Network Planning Tool for Ka-band Terrestrial Wireless and Broadband LEO Satellite Networks

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Objectives

Design a Network Planning tool to compare cost versus performance attributes of Ka-band Wireless (Local Multipoint Distribution Service or LMDS) and Broadband LEO satellite networks.

The tool tries to

• integrate economic and technology issues associated with wireless communications.
• perform feasibility analyses. Results are displayed to the analyst, to make trade-off decisions on design of networks.

thus it aids in planning a hybrid network, consisting of a combination of LMDS, satellite or other networks.
GUI

1. Retrieve profile of selected BTA

2. Use data for sensitivity analysis

3. Transfer results for display

4. Analysis Results

User edits constraints

Database of Market Demand Profile

Sensitivity Analysis

Display Results

Figure 0.1: Functioning of Tool
Functioning of Tool

1. Markets are displayed using a Geographical Information System (GIS). Analyst selects markets in which he wants to set up his communications network. He gives the type of service; market segments at which the service is aimed; QoS required etc., he wants the network to provide.

2. Retrieve data on size of selected markets and their distribution, from database. These numbers will be used to estimate demand, and design optimum networks for providing services.

3. A mathematical programming package uses the above parameters to run optimization algorithms. It returns a measure of demand the network being considered can meet and Returns On Investment that can be obtained.

4. Demand may best be met by using either homogeneous or hybrid networks.

    Returns On Investment and QoS provided, as functions of rates charged by different technologies are contrasted by graphical plots. Their variation with various factors like type of service, market penetration, time of deployment is also plotted. This helps the analyst in judging optimum network for meeting demand.
Features

All parameters used in decision making process like Nature and Quality of Services and Time for break-even desired can be modified by the analyst. Changes in results will help to gauge sensitivity of demand to these parameters.
Applications

Graphical representation of results enables analyst to

- determine which network best meets demands of market and is most lucrative for service provider.
- know which services a chosen technology is most suited to provide.
- evaluate and compare two or more markets from an investment perspective.