



Project Summary

Organization

LENC - Laboratório de Engenharia e Consultoria Ltda.

Solution

Transportation

Location

São Paulo, Brazil

Project Objectives

- Organize traffic crossing, prioritize and structure passenger and payload traffic in the São Paulo metropolitan region
- Achieve reduction in traffic congestions and travel time, and reduce the cost of maintenance of roads, vehicles and reduce fuel consumption, accidents and air pollution
- Increase efficiency in design detailing, tables creation and reports production

Products Used

PowerCivil for Brazil

Fast Facts

- Marginal Tietê, one of the most important traffic routes located in the metropolitan region of the city of São Paulo, connects west, north, and east regions of the city. It also links the region of Lapa to the region of the Penha.
- The road redesign project represents efforts to significantly reduce traffic congestion in São Paulo, of which Marginal Tietê accounted for 25 percent.

ROI

- Environmental cost reductions amounted to 14 percent of the total investment.
- Traffic congestion reduced, travel time cut by more than 35 percent, which resulted in lower cost of maintenance for roads and vehicles and less fuel waste.
- Accident and air pollution rates were reduced.

LENC Increases Productivity and Design Efficiency for São Paulo Road Redesign

Uses Bentley's PowerCivil To Analyze Horizontal and Vertical Alignments

New Road Design Reduces Traffic and Travel Time

LENC - Laboratório de Engenharia e Consultoria Ltda. based in São Paulo, Brazil, was the lead consulting firm on the Marginal Tietê road redesign project, a US\$689 million project commissioned by the São Paulo State Government and the City of São Paulo. The project's purpose was to organize traffic crossings, and prioritize and structure passenger and payload traffic in the São Paulo metropolitan region. Marginal Tietê is one of the most important traffic routes located in São Paulo. It connects the west, north, and east regions of the city and links the Lapa region to the Penha region. Using PowerCivil for Brazil, LENC increased productivity in the analysis of horizontal and vertical alignments and increased design efficiency.

"PowerCivil for Brazil substantially increased the productivity in the design department of our company, minimizing the time spent with other available technologies. With its simple interface, robust and easy customization and adaptation to our customers, it has become our ultimate solution for project development."

— Aurelio Magnani, engineer,
LENC- Laboratório de Engenharia e Consultoria Ltda.

Marginal Tietê is a main access road to major highways that connect São Paulo capital to the countryside, the north coast, and the São Paulo International Airport. It accounted for 25 percent of the city's traffic congestion,

with commuters making 1.2 million trips per day. It is estimated that commuters spent 1.7 million hours per year in traffic congestion and used 1.5 million liters of fuel per year. The LENC project team was tasked with redesigning the road to reduce travel time and the cost of road maintenance. The new design was also aimed at reducing the number of vehicles on the road and reducing fuel consumption, accidents, and air pollution.

Software Lets Team Process and Analyze Data, Model, and Issue Reports and Drawings

Initially, LENC designed the project using Autodesk's AutoCAD Civil 3D, but switched to Bentley's PowerCivil for Brazil for its ability to process and analyze data, model, and issue reports and drawings. In addition to analyzing horizontal and vertical alignments, the software increased production of cambers calculation, and cross sections for geometric design development of earthworks and services.

"PowerCivil for Brazil substantially increased the productivity in the design department of our company, minimizing the time spent with other available technologies," said Aurelio Magnani, engineer, LENC. "With its simple



PowerCivil enabled the project team to develop intuitive 3D models of the designs.

“These features make PowerCivil the best tool available on the market.”

— Aurelio Magnani,
engineer, LENC- Laboratório de
Engenharia e Consultoria Ltda.

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The redesign of Marginal Tietê called for creating auxiliary lanes (three lanes per strip rolling), constructing four access loops near Tamanduateí River, Bandeiras Bridge, Cruzeiro do Sul Avenue, and Tatuapé Bridge, constructing three access loops, installing new signaling, replanting trees, placing sidewalks with vegetation to absorb rainwater, storm drainage, pavement, interferences relocation, and landscaping. PowerCivil enabled the project team develop intuitive 3D models of these designs, helping the owner-operator to easily understand the project.

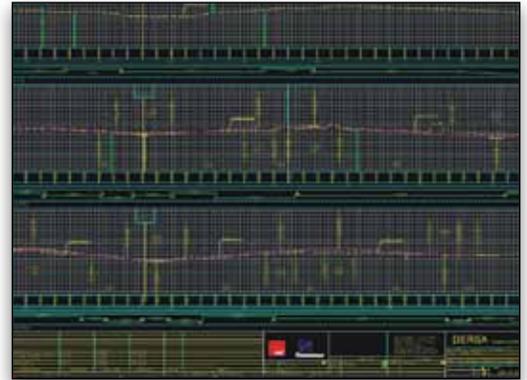
A further benefit of PowerCivil is that it enables users to match the standards and specifications of customers, and offers simplicity in calculating and verifying the calculations and agility when making modifications. “These features make PowerCivil the best tool available on the market”, said Magnani.

Improved ROI

By redesigning Marginal Tietê using PowerCivil, LENC reduced traffic congestion and cut travel time by more than 35 percent. In addition, the reduction in environmental cost was 14 percent of the total investment. The project also included the compensatory planting of approximately 980 trees. The total will exceed 170,000 trees defined in the environmental compensation.



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PowerCivil simplified calculations and modifications.



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