# ITU Seminar

Warsaw, Poland , 6-10 October 2003

## Session 5.2

## Features, Inputs/outputs for most frequent tools: application of Excel PLANITU



## Application of Excel

- entering and storing of network data (coordinates, traffic, equipment costs)
- sorting of network data
- calculating of basic formulas (demand forecasting) and simple methods (exchange locations)
- presenting of tables and charts

Excel

**Example for the location problem from Session 4.2 "Switching/Routing planning":**

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 0 | 0 | 81 | 326 | 81 | 0 | 0 | 0 | *R1* |
| 0 | 0 | 122 | 407 | 163 | 0 | 0 | 0 | *R2* |
| 0 | 0 | 81 | 366 | 204 | 0 | 0 | 0 | *R3* |
| 156 | 40 | 323 | 284 | 122 | 0 | 0 | 0 | *R4* |
| 391 | 236 | 323 | 323 | 326 | 41 | 43 | 43 | *R5* |
| 234 | 235 | 194 | 150 | 132 | 190 | 222 | 188 | *R6* |
| 38 | 208 | 326 | 310 | 240 | 283 | 317 | 317 | *R7* |



Excel

**Example for the location problem from Session 4.2 "Switching/Routing planning":**

**R1 = 81 + 326 + 81 = 488**

**S1 = R1 = 488**

**R2 = 122 + 407 + 163 = 692**

**S2 = S1 + R2 = 1180**

**R3 = 81 + 366 + 204 = 651**

**S3 = S2 + R3 = 1183**

**R4 = 156 + 40 + 323 + 284 + 122 = 925**

**S4 = S3 + R4 = 2756**

**R5 = 391 + 236 + 323 + 323 + 326 + 41 + 43 +43 = 1726**

**S5 = S4 + R5 = 4482**

**R6 = 234 +235 +194 +150 + 132 + 190 + 222 + 188 = 1545**

**S6 = S5 + R6 = 6027**

**R7 = 38 + 208 + 326 + 310 + 240 + 283 + 317 + 317 = 2611**

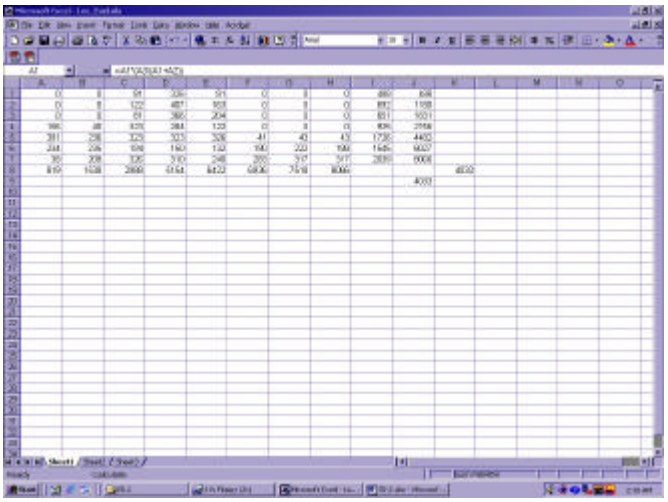
**S7 = S6 + R7 = 8638**

$S_{TOT} = S7$

$S_Y = S_{TOT} /2 = 8638/2 = 4319$

# Excel

**Result for the location problem from Session 4.2 "Switching/Routing planning":**

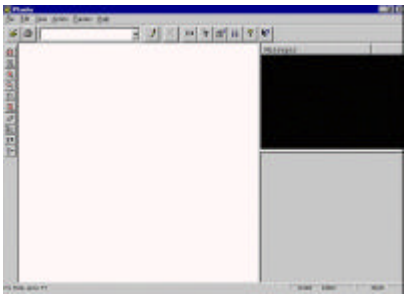




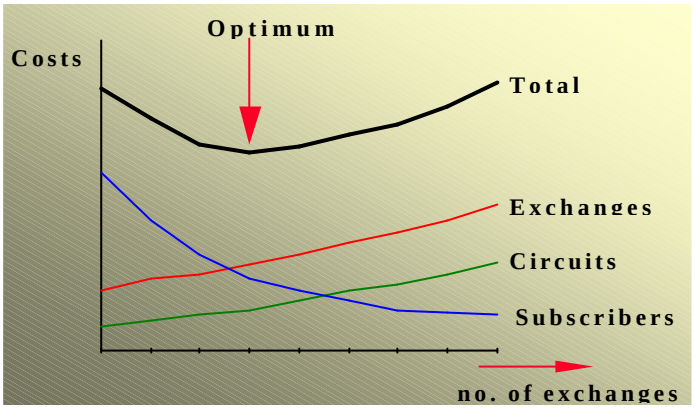
# PLANITU

***PLANITU is a tool for optimisation and dimensioning of telecom networks, based on an integrated interactive approach for finding minimum cost solutions for:***

- *location and boundaries of exchanges*
- *selection of switching and transmission equipment*
- *circuit quantities, traffic routing, switching hierarchy*
- *choice of transmission paths.*

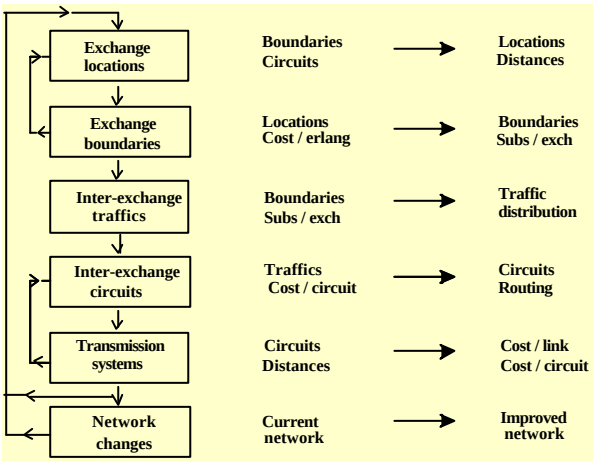


# PLANITU





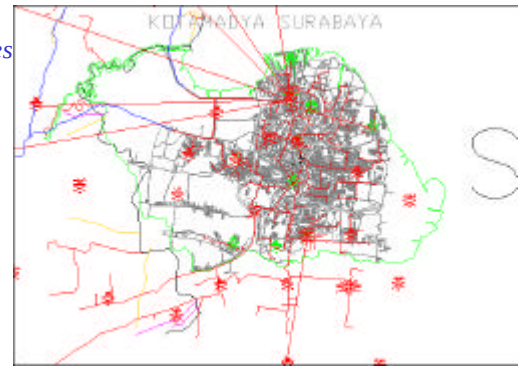

# PLANITU



# PLANITU

## Local Networks

- *Exchange locations*
- *Exchange boundaries*
- *RSU locations & boundaries*
- *Inter-exchange network*
- *Exchange hierarchy*
- *Transmission systems*

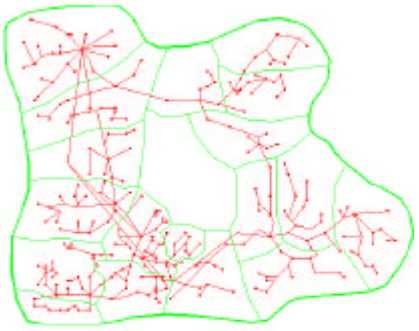





# PLANITU

## Rural Networks

- *Exchange locations & boundaries*
- *Exchange hierarchy*
- *Inter-exchange network*
- *Transmission systems*



# PLANITU

## National & International Networks

- *Traffic routing*
- *Exchange hierarchy*
- *Inter-exchange network*
- *Transmission systems*



# New Features in Planitu 3.0

## Access network optimization

1. Dial-up Internet subscriber planning
2. Broadband access planning
3. Planning of cabinet areas

## New Features in Planitu 3.0

### Backbone network optimization

1. Dual homing (load sharing)
2. Design of nonhierarchical circuit-switched networks
3. Optimization of the fixed part of mobile (GSM) networks
4. Optimization of Ring/ Mesh SDH/ SONET transport networks
5. Design of ATM, IP MPLS, WDM networks using equivalent bandwidth paradigm.



## New Features in Planitu 3.0

### Updated data handling and Planitu user interface

1. Contemporary "flat" look and feel with redesigned toolbars.
2. Integrated running cost chart for immediate inspection.
3. Export Planitu graphics into industry standard CAD formats
4. Results saveing into Access database for post processing
5. New Planitu help containing complete Planitu manual
6. Set of demo networks for the new Planitu functionality
7. New click and go installation procedure on one CD

# New Features in Planitu 3.0

## *Planitu 3.0 Manual*


*Planitu 3.0 Network planning system manual*
*© ITU Geneva*

*March 2002*



# PLANITU

***APPLICATION:***

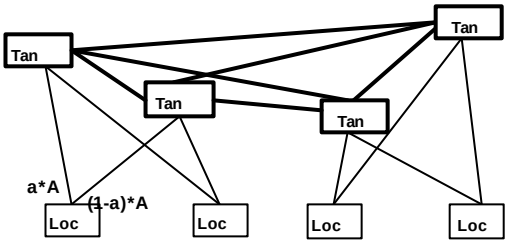
- ✓ PSTN circuit-switched (TDM) networks
- ❑ Data (packet) networks – very limited
- ❑ Evolution to NGN - limited
- ✓ Training tool for network planning

# PLANITU

## CASE STUDY - Dual homing (load sharing) :

In the hierarchical routing one option is to overflow/transit traffic through two different tandems (Tan), i.e. to implement dual homing for the source of the traffic (Loc).

General rule is to divide traffic in equal portions, i.e. 50% to 50%. More universal approach will be to use coefficient **a, 0< a <1.**

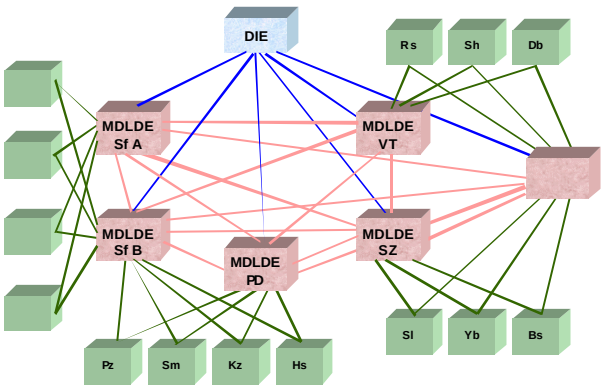





# PLANITU

## CASE STUDY - Dual homing (load sharing) :

***Optimisation of the Bulgarian National LD Circuit Switched Network***



# PLANITU

## CASE STUDY - Dual homing (load sharing)

**The optimisation of the national LD network results in:**

- **transition from semi-meshed towards dual-homing network structure**
- **more robust and reliable traffic handling and routing**
- **simplifying the network management**
- **readiness for smooth transition towards Class 4 NGN solutions, deploying MGW in the location of the existing 6 MDLDEs**