

Supply chain optimization at TNT express

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The application of optimization techniques at TNT Express during the past seven years improved the decision making process, and resulted in savings of millions of Euros. TNT Express delivers today about 4.7 million packages in over 200 countries, using a network of 2,600 facilities, a fleet of 30,000 road vehicles and 50 aircraft, and a workforce of 77,000 people. Designing a supply chain that achieves a high level of customer service, and at the same time, maintaining low operating costs is challenging. Two major challenges are of concern here: first, transportation volumes are usually low, and shipping them directly over long distances is not justified; hence, consolidating packages is necessary to reduce the costs. Second, cutoff times at the pickup and/or delivery depots must be considered when moving packages across the supply chain. To overcome these issues, ORTEC with collaboration with researchers from Tilburg University, worked closely with TNT's Global Optimization division to develop a software solution in the form of three sub-programs: DELTA for supply chain optimization, TRANS for network scheduling, and SHORTREC for pickup and delivery tactical planning. This talk begins with an overview of each of these sub-programs, their implementation challenges, and benefits. It then moves on to describe a specific module designed to determine the optimal paths for each package, given the current setup of depots and hubs, and cutoff time constraints. As a result of these efforts, TNT Express were able to save around 207 million Euros during the period of 2008–2011, 132 of which came from supply chain optimization, 48 from networks scheduling, and 27 from tactical route planning. In addition, the CO₂ emissions was reduced by 283 million kilograms from over 1,000 trucks traveling around the world.