Figure 2

EXAMPLE OF BCPM3 "ROAD" MILEAGE TO TOTAL DISTRIBUTION CABLE LENGTH

Miles of Road	10									
Feet of Road	52,800	52,800	52,800	52,800	52,800	52,800	52,800	52,800	52,800	52,800
Area to be served	52,800,000	52,800,000	52,800,000	52,800,000	52,800,000	52,800,000	52,800,000	52,800,000	52,800,000	52,800,000
Number of Lots	1	4	9	16	25	36	49	64	81	100
Lots on a Side	1	2	3	4	5	6	7	8	9	10
Area per Lot	52,800,000	13,200,000	5,866,667	3,300,000	2,112,000	1,466,667	1,077,551	825,000	651,852	528,000
Length of Lot Side	7,266	3,633	2,422	1,817	1,453	1,211	1,038	908	807	727
Number of Branch Cables	-	-	1.5	2.0	2.5	3.0	3.5	4.0	4.5	5.0
Length of Branch Cables	-	-	2,422	3,633	4,360	4,844	5,190	5,450	5,652	5,813
Length of Backbone Cable	-	-	2,422	3,633	4,360	4,844	5,190	5,450	5,652	5,813
Total Cable Length	-	-	6,055	10,900	15,259	19,377	23,356	27,249	31,084	34,879
Ratio of Total Cable Length to Total Road Length	0%	0%	11%	21%	29%	37%	44%	52%	59%	66%

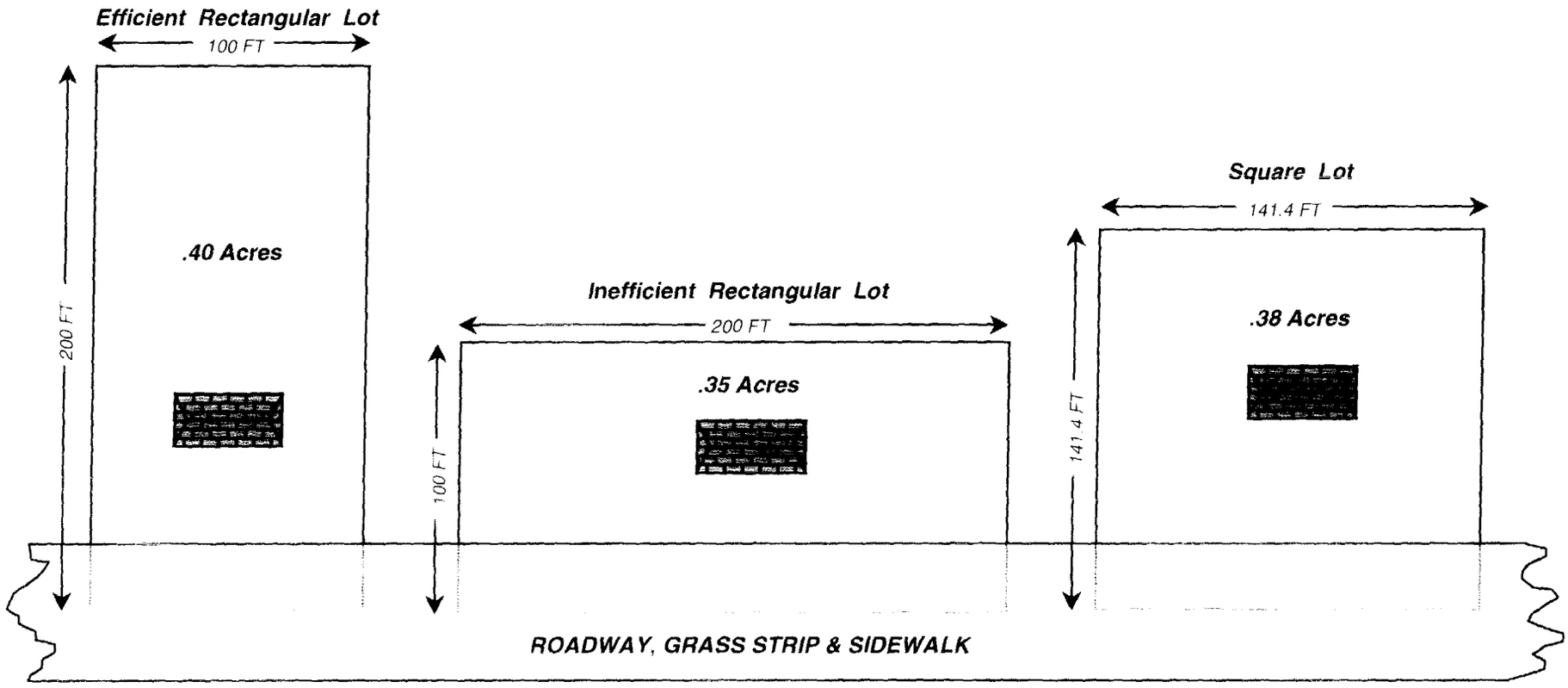
Feet of Road	52,800	52,800	52,800	52,800	52,800	52,800	52,800	52,800	52,800
Area to be served	52,800,000	52,800,000	52,800,000	52,800,000	52,800,000	52,800,000	52,800,000	52,800,000	52,800,000
Number of Lots	144	169	225	256	324	400	576	784	1024
Lots on a Side	12	13	15	16	18	20	24	28	32
Area per Lot	366,667	312,426	234,667	206,250	162,963	132,000	91,667	67,347	51,563
Length of Lot Side	606	559	484	454	404	363	303	260	227
Number of Branch Cables	6.0	6.5	7.5	8.0	9.0	10.0	12.0	14.0	16.0
Length of Branch Cables	6,055	6,148	6,298	6,358	6,459	6,540	6,661	6,747	6,812
Length of Backbone Cable	6,055	6,148	6,298	6,358	6,459	6,540	6,661	6,747	6,812
Total Cable Length	42,387	46,113	53,529	57,223	64,590	71,937	86,591	101,210	115,808
Ratio of Total Cable Length to Total Road Length	80%	87%	101%	108%	122%	136%	164%	192%	219%

Note that BCPM3 documentation states that distribution cable lengths are capped at total road distance

1/5/98

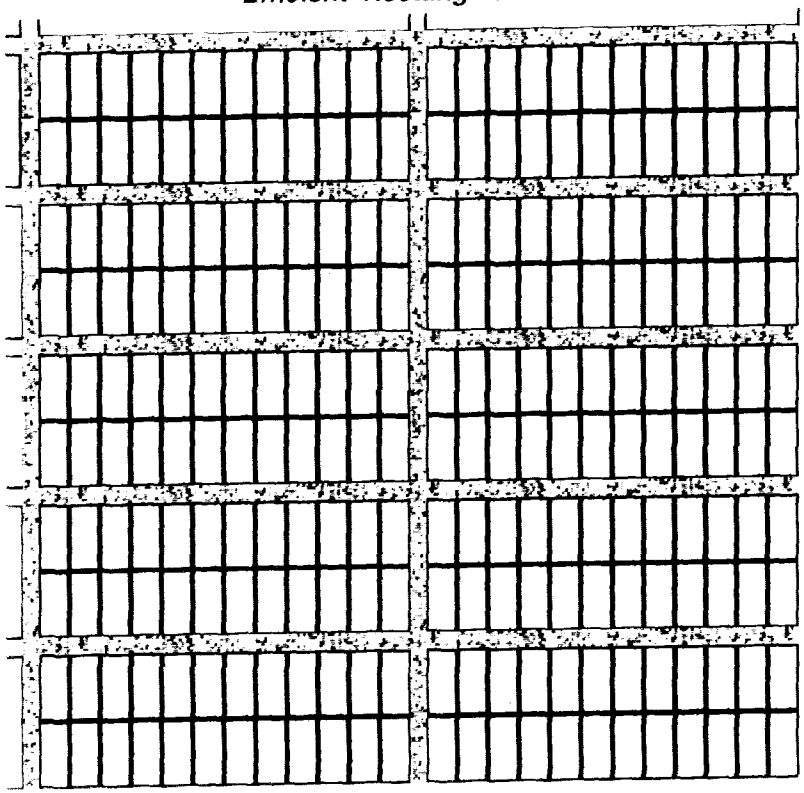
Illustration of Various Lot Designs

20,000 Square Feet of Land



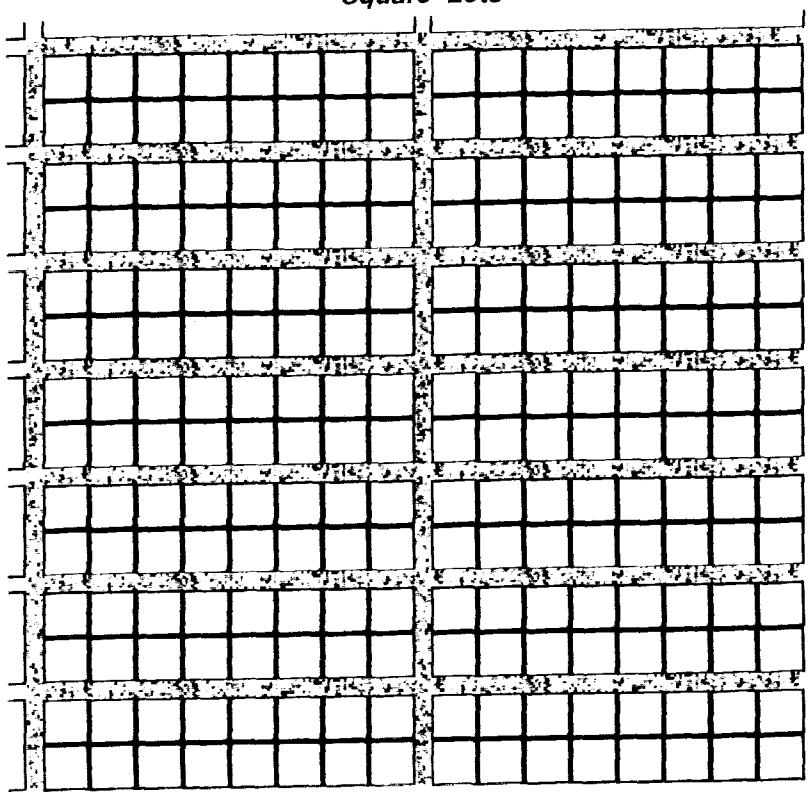
BCPM Square Lot Assumption is Inefficient

Efficient Rectangular Lots



7 Roads
14 Lengths of Grass Strip
14 Lengths of Sidewalk

Square Lots

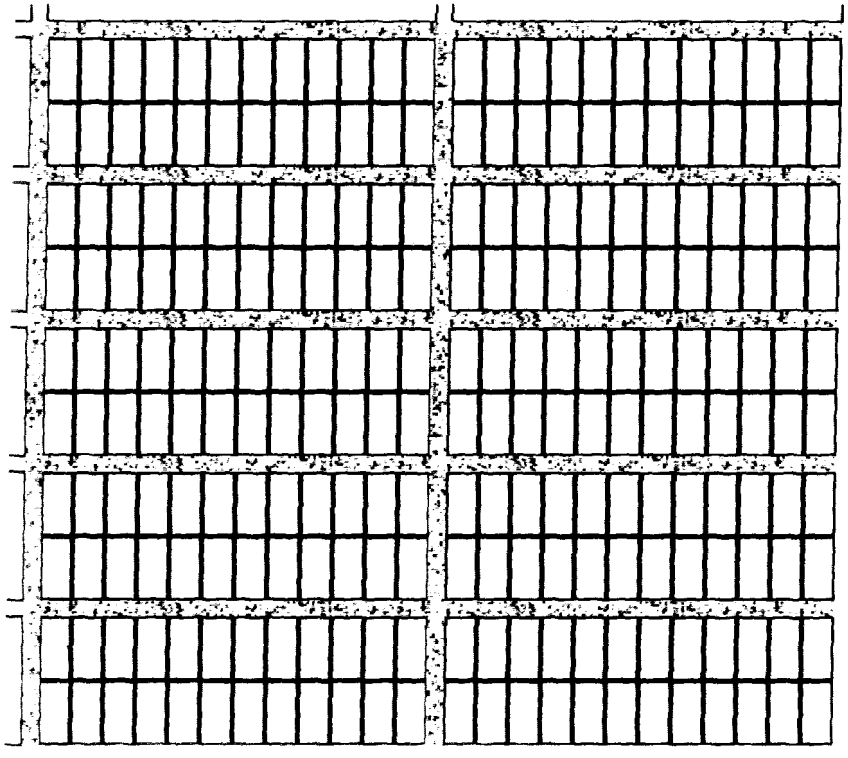


9 Roads
18 Lengths of Grass Strip
18 Lengths of Sidewalk

NOTE: ALL ROAD PAVING AT EXPENSE OF DEVELOPER
ALL GRASS STRIPS AT EXPENSE OF DEVELOPER
ALL SIDEWALKS AT EXPENSE OF DEVELOPER
USEABLE LOT SIZE IS REDUCED BY AMOUNT OF ROAD, GRASS STRIP & SIDEWALK AREA

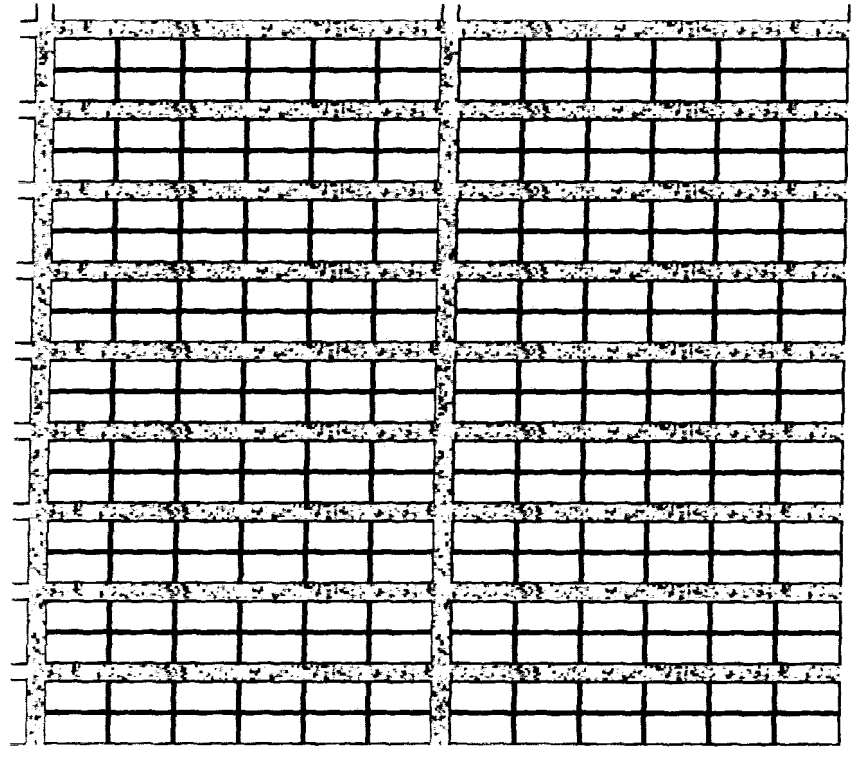
Illustration of Inefficient Rectangular Lot Design

Efficient Rectangular Lots



7 Roads
14 Lengths of Grass Strip
14 Lengths of Sidewalk

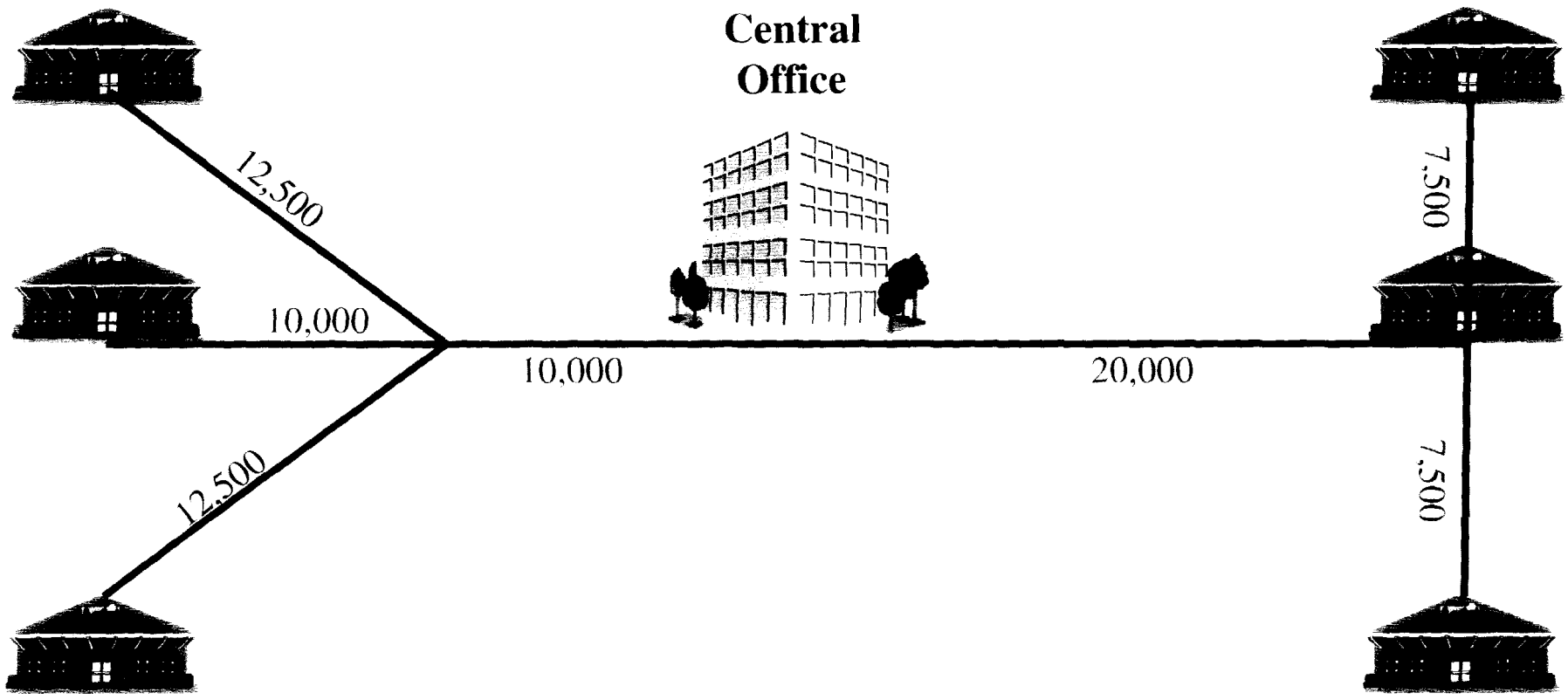
Inefficient Rectangular Lots



11 Roads
22 Lengths of Grass Strip
22 Lengths of Sidewalk

NOTE: ALL ROAD PAVING AT EXPENSE OF DEVELOPER
ALL GRASS STRIPS AT EXPENSE OF DEVELOPER
ALL SIDEWALKS AT EXPENSE OF DEVELOPER
USEABLE LOT SIZE IS REDUCED BY AMOUNT OF ROAD, GRASS STRIP & SIDEWALK AREA

BCPM Inflates Route Miles While Reducing Average Distance



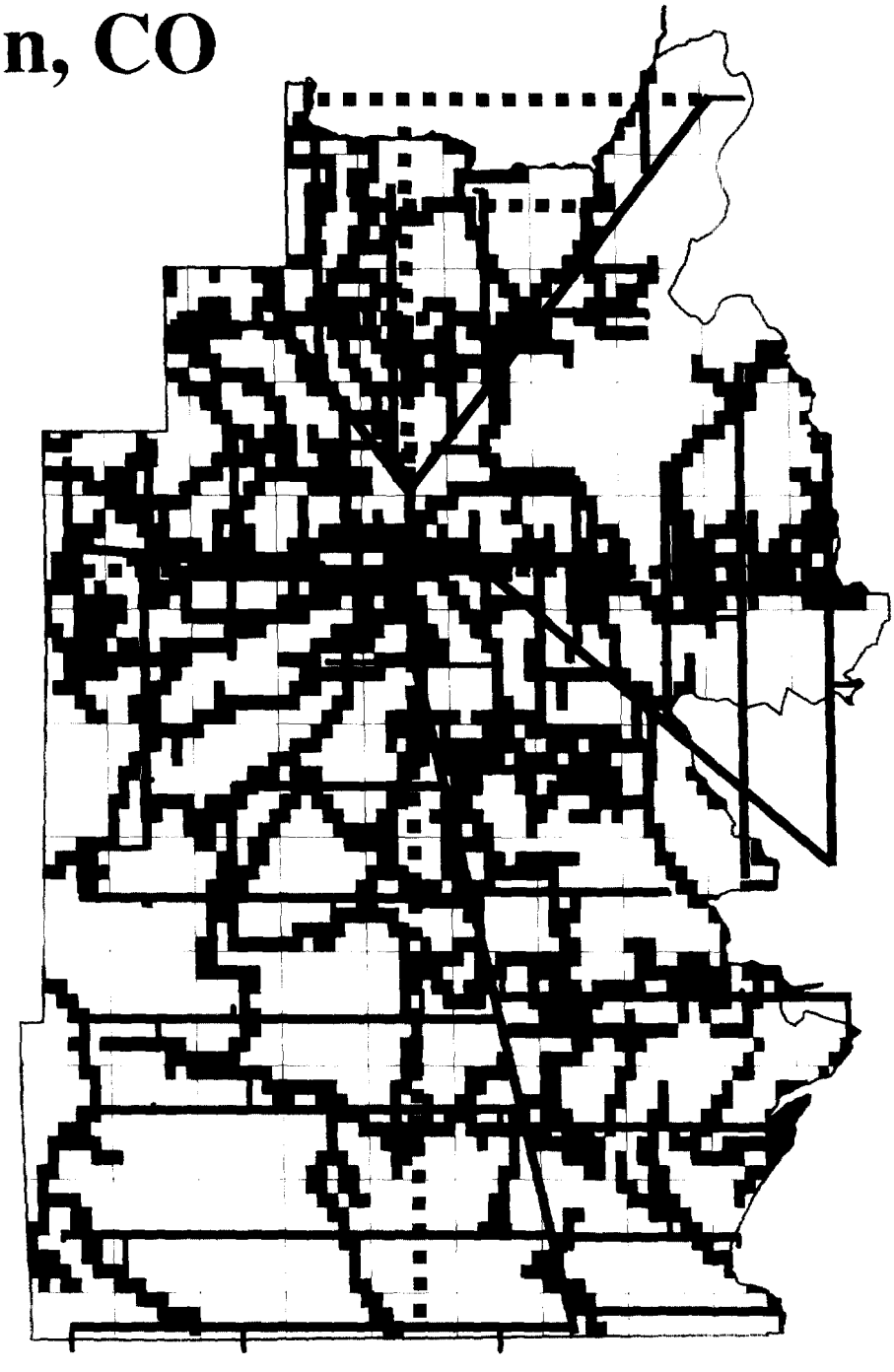
Average Distance = 21,667

Total Route (Structure) Distance = 45,000

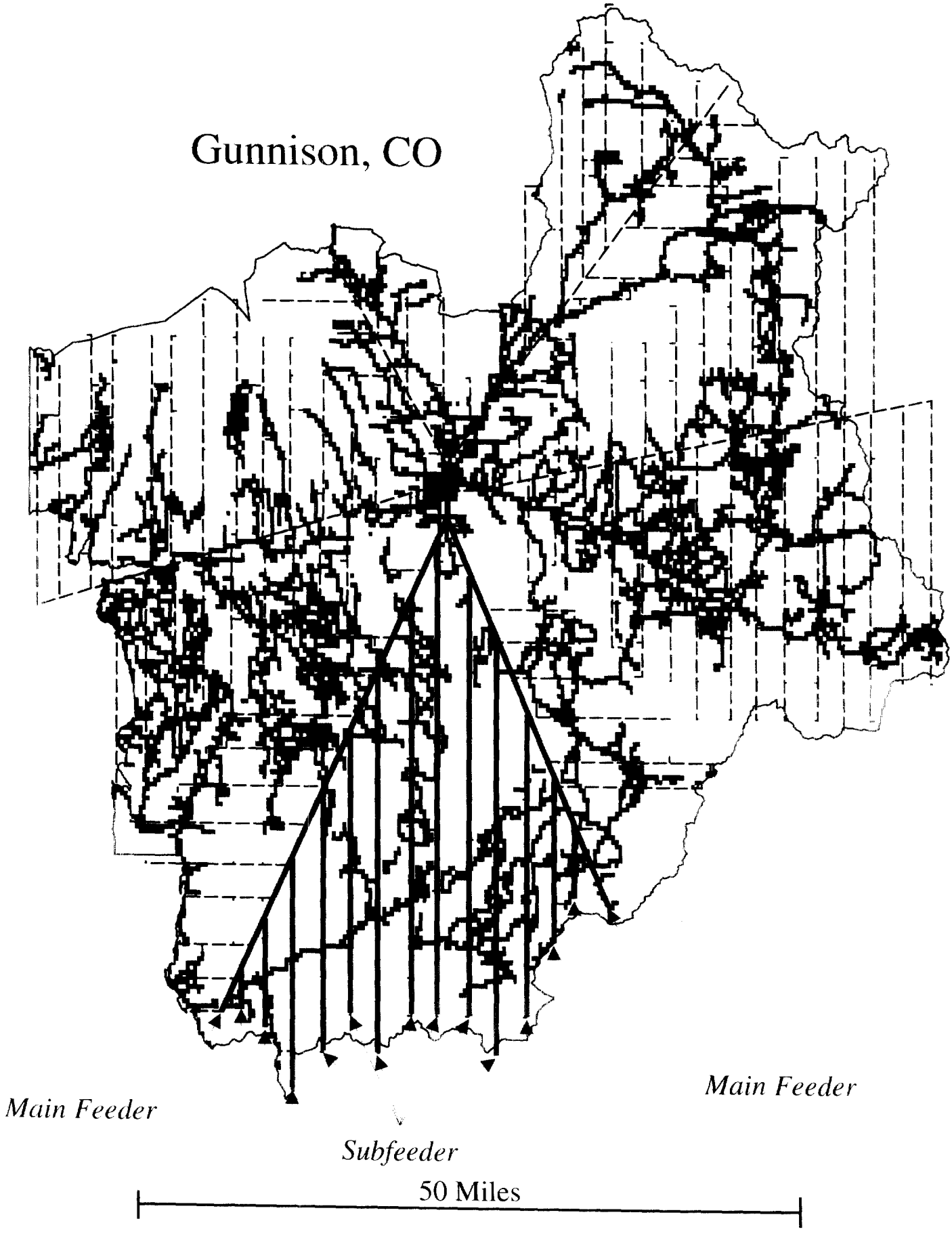
Average Distance = 25,000

Total Route (Structure) Distance = 35,000

Hayden, CO

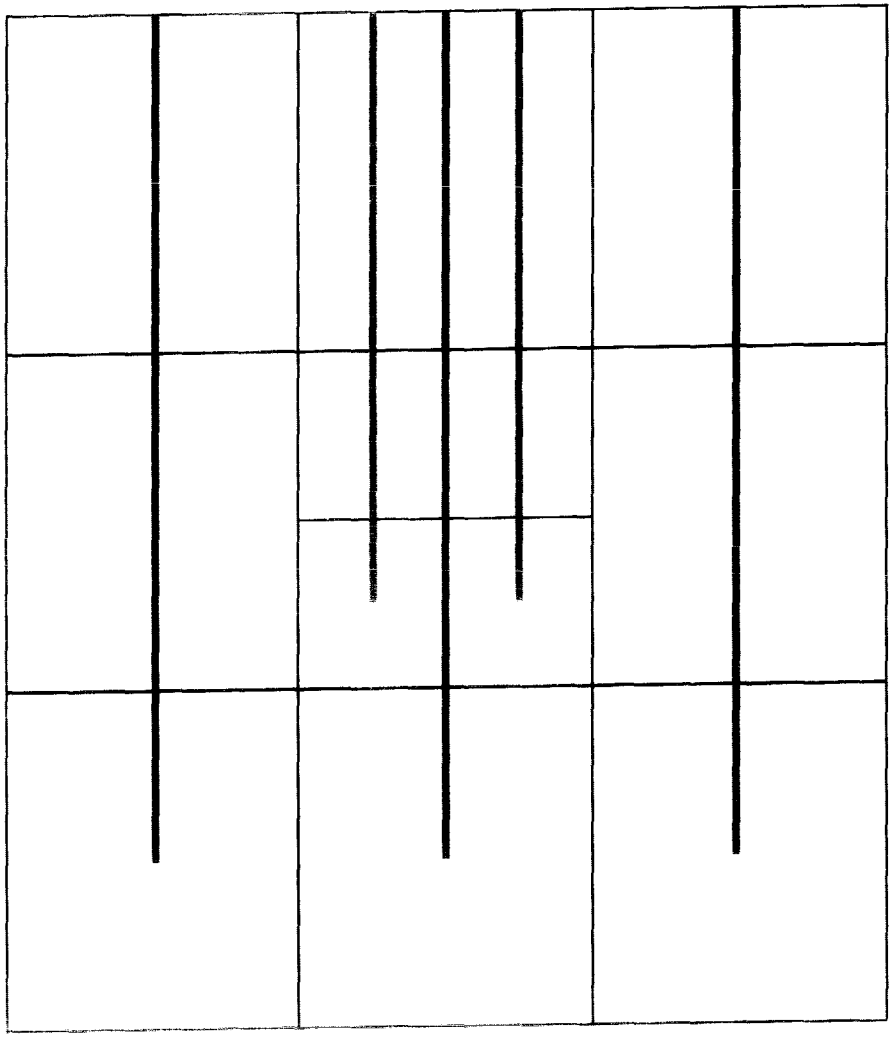


20 Miles

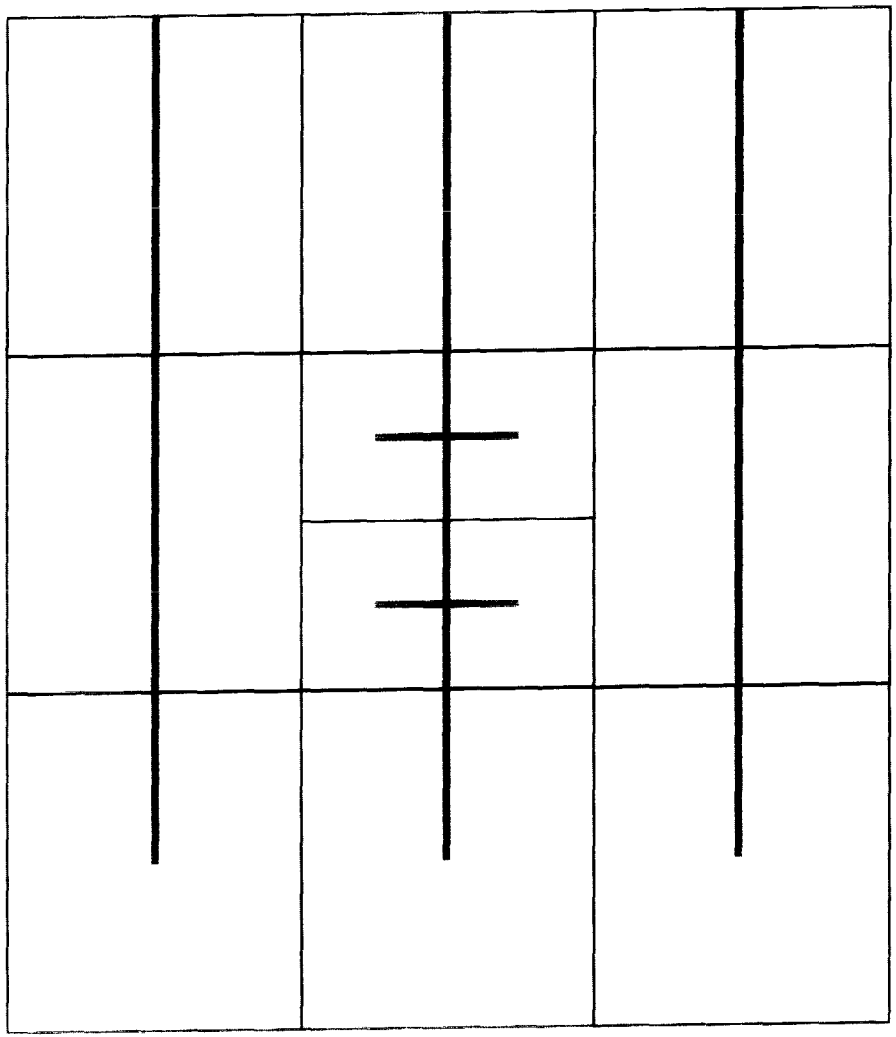

Gunnison, CO
Main Feeder
Main Feeder
Subfeeder
50 Miles

BCPM Subfeeder Design is Not Least Cost

BCPM Design



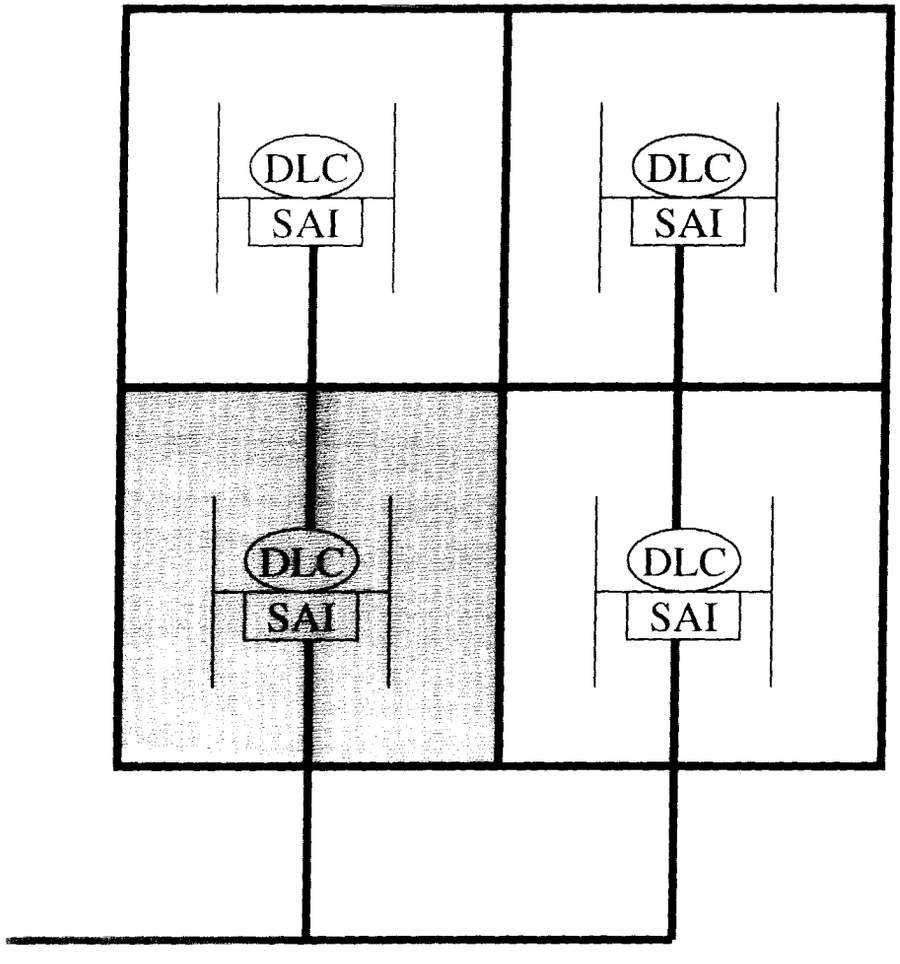
More Efficient Design



Subfeeder at 1/25 degree
Subfeeder to reach smaller grids

BCPM Criteria Results in Excessive Serving Areas and Excessive Investment

BCPM Design



Efficient Design

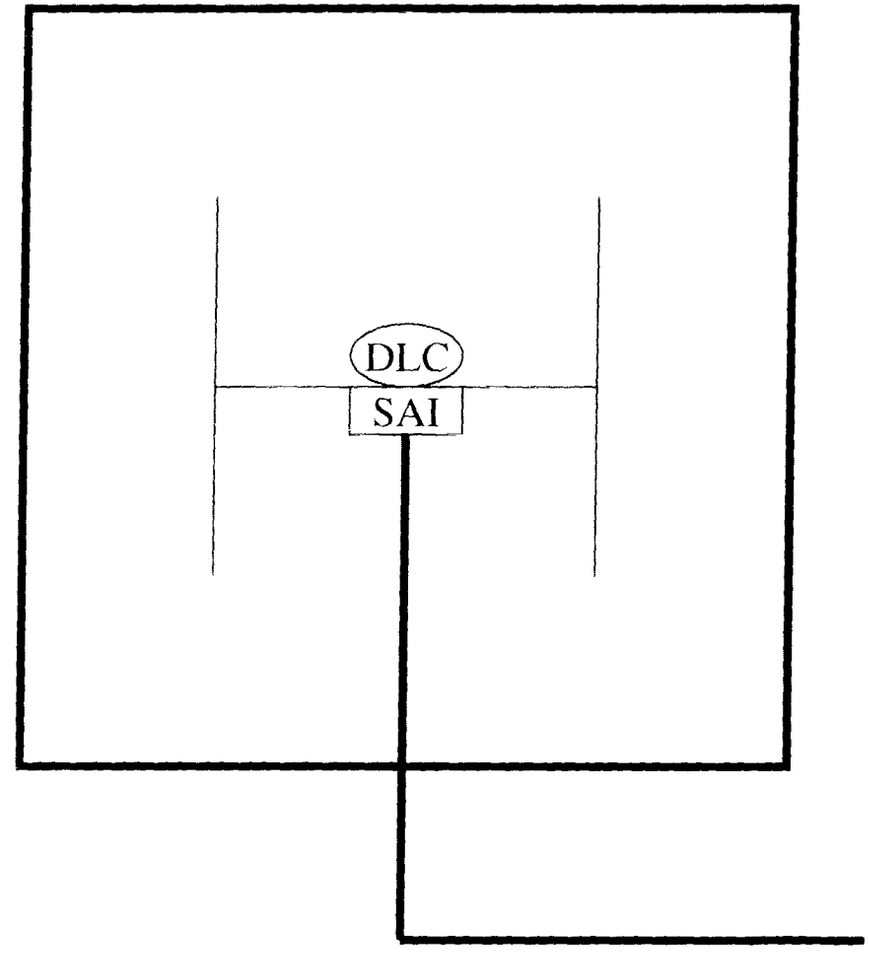


FIGURE 11

Litespan®-2000 Specifications

TYPES OF SERVICES

4-Wire
800 Service Line
800 Service Trunk
AIOD
Centrex Lines
Consolidation of SLC-96 Mode 1
Consolidation of SLC-96 Mode 3
Consolidation of SLC Series
5-Feature Package B
Dial Tone First Coin
DID
Digital Data Services (DDS)
DEC Transport
Fractional T1
FX Lines and Trunks
Hi-Cap T-1 Transport
Inter-office T-1
Intra-office T-1
ISDN
Off-Premises Extension
Off-Premises Station
P-Phone (Meridian Business Set)
PBX Tie Line
PBX Trunking
POTS
Private Network T1 Transport
Secretarial Line
Voice Data Type 1
Voice Data Type 2
Voice Data Type 3
WATS Line 2-Way
WATS Line Out
WATS Trunk 2-Way
WATS Trunk Out
Private Line Automatic Ring Down (PLAR)
DC Alarms

ENVIRONMENTAL CONDITIONS (PER TR-057)

Temperature	
CO & RT	-40° to +65°C (-40° to +150°F)

PHYSICAL MEASUREMENTS

Rack Assembly		
	Height	213 cm. (7 ft.)
	Width	66.7 cm. (26 in.)
	Depth	30.8 cm. (12 in.)
Outdoor Cabinet		
	Height	152.4 cm. (60 in.)
	Width	203.2 cm. (26 in.)
	Depth	104.2 cm. (41 in.)

BELLCORE COMPLIANT

The Litespan-2000 and Sintspan systems are designed in compliance with the following major Bellcore Standards:

Operations Technology Generic Requirements (OTGR)
TR-TSY-000008
TR-TSY-000057
TR-TSY-000253
TR-TSY-000303
TR-TSY-000496
TR-TSY-000909

OPTICAL INTERFACE

Fiber	Single-Mode
Connectors	PC/PC, or Customer-Specified
Wavelength	1310 ± 30nm
Format	SONET

DS1 INTERFACE

DSX-1	Up to 56 DS1 positions available per channel bank
Line Code	B8ZS, ZCS
Framing Formats	SF (D4, SLC-96), ESF
Alarm Monitoring	RCV frame slips, AIS, ESF, CRC, Yellow, BPVs

T1 INTERFACE

T1 SPAN	Up to 56 T1 positions available per channel bank
Line Code	B8ZS, ZCS
Framing Formats	SF (D4, SLC-96), ESF
Alarm Monitoring	RCV frame slips, AIS, ESF, CRC, Yellow, BOVs
Line Powering of Span Voltage	-130 Vdc
Current	60 mA
Line Build Out (XMIT)	7.5, 15, 22.5 dB @ 772 kHz
Line Build Out (RCV)	ALBO

POTS

Capacity	Up to 224 lines per channel bank 4 lines per POTS Card
Loop Resistance	1930 ohms (including set)

COIN

Capacity	Up to 224 lines per channel bank 4 lines per Coin Card
Loop Resistance	1750 ohms (including telephone set) Dial Tone First/Coin First

UVG (UNIVERSAL 2-WIRE)

Capacity	Up to 224 lines per channel bank 4 lines per UVG Card
Loop Design	Carrier Serving Area Rules Loop Start/Ground Start Loop Reverse Battery

EQUALIZED UNIVERSAL VOICE GRADE (EUVG)

Characteristic	Impedance	Min. (dB)	Max. (dB)
XMIT TLP	600Ω	-9.0	+1.0
	900Ω	-9.0	+1.0
RCV TLP	600Ω	-6.0	+6.0
	900Ω	-6.0	+6.0

UNIVERSAL 4-WIRE (U4W)

4-Wire Impedance	Provisionable for 150, 600 or 1200 ohms
Programmable Gain	0.1 dB steps over a 24.5 dB range
Signaling Mode	FXS, FXO, DX

4-Wire E & M (EM4)

Signaling Modes	EM4 modes I to V Tandem modes I and II PLR (Pulse Link Repeater) Modes I and II
4-Wire Impedance	600 ohms
Provisionable Gain	0.1dB steps over a 24.5 dB range
Signaling Leads	E, M, SG, SB

OFFICE CHANNEL UNIT DATA PORT (OCUDP)

Data Rates	2.4, 4.8, 9.6, 19.2, 56 or 64 kbps
Loopback Types	OCU, CSU, DSU, and customer-controlled far-end loopback
Provisioning Options	Secondary channel, customer data error correction

DSO DATA PORT (DSODP)

Primary Channel Rates	Secondary Channel Rates
2400	133.3
4800	266.6
9600	533.3
19200	1066.6
56000	2666.6
64000	Sec. Chan. Not Available

BASIC RATE INTERFACE UNIT (BRIU)

Data Formats	2B+D, B1+D, B2+D, or D only
DSL Data formats	2B1Q
Bit Error Rate	<10^{-7} for loops 0 and 2-15 with all impairments

ASYNCHRONOUS DS1U (ADS1U)

Framing Formats	N/A (transparent)
Line Coding	AMI
Zero Suppression	B8ZS
Equalization	1 to 655 feet (distance from cross-connect), 5 steps

ASYNCHRONOUS T1U (AT1U)

Framing Formats	N/A (transparent)
Line Coding	AMI
Zero Suppression	B8ZS
Equalization	
Receive	Automatic Line Build-Out (ALBO)
Transmit	0 dB, 7.5 dB, 15 dB, 22.5 dB

ELECTRONIC BUSINESS SET (EBS) (P-PHONE)

Maximum Loop Length For Powered Phones (38 mA max.)	500 Ω DC loop resistance or < 20 dB @ 8 kHz at the network interface
Maximum Loop Length For Locally Powered Phones (20 mA max.)	500 Ω DC loop resistance or < 20 dB @ 8 kHz at the network interface
Battery:	
Loop Powered - Display	38 mA max. per line
Loop Powered - No Display	20 mA max. per line
Locally Powered	20 mA max. per line
Loop Current Detection Threshold	Must detect > 4.5 mA Must not detect < 1.7 mA
Loop Current, 52.0 Ω Volt Battery	38 mA max. into Telset

DSC COMMUNICATIONS

1000 Coit Road • Plano, Texas 75075 • (972) 519-3000 • 1-800-777-6804
1420 McDowell Blvd. North • Petaluma, CA 94954 • (707) 793-7000

Specifications subject to change without notice.
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LSP2000-AP6

POTS

Capacity	Up to 224 lines per channel bank 4 lines per POTS Card
Loop Resistance	1930 ohms (including set)

Figure 12

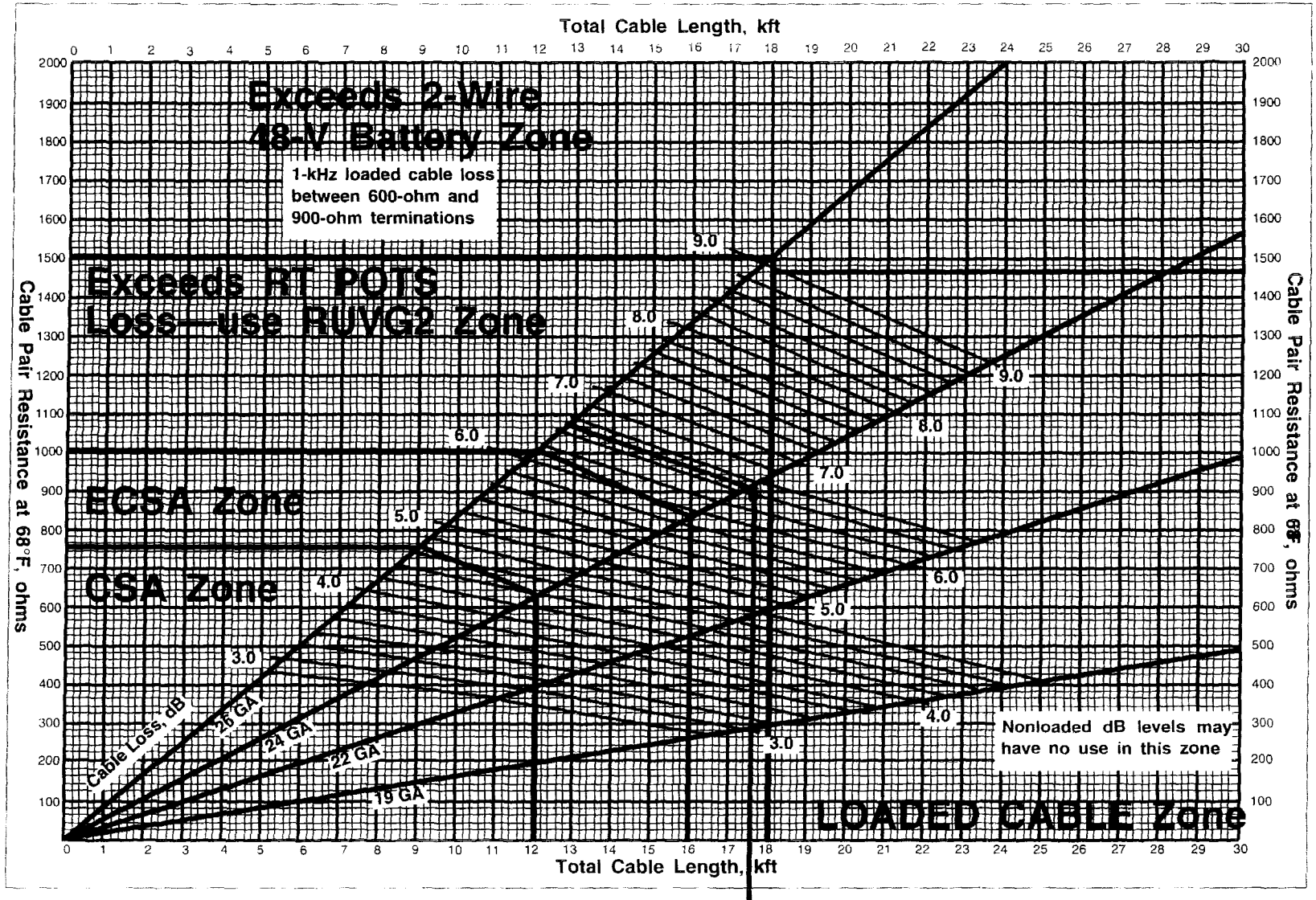
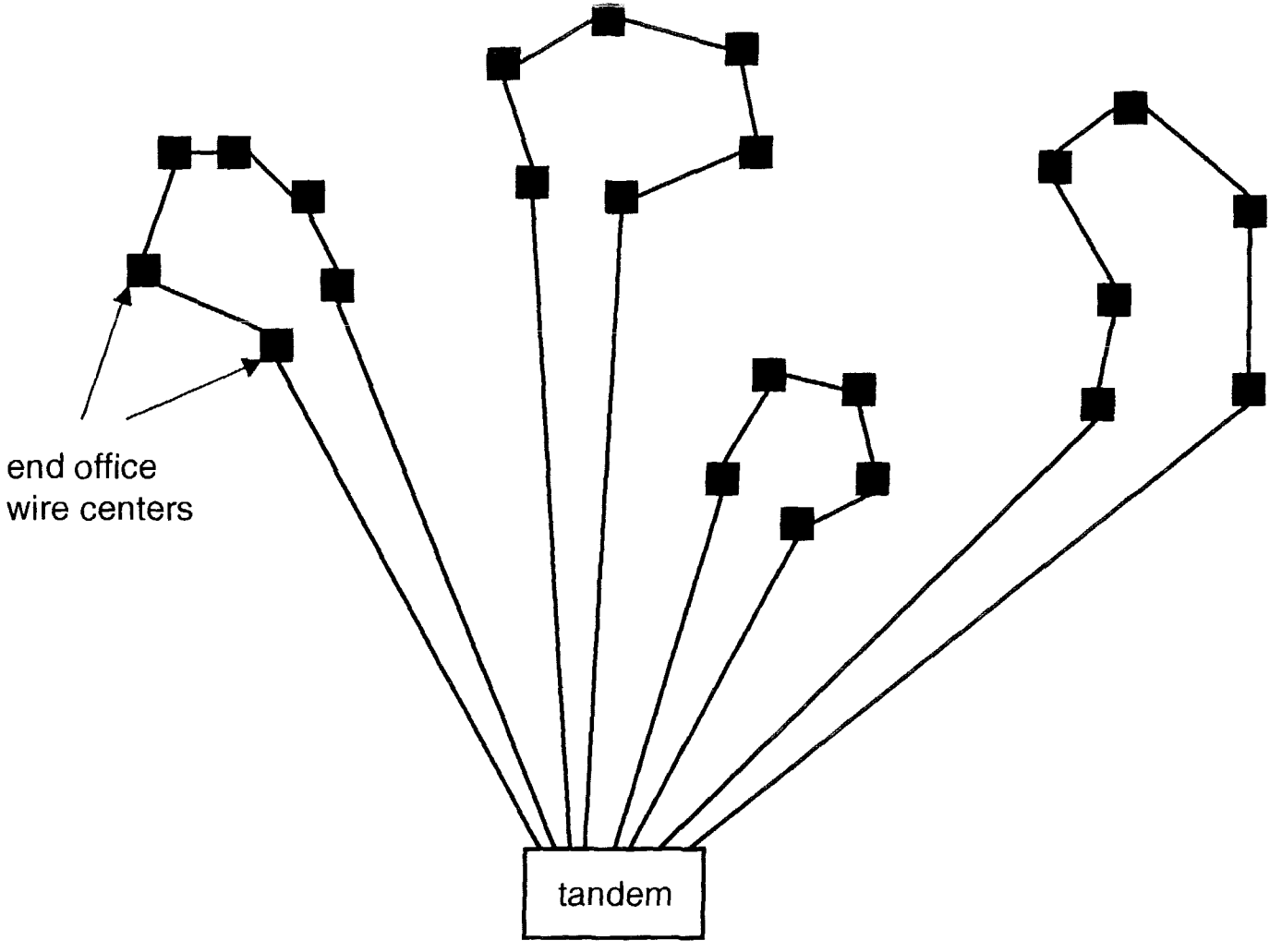


Chart III. OSP Cable Pair Resistance vs. Length, in kilofeet, for CSA & ECSA Zones, with 1-kHz Nonloaded Cable Loss between 600-ohm Terminations

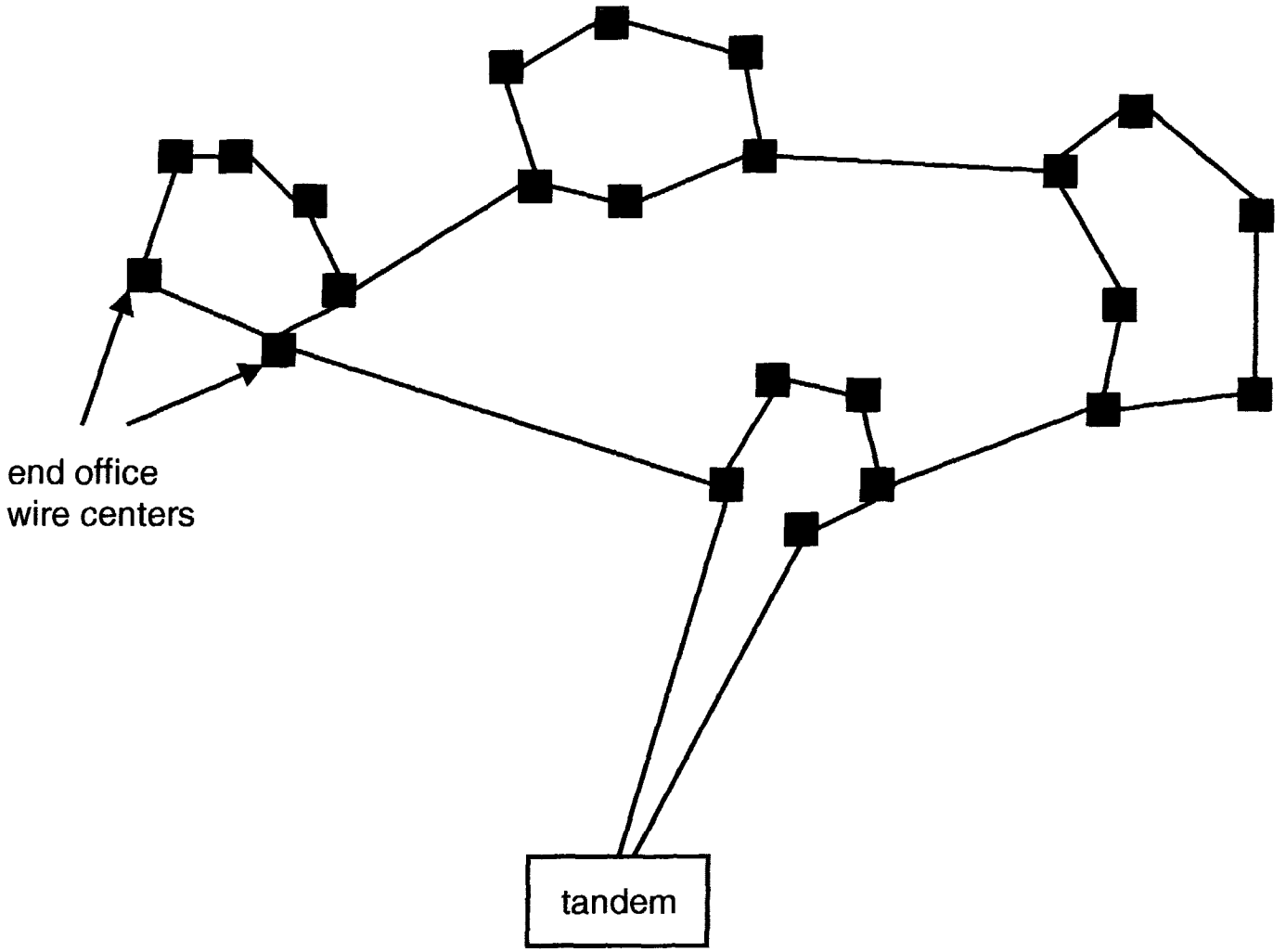
Figure 13



Efficient and inefficient tandem ring arrangements:

Inefficient ("Lollipop")

Figure 14



Efficient and inefficient tandem ring arrangements:

Efficient ("ring of rings")