Calibrated Route Finder – social, environmental and cost-effective truck routing

Mikael Rönnqvist, Université Laval

Abstract

Finding the best route with many conflicting objectives is very difficult. The online system Calibrated Route Finder, managed by the logistics organisation Biometria in Sweden, has been developed in collaboration among many companies and organizations successfully addresses the problem. A key component is an inverse optimization process that establishes more than 100 weights to balance social values, environmental impacts, traffic safety, stress, fuel consumption, CO_2 emissions, and costs. In addition, methodological and analytic developments enable measurement and inclusion of perceived hilliness and curviness.

In practical transports, it is also important to find the contractual agreement for the payment between the transportation service company and the client who agrees to use the services. The most common agreement is based on distance, which is good on average but when comparing two specific routes with the same start and end points, it typically is unfair. For example, one route may take a motorway for 120 km and another uses low quality private roads for 60 km. The time and fuel consumption may be similar but the payment very different (factor of two). We describe a new approach and results that balance both the quantitative difficulty and distance to define a new agreement.