the competitiveness of Brazilian products in the local and international markets.

To bring transparency to the process of preparation of studies, we present to society the first results of ongoing studies in this executive summary describes the methodology and the main results of preliminary demand study of Nova Ferroeste. As the studies progress, new specific materials on the proposed layout will be published, and other relevant project information.

2. METHODOLOGY

To analyze the potential demand of Nova Ferroeste, the methodology of everything suggested by the Manual of Preparation of Technical, Economicand Environmental Feasibility Studies of VALEC Engenharia, Construções e Ferrovias S.A., was used to analyze the methodology of everything suggested by valec Engenharia, Construções e Ferrovias S.A.'s Technical, Economic and Environmental Feasibility Studies Manual (Version 1.1.1.MAN.2.001). According to this manual, the market study should consider potentially collectable loads by the railroad, those moved to and from the area of influence of the railroad, in addition to estimating cargo projections for the period of operation of the railroad.

2.1 DEFINITION OF THE AREA OF INFLUENCE

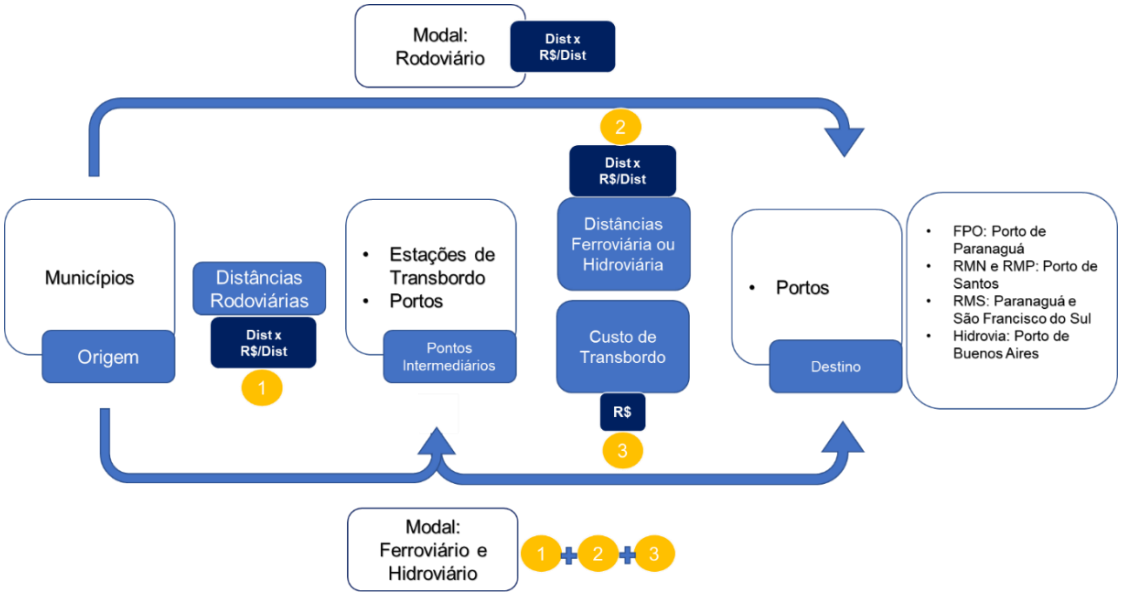
The first step in defining the area of influence of the Nova Ferroeste was to divide the areas that are influenced by the Nova Ferroeste into two categories: indirect and direct.

The Indirect Influence Area (AII) is defined by the cities belonging to the states that can be impacted by the railroad (Paraná, Mato Grosso do Sul and Santa Catarina) and paraguayan and Argentine cities that are located at a distance of up to 200 km from the transshipment points foreseen for the railroad, totaling 925 cities.

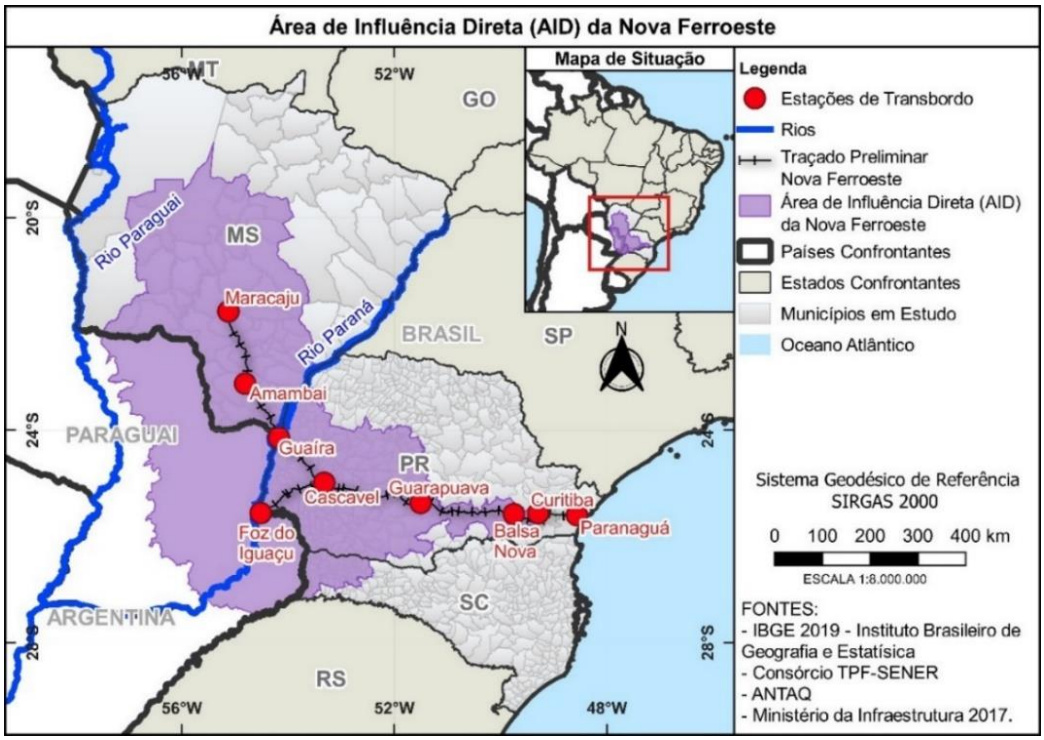
The Direct Influence Area (AII) selects only the cities that would have the lowest cost when transporting their cargo through Nova Ferroeste, even in combination with other modes of transport (intermodality or multimodality). With this delimitation it is possible to concentrate the analyses in the regions that are most likely to use the railroad services in their new configuration.

2.2 COMPARISON OF TRANSPORT COSTS

For the evaluation of the options of lower transport cost between a point of origin and its destination, a comparative matrix of transport costs was developed. In it, the costs of transporting a ton of cargo to different seaports were compared by railway, waterway and road modals and their combinations. The definition of the Area of Direct Influence (IDA) is used by this comparison, selecting those municipalities for which it would be cheaper to have their cargo transported to the Port of Paranaguá by Nova Ferroeste.



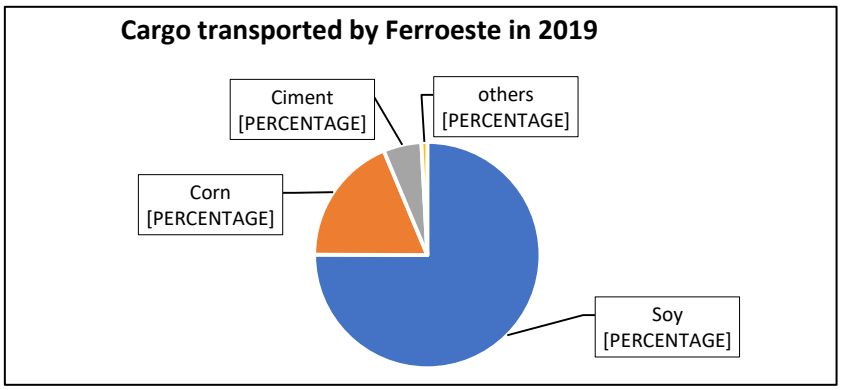
It is worth mentioning that to compare the costs between the different modals, the current values practiced in the market were used. For the railway modal, the reference values made available by the National Land Transport Agency (ANTT) were used. Data from the National Waterway Transport Agency (ANTAQ) were used for the waterway modal. For road transport costs, we used data from the Freight Information System (SIFRECA) produced by ESALQ/USP. After comparing transport costs, the definition of the Area of Direct Influence was reached, being possible to delimit the traffic zones of the study, which are tied to the transmission stations of the railroad.



2.3 POTENTIAL OF CARGO TRANSPORTED BY THE NEW FERROESTE

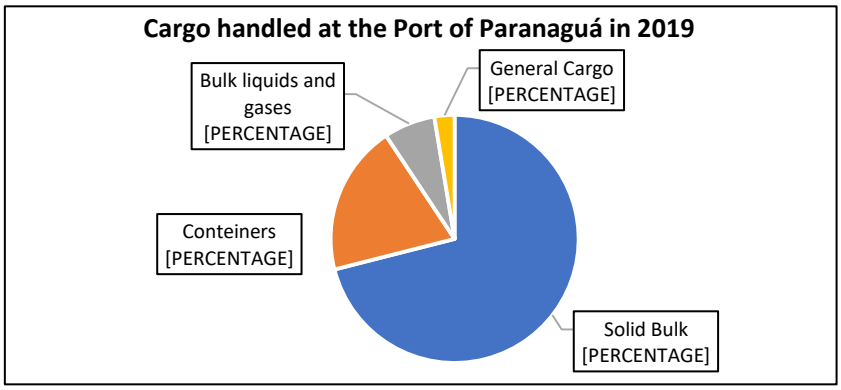
To determine the goods that could be moved by Nova Ferroeste, cargo transported by Ferroeste and moves in the Public Port of Paranaguá, both for the year 2019, were analyzed. The railroad-oriented products produced in the Indirect Influence Area (IIA) were also identified.

In all, Ferroeste moved 686,526 useful tons (TU) of goods in 2019, with agricultural commodities (soybeans and corn) being the main products moved. Soybeans, in turn, were responsible for a portion of approximately 75.0% of the total movement, while corn accounted for approximately 19.0%.



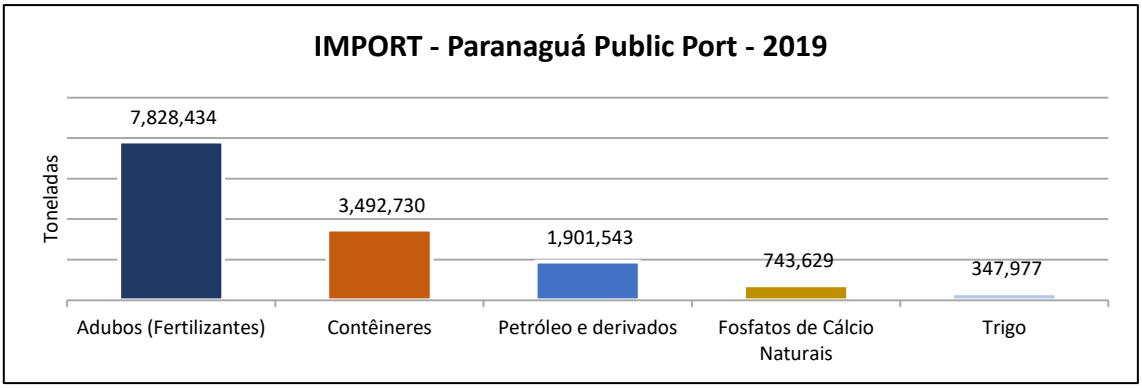
Source: ANTT

In 2019, the Public Port of Paranaguá moved48.5 million tons, of which 32.4 million were exported and 16.1 million imported. Solid agricultural bulk composed the type of cargo with the highest movement, representing about 71% of the total, 34.5million tons. Containerized loads appear second with about 20%, followed by net bulk (7%) and general loads (2%).

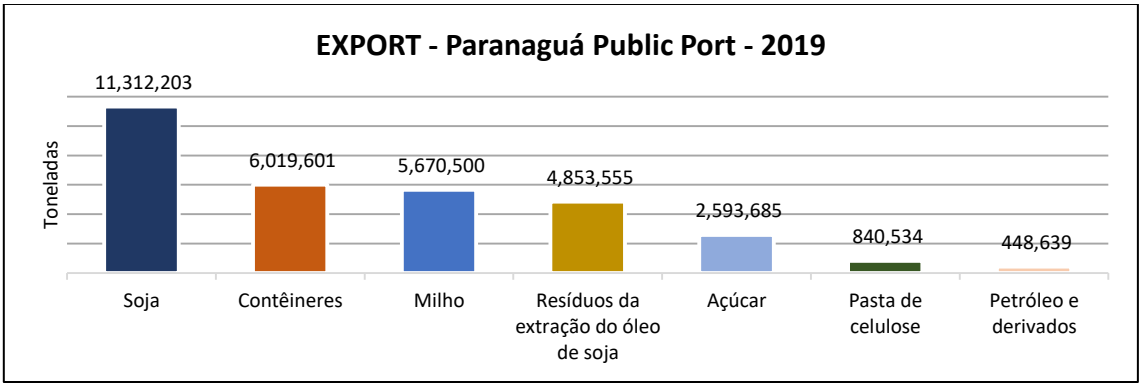


Source: ANTAQ

Among the imports, fertilizers (fertilizers), containers, oil and their derivatives, natural calcium phosphates and wheat, respectively, stand out. In turn, among the exported products are soybeans, containers, corn, soybean meal and sugar. These five goods together, in 2019, totaled 30.5 million tons, being responsible for approximately 94% of the exports of the Public Port of Paranaguá, thus showing the importance of surveying the demand for railway transport in the region with the implementation of Nova Ferroeste.



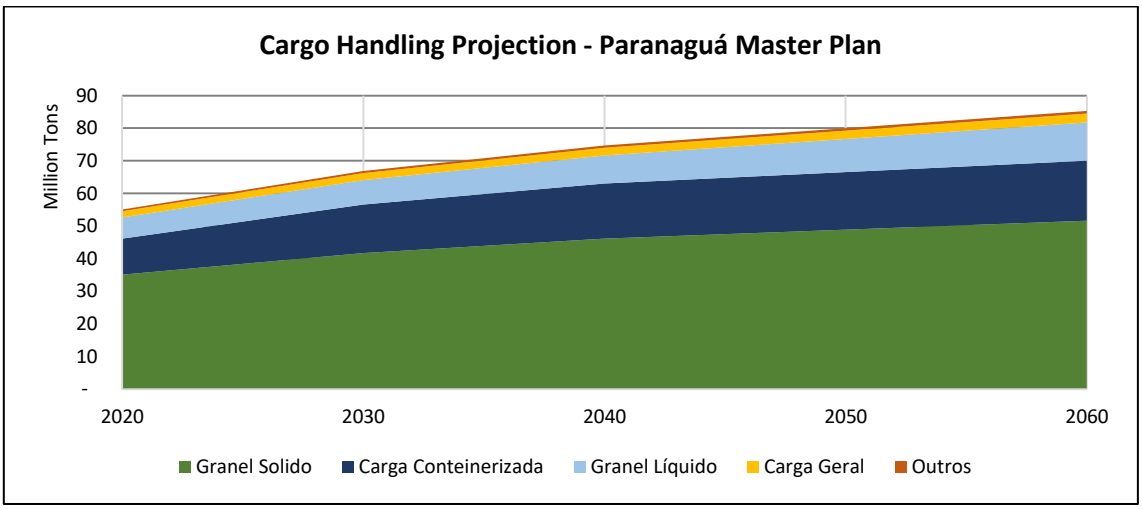
Source: ANTAQ



Source: ANTAQ

In addition to the understanding regarding the past and current movement of the Ports of Paraná, it is important to highlight the estimated projections for the coming years, as this is the main destination/origin of the goods considered in the present study. The Master Plan of the Ports of Paraná (Paranaguá and Antonina Port Complex) estimated, for the year 2020, a movement of 55.1 million tons, of which 35.1 million in solid bulk (Agricultural and Non-Agricultural). For the year 2060, the movement of solid bulk would reach 51.6 million tons, representing 60% of the expected movement, with emphasis on commodities such as soybeans and their derivatives, corn, fertilizers, and sugar.

It is also worth mentioning that the Ports of Paraná have exceeded the estimate of the Master Plan year after year. In 2020, while the projection was 55.1 million tons, the Ports of Paraná moved a total of 57.3 million tons, exceeding estimates by 4.1%.



Source: Plano Mestre dos Portos do Paraná.

Containerized cargo should be the second type of goods with the highest flow in the port, where a movement of 18.4 million tons is expected, that is, 22% of all planned movement in 2060. Net bulk, in turn, is expected to move 11.7 million tons (14%) in the same year, where oil derivatives are highlighted. Finally, the general cargo movement in 2060 is expected to correspond to 3% of all movements in the projected year, totaling 2.7 million tons. From the growth projections of the Port of Paranaguá, the potential of cargoes moved by NovaFerroeste was defined in the traffic area of Paranaguá.

2.4 ORIGINS AND DESTINATIONS

The methodology for defining the origins and destinations of potential cargo of Nova Ferroeste was built in two stages. The first identified the destinations of the loads produced in each traffic zone, and selected those destined to the Port of Paranaguá in the export direction. In the next step, the loads moved between the other traffic zones wereselected to identify those that are consumed in the regions close to production.

For this analysis, the traffic zones defined in the interregional cargo transport study in Brazil prepared by the Planning and Logistics Company (EPL) were used as reference. From the necessary adjustments to make the data compatible, it was possible to calculate the destination source matrix of loads of each traffic zone of the Nova Ferroeste.

In the present study it was considered that the loads transported between two subsequent stations or between short distances would happen by the road modal. Finally, the origin-destination matrices were elaborated with the productions in useful Tonnage (UT) of each product and in Useful Kilometer Tonnage (TKU) for the total. The calculation methodology for monthly seasonality of transport of goods was obtained through the historical series of production or export of each of the products.

2.5 DEMAND PROJECTION

Demand projections were developed using historical production data available from public sources of information. From these data, statistical tools were used to estimate the production trends of each load analyzed for the 60-year period.

PRODUCT ANALYZED	
sugar	Paper Works
corn	Soybean oil extraction residues
soy	Soybean Oil
wheat	Oil and derivatives
Meat and Ofness	Fertilizers
Wooden Works	

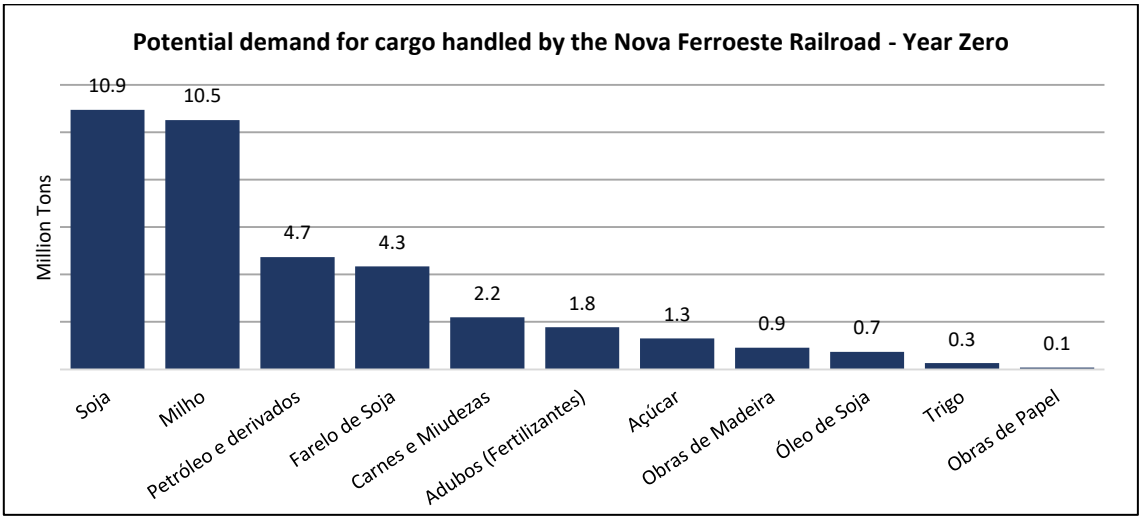
During the selection of the variables that make up the statistical models of demand projection, the sector entities (agriculture departments, cooperatives, producers' association, federation of industries, among others) were consulted in order to evaluate whether the results observed statistically were consistent with the expectations of each sector.

It is noteworthy that demand projections were produced for each state, Paraná, Mato Grosso do Sul and Santa Catarina, in addition to the regions influenced by Nova Ferroeste in Paraguay and Argentina, considering the specific characteristics of each region.

3. PRELIMINARY RESULTS

After the methodological stage, the results were consolidated in the Area of Direct Influence of Nova Ferroeste. Considering that the demand studies were elaborated with the objective of identifying the loads that canbe moved by Nova Ferroeste,the preliminary results presented below should be interpreted as potential demand, that is, if the railroad were in operation in 2021 (year zero), the identifiedloads would be moved by Nova Ferroeste,that is, while nova ferroeste is not built, these loads will be moved by the other existing modals.

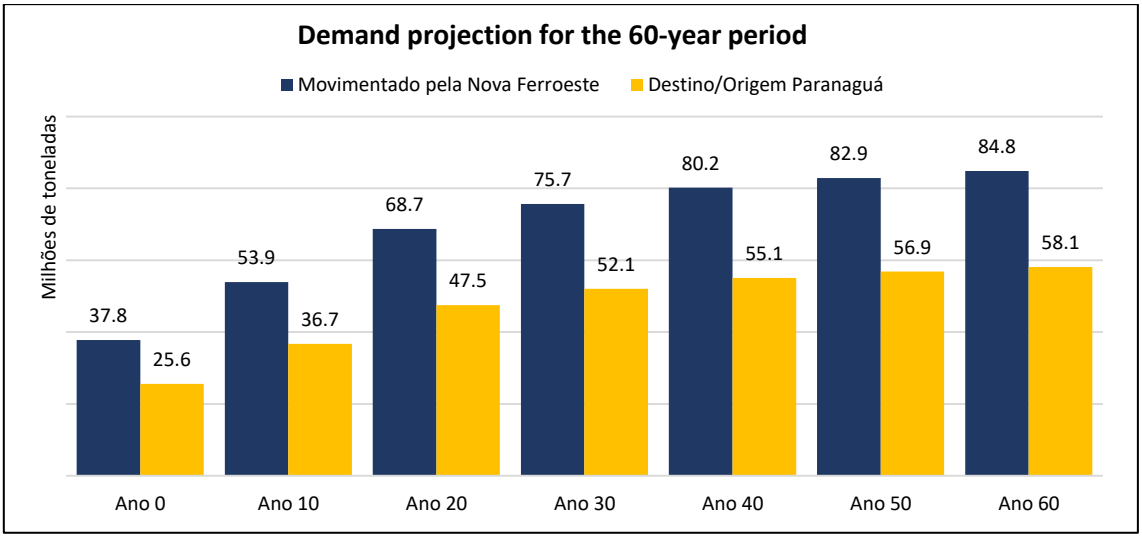
For the year zero of the operation, the demand projection estimates that Nova Ferroeste can move 37.8 million tons being soybeans (29.0%) and corn (27.8%) the main products flowed by the railway.



In the following table, the preliminary results of the direct influence area (IDA) load potential for the first year of granting (2021) are presented in detail. The Production/Consumption column shows the total volume of loads handled in IDA, regardless of the transport mode chosen. Local consumption indicates the volume consumed locally, that is, they are loads that are moved locally, within the same traffic zone, which tend to use the road modal, or cargo s moved to areas of traffic that will not be met by Nova Ferroeste. The loads flowed by Nova Ferroeste indicate the volumand moved between areas oftráfego served by the new railway infrastructure. Finally, to identify the volume of cargo moved by Nova Ferroeste in Paranaguá, both in the export and import direction was inserted in the column export /Import.

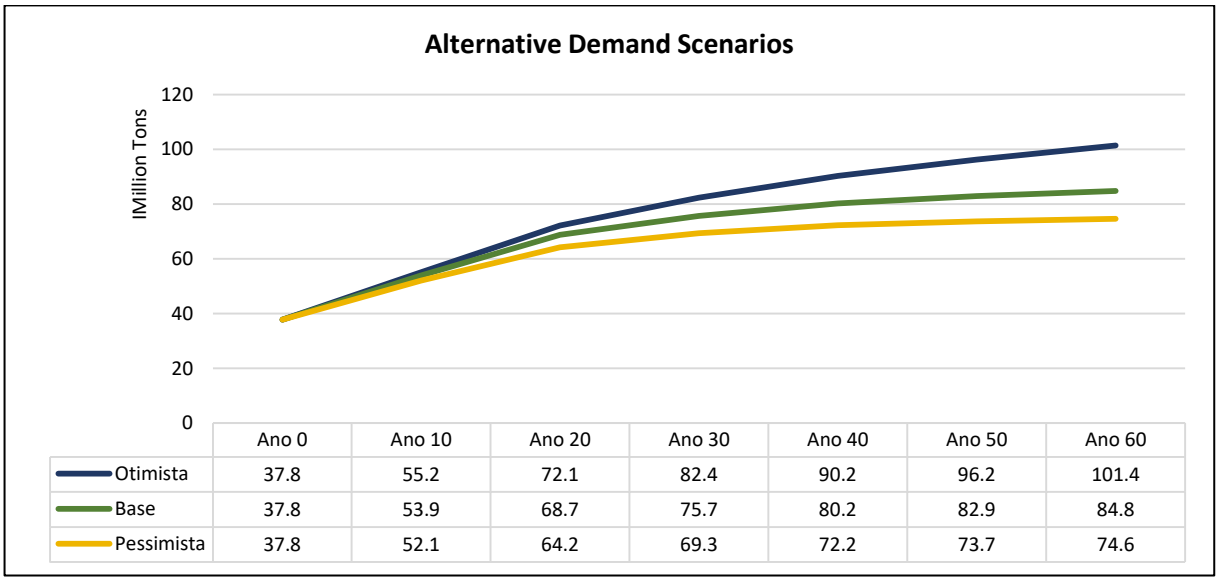
PRODUCT	TONS MOVED			
	Production / consumption	Local consumption	Drained by Nova Ferroeste	Exported /imported
AGRICULTURAL SOLID BULK (GSA)	**38.061.599**	**8.898.835**	**29.162.764**	**21.264.630**
sugar	1.369.569	63.625	1.305.944	1.179.028
Fertilizers	1.779.803	-	1.779.803	1.779.803
Soybean Meal	5.718.465	1.373.009	4.345.456	3.431.079
corn	16.687.108	6.165.793	10.521.316	5.006.132
soy	12.244.356	1.296.409	10.947.947	9.606.289
wheat	262.298	-	262.298	262.298
LIQUID BULK (GL)	**10.445.969**	**4.965.441**	**5.480.528**	**1.904.998**
Oil and derivatives	8.961.000	4.222.409	4.738.591	1.385.259
Soybean Oil	1.484.969	743.032	741.937	519.739
CONTAINER (CONT)	**7.179.058**	**4.010.873**	**3.168.185**	**2.391.122**
Meat and Ofness	4.805.008	2.615.727	2.189.281	1.441.502
Wooden Works	2.216.307	1.306.799	909.508	886.523
Paper Works	157.743	88.348	69.395	63.097
OVERALL TOTAL	**55.686.626**	**17.875.149**	**37.811.477**	**25.560.750**

It is worth mentioning the volume of cargo moved by the Port of Paranaguá. According to preliminary demand studies, approximately 25.6 million tons are destined for or from the port of Paranaguá, that is, 67.6% of the total moved in the first year of operation of the railroad. This indicates that the railway's main characteristic is to move granisagricultural solids, mainly in the export sense. The projections were made for the 60-year period, which allows evaluating the behavior of demand in the long term.



In addition to the projections of the expected values, two alternative scenarios were evaluated, defined from variations in the assumptions that led to the demand projections for each product transported by Nova Ferroeste.

Evaluating the comparison between the base scenario and the alternative scenarios (Optimistic and Pessimistic), it is verified that at the beginning of the projected series, the three scenarios start from the same value, but in the following years there is the distance between the scenarios. In year 10, the production value of the Base scenario is 3.4% higher than that of the Pessimistic scenario, while the Optimistic scenario is 2.3% higher than the Base scenario. For the year 60, this ratio is increased to 12.1%and 16.3%, respectively.



	Ano 0	Ano 10	Ano 20	Ano 30	Ano 40	Ano 50	Ano 60
Otimista	37.8	55.2	72.1	82.4	90.2	96.2	101.4
Base	37.8	53.9	68.7	75.7	80.2	82.9	84.8
Pessimista	37.8	52.1	64.2	69.3	72.2	73.7	74.6

Nova Ferroeste is expected to have nine transhipment stations, and its railway line will be subdivided into two sections, the first making the connection between the southeast of Mato Grosso do Sul, in Maracaju, and the Port of Paranaguá (PR), while the second will connect Foz do Iguaçu (PR), which is located on the border of Brazil with Paraguay and Argentina, Cascavel (PR), thus strengthening foreign trade.

4. FINAL CONSIDERATIONS

The results presented are part of the scope of the Technical-Operational, Economic-Financial, Environmental and Legal Feasibility Study (EVTEA-J) of Nova Ferroeste, called preliminary demand study, having been constructed by a multidisciplinary team. Considering the preliminary nature of the studies, it is necessary to mention that the results may change in the consolidation stage of the EVTEA-J studies.

The Preliminary Demand Study is fundamental for the elaboration of definitive studies of tracing, due to the need to develop a path that meets the productive regions and that has sufficient capacity to drain the mapped loads during the estimated concession period. Although preliminary, the demand study demonstrates the existence of a volume of cargo in the region of direct influence of Nova Ferroeste sufficient to place it among the largest railroads in the country with potential to move solid agricultural bulk and containers.

It is also worth mentioning that the project under development is based on the tripod of sustainability (environmental, social, and economic). In addition, Nova Ferroeste can transform the State of Paraná into a logistic hub for Latin America, given the potential to influence the movement of cargo from Brazil, Paraguay, and Argentina.