



FREIGHT RAILWAY ENGINEERING

PROJECT OVERVIEW

1. FROM FEASIBILITY STUDIES TO DETAILED DESIGN, AND UP TO AS-BUILT

“
USING OUR TECHNICAL
EXPERTISE TO PROVIDE
PRACTICAL SOLUTIONS
TO COMPLEX
CHALLENGES”



**TECHNICAL,
ENVIRONMENTAL AND
ECONOMIC FEASIBILITY
STUDIES FOR THE
BRAZILIAN LOGISTICS
INVESTMENT PROGRAM**

client FCA

10.750 km



**BASIC DESIGN FOR THE
TRANSCONTINENTAL
RAILWAY FROM RIO
RONURO TO LUCAS DO RIO
VERDE**

client Valec

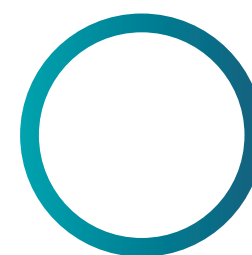
180 km



**DETAILED DESIGN FOR THE
DUPLICATION OF RAILWAY
LINE FROM CAMPINAS TO
ITIRAPINA AND YARDS
ALONG THE NETWORK**

client Rumo

320 km



**AS-BUILT FOR THE
DUPLICATION OF
CARAJÁS RAILWAY
AND S11D BRANCH
CONNECTING
TO THE LARGEST IRON
ORE MINE**

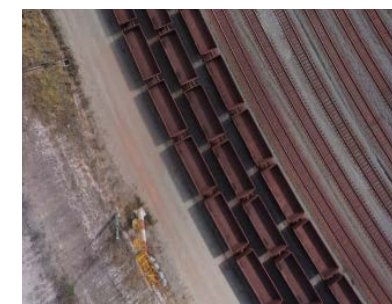
client Vale

350 km



INDUSTRIALIZING AS-BUILT DESIGN WITH THE USE OF DRONES

Vale needed to elaborate the As-Built for the duplication of the Carajás Railway to attend the requirements of the Brazilian Transport Agency (ANTT). The time available to carry out this work was extremely short and applying the traditional method was not an option – Egis had to innovate!



Thanks to the availability of **new technologies**, the way to carry out the cadastral survey and field information register are evolving rapidly, with the use of drones or unmanned aerial vehicles.

With the objective of standardizing procedures, optimizing the use of resources and maintaining a high level of quality in the final product, Egis has developed a methodology based on the combination of 3 approaches: Visual, Topographical and Aerophotogrammetric survey. This methodology, called **VisTA**, associated with high performance computational tools, represents a major advance on the traditional methodology, **increasing productivity and reducing the**

2. WORKS SUPERVISION

“
ENSURING TRANSPARENT
AND INDEPENDENT
SUPERVISION OF THE WORKS
FOR THE BEST INTEREST OF
OUR CLIENTS”



SUPERVISION OF THE RAILWAY'S LOWERING WITHIN THE CITY CENTER OF MARINGÁ

client City of Maringá

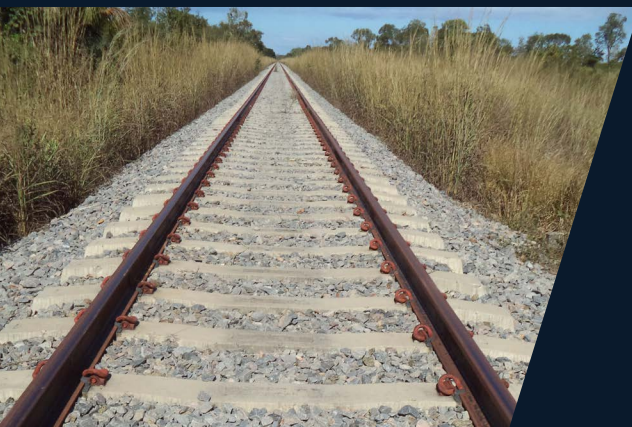
4 km with
4 overpassings



THINKING OUTSIDE OF THE BOX OF RAILWAY CITY BYPASS

This project enters a bigger program where Brazilian cities decided to remove freight railways from their cities centers. The classic solution, implemented by Egis in more than 18 cities, is to bypass or to circumvent the urban area.

In Maringá, Egis designed a different solution, in order to reduce cost, but still removing the urban conflicts. With the use of geotextile, Egis proposed a solution that helped the City of Maringá to **reduce the CAPEX** and minimize the intervention area: lowering the railway. This project received nationally the **Milton Vargas Award** and was a highlight of the 8th International Conference on Geosynthetics.



SUPERVISION OF THE BRAZILIAN NORTH- SOUTH RAILWAY LINE

client Valec

1.250 km

3. PROJECT MANAGEMENT



“
MANAGING AND COORDINATING
YOUR ENTIRE PROJECT BASED ON
INTERNATIONAL STANDARDS”

Egis operates a skillful balance to master your scope, cost, schedule and quality objectives. We are committed to manage all the technical and contractual aspects to provide you a complete service.

PROJECT MANAGEMENT FOR THE MODERNIZATION OF THE MAIN LINE SANTOS – RONDONÓPOLIS INCL. PORT OF SANTOS AND TERMINALS

client Rumo

1.400 km

6 yards

PROJECT MANAGEMENT CONSULTANCY FOR DEVELOPMENT OF UAE RAILWAY NETWORK (STAGES 2 AND 3)

client Etihad Rail

1.000 km

40 facilities



4. TECHNICAL ASSISTANCE DURING CONSTRUCTION

"PROVIDING TO YOUR CLIENTS OUR BEST EXPERTS"

TECHNICAL ASSISTANCE DURING CONSTRUCTION FOR CARAJÁS RAILWAY

client Vale

250 km

TECHNICAL ASSISTANCE FOR THE STABILIZATION OF THE SLOPE OF LOOP RAILWAY IN MINAS GERAIS

client Vale

> 70 m height



PROVIDING SPECIALIZED SOLUTIONS WHEN ENCOUNTERING SOFT SOILS

When duplicating the Carajás Railway, Vale hired Egis to ensure the Technical Assistance during the implementation of the project and challenged Egis to optimize the design.

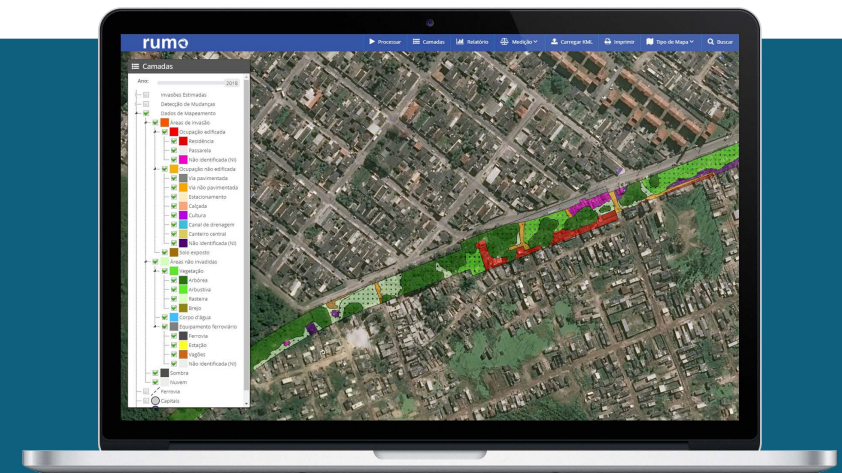
Egis was responsible for redesigning the duplication project for the Carajás Railways using highly effective geotechnical solutions to stabilize landfills based on soft soils.

The solutions employed, which made possible the construction of the railway in this region, **mitigated the risks involved, ensured operational safety and reduced the CAPEX** of the duplication.

The monitoring of the construction and of the built structures allowed concluding that the proposed alternatives were **fully assertive**.

5. STRATEGIC CONSULTANCY SERVICES

"UNDERSTANDING THE INTERESTS AND OBJECTIVES OF EACH STAKEHOLDER TO CREATE A WIN-WIN PROJECT"



FREIGHT ASSET MANAGEMENT WITH DIGITAL TOOLS

INVESTMENT PLAN FOR RENEWING A 30-YEARS RAILWAYS CONCESSION

client Rumo

1.900 km

Review of **CAPEX** and **OPEX**, and strategic programming of the **Investment Plan** taking into account contractual obligations, as well as Rumo's internal Business Plan.

ASSET MANAGEMENT OF RIGHT-OF-WAY FOR RAILWAY BRANCHES

client Rumo

100 km

Egis has developed a solution, **Strategis**, to detect and monitor the encroached areas and illegal invasions of the **Railway Right-of-Way**. The solution consists of a Geographic Information System (GIS) that compiles the encroached areas extracted automatically from satellite imagery by an algorithm. Accessed through a web interface, the Egis solution assists our Clients in their decision-making process considering the spatial attributes of their assets.

This solution has been tested with a **Proof of Concept methodology**, with **risk-sharing and investment-sharing**, between the Brazilian Freight Operator Rumo and Egis.

DIAGNOSTIC OF PHYSICAL ASSETS ALONG INOPERATIVE NETWORK

client Rumo

4.000 km

Egis deploys digital tools to ensure the diagnostic of **physical assets**. With the use of a tablet, our team collects digitally on-site field information. These data introduced in the system contain a description, a picture and is automatically georeferenced. This sustainable and transparent **client-driven solution** allows faster processing of the information, more proactive follow-up of the assets and easier data compilation and extraction.

one of the major players in freight railway



INVOLVEMENT IN MORE THAN
17.000 km
OF FREIGHT RAILWAYS

25%

DIRECT PARTICIPATION IN MORE THAN 25% OF THE EXISTING BRAZILIAN FREIGHT RAILWAYS NETWORK



ALWAYS PROVIDING ENGINEERING SERVICES WITH INNOVATIVE SOLUTIONS



AWARDED BRAZILIAN BEST RAILWAY CONSULTANCY IN 2017



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AN INGENIOUS STORY »



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a sustainable future

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