

# **Case Study**

## University of Madrid relies on TomTom Speed Profiles to analyse travel times for access to rail stations

Customer	Location	Product/Service
Complutense University of Madrid, Department of Geography	Madrid, Spain	Traffic Stats

#### Overview

When traveling by high-speed train, the travel time from door-to-door does not only depend on the station-to-station journey, but also includes access and egress travel times, which can make the overall journey much longer due to traffic. In other words, how long does it take for an individual to drive or take other forms of transport (be that bus, taxi or ride share) to reach or leave the rail station? The answer to that question is highly dependent on public transport availability, time, traffic, and overall infrastructure.

With this question in mind, researchers from the Complutense University of Madrid recently focused on the importance and the impact that access and egress times have on the overall travel time of high-speed rail journeys in and between the two biggest metropolitan areas in Spain: Madrid and Barcelona.

### The Challenge

The group of researchers headed by Javier Gutiérrez, Director of the Department of Geography, was confronted by the problem that access and egress times to central high-speed railway stations can vary significantly throughout the day, considering morning and afternoon peak hours and different forms of transportation, including taxi or other forms of public transport. Often the door-to-door journey is not evaluated separately but unjustly neglected, as the in-vehicle travel time and experience is given more importance. Nonetheless, the door-to-door travel time is what can tip the scale in favor of choosing one or another form of transportation, as the duration of a trip determines if it is a valid alternative to driving or flying. Against common procedure, door-to-door travel times should be a key factor of any research made in this sector. Although this conclusion seems obvious, the Madrid based researchers could not rely on any examples in the literature, but made their way forward as pioneers creating groundbreaking analysis based on TomTom Speed Profiles.

TomTom Speed Profiles are derived by aggregating and processing trillions of anonymous GPS measurements from millions of devices that reflect real life driving patterns, providing optimal routing and delivering the most accurate travel time estimation. Speed Profiles offer the average speed per road element, per direction of traffic for every 5 minutes of each day of the week. This level of granularity provides optimal routing and delivers the most accurate travel time estimation.

#### The Solution

In order to study door-to-door travel times and its impact on choosing one form of transportation over another, the group of researchers relied on data such as General Transit Feed Specifications for public transport and TomTom Speed Profiles for private vehicles including taxis.



TomTom Speed Profiles is currently the most accurate estimation to calculate arrival times. It offers precise estimated arrival times as known delays are incorporated in the overall travel time. While this product is traditionally derived from map features such as road class, legal speed and segment length, the actual travel time strongly depends on the density of cars on the road, curvature and slopes, priority rules, traffic lights and pedestrian crossings. Also, the travel time will never be static but vary consistently throughout a 24-hour time span. TomTom Speed Profiles allowed the researchers to obtain actual observed data on the daily variations in speed profiles for all types of cars, making it possible to assess the impact of congestion on accessibility of high-speed rail stations.

#### View of TomTom Speed Profiles



de délate connis y Documentación por ever transmittación transmitt

Barcelona



#### Madrid



Atocha

Sants

©2022 TomTom. All rights reserved. TomTom and its logo are trademarks of TomTom N.V. or one of its subsidiaries. All other trademarks are the property of their respective owners. TomTom N.V. assumes no responsibility for errors that may appear in this document. Information contained herein is subject to changes without notice.

## TOMTOM.COM