

Transportation | Brazil

# Driving intelligent highway management with AI

Nova Rota do Oeste

Highway concessionaire Nova Rota do Oeste accelerated data processing and enhanced the efficiency of its AI-powered road monitoring system, ensuring greater precision and agility in highway monitoring and management.



Lenovo

# 1

## Customer background

### Who is Nova Rota do Oeste?

Nova Rota do Oeste is a Brazilian highway concessionaire responsible for managing the BR-163/364 and Rodovia dos Imigrantes (BR-070) highways between the cities of Itiquira and Sinop in Matto Grosso state—a stretch of around 850 kilometers. Nova Rota do Oeste's mission is to promote safe and sustainable mobility, connecting people and driving development.



## 2 The challenge

Nova Rota do Oeste manages a critical section of the BR-163/364 and BR-070 highways, with a high volume of trucks transporting agricultural products from the Central-West region across the country and for export. As such, the concessionaire has worked hard to increase traffic capacity in recent years, including adding more lanes in key areas.

With the highways in constant use, Nova Rota do Oeste must deliver continuous road maintenance to ensure effective operational service, while also supporting the development of communities along the route.





**With support from the Federal University of Mato Grosso, Nova Rota do Oeste implemented an advanced AI-powered monitoring system to automate the detection of road surface cracks, sidewalk deterioration, damaged signage, and other road safety issues.**

## 2 The challenge

Today, service vehicles equipped with high-resolution 360° cameras, high-speed line-scan cameras, and a laser profilometer capture detailed 3D images as they drive along the highways. The data is processed at Nova Rota do Oeste's headquarters by a highly specialized team of engineers and developers with expertise in machine learning and computer vision. This automated system enables rapid, accurate analysis of the road infrastructure.

From the outset of the project, the need for a robust computational infrastructure to handle large data volumes and complex AI models was clear. Initially, the team used standard commercial laptops, which did not deliver the high performance needed for advanced AI processing.

## Investing in best-in-class infrastructure

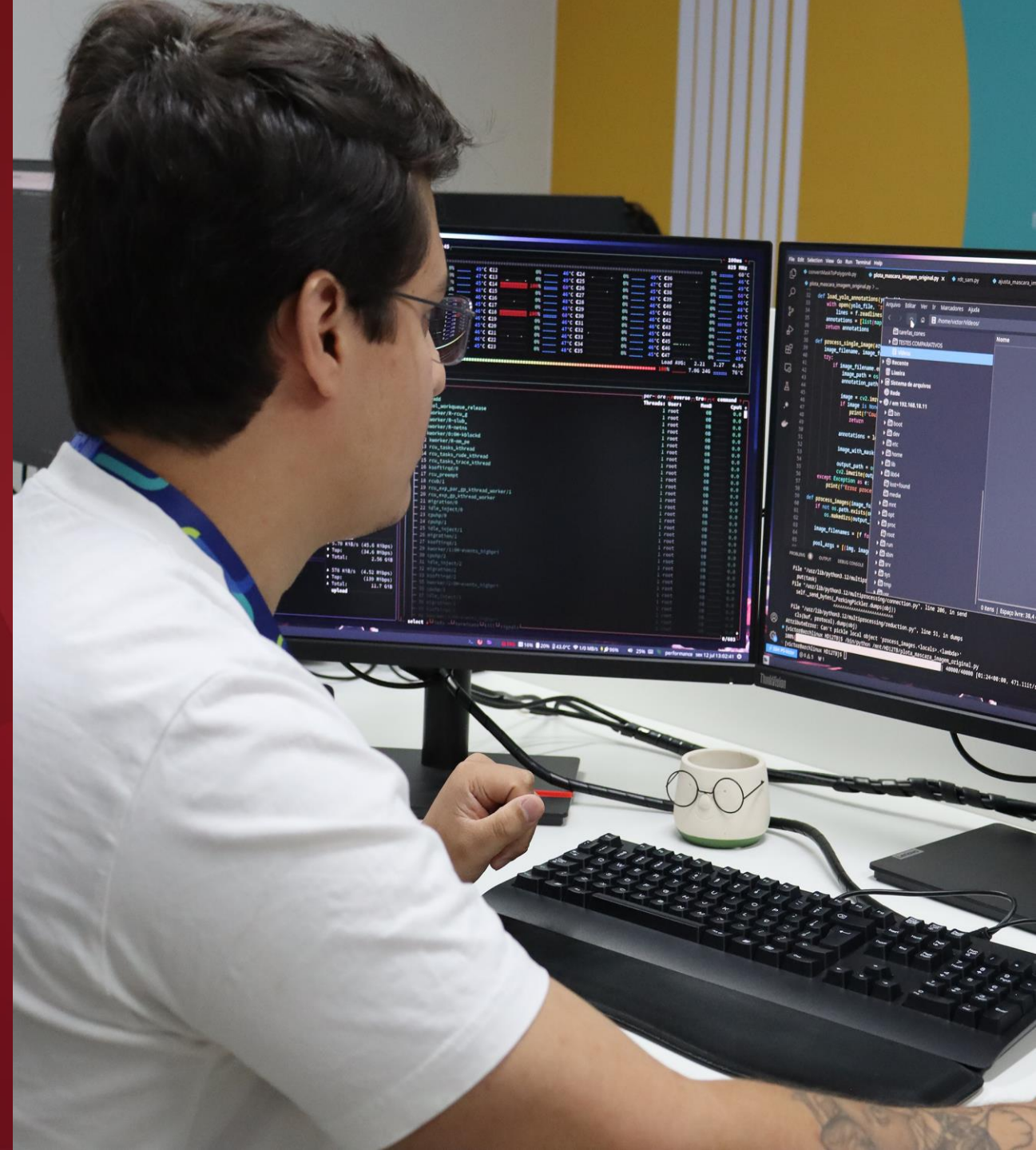
In search of more performance, Nova Rota do Oeste decided to invest in high-end Lenovo workstations. The concessionaire opted for a Lenovo ThinkStation PX workstation, equipped with powerful Intel Xeon processors and four NVIDIA RTX 6000 graphics cards, along with four Lenovo ThinkStation P5 workstations. The ThinkStation P5 units feature a mix of NVIDIA RTX A6000, A5500, A4500, A2000, T1000, and T400 GPUs.

### Hardware

Lenovo ThinkStation PX  
Lenovo ThinkStation P5  
Lenovo ThinkPad P16v Gen 2



**Nova Rota do Oeste also acquired a Lenovo ThinkPad P16v Gen 2 mobile workstation, featuring a 13th Gen Intel Core processor and an NVIDIA RTX 5000 Ada Generation GPU—offering high performance for AI and computer vision tasks on the go.**



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“The Lenovo ThinkStation PX and P5, and Lenovo ThinkPad P16v offer **the perfect combination of performance, reliability, and stability** for the Brazilian market, essential for meeting operational demands and complex projects. Our partnership with Nova Rota do Oeste is a great example of how our solutions can deliver the computational power needed for **demanding tasks such as AI**, and optimize critical infrastructure management by **enabling faster, more accurate decisions.**”

Leandro Lofrano

**Director of Corporate Products, Lenovo Brazil**



# 4

## The results

With the Lenovo workstations, Nova Rota do Oeste has significantly boosted processing power and application efficiency of its AI-powered road monitoring system.

Using a standard laptop, it took Nova Rota do Oeste around two hours to process just eight images. With a Lenovo ThinkStation PX, the same process takes just seven seconds—99.9% faster. On its highest-performance devices, the organization can now process up to 192 high-resolution images in as little as 1.5 minutes.



99.9% faster image processing



1.5 minutes to process  
192 high-res images with  
the Lenovo ThinkStation PX



Optimized AI model  
training and execution

## 4 The results

### **Smarter, safer roads**

The new Lenovo workstation infrastructure enabled the use of advanced and complex AI models without performance limitations, enabling Nova Rota do Oeste to automate the processing of large volumes of images and to implement sophisticated monitoring and maintenance prediction algorithms—paving the way for smarter highway management.



**Today, the concessionaire can detect faults earlier, carry out repairs sooner, and take more precise preventative measures, helping to ensure road longevity and greater safety for drivers.**



## 4 The results

# Supporting sustainable growth

Luciano Uchoa, CEO of Nova Rota do Oeste, comments: “With this technology, we’ll be able to anticipate road condition diagnoses and correct flaws with high precision at early stages. The result is greater safety and comfort for highway users.”

Through this initiative, Nova Rota do Oeste directly supports the continuity of economic activities in the region and across Brazil, boosting not only road safety but also sustainable growth and the strengthening of local communities.

# Why Lenovo?

For Nova Rota do Oeste, performance was by far the most important feature it was looking for in a new workstation environment. Equipped with the latest Intel processors and NVIDIA GPUs, the high-end Lenovo ThinkStation PX and P5 workstations deliver maximum performance for demanding AI and machine learning workloads.

The concessionaire has been so impressed by the processing power of its new Lenovo ThinkStation and ThinkPad devices that it is already planning to implement more Lenovo workstations to process the highway images collected by its service vehicles even more efficiently. This will ensure the continuous evolution of AI in road monitoring, making highway management increasingly intelligent and proactive.

# How can AI help to keep roads safe?

With its AI-powered road monitoring system running on high-end Lenovo workstations, Nova Rota do Oeste can detect faults earlier and carry out repairs sooner.

**Explore Lenovo Workstation Solutions**