Open mathematics
Making Timetables from Graphs

Judy Ekins
In situations like this, graphs are very useful. But for other purposes a table might be preferable.

John Hill
The peak-season, summer timetable is Table C, with a train departing at every 45 minutes. This is a working timetable, Table C working timetable, showing light engine movements, passenger-train movements and empty-stock movements. It is impossible to squeeze in another train that runs the whole length of the line from Kidderminster to Bridgnorth, but it is possible to run trains that will be doing shorter distances, for instance, Kidderminster to Bewdley. And to see how this is done, we need to go back to Keith's graphs.

Keith Shaw
This is our C Timetable; it's the maximum possible service at the present time, drawn on a similar basis, using all the crossing points – Bewdley, Arley and Hampton Loade. If we wished to increase the service any further, we would need additional crossing points in between each of the existing ones, for example, at somewhere near Northwood Holt. This would enable us to double the frequency again, but we would need three more crossing points in order to do that.

Judy Ekins
So what happens if you want to add in a special train to this service?

Keith Shaw
Well, by definition, because we've got the maximum service over the whole line, we can't add in a further train for the whole line. We could add a train between Bewdley and Kidderminster quite easily, and just about run a train between Bewdley and Arley and vice versa. And there are a number of these slots during the day which we could use.

Judy Ekins
The long journey time between Bridgnorth and Hampton Loade prevents Keith from devising a more frequent service for the whole line. However, the single journeys from Arley to Bewdley and Bewdley to Kidderminster are shorter, and so it is possible to increase the frequency of the service over this top half of the line.

At Christmas this greater flexibility is tested to the full, because the Severn Valley Railway has many thousands of customers queuing up at Kidderminster to make the journey to Arley, where Santa's grotto is to be found. It's an essential part of the railway's effort to balance the books. It's also very important to the children, and they have limited patience, so the more trains, the better.

Santa - John Hill
I see, and have you been good enough to get these presents?

Judy Ekins
The children's wishes come first, of course. But finally, what would a railwayman dream of for Christmas?

Santa - John Hill
Ho, ho, ho, who's next for Santa?

Keith Shaw
Oh, hello, Santa.

Santa - John Hill
Oh, hello, Keith. What do you want for Christmas?

Keith Shaw
Well, I wouldn't mind a new signal box. Perhaps a coat of paint for the station. But what I'd really like is a passing loop at Northwood; do you think you could fix that?

Santa - John Hill
Well, we could have a try for Christmas.