



SUCCESS STORY

Analysis and redesign of a congested motorway

WITH PTV VISSIM

General Directorate of Roads

The General Directorate for Roads of the Ministry of Transport and Sustainable Mobility in Spain is the responsible for the planning, design, construction, maintenance and operation management of national roads. Their objective is to ensure that citizens have access to a high-quality road transport network, paying special attention to maintenance and improving safety. This is crucial given that approximately 90% of internal traffic of people and goods moves by this means.

What was the challenge?

The city of Alicante is located on the southeast coast of Spain, a tourist destination known worldwide as the Costa Blanca. It is indeed a vibrant hub for industrial, tourism and service-oriented economic activities, which definitely influences traffic intensities.

The A-70 dual roadway is part of the state road network which serves as the primary thoroughfare within the Alicante-Elche metropolitan area, comprising several municipalities with a total population of approximately 650 thousand inhabitants.

A 4 km motorway section, located between the A-70 junction and A-77 and A-31 motorways, experiences significant congestion, especially in peak hours, where levels of service notably decrease to E and F values. The traffic intensity of around 95 thousand vehicles per day in two lanes per carriageway.

Furthermore, the interchange located between the A-70 and A-31 motorways also connects with the western exit of the city of Alicante, and during peak hours, it experiences significant congestion and reduced levels of service, between D and F, in its primary segments. Additionally, the design of the new basic layout elements necessary for remodelling these sections is hindered by the presence of some industries in the area around this junction.

“PTV Vissim is an extremely versatile tool for road traffic engineering. It’s an excellent software for designing or remodelling junctions, roundabouts or intersections of all types and sizes, as well as analysing the impact of new traffic-generating activities or changes in urban planning on the level of service of existing roads.”

Eng. Rafael Caro Sogorb, State Roads Unit in Alicante. Ministry of Transport and Sustainable Mobility

Which PTV product and why?

PTV VISSIM software was chosen due to its flexibility and usefulness to study different situations and find an optimal solution.

In this case PTV VISSIM was used to redesign a 4 km road section and a traffic node according to the analysis of traffic of the current road network and to traffic forecasts of 20 years.

Four scenarios were analysed at the A-70 for the southbound carriageway and three scenarios for the northbound carriageway, selecting the most favourable scenario for each carriageway. Furthermore, new elements at the A-70/A-31 node were analysed, such as collector-distributor roads, connecting branches, acceleration and deceleration lanes, service roads and roundabouts. Furthermore, different alternatives were analysed for the A-70 trunk road between this node and the A-70/A-77 node.

What were the results?

A significant improvement was achieved in the levels of service for the established horizon year when remodelling the A-70/A-31 node. In the new roundabouts designed in the nearby urban road, levels of service between A and D were obtained.



The A-70 has been designed with a new collector-distributor road in each traffic direction. These roads are conveniently connected to the trunk of the dual carriageway on the south side and to the A-77 node on the north side. This achieves a level of service between B and D in all the basic segments.

The study therefore concludes that the new design achieves adequate levels of service, which will contribute to a significant improvement in traffic flows and road safety on this section of the state road network.

