

Step 10

Assess Available Equipment and Systems

The first major step in the feasibility study is to survey the technical solutions available to the system designer. For convenience, they can be functionally grouped into the following categories (see Figure 10.1):

- subscriber apparatus,
- subscriber access systems,
- exchange and collection point systems,
- transfer and trunk transmission systems, and
- remote power systems (when applicable).

This section briefly surveys the different equipment types and suggests some factors to consider during assessment.

10.1 Equipment Types

Within each category are many types of equipment suitable for rural applications. Some common ones are listed here:

Subscriber Apparatus

- standard wall and desk telephone sets,
- coin-box telephone sets,
- telephone sets with metering devices, and
- party-line telephone sets;

Subscriber Access

- open-wire lines,
- aerial and buried cable,
- HF radio,
- VHF and UHF single-channel radio,
- frequency division multiple access radio,
- time division multiple access radio, and
- satellite;

Exchange and Collection Point

- rural exchanges,
- satellite exchanges,
- remote switching units,
- remote line units, and
- subscriber multiplex;

Trunk and Transfer

- open-wire carrier,
- PCM cable,
- light route analog radio,
- light route digital radio, and
- satellite;

Remote Power Systems

- solar photovoltaics,
- wind-driven generator,
- thermo-electric pile,
- diesel engine generator set, and
- hybrid systems.

For a comprehensive list and descriptions of systems for rural networks, consult the CCITT handbook and supplement on rural telecommunications.

Detailed information must be compiled on suitable systems, including equipment and installation costs. Contact suppliers for information.

10.2 Assessment Factors

Suitability of equipment and systems should be based on consideration of what is required and what is available for such factors as the following:

- *capacity*: minimums, maximums, and expansion increments for lines or channels;
- *range*: typical minimum and maximum distances as well as factors that affect range, such as terrain and the use of repeaters;
- *spectrum*: frequency band and spectral efficiency of equipment, considering the availability of spectrum;
- *compatibility*: technical compatibility for interworking with existing network facilities; consistent with standards established by the administration and the CCITT and CCIR; and consistent with any network modernization and analog-to-digital conversion plans;
- *general design*: suitable for local conditions such as environment, power, and source of skill levels; and
- *commercial availability*: equipment in production, field-proven, and available from multiple sources for competitive procurement.

When compiling an inventory of available technical solutions, characterize each product offering in the context of these factors. Figure 10.2 shows sample worksheets for typical product types.