CASE STUDY

I-SEC: Designing Optimal Shifts for Airport Security Staff

With a solution built by Syntro, a Gurobi partner, I-SEC designs optimal shifts that maximize efficiency and guarantee compliance, while keeping employee needs in mind.

Thorough workforce planning is essential to maintaining tight and effective airport security. But this scheduling challenge is also one of the most complex, with uneven passenger flows and intense peaks throughout the day.

And beyond operational efficiency and public safety, airport security planning has a direct and personal impact on hundreds of employees. An effective shift design must not only meet fluctuating demand and regulatory constraints, but also create shifts that are fair, predictable, and workable for employees in practice.

To address this multifaceted challenge, I-SEC, an airport security company, worked with Syntro, a Gurobi partner and provider of workforce scheduling solutions, to transform their shift planning process using mathematical optimization.

Addressing the Challenges of Manual Planning and Misaligned Staffing

Passenger flows through airport terminals are highly uneven, with pronounced demand peaks occurring early in the morning, before standard business hours, and again in the evening, after the workday ends. These peaks are short, intense, and cannot be covered by the same security agent—making precise shift times critical.

At the same time, airports are high-risk, highly regulated environments. Security staffing must comply with strict labor rules that vary by country. For example, in the Netherlands, security agents are required to take a break at least every two hours. Adding further complexity is the fact that large airports operate multiple security locations—each with their own demand patterns, staffing requirements, and peak periods.

Before I-SEC implemented Syntro's Gurobi-powered solution, staff planning relied heavily on manual processes. Planners were responsible for assigning every security agent to a specific location, ensuring sufficient coverage at all times, and coordinating breaks in compliance with regulatory requirements.

Because operational disruptions—such as delays, absences, or unexpected fluctuations in passenger volumes—were difficult to predict, planners compensated by building in substantial buffer capacity. As a result, staffing levels were frequently misaligned with actual demand. At times, far too many agents were present, leading to idle hours and unnecessary labor costs. At other times, staffing fell short, increasing pressure on employees, as well as operational risk.

The planning process also lacked a structured way to account for the employee experience. Breaks were typically taken individually, rather than in groups, which limited opportunities for team bonding. Shift lengths and start times were driven primarily by operational convenience, rather than by a balance between business needs and employee preferences.

> 'With many regulations and constraints, scheduling the right people in the right place was a complex puzzle, making it difficult to see all possible options"
>
> Rawin Jharap, CEO, I-SEC Benelux.

Solving the Planning Puzzle with Mathematical Optimization

To solve these challenges, Syntro developed a shift generation solution for I-SEC using Gurobi's optimization technology. Instead of assigning agents directly to shifts, the new approach focuses on solving the operational planning puzzle upfront.

Partner Spotlight

syntro

Syntro was founded in the Netherlands in 2009, with a focus on sustainable and efficient scheduling. In addition to their consultancy activities, Syntro develops tools to analyze data and, using mathematical techniques, convert workload profiles into efficient planning. They strive to create manageable scheduling programs that give employees more control over their schedules.

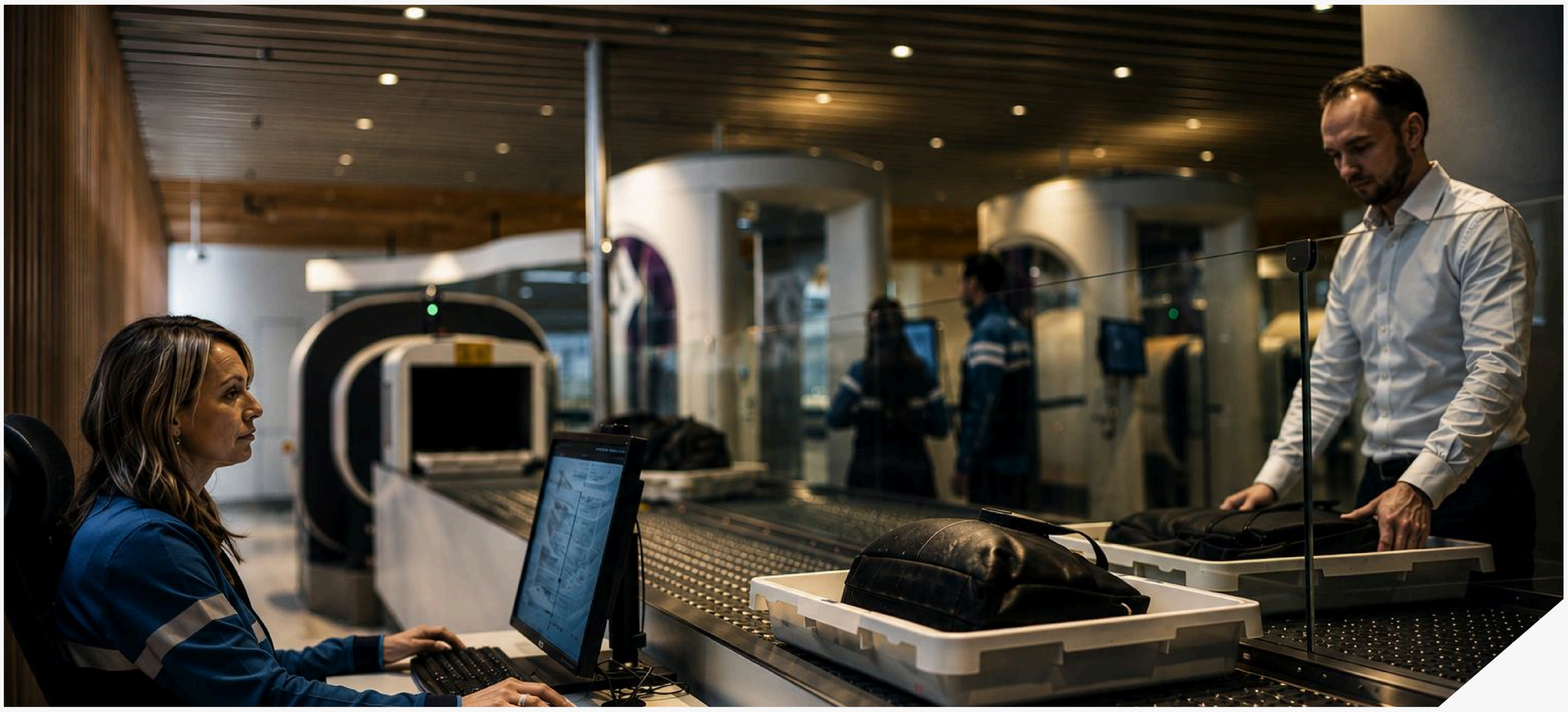
Learn more at syntro.nl.

Industry	Consulting
Location	Europe
Use Cases	Workforce Scheduling
Websites	i-sec.com & syntro.nl

I-SEC was established in 2005 and specializes in providing advanced security services worldwide for high-risk environments and circumstances that ask for extra attention with hospitality.

Results

- 4-5% reduction in overall labor costs, due to reduced idle hours over five years
- Increased employee satisfaction with a broader range of shifts and the ability to take breaks with colleagues



Using an integer programming model, the shift generator creates an ideal set of shifts before staff are assigned. These shifts are mathematically optimized to account forts:

- Demand patterns
- Regulatory constraints
- Staff breaks
- Walking times between locations
- Transitions across different security checkpoints

In an ideal scenario with no disruptions or absent employees, the model produces the best possible shift structure from an efficiency standpoint.

While real-world disruptions cannot be eliminated, the optimized shift design significantly reduces the amount of buffer capacity required.

Now, rather than compensating for uncertainty with large staffing surpluses, planners can rely on a much smaller, more targeted buffer.

The optimization model also enables more employee-centric planning. Shifts are designed to start just before demand peaks and end as peaks subside, ensuring staffing is aligned precisely with passenger flows. Breaks are also optimized around peak periods, minimizing the impact on coverage.

In addition, the solution supports team-based planning. Agents can now take breaks together, rather than one at a time, fostering a stronger sense of teamwork and improving overall employee satisfaction. The model also enables a wider variety of shift lengths and start times, creating flexibility that benefits both the organization and its workforce.

Measurable Efficiency Gains

With Syntro's solution, I-SEC can achieve staffing levels that are much better matched to actual needs, resulting in reduced idle hours. Aligning shifts more precisely with demand has improved productivity and lowered operational inefficiencies.

Furthermore, optimized shift lengths and start times create schedules that work better for both employees and their employer. The ability to offer a broader range of shifts supports different contract types and contributes to higher employee satisfaction.

> 'Syntro's tool, powered by Gurobi, made our planning more efficient and reduced the workload for our planners. This allows them to spend more time on the human side of the job, which is very important at I-SEC.'
>
> Rawin Jharap, CEO, I-SEC Benelux.

Of course, after creating ideal shifts, the next step is to create an ideal schedule. Syntro is currently working to launch a schedule generator that optimizes schedules for specific employees.

Syntro's shift generator for I-SEC demonstrates how mathematical optimization can transform a high-stakes and complex task like airport security staffing into a precise, employee-aware planning system that delivers concrete operational benefits enabling to have a more consideration for individual preferences.