

Step 6

Forecast Traffic Flow

Traffic in the rural network must be estimated so that all traffic-sensitive elements can be provisioned. This step discusses ways of estimating the intensity of traffic, its distribution in the network, and growth.

Traffic intensity is normally measured in Erlangs (E) during the busy hour. One Erlang during the busy hour is equivalent to one circuit being fully occupied for one hour. What is often meant by a busy hour is the average busy hour during the busy season.

6.1 Traffic Estimates

Ideally, traffic estimates should be based on traffic statistics for similar situations. If no data are available, a trial, particularly if the rural network project is a large one, should be considered.

If relevant statistics cannot be obtained, educated estimates must suffice. One method involves developing traffic models to represent each subscriber type. The model will estimate the number of calls (N) during the busy hour and their average duration (D) in minutes. Thus, busy hour (BH) traffic in Erlangs is given by

$$\text{BH traffic} = (N \cdot D) / 60 \text{ Erlangs}$$

Alternatively, the model can estimate the traffic for a normal busy day (a week day for business customers) and some percentage of this total traffic applied to the busy hour. Typically 8 to 12 per cent of the total daily traffic will occur in the busy hour, with 10 per cent representing a reasonable rule of thumb.

When only a limited number of telephones are available, usage might be relatively high. In a busy public call office (PCO), where customers are waiting, usage per telephone line could approach the theoretical maximum of one Erlang (60 minutes occupancy during the busy hour).

If traffic estimates are made using models, it might be useful to compare the estimates to some typical figures suggested by other sources, such as other administrations, consultants, and system suppliers. Figure 6.1 gives typical ranges for different subscriber types. These traffic figures are provided for comparison only. Whether they are representative depends on the conditions encountered in a specific situation.

6.2 Distribution

To dimension trunk groups and to examine the impact of the rural traffic on the long-distance network, you need to estimate the distribution between local and long-distance traffic (see Figure 6.2).

If the rural network is small compared to the existing national long-distance network, the rural traffic will probably have little impact on the existing network.

The amount of internal traffic depends on community interest factors, such as prevailing social and kinship customs and relations, and the presence of large industrial, commercial, educational, or military institutions.

Rural networks usually have a high percentage of long-distance traffic (higher than a corresponding urban network). This traffic is generally to the main commercial centre of the area or to the capital. Again, in the absence of statistics, a model can be used to determine the proportion of long-distance traffic. About 50 per cent could be reasonable for a typical rural network.