PLANT ANNUAL COST DATA FOR SYSTEM DESIGN PURPOSES

CONTENTS

1. GENERAL

1.1 This section provides REA borrowers, consulting engineers, and other interested parties with technical information for use in the design and construction of REA borrowers' telephone systems. It furnishes annual cost data for various items of plant together with information for applying the data to system designs. This issue replaces Issue No. 3 dated July 1968 and one Addendum thereto. Revised depreciation and maintenance factors are included for various types of equipment.

1.2 This section is intended as a guide-line for using annual cost information in engineering studies related to system designs. If appropriate factors can be developed from individual system operating data, these factors should replace those found in these guidelines.

1.21 The cost factors are based on telephone industry experience, modified, where appropriate, to reflect experience suitable to the types of rural telephone systems which generally receive REA financing assistance. The use of the cost factors presented is recommended except where local conditions, unusual circumstances, or requirements of regulatory bodies indicate the use of other factors or methods.

1.3 The primary application of the annual cost data will be in the Area Coverage Design, the details of which are discussed in REA TE&CM 205, "Preparation of an Area Coverage Design." It is essential, however, that engineering judgment govern the design process. Initial and annual cost data are used in economic selection studies to supplement and support engineering judgment and decisions. The objective is to choose the most suitable new facilities. In general, the design that has the lowest annual cost should be selected. However, other considerations such as the amount of capital required, reliability and quality of service, connecting company arrangements, availability of equipment, flexibility for meeting unforeseen conditions, or other effects on system operation may outweigh annual cost considerations.

1.4 Most of the data discussed herein applies throughout the country. Some local variations are included, where measurable differences are known to exist. There will be conditions in certain areas which will contribute to greater or lesser annual costs than those set forth. The engineer should consider these fully and in such cases use data applicable to the area. Appropriate explanations of such deviations should be included in the narrative of the Area Coverage Design or Supplemental Loan Proposal.

1.5 The following components constitute the major annual cost elements to be considered in the comparison of alternative designs. These annual cost elements are used to adapt the first cost economic comparisons of alternate designs to a time based economic comparison.

(a) Depreciation
(b) Maintenance
(c) Return on investment (return on equity, debt service)
(d) Federal, state income taxes
(e) Property taxes and insurance
(f) Traffic expenses
(g) Miscellaneous expenses and revenues (toll settlements, lease of facilities, pole rentals, electrical power supply costs, etc.)

2. DEPRECIATION

2.1 Depreciation is defined as an expense due to loss in service life not restored by maintenance. It is caused by wear and tear, decay, obsolescence, and inadequacy. Additional causes may be changes in the art, fluctuations in demand, and legal requirements. Depreciation expense is established to charge the expected loss in value of a plant component to system operating costs during the expected service life of the component.

2.2 Depreciation rates distribute the original costs, other components of plant and other tangible capital assets (plus cost of removal less salvage where applicable) in a definite manner over the period of expected service life of the unit. The service life is defined as the interval between the time of installation of the unit and the time of its retirement.

2.3 Table 1 (Suggested Maximum Depreciation Rates and Service Lives) lists values for use with items of existing plant. These depreciation rates are recommended for the country as a whole.

2.31 Table 2 (Suggested Maximum Depreciation Rates and Service Lives) lists values for use with items of new plant construction. These depreciation rates are recommended for the country as a whole.

2.32 Table 3 (Composite Plant Depreciation) was created from data collected from a representative sample of borrowers and the depreciation rates approved by the applicable PSC (Public Service Commission) in their states. A weighting factor was developed for each of four classes of borrowers (large holding companies, small holding companies, small commercial companies and cooperatives) to adjust their reported share of the Plant-in-Service balance to the total value reported in the annual Statistical Report. Table 3 provided the basic data from which REA determined the rates listed in Tables 1 and 2.

2.33 Occasionally items of plant may be depreciated at an accelerated rate because of planned retirement much shorter than their useful serice life. Depreciation rates based on the expected life should be calculated for such items.

2.34 The life of exposed plant items is reduced in coastal, industrial, and other areas with corrosive atmospheres. The depth of the coastal area ranges up to 20 miles from the ocean. Map 1 shows the general outline of coastal areas and other areas where higher depreciation rates for exposed plant may be justified.

2.35 From experience within the operating region of a project, the engineer must determine any conditions which will indicate the possibility of accelerated corrosion. Such conditions might include industrial or mining installations, chemical plants, fertilizer plants, etc., where air pollution is present. Also hot, humid areas may be a cause of serious corrosion such as where Spanish Moss grows and collects along the lines.

2.36 Although corrosion is probably the most widespread factor in accelerated deterioration of outside plant, the engineer must be aware of other factors that may be only local or regional in nature. For example, some factors may be rodent damage, extreme temperatures or wind driven sand or abrasives.

3. MAINTENANCE

3.1 Maintenance expense is the cost incurred in connection with the repair, inspection, adjustment, cleaning, and rearranging of plant components and the replacement of "minor" components of plant. Minor components are those units smaller than a unit of property as defined in the applicable Federal Communication Commission (FCC) Uniform System of Accounts. Table 4 (Average Annual Maintenance Costs) lists estimated factors for use in comparative studies.

3.2 The maintenance experience of operating telephone companies indicates that factors which result in substantial variations in the initial cost of identical items of plant in different parts of the country are not necessarily reflected in maintenance expense. Therefore, the method of expressing maintenance costs as a percentage of initial cost may lead to erroneous conclusions. For this reason, annual maintenance charges are almost entirely expressed as annual cost per unit of plant.

3.3 The engineer may adjust the estimate of annual maintenance costs for the local situation where justifiable. Local maintenance cost experience should be a minimum of duration of 2-3 years and pertain to the particular plant components being studied.

4. RETURN ON INVESTMENT AND INCOME TAXES

4.1 Two other components of annual cost are the return on the investment (both loan and nonloan funds) and income taxes. Because of the relationship between these two items, they have been combined into a single factor for purposes of these studies. The amounts required for these purposes will depend on the borrower's form of organization, practices of its management, its capital structure, and any limitations imposed by Federal or State regulatory bodies.

4.2 The following example illustrates a method of computing a single factor covering both the return on investment and income taxes:

(a)	Total REA loans outstanding (Original Loan Amounts).	$ 900,000
(b)	Total equity capital (capital stock, surplus memberships, patronage capital, etc.).	100,000
(c)	Total investment of capitalization.	$1,000,000
(d)	Annual interest on REA loans (8% of (a)).	72,000
(e)	Annual return on equity capital and/or margin for contingencies, etc. (for example, 12.75% of (b)).	12,750
(f)	Federal, State, and local income taxes, if any. (Determine borrower's ratio of such taxes to its net income or margin in latest year, (for example, 40%), and apply this ratio to (e)).	5,100
(g)	Required "Return and income taxes" (equals the sum of items (d), (e), and (f) for corporations paying income taxes or items (d) and (e) for most nonprofit corporations paying no income taxes).	$ 89,850

4.3 Factors developed from a borrower's experience should be modified when necessary to reflect changes in the relative amounts of loan and equity capital, tax rates, etc. The component for return and income taxes should then be tested to ascertain that it will provide the flow of cash required. For example:

(a)	Return and income taxes (net income or margin before interest and income taxes).	$ 89,850
(b)	Less income taxes, if any.	5,100
(c)	Net operating income or margin.	$ 84,750
(d)	Add depreciation (based on borrower's experienced or proposed composite rate).	63,600
(e)	Available for debt service.	$ 148,350
(f)	Less debt service (composite rate of amounts originally borrowed) (example, 5% of $2,000,000).	100,000
(g)	Available for contingencies, additions and replacements, dividends, etc.	$ 48,350

4.31 To ensure adequate provision for plant replacements during the debt amortization period, item (g) should be equal to at least one-half of item (d).

4.4 The annual charge factor for return and income taxes should be developed jointly by the borrower and the engineer. The engineer will be required to estimate the cost of construction. The borrower will indicate the nonloan funds furnished by the corporation, the desired rate of return on this investment, tax criteria, etc.

5.0 PROPERTY TAXES AND INSURANCE

5.1 Property taxes for operating telephone systems are frequently expressed as a percentage of the cost of construction even though, in some states, property assessments are based on physical units rather than on the book value of plant.

5.2 No suitable method of estimating property tax has been devised for new systems which would not tend to penalize higher first cost designs of some components of the system. It is therefore desirable not to include property tax in the annual cost studies of designs for new systems unless local data is available which will provide a reasonable estimate of the expected tax.

5.3 The property tax (expressed as a percentage of the cost of construction) of existing systems having approximately the same cost per station as the proposed addition should be used in the system design studies of the addition. This situation may arise for supplemental designs or when designs are prepared on a sectional basis.

5.4 The rates for fire and extended coverage insurance on buildings and their contents vary for many reasons. Attended or unattended operation, type of construction, method of heating, location and size of building are a few of the variables. Variations in rates as great as ten to one are possible so that with careful attention this annual operating expense associated with buildings and their contents can be materially reduced.

5.41 The engineer should obtain information on fire and extended coverage insurance rates locally because geographical variations make national generalizations unrealistic.

5.42 Before preparing plans and specifications for a building, the engineer should determine that the total estimated annual cost for the building is a minimum and that the locally derived insurance rates are applied.

6.0 MISCELLANEOUS EXPENSES AND REVENUES

6.1 The toll settlement and operator dial service assistance (DSA) agreements are two contracts which frequently enter into economic selection studies relating principally to toll line ownership, toll terminal locations, automatic toll ticketing, or station identifying service. Agreements for the joint use of plant with other utilities or leasing of facilities from or to other Intra-LATA or Inter-LATA carriers also affect annual charges. Portions of plant involved in such agreements and therefore, should be considered in annual cost studies where applicable.

6.2 Traffic expenses are the direct and indirect expenditures for providing operators to process telephone calls and to assist subscribers. An estimate of these expenditures is required in cost studies which compare the cost of providing ticketing or dial assistance services, versus having the connecting company provide them.

6.3 Table 5 (Annual Traffic Expenditure) lists expenses for various numbers of switchboard positions. The costs shown are for full time attendance of the switchboard.

TABLE 5
Annual Traffic Expenditure

Number of Position	Traffic Expense*
1	100%
2	175%
3	240%
4	300%
5	350%
6 or more	add 50% for each position

*Use local loaded wage rate for one full-time operator and multiply by appropriate percentage.

7. DISCUSSION OF COST STUDIES

7.1 Engineering studies for the economic selection of alternatives concerning the renewal or extension of telephone facilities should convert all costs to a common base for comparison. The Present Worth of Annual Charge (PWAC) method effectively does this as it develops the total Present Worth of Annual Charges necessary to support an investment. Cost elements to be considered in making PWAC comparisons should include all expenses incurred by virtue of each alternative investment. These include depreciation, maintenance, cost of money, and other expenses as previously described. Expenses for plant additions to be made at different times should be considered in the study in such a manner as to determine the proper relationship between alternative plans. The present worth costs of a new facilities should be supplemented where applicable to include the continuing present worth costs of plant items that are being replaced.

7.2 When the PWAC comparison for two or more plans indicate less than 10 percent difference, other factors should be carefully considered in the recommendation of the optimum plan. Such factors as obsolescence, flexibility for growth, etc., may have an important bearing on the decision.

7.3 A detailed explanation of the development of PWAC studies can be found in TE&CM 219, "Present Worth of Annual Charge Studies for System Design". In addition, examples of the use of PWAC studies in outside plant design can be found in TE&CM 231, Issue 2, "Design Techniques of Feeder-Distribution Cable Engineering (SAVE)" and in TE&CM 232, Issue 2, Transmission Design and Costs Considerations of Feeder-Distribution Cable Engineering (SAVE)".

8. COMPOUND INTEREST THEORY

8.1 For many years, the interest rate and REA's decision to provide financial assistance to construct telephone plant capacity sufficient for 5 years growth made present worth annual charge studies unnecessary.

8.2 The variable interest rates, the wide divergence in growth rates between borrowers and between exchanges in the same system, and the impracticality of attempting to reinforce buried cables several times now make present worth of annual charge studies worthwhile. System planners should familiarize themselves with books such as "Engineering Economy" by the A.T. & T. Engineering Department, or "Engineering Economics" by Ollie Smidt. A more general book on engineering economics such as "Engineering Economy" by Grant and Ireson is also recommended.

8.3 Figure 1 (Cost of Money and Circuit Growth Nomograph) has been included to help in decision making. It can be used in determining whether a larger cable should be installed initially or to compare different size installations of electronic equipment. Because of the difference in annual charges, it should not be used to compare electronic reinforcement with cable reinforcement. See TE&CM 231 and 232 for examples of mixed plant reinforcement.

9. COST OF MONEY AND CIRCUIT GROWTH EXAMPLES

9.1 In the following examples, the Future Worth refers to the number of dollars that will be required to do some predetermined construction at some time in the future. In annual cost studies, items that are identical should be removed from the analysis. Figure 1 is another example of removing identical costs from alternative studies. A basic assumption was made that the Depreciation, Maintenance, Taxes, and other annual charges can be expressed as a percentage of the installed cost of the facilities and the <u>sum</u> of these individual percentages is identical for the two plans. Therefore, all annual charges except the cost of money can be removed from the analysis. This is a reasonable assumption when comparing two cables of the same type or two electronic plans. It is not a valid assumption when comparing a cable reinforcement with an alternative carrier reinforcement.

9.2 Examples are provided to show some uses of the Cost of Money and Circuit Growth Nomograph. The nomograph is a very convenient tool to help decide plant design issues. The method shown in Example 1 (paragraph 9.42) generally justifies an increased number of pairs for cables 50 pair and smaller than the minimum recommendations found in TE&CM 210, "Telephone System Design-Sizing Criteria." The example does not take into consideration the costs of converting the feeder portion of the cable to distribution use, which will vary due to factors such as distance from central office, size of reinforcing cable, or the type of electronic reinforcing facility. These factors should be considered in an actual study. Decisions made through the use of the nomograph generally reduce considerably the effort required to complete the full fledged alternative studies.

9.3 When uniform growth is expected in an exchange, the maximum fill of the various size cables can be determined on the nomograph. Since in most rural systems cables of 200 pair and less generally contain both feeder and distribution complements, the maximum fill referred to should generally apply to the distribution pairs. It is expected that during the life of the cable the feeder pairs will gradually be converted to distribution use by applying pair gain devices to a reduced number of feeder pairs or by transferring the feeder circuits to an all feeder cable. TE&CM 628 "Plastic Insulated Cable Plant Layout" defines feeder and distribution pairs.

9.4 USE OF FIGURE 1

9.41 In Example 1, another identical cost is removed from the two plans. The cost of the initial installation of a 25 pair cable is eliminated from consideration by deducting its costs from both plans. The present worth of the second 25 pairs in the 50 pair cable is the difference between the cost of the 50 pair and the 25 pair cables. The future worth is the cost of installing a second 25 pair cable in the breakeven year.

9.42 Example 1: If (1) a 4.5 KF (kilofoot) length of 25-24 cable costing $3,500 initially (and 15% additional in 5 or more years in the future) has 8 distribution pairs and 7 feeder pairs working at cutover, (2) a 50-24 cable costing $5,000 would appear to meet substantially all of the 25-year requirements of the serving area, (3) the compound interest rate is 8 percent, and (4) the circuit growth rate in this length of cable is expected to be 5 percent compounded annually:

a. What is the minimum number of years before reinforcement of the 25 pair cable with another 25 pair cable is economical?

First compute the ratio of the future expenditure for the second 25 pair cable to the incremental cost of the second 25 pair in the 50 pair cable.

$$\frac{(FW)}{(PW)} = \frac{\$3,500 + (.15 \times \$3,500)}{\$5,000 - \$3,500} = \frac{\$4,025}{\$1,500} = 2.7$$

Using Figure 1 and a straight edge, connect this ratio (2.7) to the cost of money (8 percent), and read the breakeven year (approximately 13 years). Reinforcement of the 25 pair cable with a second 25 pair cable should not take place in less than 13 years or initial installation the 50 pair cable would be more economical.

b. With the economical choice at 13 years and if the total pair growth is 5 percent, what is the maximum fill?

The economical maximum fill is determined by laying a straight edge between 13 years and 5 percent growth and is approximately 55 percent.

c. What is the economical choice in this case?

With 8 initial distribution pairs (32 percent fill), and 15 total initial feeder plus distribution pairs (60 percent fill) the 25 pair cable appears adequate.

9.43 Example 2: If (1) analog station carrier can be installed in 8 channel groups or digital subscriber carrier in 24 channel groups, (2) field installation of groups at a particular location is to be made no more than once in 18 months, (3) annual circuit growth is 10 to 15 percent (4) one channel is used for maintenance and (5) one channel is reserved to provide new service quickly.

a. From Figure 1, what is the recommended percentage for working versus wired channels:

If the breakeven year is 1 1/2, the percent circuit growth is 15, and the recommended maximum working fill is 80 percent.

b. What is the recommended fill range for one or more 8 channel groups of station carrier at the same location?

	Minimum Working Fill (2 channels - Min.)	Maximum Working Fill (80% Max.)
Group 1	2 out of 8 = 25%	6 out of 8 = 75%
Groups 1 & 2	7 out of 16 = 43%	12 out of 16 = 75%
Groups 1, 2, & 3	13 out of 24 = 54%	19 out of 24 = 79%
Groups 1, 2, 3, & 4	20 out of 32 = 62%	25 out of 32 = 78%

c. What is the recommended percentage working fill range?

25 percent to 79 percent.

d. What is the recommended percentage fill for one or more 24 channel subscriber carrier groups at the same location?

	Minimum Working Fill (2 channels - Min.)	Maximum Working Fill (80% Max.)
Group 1	2 out of 24 = 8%	19 out of 24 = 79%
Group 1 & 2	20 out of 48 = 41%	38 out of 48 = 79%
Group 1, 2, & 3	39 out of 72 = 54%	57 out of 72 = 79%
Group 1, 2, 3, & 4	58 out of 96 = 60%	76 out of 96 = 79%

e. What is the recommended percentage working fill range?

8 Percent to 79 Percent.

TABLE 1

SUGGESTED
MAXIMUM DEPRECIATION RATES AND SERVICE LIVES
(EXISTING PLANT)

DEPRECIATION ACCOUNT		MAXIMUM DEPRECIATION RATE (%/YR)	SERVICE LIFE (YRS)
212.0	BUILDINGS	4.00	25
221.0	CENTRAL OFFICE EQUIPMENT-GENERAL	9.00	11
232.0	STATION CONNECTION-OTHER	6.00	17
241.0	POLE LINES	6.00	17
242.1	AERIAL CABLE	5.00	20
242.2	UNDERGROUND CABLE	3.50	29
242.3	BURIED CABLE	4.50	22
242.4	SUBMARINE CABLE	5.00	20
243.0	AERIAL WIRE	15.00	7
244.0	UNDERGROUND CONDUIT	3.00	33
261.0	FURNITURE/OFFICE EQUIPMENT	10.00	10
254.0	MOTOR VEHICLE	20.00	5
ALL BUILDING COMPOSITE		4.00	25
ALL CENTRAL OFFICE EQUIPMENT COMPOSITE		9.00	11
ALL CUSTOMER PREMISE EQUIPMENT COMPOSITE		6.00	17
ALL OUTSIDE PLANT COMPOSITE		4.70	21
ALL GENERAL COMPOSITE		16.10	6
ALL PLANT COMPOSITE		6.60	15

TABLE 2

SUGGESTED
MAXIMUM DEPRECIATION RATES AND SERVICE LIVES
(NEW CONSTRUCTION)

DEPRECIATION ACCOUNT		MAXIMUM DEPRECIATION RATE (%/YR)	SERVICE LIVES (YRS)
212.1	BUILDINGS	4.00	25
212.3	LEASEHOLDS	4.00	25
221.0	CENTRAL OFFICE EQUIPMENT-GENERAL	7.50	13
221.1	CENTRAL OFFICE EQUIPMENT-MANUAL SWTCHBOARD	12.00	8
221.2	CENTRAL OFFICE EQUIPMENT-TSPS	8.00	13
221.3	CENTRAL OFFICE EQUIPMENT-ELEC-MECH	12.00	8
221.4	CENTRAL OFFICE EQUIPMENT-CROSSBAR	10.00	10
221.5	CENTRAL OFFICE EQUIPMENT-ELEC ANALOG	10.00	10
221.6	CENTRAL OFFICE EQUIPMENT- DIGITAL	7.00	14
221.7	AUTOMATIC MESSAGE RECORDING	20.00	5
221.8	CENTRAL OFFICE EQUIPMENT-CIRCUIT	10.00	10
221.9	CENTRAL OFFICE EQUIPMENT-SUBSCRIBER CARRIER	10.00	10
221.10	CENTRAL OFFICE EQUIPMENT-RADIO	10.00	10
221.11	CENTRAL OFFICE EQUIPMENT-COMPOSITE	8.00	13
232.0	STATION CONNECTION-OTHER	6.00	17
241.0	POLE LINES	6.00	17
242.1	AERIAL CABLE	5.00	20
242.2	UNDERGROUND CABLE	3.50	29
242.3	BURIED CABLE	4.50	22
242.4	SUBMARINE CABLE	5.00	20
243.0	AERIAL WIRE	15.00	7
244.0	UNDERGROUND CONDUIT	3.00	33
261.0	FURNITURE/OFFICE EQUIPMENT	10.00	10
261.1	OFFICE EQUIPMENT	10.00	10
261.2	COMPUTERS	15.00	7
261.3	FURNITURE-OTHER	10.00	10
246.0	MOTOR VEHICLE	20.00	5
264.1	PASSENGER CAR	20.00	5
264.2	TRUCKS	15.00	7
264.3	AIRCRAFT	13.00	8
264.4	VEHICLES-OTHER	15.00	7
264.6	TOOLS & WORK EQUIPMENT	10.00	10
ALL BUILDING COMPOSITE		4.00	25
ALL CENTRAL OFFICE EQUIPMENT COMPOSITE		9.20	11
ALL CUSTOMER PREMISE EQUIPMENT COMPOSITE		6.00	17
ALL OUTSIDE PLANT COMPOSITE		4.70	21
ALL GENERAL COMPOSITE		14.40	7
ALL PLANT COMPOSITE		6.60	15

TABLE 3

COMPOSITE PLANT DEPRECIATION
ALL ACCOUNTS - ALL BORROWERS
SURVEY DATA AS OF 1/1/85

DEPRECIATION ACCOUNT		PLANT IN-SERV BALANCE ($000)	WEIGHT FACTOR	WEIGHTED PLANT IN-SERV BALANCE ($000)	DEPRE RATE (%)	WEIGHTED DEPRE ($)
212.1	BUILDINGS	276828	2.3348	646326	3.06	19751924
212.3	LEASEHOLDS	5827	1.6513	9622	10.38	998718
221.0	COE-GENERAL	236634	4.2084	995859	7.51	74773687
221.1	COE MAN. SWT.	19896	2.2676	45117	7.95	3585280
221.2	COE TSPS	18213	2.1179	38574	8.03	3098146
221.3	COE ELEC-MECH	523655	1.5301	801231	11.95	95781171
221.4	COE CROSSBAR	94325	1.6161	152434	9.47	14436777
221.5	ELEC. ANALOG	19907	4.0352	80328	7.97	6401925
221.6	COE DIGITAL	377477	2.0481	773119	6.08	46982129
221.7	AUTO MSG REC	18119	1.1028	20070	20.42	4097752
221.8	COE CIRCUIT	349448	1.3972	488234	8.77	42837961
221.9	COE SUB CXR	43886	3.8451	168748	9.16	15454064
221.10	COE RADIO	67463	1.5943	107558	8.51	9151219
221.11	COE COMPOSITE	14303	1.0000	14303	7.67	1096738
231.1	TEL STA APPAR	185895	2.0934	389147	13.28	51684228
231.2	MISC STA APPAR	16369	2.3420	38336	13.59	5208627
231.3	TELETYPE APPAR	377	1.9416	732	8.74	63941
231.4	RADIOTELEPHONE	6778	3.0839	20903	11.67	2439186
232.0	STA CONN OTHER	315028	1.7118	539264	8.79	47382005
234.1	PBX-ELECTONIC	14357	2.1663	31102	20.56	6394188
234.2	PBX-DIGITAL	525	4.7962	2518	12.62	317805
234.3	PBX-OTHER	42516	1.5128	64317	17.32	11139127
241.0	POLE LINES	164521	1.7003	279739	6.35	17773927
242.1	AERIAL CABLE	580529	1.7364	1008018	4.70	47374336
242.2	UDG CABLE	82526	1.9452	160528	3.30	5304431
242.3	BURIED CABLE	2078140	1.8920	3931925	3.97	155948914
242.4	SUBMARINE CABLE	1877	2.4108	4525	4.32	195422
243.0	AERIAL WIRE	32853	2.1809	71649	14.22	10187087
244.0	UDG CONDUIT	51795	2.2520	116644	2.56	2981649
261.0	FURN/OFC EQUIP	31045	3.0628	95086	8.76	8332865
261.1	OFFICE EQUIP	5538	1.8147	10050	8.24	828461
261.2	COMPUTERS	11585	4.7174	54651	14.03	7668393
261.3	FURN-OTHER	2005	1.5566	3121	10.91	340377
264.0	MOTOR VEHICLE	36523	3.3769	123333	18.26	22519851
264.1	PASSENGER CAR	2974	4.4301	13175	13.88	1828515
264.2	TRUCKS	3887	4.8220	18743	16.94	3175215
264.3	AIRCRAFT	1345	1.8848	2535	12.27	311133
264.4	VEHICLES-OTHER	9007	2.1780	19617	10.26	2013668
264.6	TOOLS & WK EQUIP	30347	2.5233	76574	9.14	6996444
ALL BLD COMPOSITE		282655	2.3207	655948	3.16	20750642
ALL COE COMPOSITE		1783406	2.0666	3685575	8.62	317696849
ALL CPE COMPOSITE		581845	1.8670	1086319	11.47	124629107
ALL OSP COMPOSITE		2992241	1.8625	5573028	4.30	239765766
ALL GEN COMPOSITE		134256	3.1051	416885	12.96	54014922
ALL PLANT COMPOSITE		5774403	1.9773	11417755	6.63	756857286

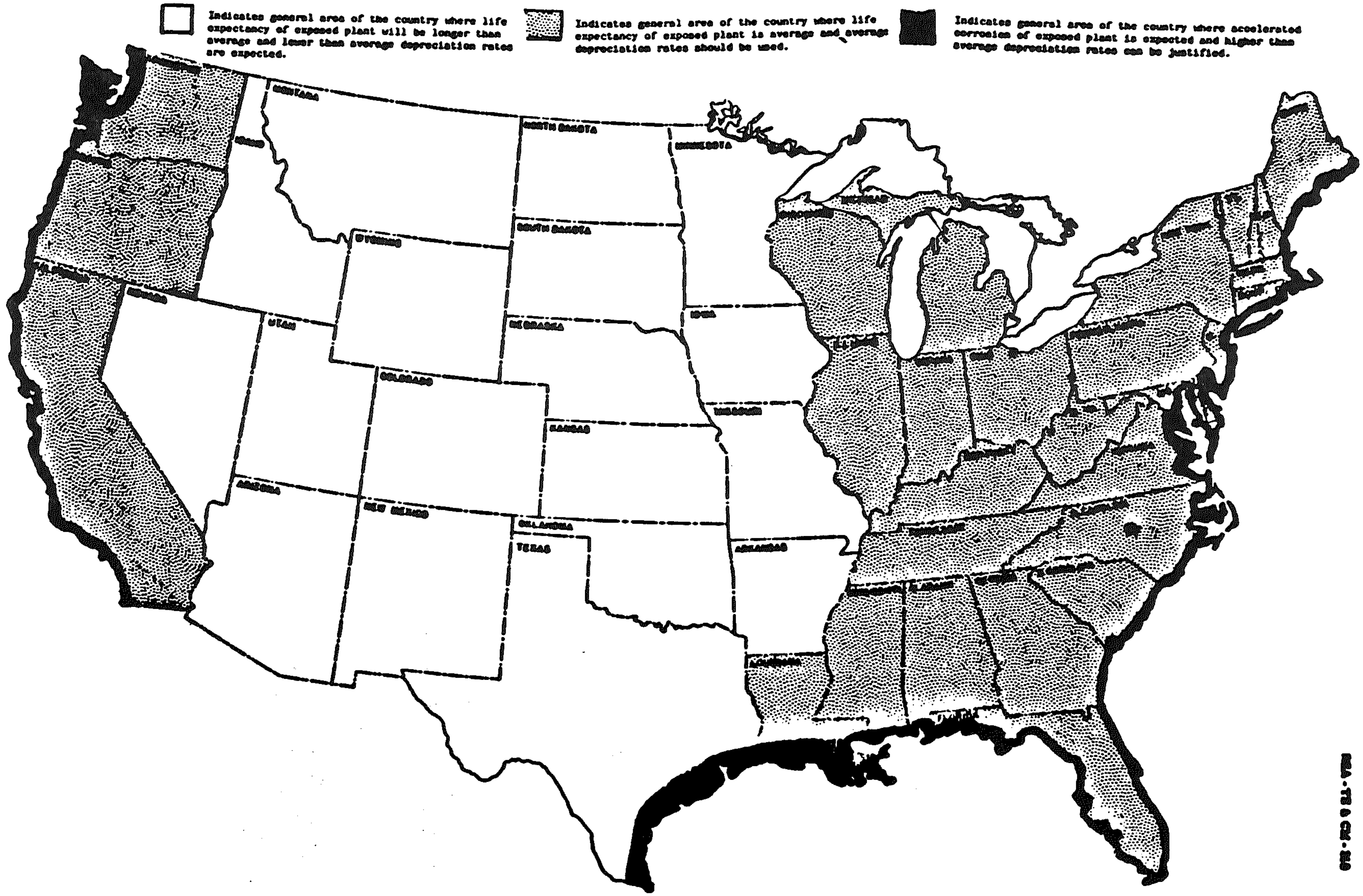
TABLE 4

AVERAGE ANNUAL MAINTENANCE COSTS*

ITEM	UNITS	DOLLARS/UNIT	AS A PERCENT OF INVESTMENT
Buildings & Grounds	Per Location	N/A	2.0-4.0
Electro-Mech Switch	Per Line	$ 15-$40	6.0-8.0
SPC Switch	Per Line	$ 5-$10	3.0-5.0
Carrier	Per Channel	$ 15-$30	9.0-15.0
Aerial Cable	Sheath-Mile	$100-$300	2.0-3.5
Buried Cable	Sheath-Mile	$ 40-$110	1.5-2.5
Udg. Cable	Sheath-Mile	$100-700	1.0-3.5
Aerial Wire	Circuit-Mile	$ 20-$ 70	5.0-8.0
Pole Line	Route-Mile	N/A	1.5-3.5
Udg. Conduit	Route-Mile	$ 35-325	0.2-1.0
Station Connections	Per Station	$ 15-30	10.0-15.0
Station Apparatus	Per Station	$ 25-50	15.0-20.0
Large PBX	Per Line	$ 50-75	8.0-10.0
Total Plant	Rate Base	N/A	5.5-6.5
Total Plant	Per Subscriber	$ 60-130	N/A

*Note: It is intended that these values are initial guidelines only. The engineer should determine appropriate values from the borrowers records and use those values in the annual cost studies.

DEPRECIATION RATES FOR EXPOSED PLANT



REA-TE & CM-210

MAP I

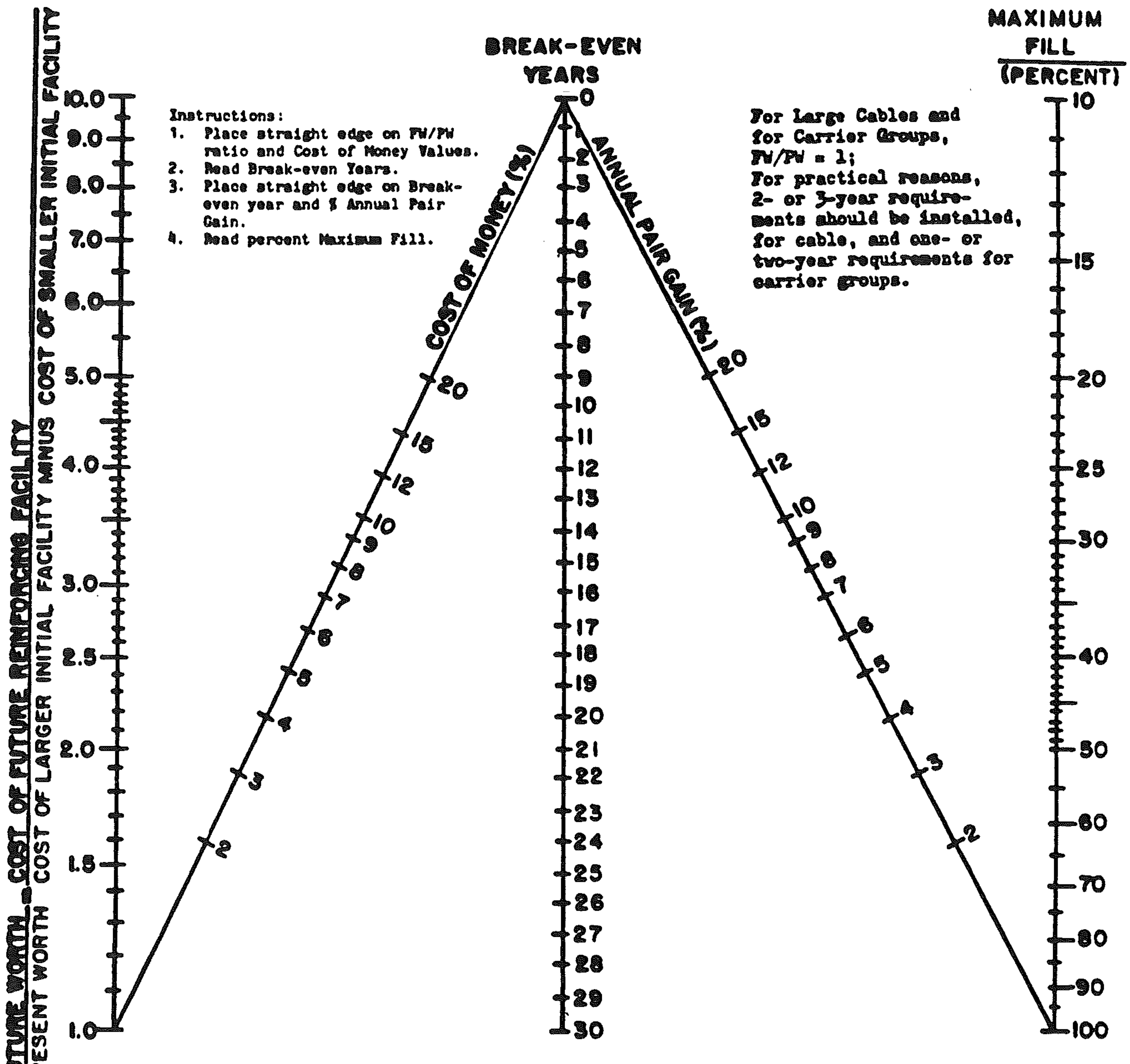


FIGURE 1- COST OF MONEY AND CIRCUIT GROWTH NOMOGRAPH