

The Science of Transport

GIRO (*Le Groupe en Informatique et Recherche Opérationnelle*) is helping solve the world's public transit issues

By Claude Turcotte, *Le Devoir*

Have you ever waited patiently for a bus, only to have it zoom by – completely empty – without so much as yielding? It can be frustrating, especially when it's minus 20 degrees outside on a cold February morning! It's times like this when seeing that "Sorry, not in service" message feels like a cruel joke. But there's a reason the bus is empty: in most cases, it just completed a route and is on its way to pick up other passengers on another route elsewhere in the city. It's all planned in advance... perhaps with the help of software designed and manufactured by GIRO, a Montreal-based company with an international reputation.

GIRO, an acronym for *Le Groupe en Informatique et Recherche Opérationnelle*, actually began as a research project in major university research centers in Montreal – in particular, the Center for Research on Transportation at *l'Université de Montreal*. GIRO was officially founded during the course of the project with the purpose of using mathematical calculations to optimize transportation; meaning, to offer better services and working conditions for drivers while reducing costs. Today, GIRO software helps reduce operating costs by 2% to 3% per year, and return on investment is fast: sometimes within a year, according to Paul Hamelin, president of GIRO.



Paul Hamelin, GIRO president

Photo: Jacques Grenier, *Le Devoir*

GIRO was founded in 1979 by Jean-Yves Blais, a computer science student at the time, and Jean-Marc Rousseau, then head of the Center for Research on Transportation (CRT). The pair formed the company with the idea of analyzing the impacts of changes to the collective agreement of Montreal bus drivers. In short, they worked together to design a tool for analyzing union demands. They later incorporated driver work schedules, vehicle schedules, and postal worker routes into the system. The first clients to implement their analysis tool were the Montreal and Québec City public transit agencies.

Work schedules may not seem complicated: the average 9 to 5 straight schedule does not present major challenges, it's true. The real complications are due to atypical vehicle and driver schedules involving morning and evening peak periods, which can vary from city to city. The challenge is minimizing the amount of not-in-service travel (no passengers onboard) and reducing the number of vehicles required. The solution, however, is anything but simple. For any given day, you have to factor in trips to the garage, employees arriving late to work, driver absences, metro service disruptions, and much more. Creating schedules that can consider all these variables is GIRO's area of expertise. The company's *HASTUS* software defines simple mathematical formulas and creates algorithms that deliver a simple solution to complex problems.

Since its inception over 30 years ago, GIRO has set its sights on the international market: the local industry is simply not large enough to sustain profitability. In 2000, GIRO's co-founders announced their retirement and implemented a plan to progressively transfer leadership. In 2005, Paul Hamelin was selected as GIRO's new president. Hamelin, the obvious choice for the deciding management, had been with the company since 1983 and possessed a background in operations research. Hamelin had been in charge of software development at GIRO prior to becoming president. As the new head of the company, his primary mission would be to continue software development and ensure proper support services for customers.

Paul Hamelin has always remained true to the original corporate culture, which was never concerned with runaway growth. Nonetheless, GIRO has experienced annual growth of 5% to 10% over the last 25 years, and sales are expected to exceed \$30 million this year. About 80% of the company's sales come from 26 countries spread across Europe and the United States; approximately 10% of sales come from Australia and Asia. Most of GIRO's growth is due to version upgrades and software add-ons by the company's roughly 200 current customers.

Flagship project: New York

The future looks promising for GIRO, thanks to the constant innovation of transit technology. While Montreal may not be on the cutting edge just yet, various European cities are already using technology that can pinpoint the exact location of each vehicle in real time, as well as the number of passengers onboard at any given time. This information is collected using automatic passenger counting (APC) technology such as ticketing systems or treadle mats installed at the entrance and exit of vehicles; some vehicles are also equipped with cameras. GIRO's *HASTUS* software can import passenger and vehicle information obtained by these technologies, enabling transit agencies to react quickly to any disturbance that may occur on the network and make operations more predictable.

GIRO is expanding its business in the rail, metro, and tram segments: markets in which the company has been involved for the last five years. In fact, GIRO is on-track to complete a major project for the New York subway system. Each software solution is configured specifically for a client's particular network. In the case of New York, the client wanted the same software to be used for both its bus and subway networks – which, collectively, comprise 4,000 buses and 7,000 subway cars. This is a major installation for GIRO and, according to Mr. Hamelin, the company's flagship project. Plans are also underway for a major project in Australia.

The postal industry is another key market for GIRO, and one that offers good growth potential as a result of the growing competition that has arisen from deregulation of the industry, particularly in Europe. The increased pressure to save money is good for GIRO's business, because its software is designed to help clients manage vehicle resources and delivery routes as efficiently as possible.

As computers become faster and more powerful, GIRO can easily push the optimization capabilities of its software even further. For instance, computers with multiple processors enable various tasks to be performed in parallel, such as optimizing driver schedules while taking into account parameters with slight variations. This provides considerable flexibility for analyzing the impacts of costs, in particular salaries and bonuses. Given that, you may wonder what workers' unions think about the work GIRO does? Mr. Hamelin acknowledges there have been concerns coming from the UK the postal sector recently: certain unions see GIRO's *GeoRoute* software as a threat to job security and compensation – this made headlines at the BBC last year.

Going forward, GIRO will continue to focus on its current strengths and market segments, although it's still keeping an eye on the South American market. But growth at any cost is not part of GIRO's playbook: it strives for quality over quantity.

That quality extends to staff as well. Thirty percent of GIRO's workforce is engaged in research and development, with approximately 10 employees working full-time on algorithms. This SME is privately owned by a dozen shareholders that comprise a mix of current and retired key GIRO executives.

Of the company's 225 employees, roughly 80% are university graduates of *l'Université de Montréal*, *l'Université de Sherbrooke*, and *École Polytechnique*. Mr. Hamelin points out that GIRO is very selective about its workforce, hiring only high-caliber graduates with excellent academic records. Of the entire staff, about 100 people work in the service department, which is responsible for software installation, customer training, and product familiarization. The excellent reputation GIRO enjoys today is due in large part to word of mouth. "It's true we have a very good reputation around the world, and this is thanks in large part to our clients," said the president of this Montreal-based company whose main competitor is based just next door, in Toronto.