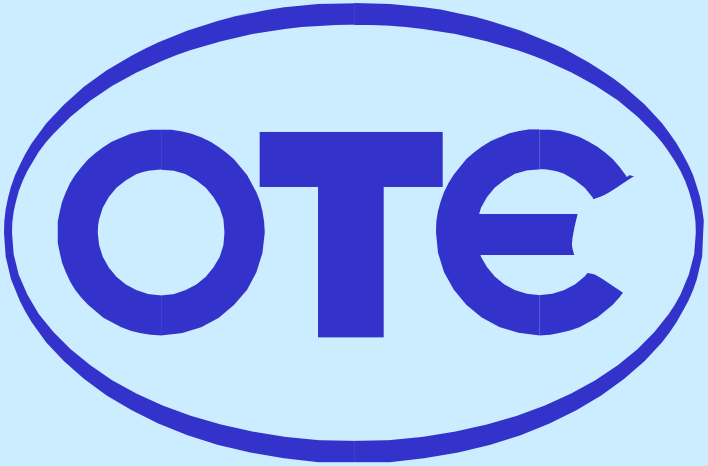
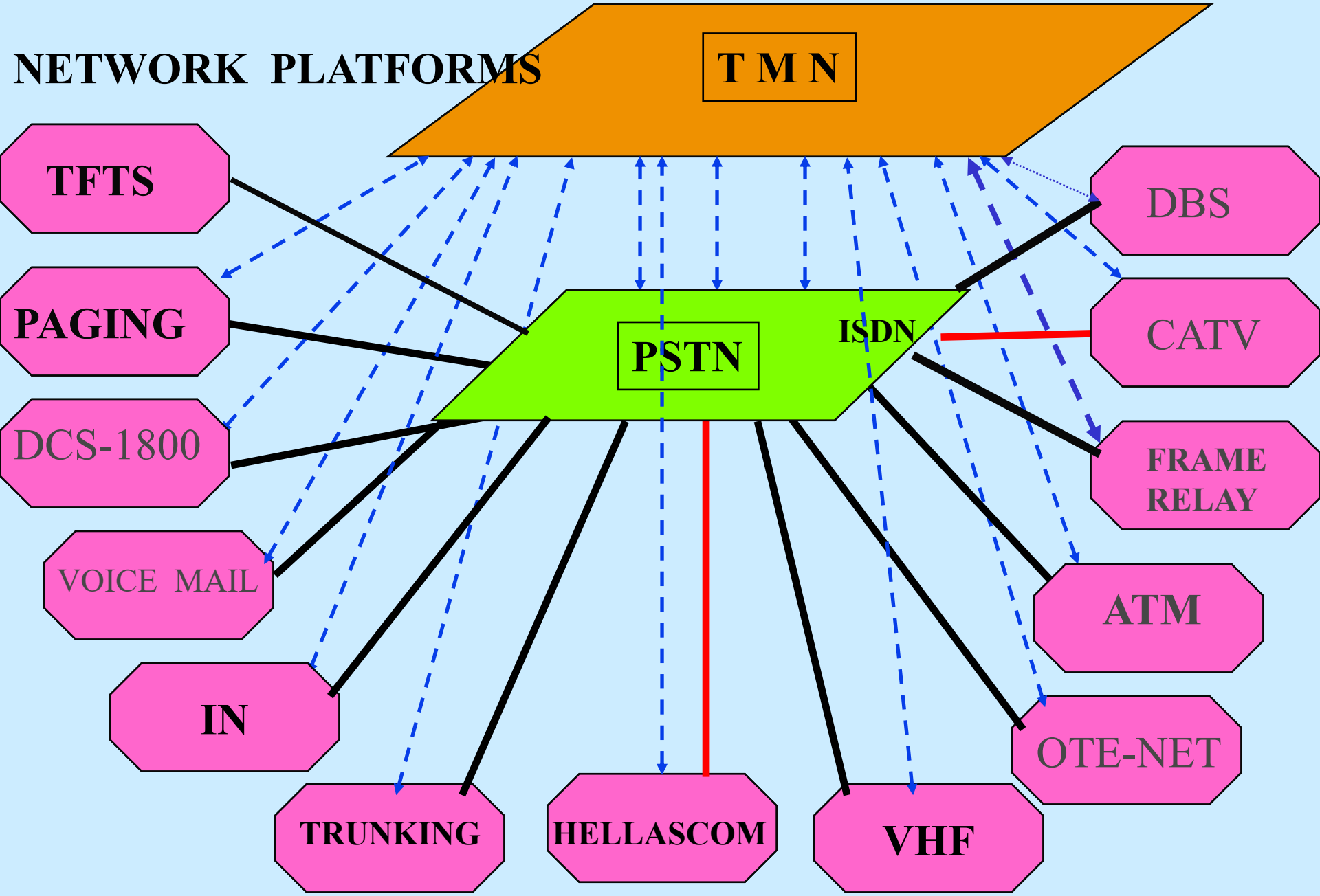

OTE

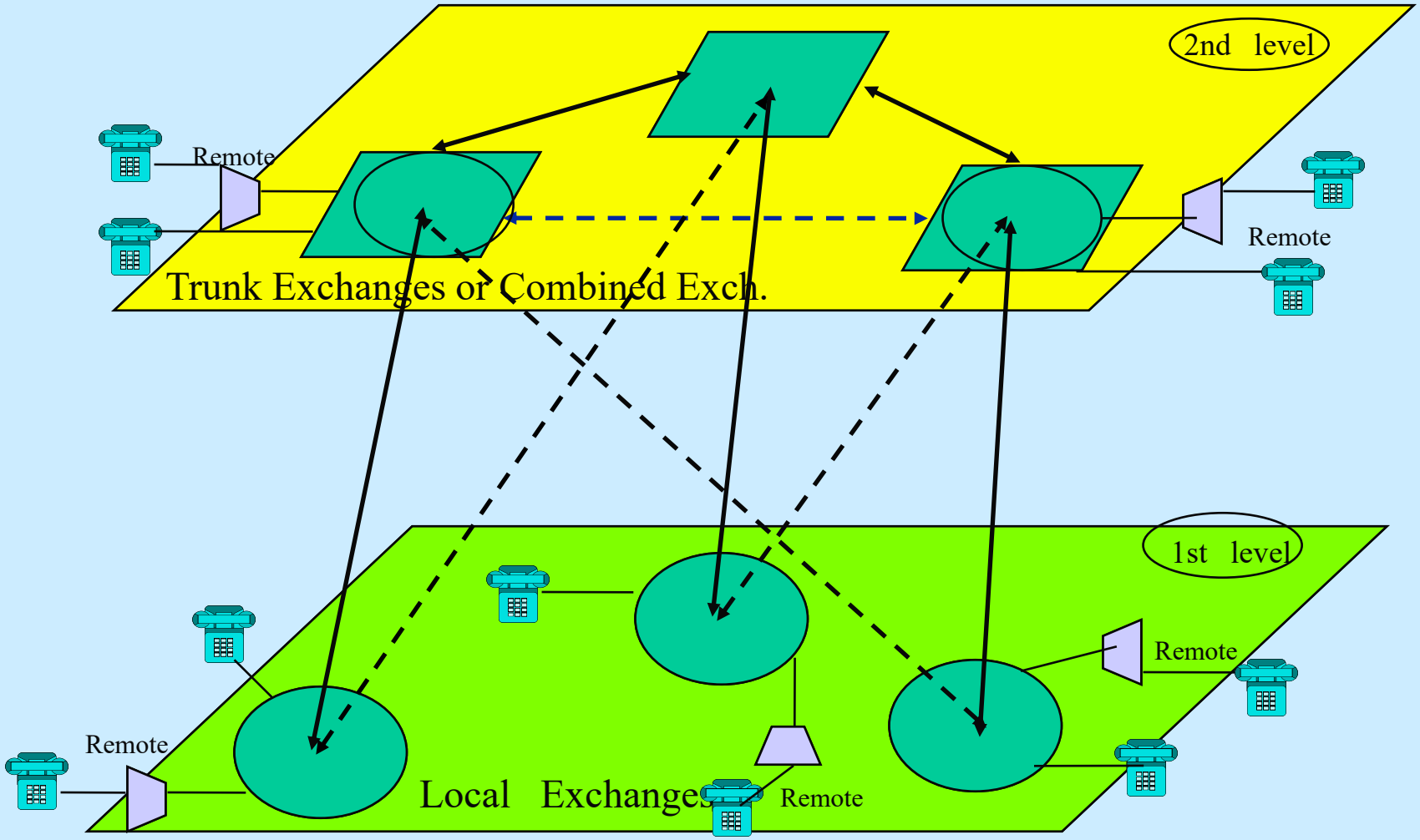
HELLENIC TELECOM NETWORK

NETWORK PLATFORMS

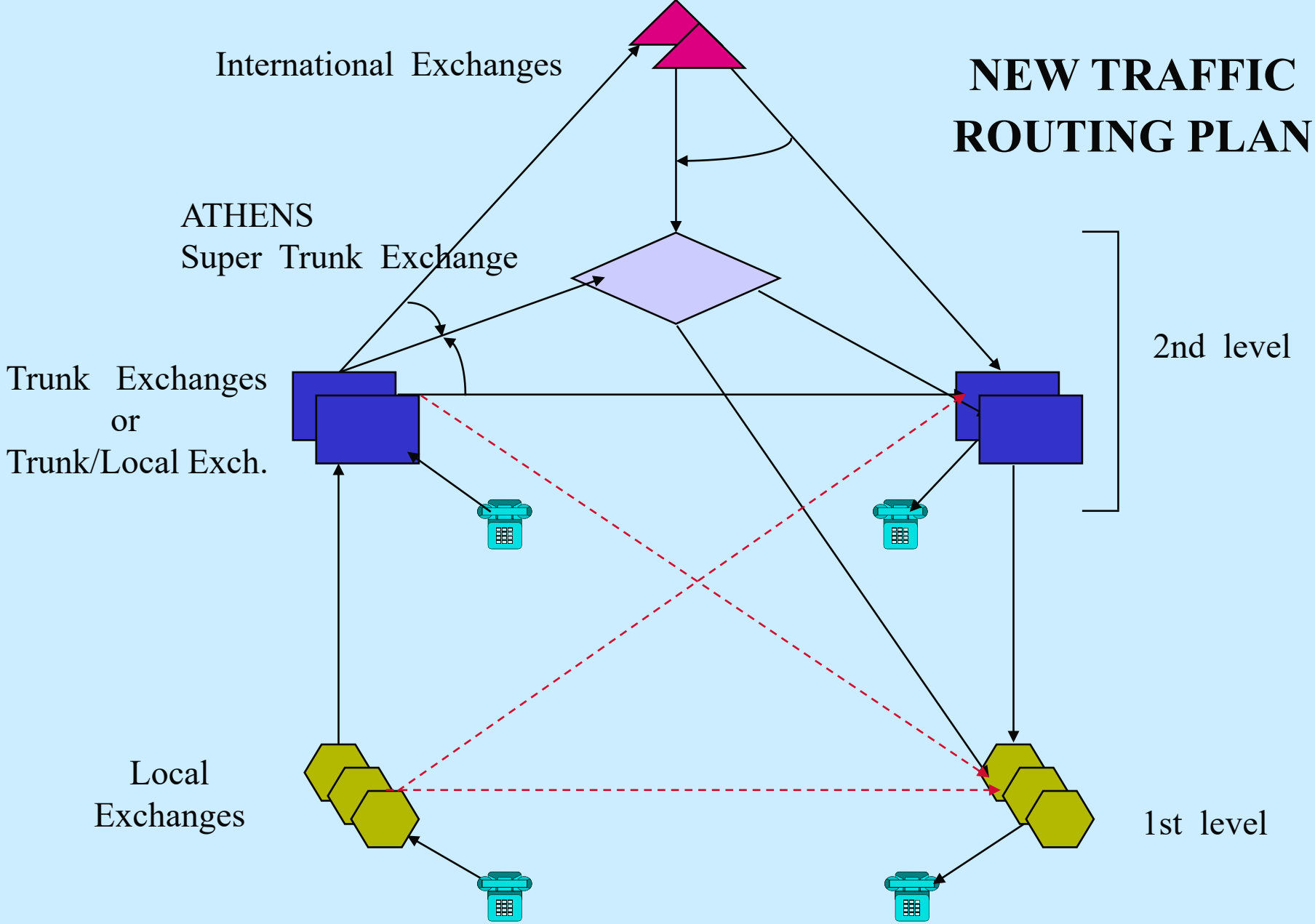


SWITCHING STRUCTURE IN THE HELLENIC NETWORK

NEW DIGITAL SWITCHING STRUCTURE



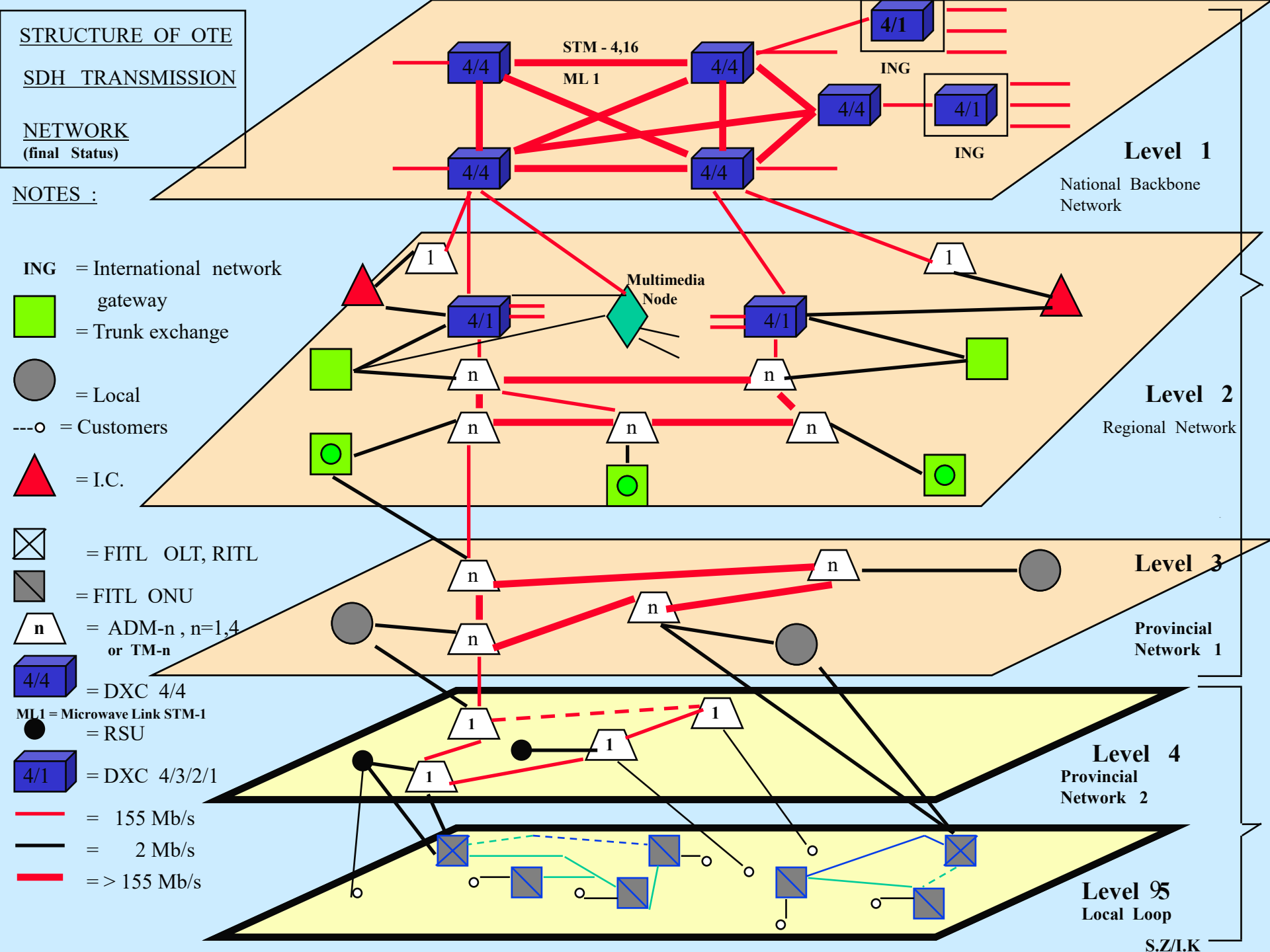
NEW TRAFFIC ROUTING PLAN



New Digital Switching Hierarchy

- 3 International Exchanges
- 12 Trunk Exchanges
- 44 Combined Trunk/Local Exchanges
- 160 Local Exchanges

TRANSMISSION NETWORK STRUCTURE


STRUCTURE OF OTE
SDH TRANSMISSION
NETWORK
(final Status)
NOTES :
ING = International network gateway
= Trunk exchange
= Local
= Customers
= I.C.
= FITL OLT, RITL
= FITL ONU
n = ADM-n , n=1,4 or TM-n
4/4 = DXC 4/4
ML1 = Microwave Link STM-1
= RSU
4/1 = DXC 4/3/2/1
= 155 Mb/s
= 2 Mb/s
= > 155 Mb/s
STM - 4,16
ML 1
ING
ING
Level 1
National Backbone Network
Multimedia Node
Level 2
Regional Network
Level 3
Provincial Network 1
Level 4
Provincial Network 2
Level 5
Local Loop
S.Z/I.K

Digital Transmission Network
Hierarchy & Architecture

- **Core Network**

Level 1 : Multiple Ring Configuration plus DXC (International, TE-TE).

Level 2 : Ring Configuration plus Point to Point systems (regional network NE-TE).

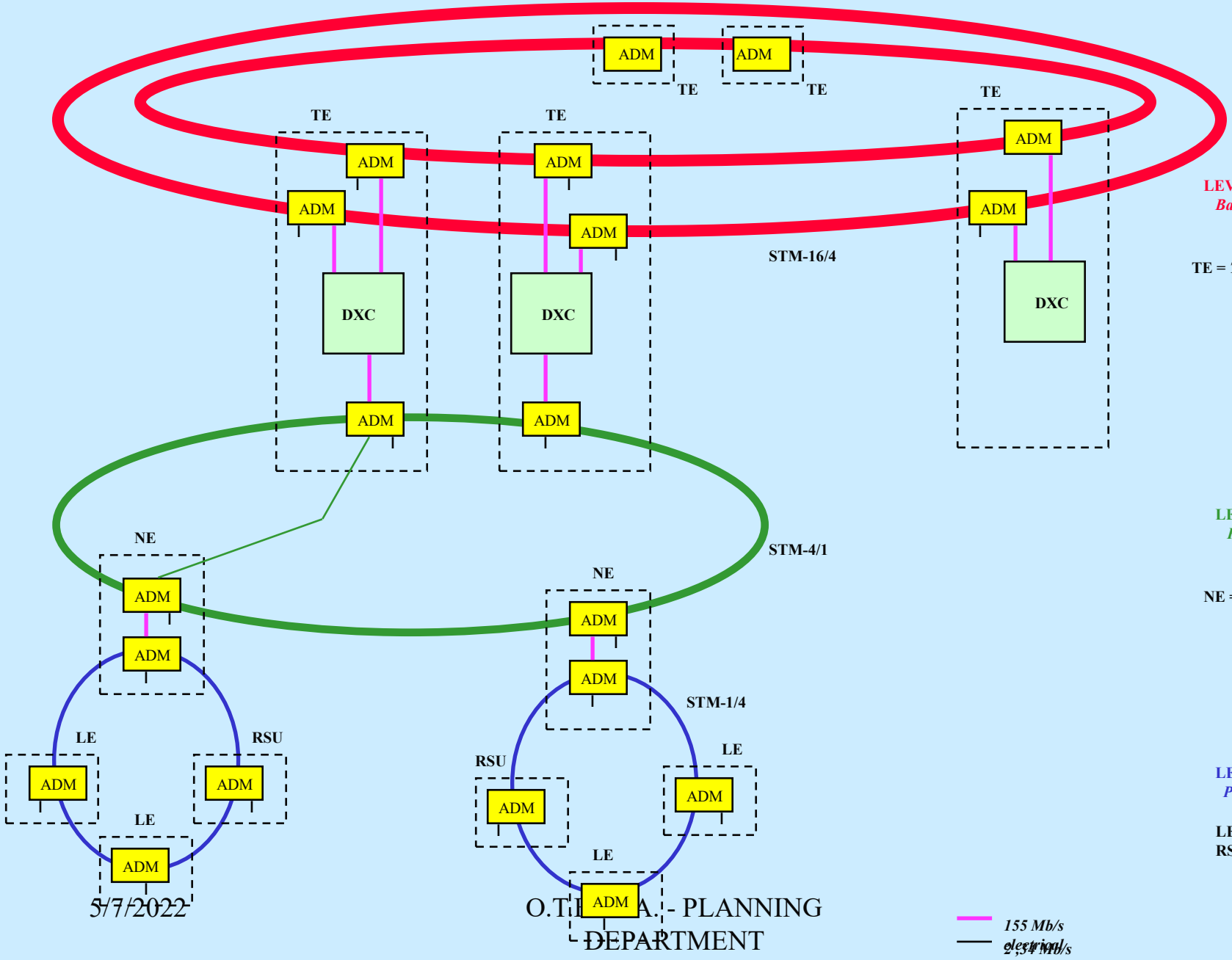
Level 3 : Ring Configuration (provincial network LE-NE).

- **Access Network**

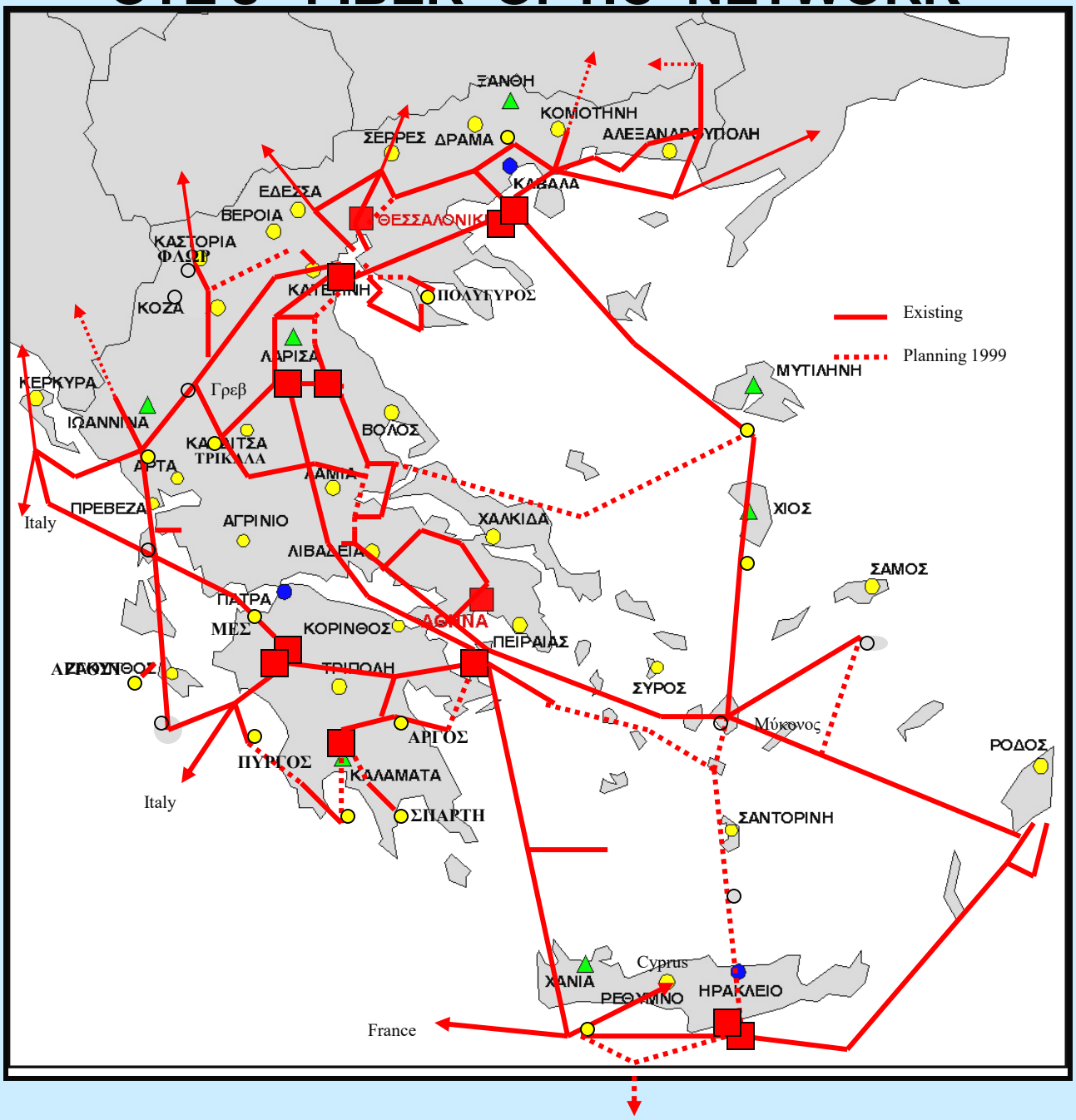
Level 4 : Star or Ring Configuration (provincial network LE-RSU).

Level 5 : Star or Ring Configuration (subscriber's local loop).

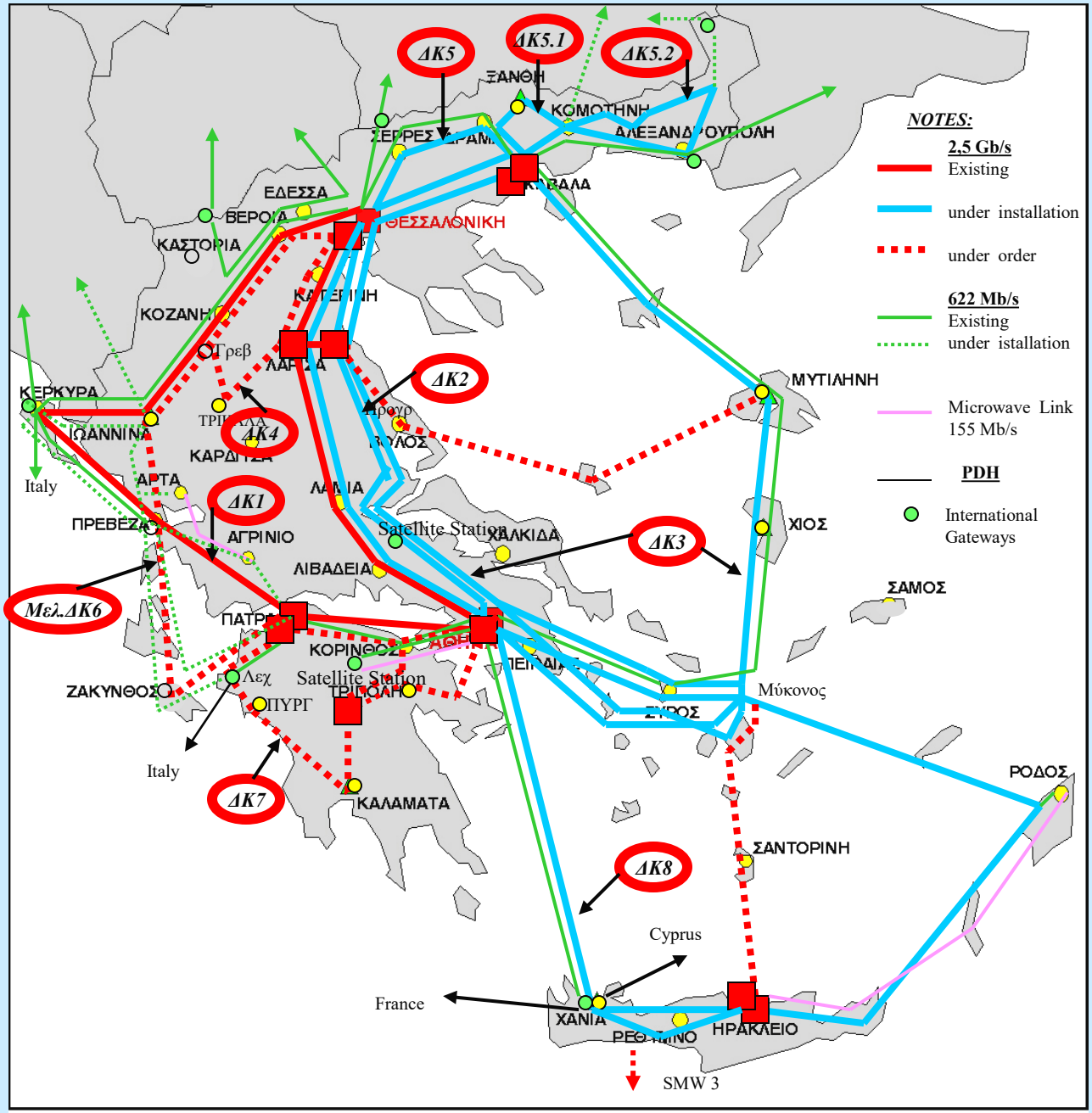
ARCHITECTURE NETWORK STRUCTURE

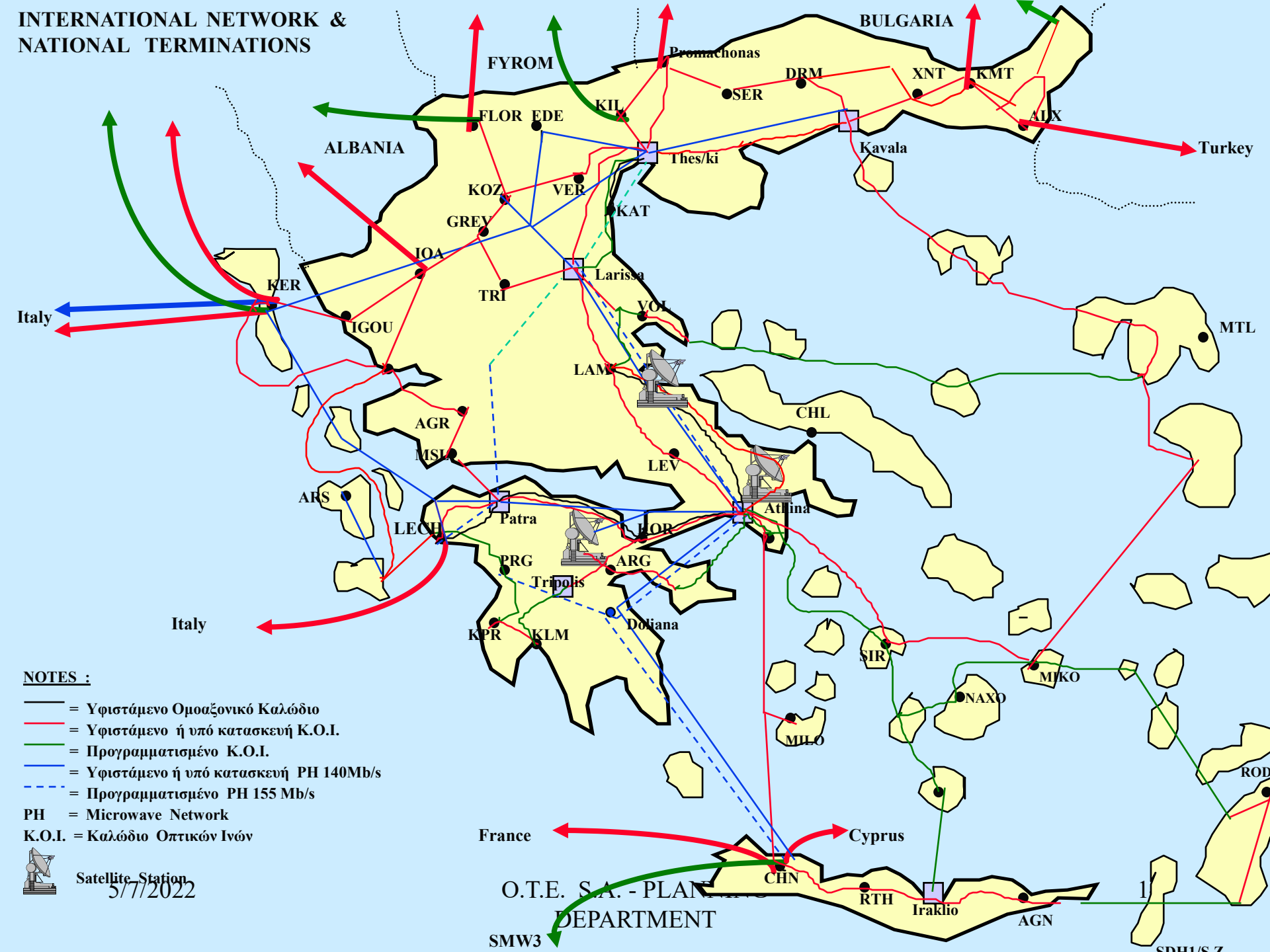


OTE's FIBER OPTIC NETWORK



OTE SDH BACKBONE TRANSMISSION SYSTEMS




INTERNATIONAL NETWORK &
NATIONAL TERMINATIONS
BULGARIA
FYROM
Promachonas
DRM
XNT
KMT
SER
KIL
FLOR
EDE
ALX
ALBANIA
Kavala
Turkey
Thes/ki
KOZ
VER
KAT
GREV
IOA
Larissa
KER
TRI
VOL
Italy
IGOU
MTL
LAM
CHL
AGR
MSLO
LEV
ARS
Patra
Athina
LECH
KOR
PRG
ARG
Tripolis
Italy
Doliana
KPR
KLM
SIR
MYKO
NAXO
MILO
ROD
France
Cyprus
CHN
RTH
Iraklio
AGN
SMW3
NOTES :
= Υφιστάμενο Ομοαξονικό Καλώδιο
= Υφιστάμενο ή υπό κατασκευή K.O.I.
= Προγραμματισμένο K.O.I.
= Υφιστάμενο ή υπό κατασκευή PH 140Mb/s
= Προγραμματισμένο PH 155 Mb/s
PH = Microwave Network
K.O.I. = Καλώδιο Οπτικών Ινών
Satellite Station
5/7/2022
O.T.E. S.A. - PLAN
DEPARTMENT
1
SDH1/S-Z

DESIGN OBJECTIVES FOR OTE TRANSPORT NETWORK

- **AVAILABILITY** ≥ 99,9982 %

  G803, Q706, Q707 ITU-T and ETSI

- **QUALITY PERFORMANCE**:

  G823-G826, G811-G813 ITU-T and ETSI

- **CAPACITY**:

  - Switched traffic up to the year 2002
  - Early broadband services such as ATM, Fast Internet etc.
  - Leased lines up to 155 Mb/s

Digital Transmission (1)
Carriers used

International Network

- **Fiber optic cables mainly (submarine, underground)**
- **Microwave links**
- **Satellites**

Digital Transmission (2)
Carriers used

National Network

- **Fiber Optic Cables (mainly).**
  > 12400 Km of underground and submarine F. O. C. (6/98)
  > 19500 Km F. O. C. by end 2002

- **Coaxial Cables.**
  To be replaced by F. O. C. until 1999

- **Twisted pair Cables**
  Limited in the provincial areas (Level 4); LE-RSU connections

Digital Transmission (3)
Carriers used

- **Digital Microwave Links**

Radio Links

~500 hop arteries 140, 34 and 8 Mb/s (11000 Km).
~180 STM-1, STM-0 arteries to be installed (4000 Km)

Outdoor Radio Links

4x2, 16x2 Mb/s in rural areas (Level 4).
100 links installed, to be increased to >500 by 2002
Connection LE-RSU, Leased Lines

Digital Transmission (4)
Line Systems - Multiplexers

- **DXC 4/1 (Digital Cross Connects)**
- **SDH systems (155 Mb/s, 622 Mb/s, 2.5 Gb/s) generally for levels 1, 2 and partly for level 3.**
- **PDH systems (2 Mb/s, 8 Mb/s, 34 Mb/s, 140 Mb/s) partly for levels 3, 4.**

TRANSPORT NETWORK

DIGITALIZATION - ROUTING

- **Transport network fully digitized by the end of 1999**
- **Routing of digital lines by the end of 1999 will be:**
  - 65% through SDH systems (International traffic, TE-TE, NE-TE, LE-NE, ATM, H/C, H/P, Leased Lines)

  - 35% through PDH systems (LE-RSU Provisional Networks, Leased Lines for TV program distribution and other minor services)

ACCESS NETWORK

ACCESS NETWORK
1. Installed infrastructure (end 1998)

- **10 million copper pairs (main lines)**
- **PCM 2,4,30 ch on copper or point-to-point Radio Links (150,000 lines)**

- **Point-to-multipoint Radio Links (51000 lines)**
- **DECT (fixed & local mobility) (1500 lines)**
- **FTTO technology on SDH configuration, to offer N.B. & B.B. services (80 KAC in Athens and Thessaloniki, 15000 lines)**

- **Copper rehabilitation :**

  27,000 64-kbps lines

  FTTC and FTTB over SDH

  To offer N.B. & B.B. services to business and residential customers.

2. New infrastructure according to the Busines Plan (1999 - 2002)

per year:

- **30,000 copper pairs (main lines)**
- **40,000 lines PCM 2,4,11,30 ch on copper or point-to-point Radio Links**
- **10,000 lines point-to-multipoint Radio Links**

- **500 lines provided by point-to-point 2 ch Radio Links**

- **Copper rehabilitation:**
  250,000 lines
  FTTC, FTTB or FTTO technology on SDH configuration

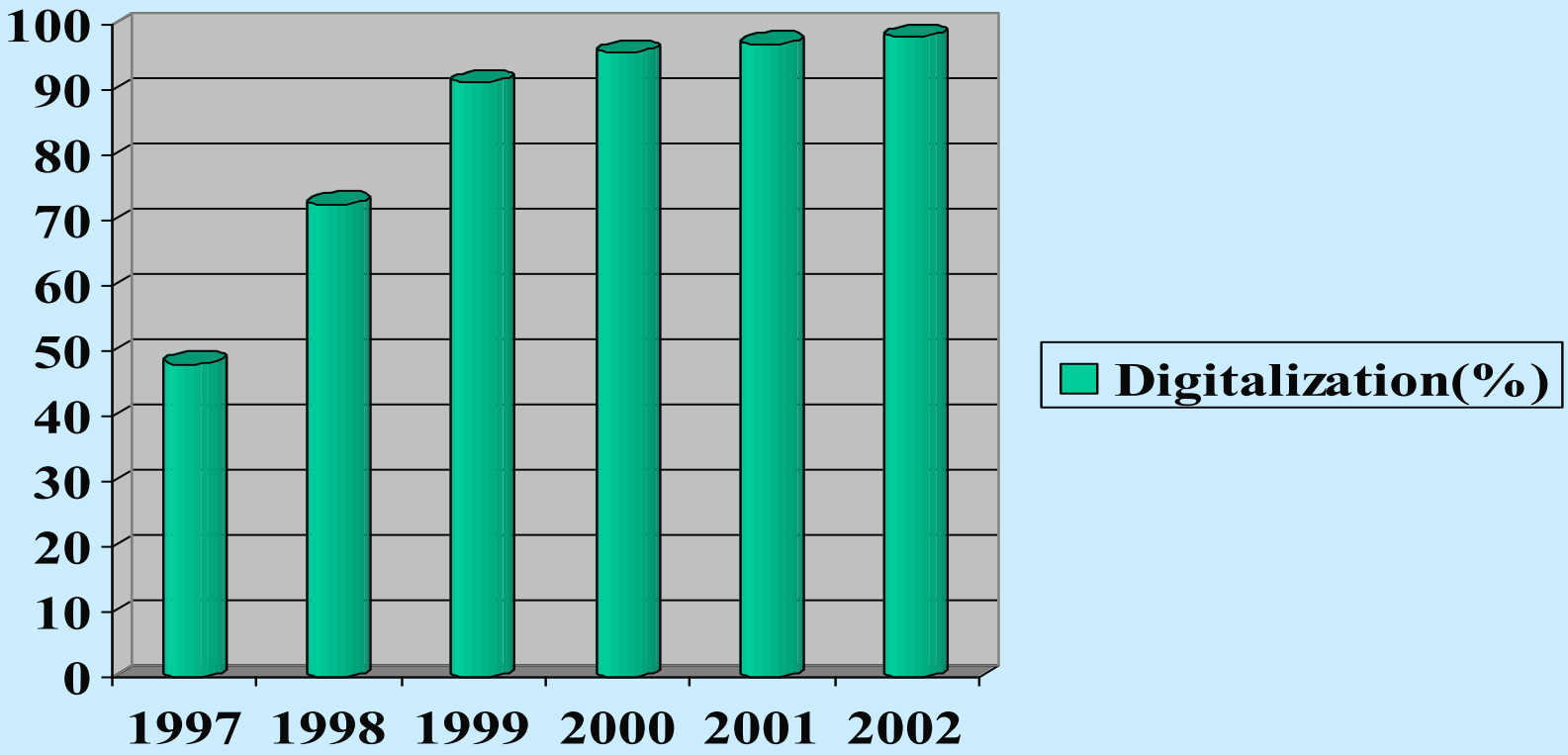
- **For copper lines rehabilitation or new lines :**
  20,000 lines provided by DECT technology (fixed & local mobility)

- **2,000 lines on xDSL technology**
  B.B. services to business and residential customers (2000 - 2002)

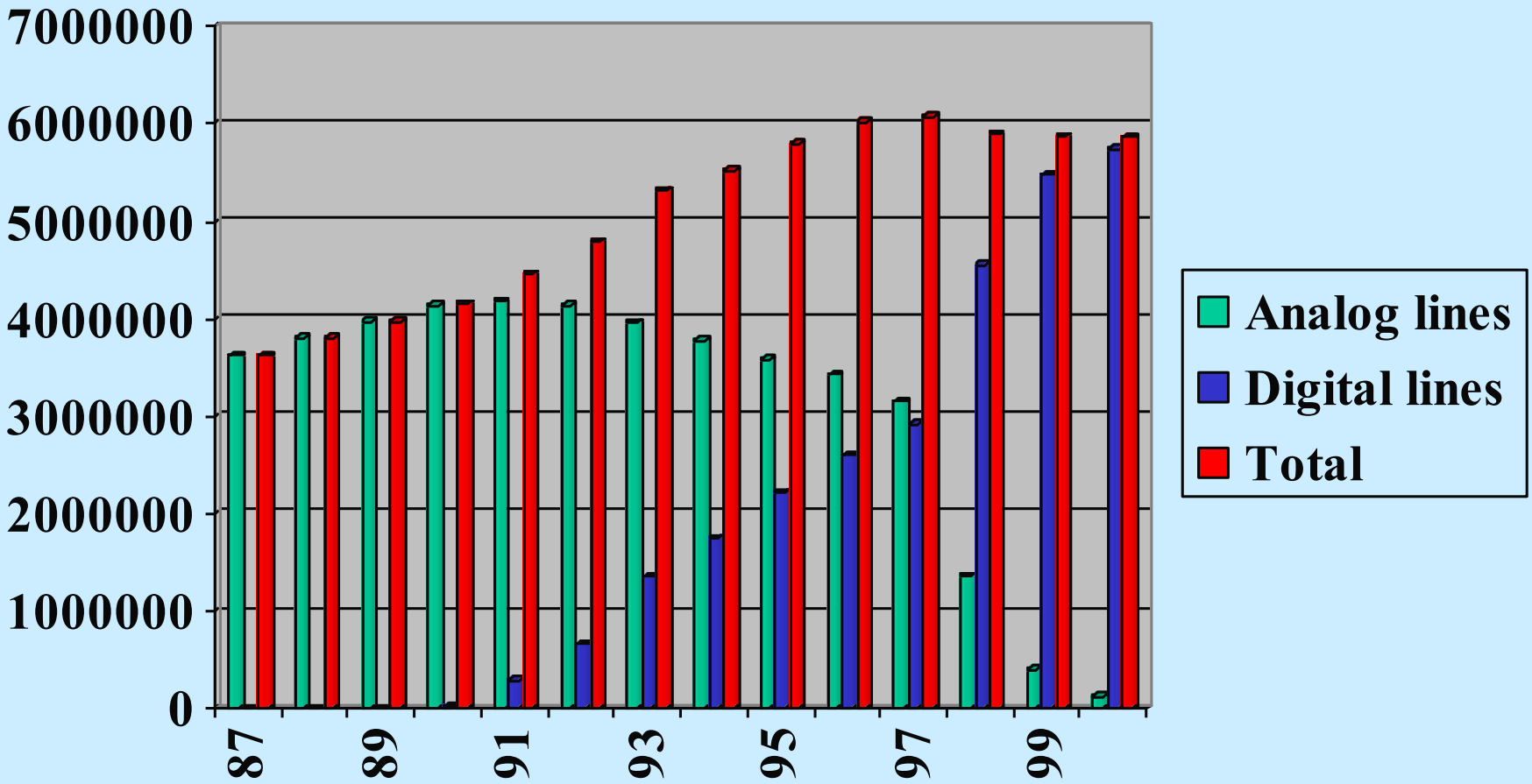
- **10,000 64-kbps lines, point-to-multipoint wireless B.B technology, services to medium and small business customers.**

- **to offer video services :**
  - *** HFC networks**
  - *** Satellite network (DBS technology)**

Digitalisation of Switching Subscriber lines



Installed subscriber lines as of 31/12/2000



Intelligent Network

Broadband Plans by OTE

- Fast Internet
- xDSL
- Digital Broadcast Services
- HFC/Cable TV
- LMDS

Fast Internet

- Internet demand increasing
- OTE subsidiary is one of the primary ISPs in Greece
- Universal access numbers to be given

xDSL

- Ambitious research project currently under way in cooperation with Greek Universities
- To offer Video Services, Internet access
- Voice over IP a future consideration

Digital Broadcast Services

- OTE is planning to enter the market in cooperation with content providers
- Business plan ready
- Legislative issues still unresolved

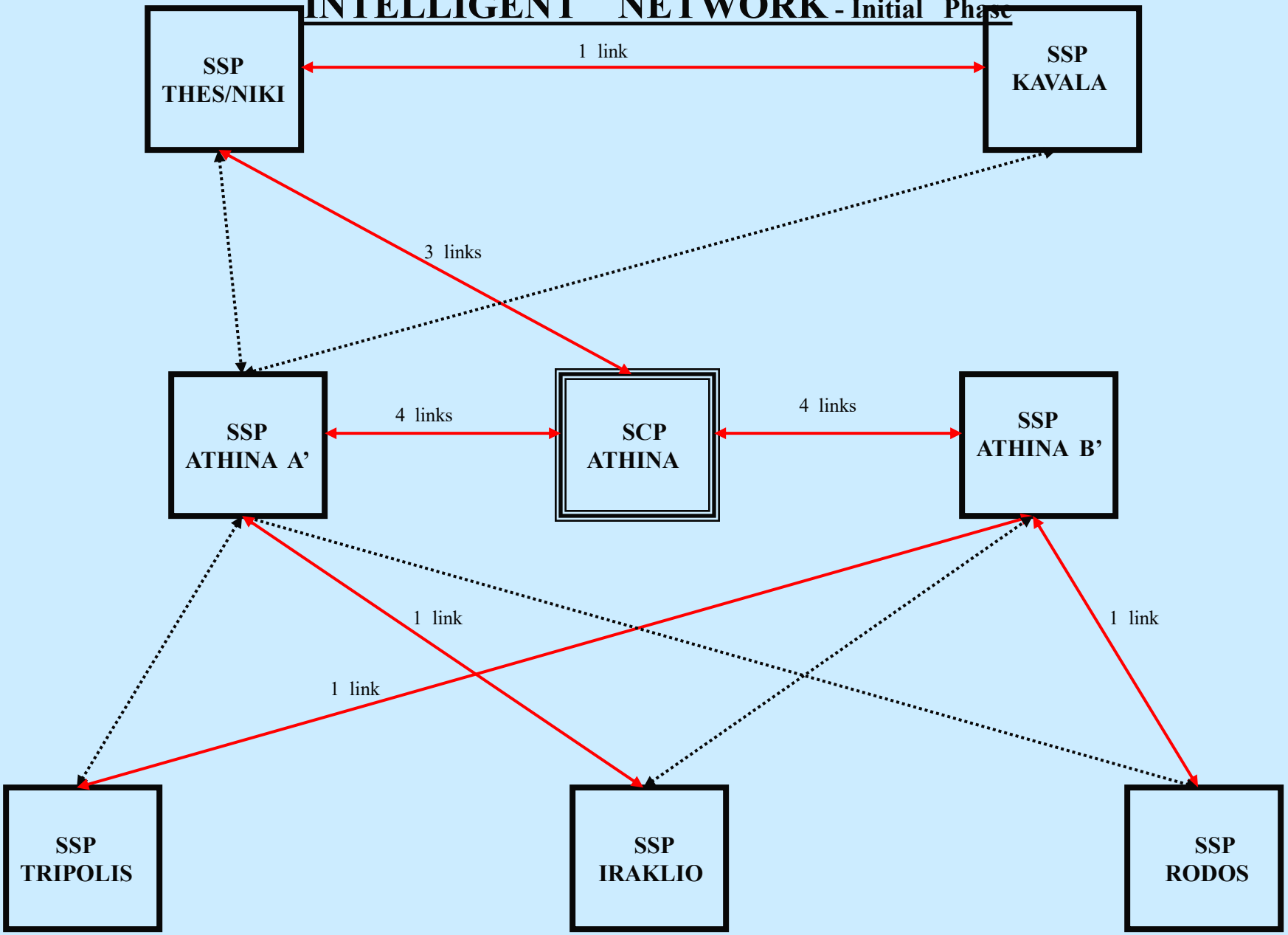
HFC/Cable TV

- HFC will be an alternative network
- Problem: After deregulation, incumbent carriers not allowed to own multiple networks
- Not sure whether there is a market demand for Cable TV
- Planning to run pilot project in Volos (medium city, population 80000)

LMDS

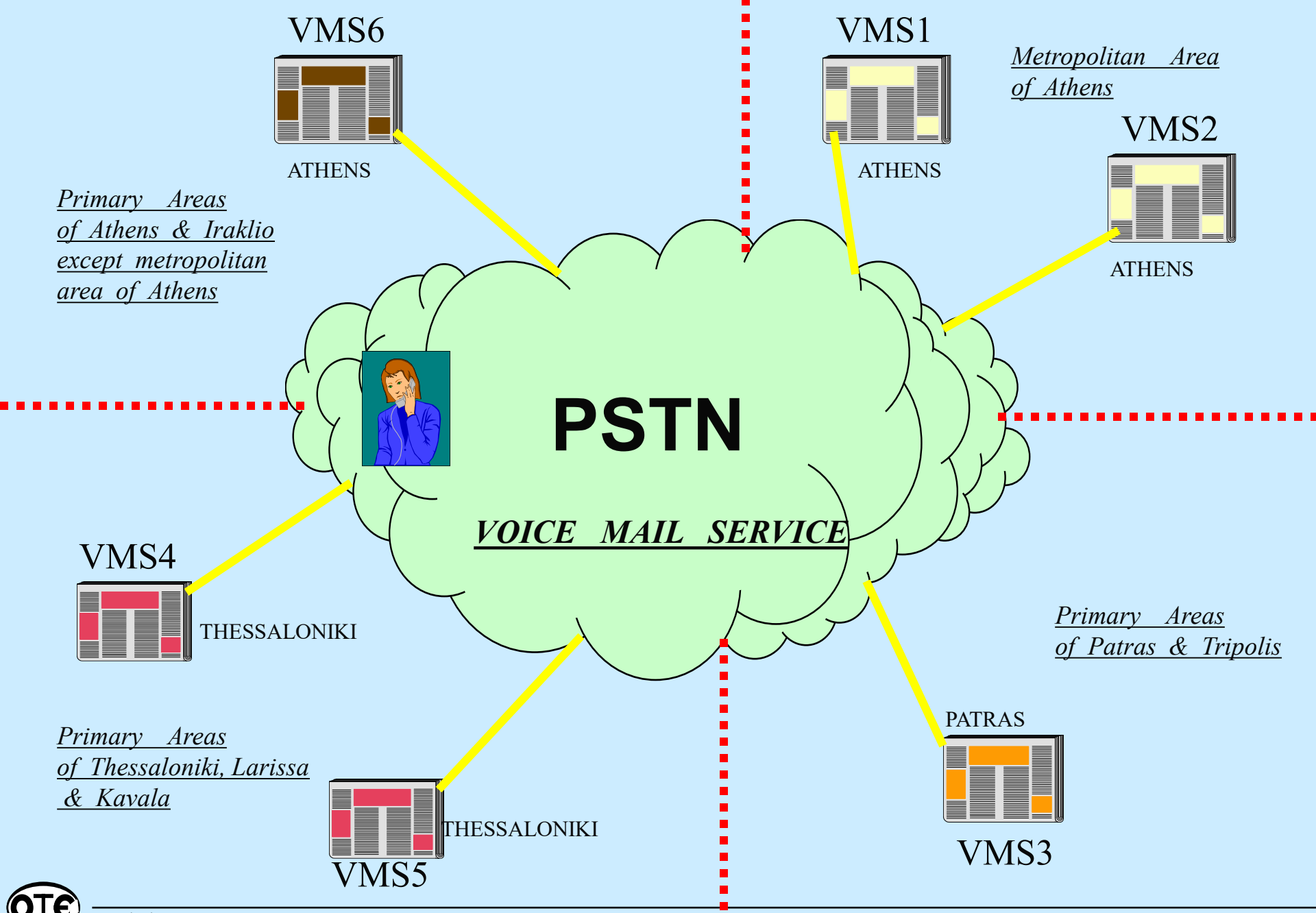
- To provide wireless broadband services
- Pilot projects about to start in cities and in industrial areas
- Expected to stimulate interest in areas such as internet access, LAN connection, leased lines, even voice telephony

INTELLIGENT NETWORK - Initial Phase



INTELLIGENT NETWORK SERVICES

- Freephone (FPH)
- Universal Access Number (UAN)
- Virtual Private Network (VPN)
- Personal Number
- Virtual Card
- Premium Rate (PRM)
- Televoting (VOT)
- Prepaid Card

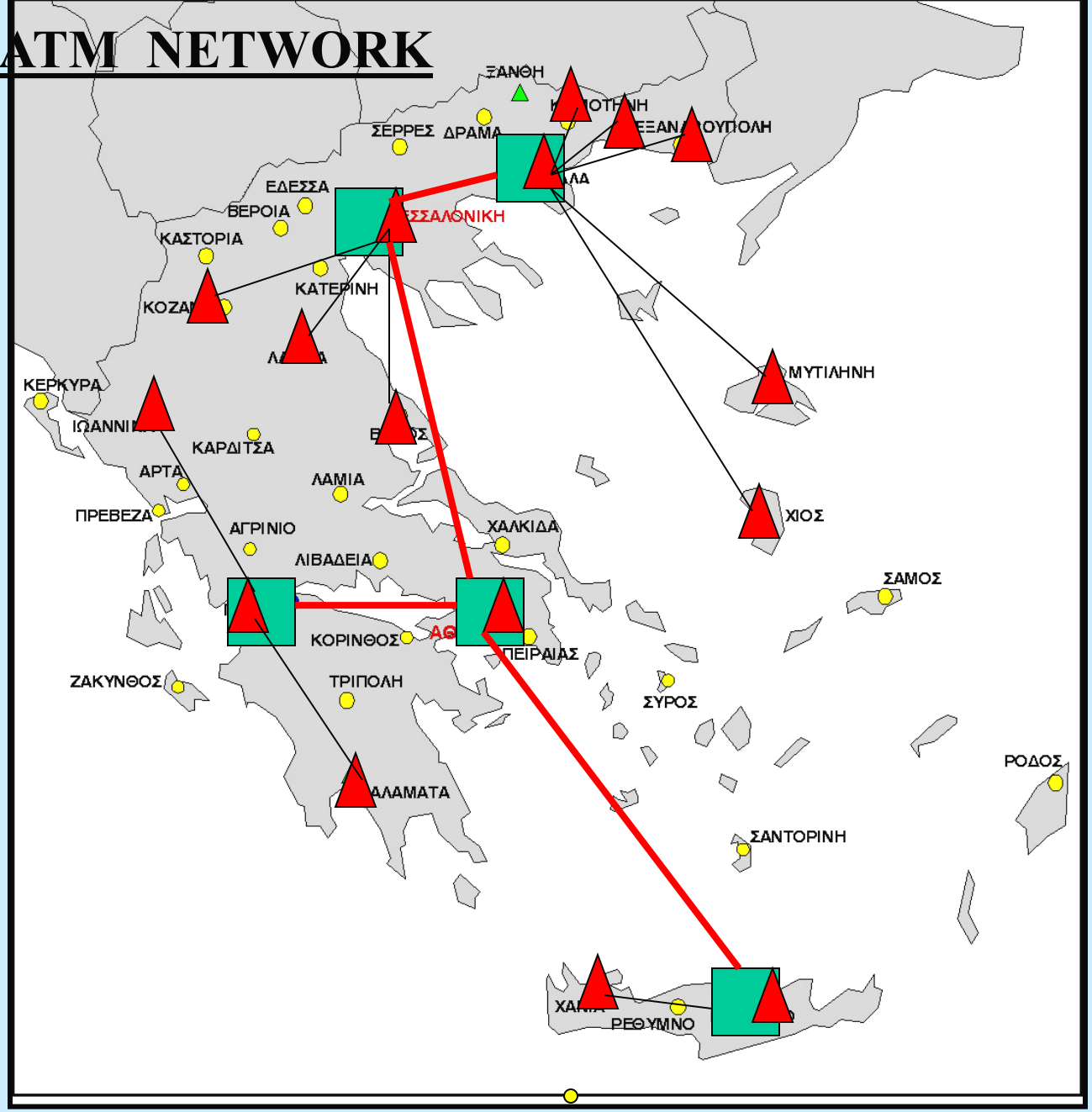

VMS6
ATHENS
VMS1
ATHENS
Metropolitan Area of Athens
VMS2
ATHENS
Primary Areas of Athens & Iraklio except metropolitan area of Athens
PSTN
VOICE MAIL SERVICE
VMS4
THESSALONIKI
Primary Areas of Patras & Tripolis
Primary Areas of Thessaloniki, Larissa & Kavala
PATRAS
VMS3
THESSALONIKI
VMS5

VOICE MAIL SERVICES

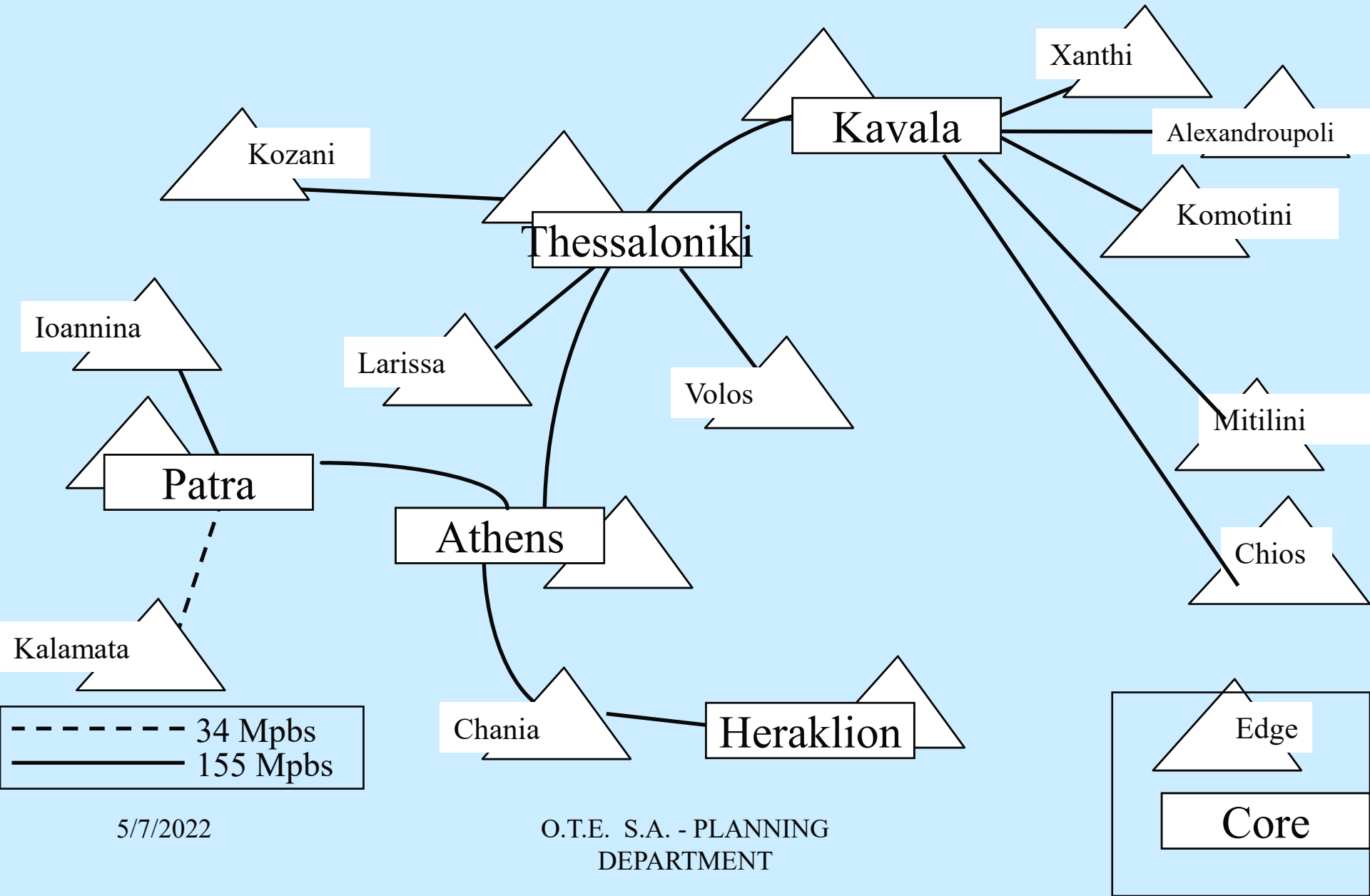
- Call Answering
- Fax Mail
- Virtual Telephone
- Notification

A T M Network

PUBLIC ATM NETWORK



Public ATM Network

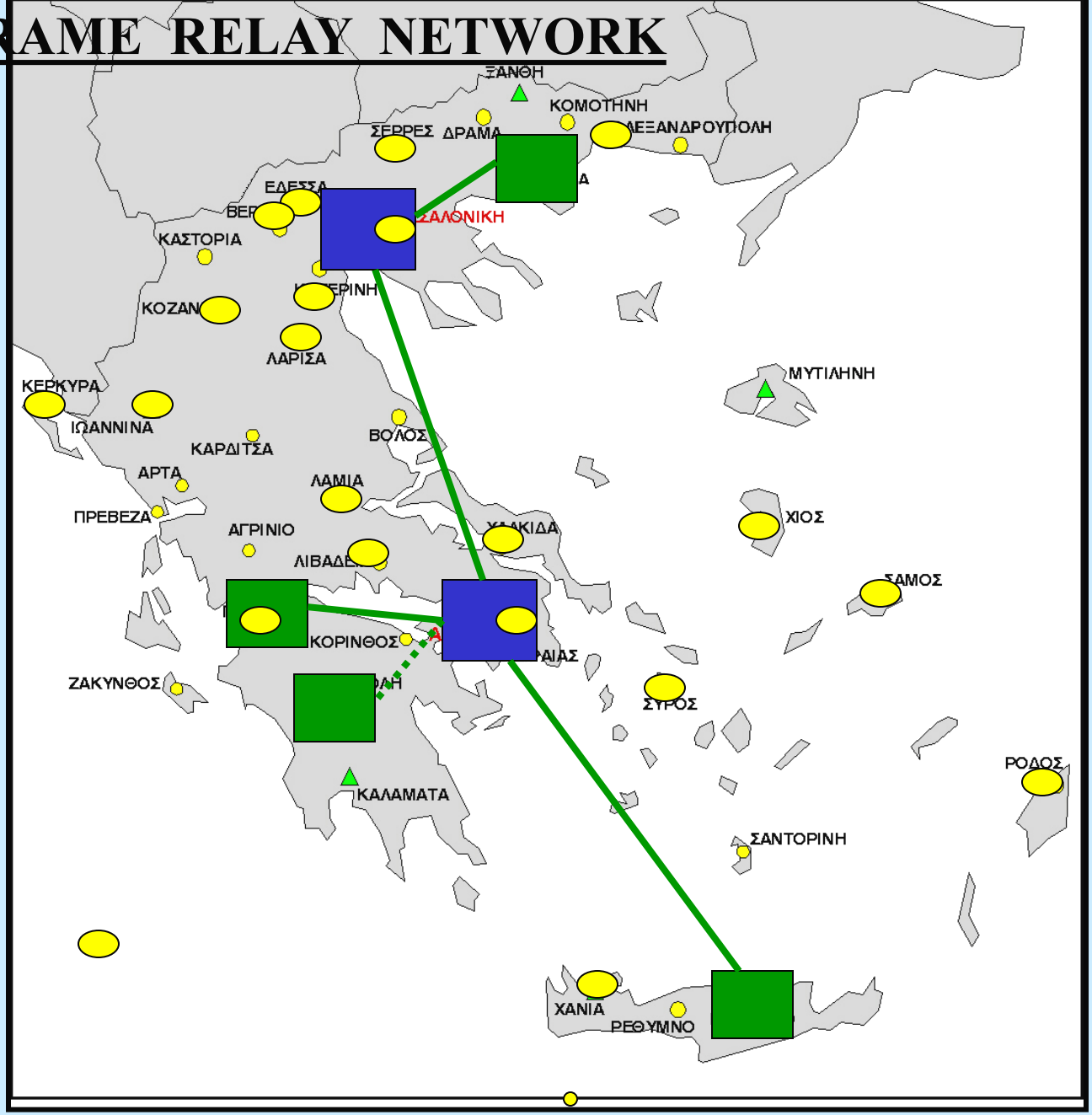


SERVICES

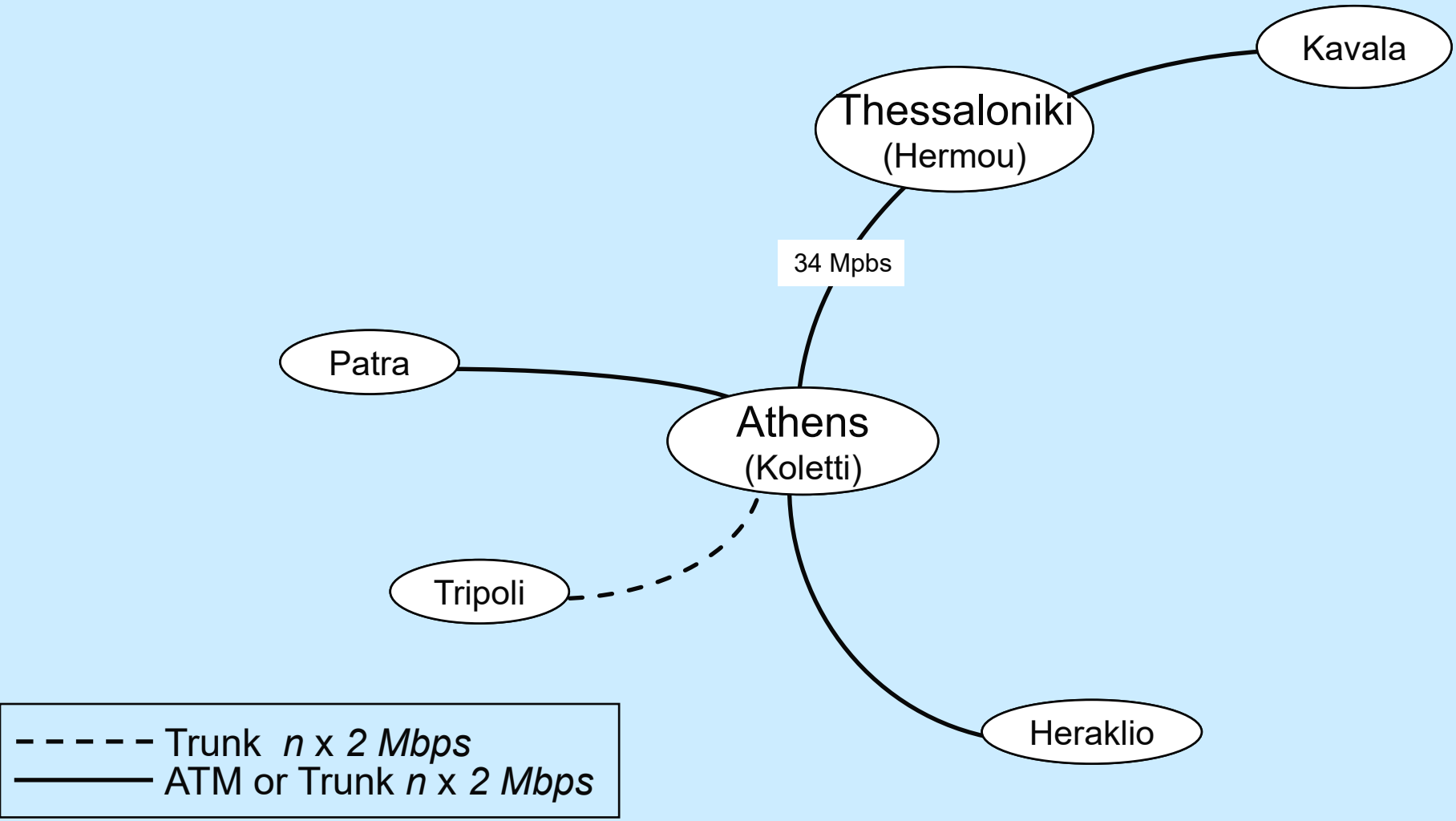
- **ATM Cell Relay**
- **Frame Relay**
- **Circuit Emulation**

Frame Relay Network

PUBLIC FRAME RELAY NETWORK



Public Frame Relay Backbone Network



SERVICES - CHARACTERISTICS

- CIR
- PVC, SVC
- International NNI
- Voice
- Interworking with the ATM backbone network