

# Intelligent shift patterns

**More and more forces are recognising that the adoption of an evidence based decision making approach can radically improve business processes and, as a result, lead to significant financial benefits. We need not look any further than North Wales Police for proof. The force has transformed its resource management model, achieving immediate performance improvements whilst anticipating savings of over £1.2 million in the first year of operation.**

Like all forces, North Wales is constantly striving to improve the service it provides. In 2005, the force decided to embark on a complete review of its approach to demand management. One key aspect of this project was analysis of shift patterns being used within the organisation. Several things had prompted the review. Firstly, a best value review of response undertaken in 2004 had indicated that more demand-led shift patterns could increase resource capabilities at key times without employing additional officers. Then, in 2004, Home Office research showed the potential benefits of using variable shift patterns to match availability of officers more closely to demand.

Added to this, the force's staff association was feeding back a general concern that workloads varied greatly across shifts, perhaps indicating that staff deployment wasn't quite matching demand.

Using the services of Process Evolution consultants, North Wales set about embedding a model that would create financial savings and put officers where they are needed most.

"With this model, we learned that some busy periods identified by staff were in fact not due to high demand, but rather were the result of other factors that have an indirect effect on workload," said project manager Inspector Paul Cuddihy.

"Senior management also discovered that peaks and troughs in demand were not always occurring when they thought and, as a result, there had been occasions when staff numbers had been bolstered at the wrong times."

## At least 50 different shift patterns

Before the model, Insp Cuddihy said there were between 50 and 130 different shift patterns in operation within the organisation. With the introduction of the European Working Time Directive, each team had been required to create a pattern that suited their needs whilst meeting legal requirements.

"The legacy, however, was bespoke patterns that may have been effective at conception, but which, with subsequent staff and demand changes, no longer necessarily reflected the needs of the region," said Insp Cuddihy.

He added: "I understood the need to be clear about the project's scope from the start. At the beginning we spent a great deal of time identifying what we wanted to achieve. We wanted to identify best practice within the force and make better use of our duty management system, but, most importantly, establish whether our current shift patterns were producing the best

results for us and if they were not, develop a more appropriate uniform model.

"We also recognised that if we needed to embark on a highly sensitive shift changing project, we had to be confident that we were making the right decisions from the start."

Insp Cuddihy recognised that the accuracy and 'what-if' capabilities of simulation techniques would give him the confidence he sought, and in the autumn of 2005 he began a tendering process with leading suppliers in this area.

Process Evolution was chosen because of the organisation's significant experience and success in delivering evidence-based solutions. Insp Cuddihy and his team then set out to not only simulate resource needs, but also turn this valuable information into workable shift patterns.

## The challenges

Simulation is a technique by which a computer model mimics the behaviour of a real life process. This model is built using actual data, which is then validated to ensure it represents reality. The initial hurdle Insp Cuddihy faced was how to ensure the accuracy of any data gathered.

"Data needed to reflect what was actually happening within our force. As the project progressed, however, we became more skilled in identifying when the data was poor, thus enabling us to iron out inaccuracies before going down the route of model creation."

Further challenges were presented by the diverse nature of the force. North Wales Police serves a large geographical area that encompasses rural, semi-rural and large town communities, and it was anticipated that demand profiles would vary greatly in each one.

"Demand is also seasonal with some parts of the region experiencing a one hundred per cent increase in calls in peak holiday periods," said Insp Cuddihy. "We needed a model that would take into account those shifts in demand."

In addition, there was a great deal of resistance to changing working patterns. "We have a very good performance record and many questioned the validity of embarking on a project which could radically change the way the force operated in order to make what were then perceived as marginal performance improvements."

However, despite officers' inveterate reluctance to change, the solution has been well received. "The staff's association feedback from officers on the ground has been very positive," said Insp Cuddihy.

## Choosing a pilot area

It was decided that the model should be piloted in the force's best performing Basic Command Unit (BCU). This BCU covers a large geographical area with high levels of seasonality and diversity. With demand fluctuating throughout the year, the force wanted to understand whether they were overstaffed in winter or understaffed during holiday periods.

Insp Cuddihy said it was also felt that improvements would be more difficult to realise in this already well-performing division. "If the approach realised benefits in the pilot area, then benefits would be even greater in lesser performing areas," he said.

"The results of the simulation were surprising. Firstly, the analysis revealed that although resource levels were appropriate for the winter months, they were insufficient for the busy summer period, therefore necessitating a number of resource management changes, including a change in shift patterns. It also became apparent that professional judgement doesn't always hold true."

## The power of 'what-if?'

Insp Cuddihy said two strategically important discoveries really emphasised the strength of the approach.

"Firstly, the analysis showed that although volumes varied greatly, the demand profile was the same for each of the BCUs' six inspector areas. This discovery would greatly simplify the task of standardising shift patterns across the organisation.

"The second discovery related to the feasibility of targets set by the force. North Wales Police allocates incidents to three categories of response; immediate, delayed and advised.

"The force had set itself a target of responding to 91 per cent of immediate incidents within nineteen minutes, but simulation showed that, due to the geography of the region, on some occasions they still could not reach that performance target, even with unlimited resources."

Insp Cuddihy is unequivocal about the strengths of their approach: "These two examples underline the power of the 'what-if?' capabilities employed by the software. With simulation, we have been able to ask highly strategic questions such as 'what will be the effect of closing a station or removing response duties from neighbourhood officers', and fully understand the implications before making the decision to proceed.

"Even when evaluating staff requirements there are hugely complex measures involved which you would never be able to calculate with a pen and paper alone."

## Changing the face of resource management

As a result of the project, North Wales has radically changed its approach to resource management. Having identified when it is most likely to experience peak demand, it now works to a 'top ten days' system to ensure resource cover.

Insp Cuddihy said the recommendations from the simulation project have now also been fed into the work planning software to identify the optimum demand-led shift pattern for the whole force.

"After almost one year from project start, the resulting shift pattern has now been implemented in each area with local level customisation to reflect individual needs," he said.

According to Peter Loader, of Process Evolution, this project clearly demonstrates the strength of the EBDM approach. He said:

"North Wales Police quickly understood the benefit of linking different quantitative techniques to find the best solution for their operation. By applying value stream analysis to analyse the operational data prior to simulation, we were quickly able to give confidence to those who were initially sceptical about the project. By applying XIMES software to the output from the simulation, we were able to take the optimal resource profile and provide practical shift rosters, rather than passing this critical task back to the client."

## Reaping the benefits

Benefits from the model have been significant, outweighing the initial investment many times over. During the first four months of operation of the new shift pattern, in one BCU alone, short notice overtime costs reduced by £20,000.

"That benefit was replicated in another three areas with the remaining twelve BCUs achieving some level of improvement," said Insp Cuddihy. "By changing shift patterns to reflect demand, two sergeant posts have also been redeployed to frontline policing, generating an annual saving."

But the benefits aren't restricted to cost reductions. One major benefit has been cost avoidance of £700,000 on the build and upkeep of new custody suites.

Insp Cuddihy said simulation clearly showed that the planned construction of a custody suite was twice as large as demand would ever necessitate.

"Without this project, valuable resources would have been needlessly allocated in this area. The force has also achieved the performance improvements it sought, with a 3.8 per cent improvement in immediate response and a 2.2 per cent improvement on delayed response, whilst at the same time increasing attendance at delayed incidents."

Demand-led staffing has also enabled North Wales to take on a more proactive approach to anti-social behaviour.

"With appropriate staffing levels on Friday and Saturday nights, we are able to manage all incident types as they occur, providing a visible presence in known hot spots," said Insp Cuddihy.

The model has been embedded throughout response and neighbourhood policing and Insp Cuddihy is now in the process of rolling it out in the communications division and operational support division.

Assistant Chief Constable Ian Shannon is very pleased with the project's results so far. "Whilst the benefits have not yet been fully assessed, it is absolutely clear that the new shift patterns are making a real difference," he said.

"Going on patrol on Friday or Saturday evenings is now a different experience. Rather than reacting to situations as they arise we have more opportunity to prevent crime and disorder."

He added that despite initial resistance to the project, officers have also adapted well to the changes.

"We expected increases in sick leave as officers moved to new working patterns but instead, with workloads now equalised across the board, staff members are beginning to enjoy greater job satisfaction and positive comments are now feeding back."

For Paul Cuddihy, this makes the whole project worthwhile. "One officer told me recently that 'it's fun to be in work again'. Combined with all the financial and performance improvements this project has brought, you just can't get better than that."