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METHODOLOGY FOR FINANCIAL FEASIBILITY STUDY

EXECUTIVE SUMMARY

M.J. Primiani, eng.

6 April, 1979

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1.0 INTRODUCTION

As a result of an "Unsolocited Proposal" (Ref. No. UP-D-113), Doucet and Associates was awarded this contract on 28 September, 1978. The mandate as further defined by D.O.C. encompassed quite a broad scope:

"TO DEVELOP A METHODOLOGY FOR DETERMINING THE OPTIMUM WAYS WHEREBY THE FEDERAL GOVERNMENT COULD CREATE AN INCENTIVE FOR TELCOS TO INVEST IN RURAL SERVICE UPGRADING PROGRAMS".

The full efforts of the research team are detailed in a seperate volume. This summary will merely highlight the findings.

2.0 PROBLEM DEFINITION

In Canada, a large portion of our population (23.9%; Statistics Canada 1971) is located in "rural" areas. The problem of providing any type of service to these communities is magnified due to the large distances, less favourable terrain, and very low densities.

Telephone companies are not exempt from these obstacles; and they are obliged to ensure high quality service to all its subscribers, regardless of their location. For the Telcos this produces a dilemma of having to provide a service at higher costs (see Table 2.1) within areas of much lower returns. Nevertheless, they have taken the initiative to upgrade service within these "rural" territories.

However, if this improvement were to be accelerated or extended to every subscriber, the companies would face an even more serious financial drain since the upgraded service is non-compensatory. Nevertheless, if additional capital were readily available, the telcos could intensify their upgrading programs. Therefore this study set out to explore the means whereby this financial problem could be resolved.

2.0 PROBLEM DEFINITION (Cont'd)

TABLE 2.1

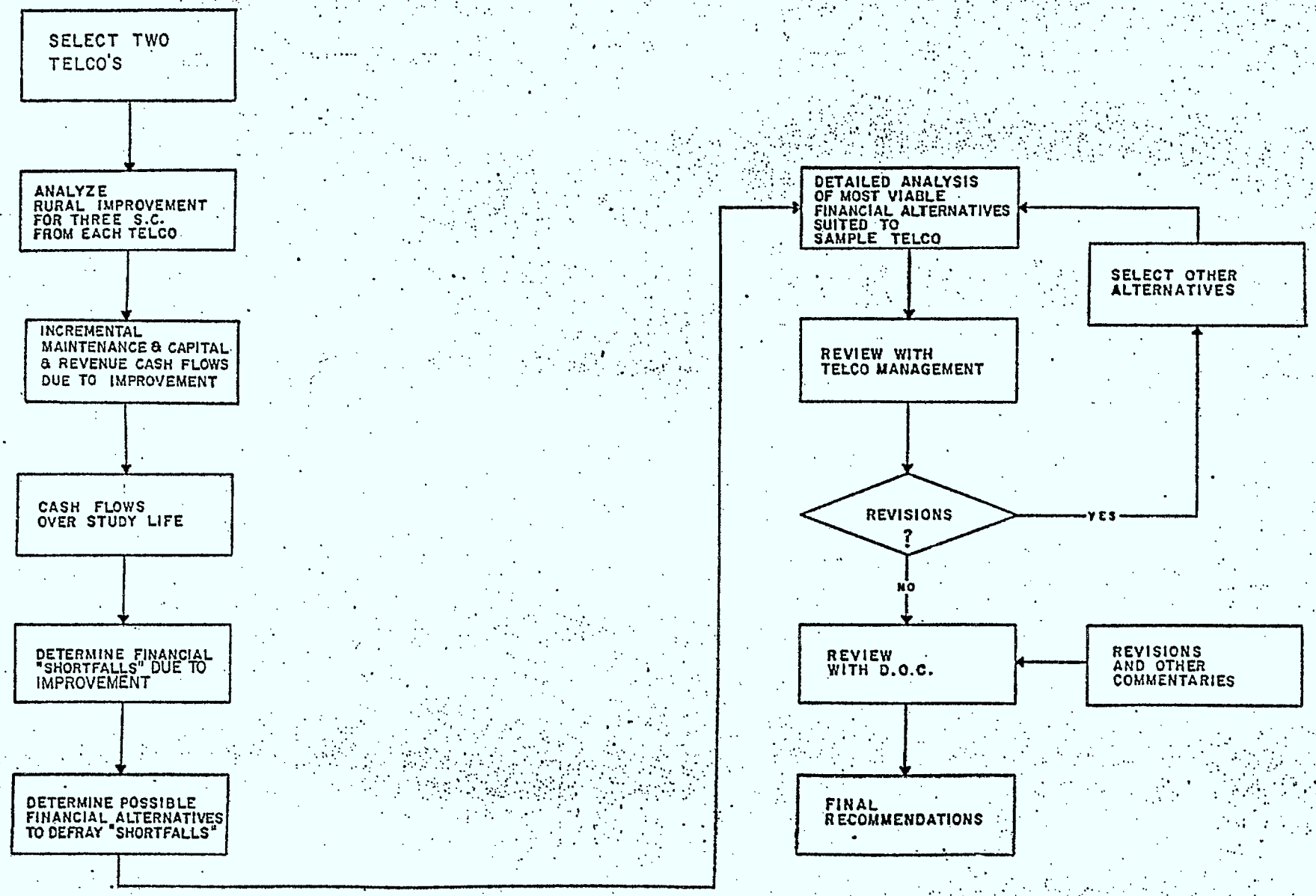
COST OF SERVICE		
	COMPANY	
CATEGORY OF INVESTMENT	"A"	"B"
BLDGS.	30.	32.
C.O.E.	450.	522.
O.P.	2,500.	1,094.
TOTAL INVESTMENT (1)	2,980.	1,648.
(1) TO PROVIDE SINGLE PARTY SERVICE TO A NEW RURAL SUBSCRIBER		

COMPANY "A" - INVESTMENT AS A FUNCTION OF SERVICE		
GRADE OF SERVICE	URBAN $/SUBSCR.	RURAL $/SUBSCR.
1 Party	450	2980
2 Party	250	1660
4 Party	160	1060

COMPANY "B" - INVESTMENT AS A FUNCTION OF SERVICE		
GRADE OF SERVICE	URBAN $/SUBSCR.	RURAL $/SUBSCR.
1 Party	800	1648
2 Party	444	915
4 Party	242	550

SOURCE FOR ABOVE DATA: SAMPLE TELCO ENGINEERING & PLANNING GROUPS

METHODOLOGY FOR FINANCIAL FEASIBILITY STUDY



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(M.J.P.) January 1979

3.0 RESEARCH APPROACH

The intent of this study was to define a methodology whereby financial incentive schemes could be formulated and tested within some existing framework. To do this, it was decided to approach a few telephone companies and request realistic cost figures on rural service improvement. Two large telcos (one was a Provincial Crown Corporation, the other a public company) were then selected, on the premise that they had done extensive work in rural improvement and consequently would be able to provide the largest amount of data.

Once the costs had been determined, company revenues with the improved services were calculated, along with all the operational costs. These analyses produced several "cash flows", given various assumptions (as detailed in the full report). They also identified a "revenue shortfall" that would result when an upgrading program was implemented. Therefore to offset this "shortfall" some financial incentive schemes were postulated and an estimate of their effectiveness was made on the basis of their ability to reduce the "shortfall" for the particular company.

3.0 RESEARCH APPROACH (Cont'd)

3.1 SAMPLED TELCOS' INVOLVEMENT

In order to identify the actual costs associated with an upgrading program, three Switching Centres were selected from each company and a design of the "improvement" was superimposed on existing conditions. For both companies, this "existing condition" was assumed to be at the end of their present programs which will leave every rural subscriber with four-party service (or better). The "improvement" was assumed as the upgrading to an ultimate single-party service.

The Switching Centres were chosen in conjunction with the engineering group within each company so that they would be representative of the total company conditions. Some of the factors considered were:

i) Extent of territory serviced
ii) Population density
iii) Type of terrain
iv) Physical plant distribution patterns
v) Outside plant status and future needs
vi) Central Office Equipment loadings and capacity
vii) Building condition (extension required?)
viii) Subscriber services rearrangements

3.0 RESEARCH APPROACH (Cont'd)

3.1 SAMPLED TELCOS' INVOLVEMENT (Cont'd)

Furthermore, a judgment factor entered the final choice so that economic conditions within each exchange boundary were considered, since these affect the total growth and the growth rate for service demand. Some indicators were:

i) Economic activity of the region (prosperous, poor, etc...)
ii) Adjacency to large urban centres
iii) Present and predicted subscriber population
iv) Type of residence occupancy (eg. seasonal, emerging suburbia, etc...)
v) The percentage of total company exchanges (S.C.) that are similar to the one selected for analysis

A summary of the main indicators for the selected centres is reprinted on the following pages for the sake of clarity.

3.0 RESEARCH APPROACH (Cont'd)

3.1 SAMPLED TELCOS' INVOLVEMENT (Cont'd)

SUMMARY OF MAIN INDICATORS FOR SELECTED SWITCHING CENTRES

SAMPLE COMPANY "A"

S.C. No. 1 :
- high density
- good terrain (buried plant)
- low cost (due to high density)
- adjacent to large metropolitan centre
- prosperous community (present and forecast)

S.C. No. 2 :
- low density
- poor terrain (rock)
- high cost (density and terrain)
- poor economic environment (no improvement foreseeable)

S.C. No. 3 :
- medium density
- good terrain
- medium costs
- good farming community (stable)

3.0 RESEARCH APPROACH (Cont'd)

3.1 SAMPLED TELCOS' INVOLVEMENT (Cont'd)

SUMMARY OF MAIN INDICATORS FOR SELECTED SWITCHING CENTRES

SAMPLE COMPANY "B"

S.C. No. 4 :
- representative of S/W region of province
- large areas
- consists of three "routes"
- high costs

S.C. No. 5 :
- representative of S/E region
- large areas
- consists of four "routes"
- low costs

S.C. No. 6 :
- representative of N/E region
- large areas
- consists of four "routes"
- medium costs

3.0 RESEARCH APPROACH (Cont'd)

3.1 SAMPLED TELCOS' INVOLVEMENT (Cont'd)

Rather than attempt a full scale study of the entire company to determine the actual costs for an upgrading program, it was possible to study these three "representative" Switching Centres alone. Since they reflected the worst, medium, and best conditions throughout the operating territory, an averaging of their results could serve as an accurate first approximation for the total company.

An example of the layout for two of the centres is shown in Appendix 12.1 (final report) so that the reader can appreciate the design problem.

3.0 RESEARCH APPROACH (Cont'd)

3.2 COMPANY DIFFERENCES

With the two companies chosen for this study, it was easy to see that several differences exist which will affect both the total amount and the nature of the incentive. However, this study did not attempt to diagnose these variances, since such was not our mandate. All the data provided and the costs, growth rates, or inflationary values used in the report are those submitted from the company representatives unless otherwise stated. The following table provides a summary of some of the most obvious differences.

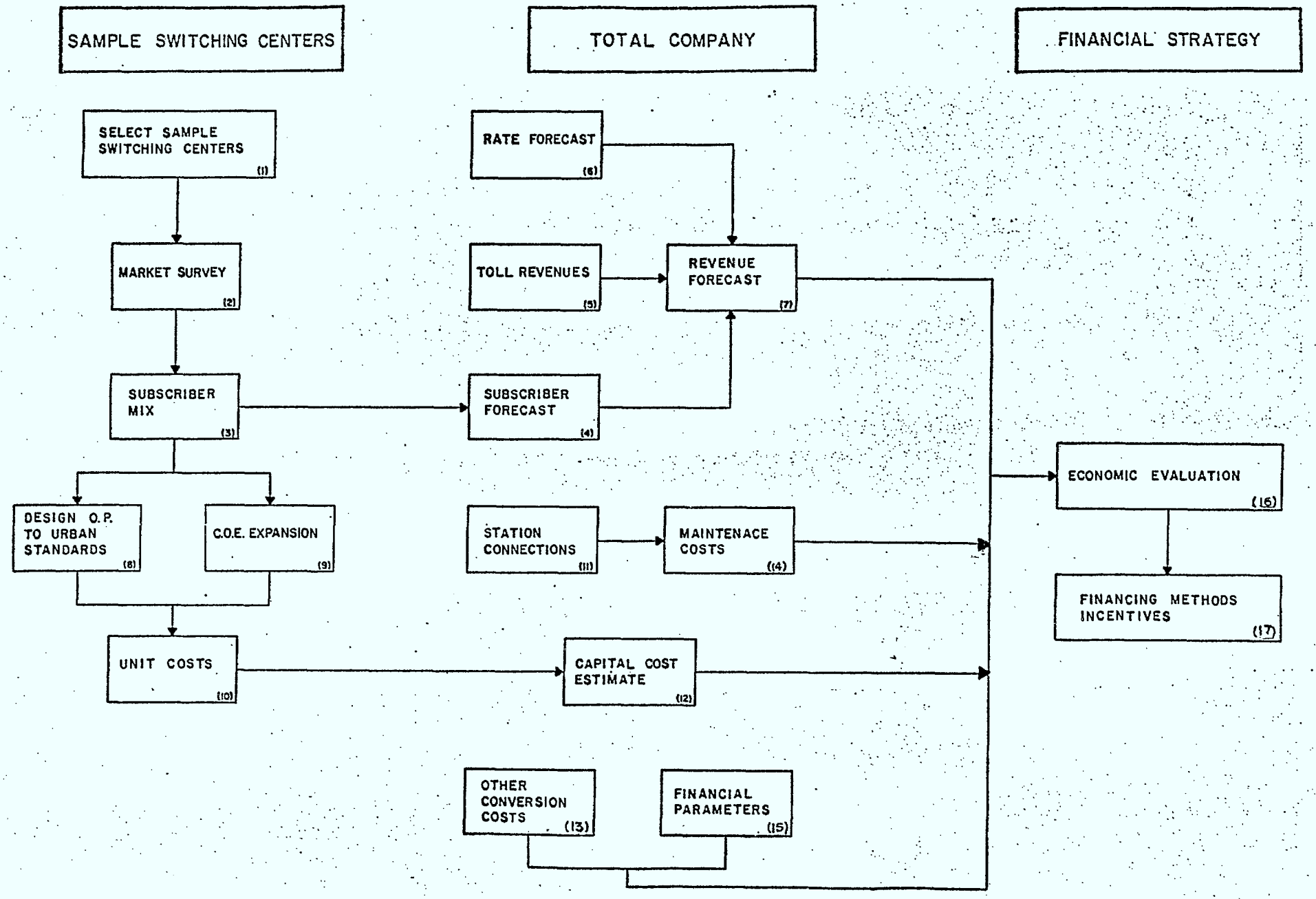
COMPANY DIFFERENCES - SUMMARIZED

(1)	COMPANY "A"	COMPANY "B"
SYSTEM DESIGN FACTOR (CUSTOMER/LINE FOR 4-P)	2.8	3.3
TOTAL RURAL STATIONS	63,764	33,032
TOTAL RURAL LINES	12,464	8,274
RURAL STATIONS/LINE	5.1	4.0
RURAL LINES > 4(*)	33.1%	42.1%
% RURAL LINES > 4 (*)	33.1%	42.1%
O.P. CONSTRUCTION	95% buried	95% aerial
JOINT USE OF POLES	N/A (very limited)	N/A 40% Telco 60% Hydro
ENGINEERING APPROACH	computer	manual
ROAD NETWORK	grid	linear

(*) The number of Rural Lines where there are actually more than 4 subscribers per line.

(1) As of September, 1978

ECONOMIC EVALUATION MODEL



Economic Evaluation Model
Doucet & Associates Consulting Ltd.
(M.J.P.) January 1979

3.0 RESEARCH APPROACH (Cont'd)

3.3 ECONOMIC EVALUATION

It was assumed that any "improvement" that would qualify for an "incentive" plan was the effort beyond whatever a company had already planned in its normal program. Thus only the costs and revenues associated with the improvement aspects of a new program were analyzed. The economic evaluation followed an "incremental" approach in assessing the impact upon the company's financial picture when it undertakes an upgrading program.

The accompanying flow chart (opposite page) illustrates the basic methodology, however a detailed description can be found in the final report.

3.0 RESEARCH APPROACH (Cont'd)

3.3 ECONOMIC EVALUATION (Cont'd)

3.3.1 Parameters and Assumed Variables

The basic premise for this economic evaluation was the assumption that all rural subscribers are provided with a four-party service prior to the start of the rural upgrading program proposed by this analysis. The incremental costs (capital and maintenance) and revenues used are therefore those encountered while upgrading the total rural population from four-party to one-party (or "urban grade") service.

Two schedules were assumed for the completion of the upgrading program, one of 5 years and the second of 15 years.

In order to undertake the economic evaluation, certain assumptions were made regarding the financial operation of the companies, taxes, inflation, etc. This data was provided by the Telcos and is summarized in the following paragraphs.

3.0 RESEARCH APPROACH (Cont'd)

3.3 ECONOMIC EVALUATION (Cont'd)

3.3.1 Parameters and Assumed Variables (Cont'd)

i) A study period of 15 years is used.

ii) Cost of capital is:

	COST OF DEBT	COST OF EQUITY	DEBT RATIO	COST OF CAPITAL
TELCO "A"	10.5%	10.5%	85.0%	10.5%
TELCO "B"	10.0%	13.58%	47.5%	11.88%

iii) Federal and Provincial profits taxes are:

COMPANY	TAX
"A"	0.0%
"B"	48.0%

There are no profits taxes for Telco "A" as it is a Provincial Crown Corporation.

3.0 RESEARCH APPROACH (Cont'd)

3.3 ECONOMIC EVALUATION (Cont'd)

3.3.1 Parameters and Assumed Variables (Cont'd)

iv) Cost increase factors (reflecting expected inflation) are:

	BLDGS.	C.O.E.	O.P.	MAINT.
COMPANY "A"	7.0%	6.0%	5.0%	5.5%
COMPANY "B"	5.0%	5.0%	5.0%	5.0%

v) The rate increase factor reflecting inflation used in revenue estimates is 2.5% for both Telcos.

vi) The components of capital costs of Buildings, COE, and Outside Plant are assumed to be:

Engineering	12%
Labour	38%
Purchased Materials	50%
TOTAL CAPITAL COST	100%

3.0 RESEARCH APPROACH (Cont'd)

3.3 ECONOMIC EVALUATION (Cont'd)

3.3.1 Parameters and Assumed Variables (Cont'd)

vii) The capital cost allowance (CCA) for all capital expenditures (Buildings; C.O.E.; O.P.) is 8%.

viii) The assumed service life for all plant and equipment is 30 years.

ix) It is assumed that the plant and equipment will have a zero salvage value at the end of its service life.

x) The Survivor Curve is assumed to be rectangular.

xi) For the purpose of this analysis it is assumed that the rural improvement program would be implemented on a linear basis for the total upgraded population, either over a five-year, or alternatively, a fifteen-year period.

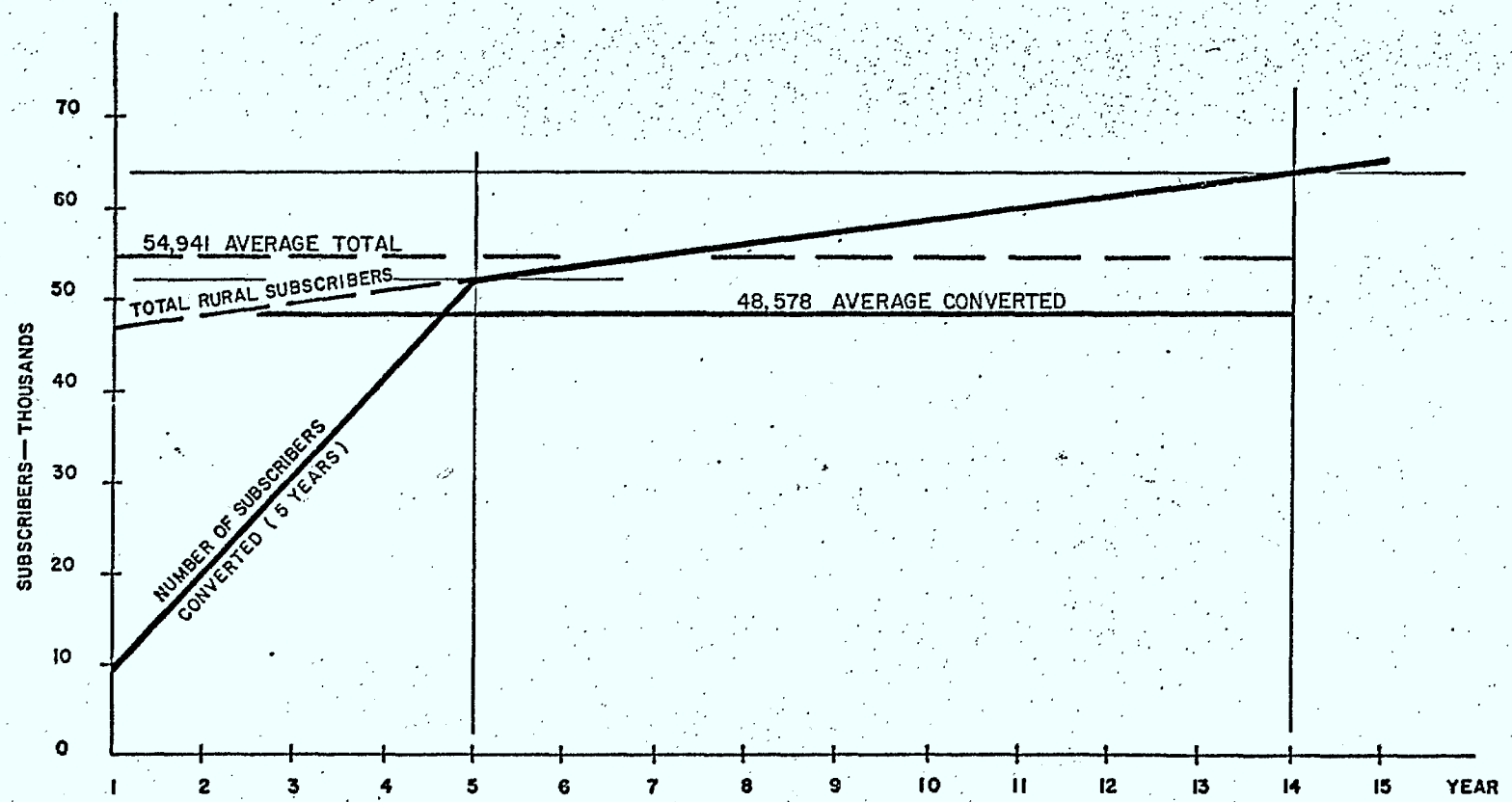
3.0 RESEARCH APPROACH (Cont'd)

3.3 ECONOMIC EVALUATION (Cont'd)

3.3.2 Subscriber Populations

In order to arrive at meaningful revenue projections with the assumed improvements, realistic subscriber population figures were required. The number of rural subscribers was found within the companies' General Planning Forecasts (GPF) and then extrapolated for a fifteen-year period. For Sample Company "A", the average growth rate for total subscribers was 2.5% per annum, whereas for Sample Company "B" it was 2.0% per annum. The resulting projections are shown in the accompanying graphs.

SUBSCRIBER POPULATION
COMPANY ·A·

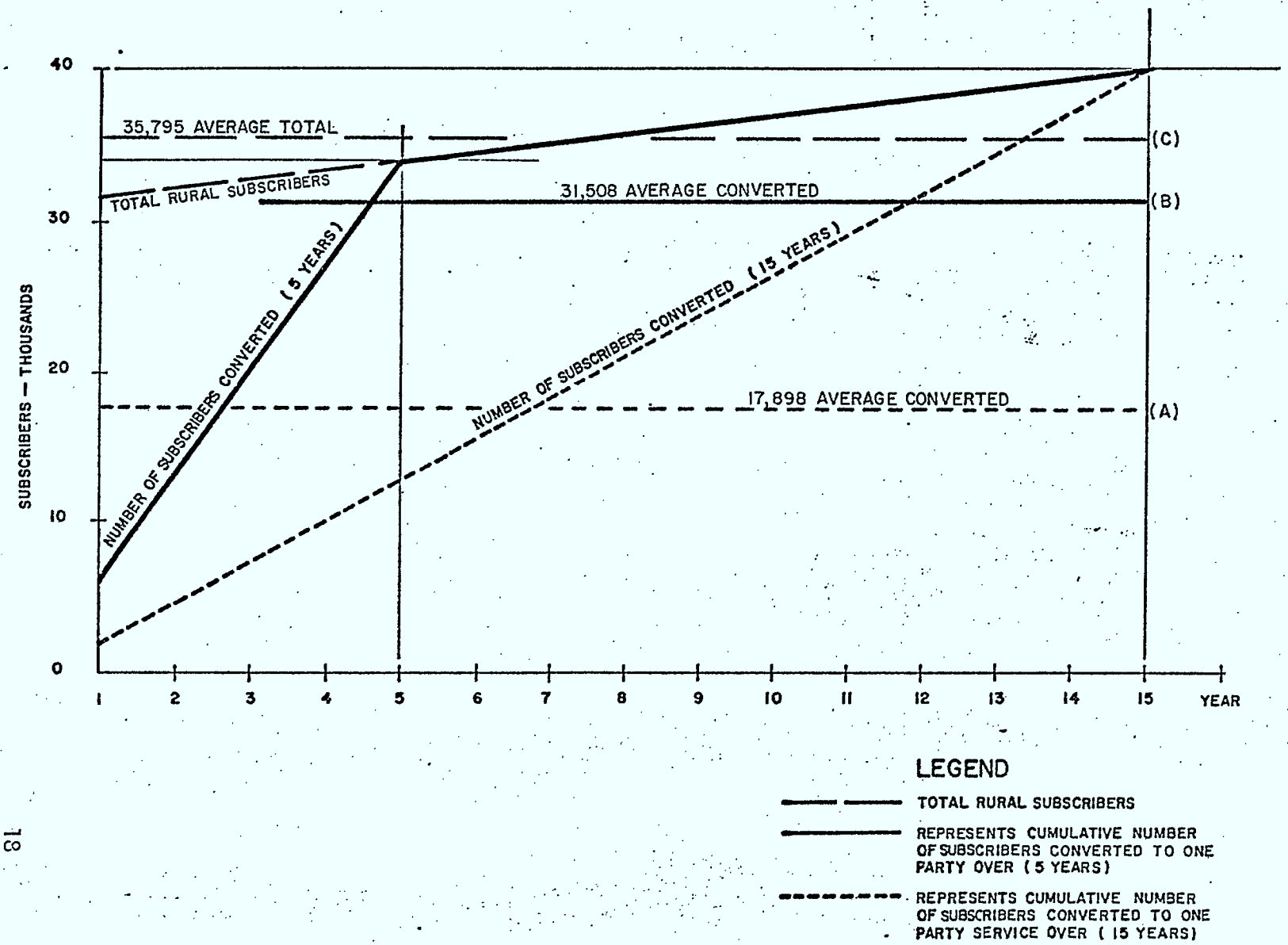


LEGEND

REPRESENTS CUMULATIVE NUMBER OF SUBSCRIBERS CONVERTED TO ONE PARTY SERVICE OVER (5 YEARS)

TOTAL RURAL SUBSCRIBERS

SUBSCRIBER POPULATION
COMPANY ·B·



3.0 RESEARCH APPROACH (Cont'd)

3.3 ECONOMIC EVALUATION (Cont'd)

3.3.3 Cash Flows

As a result of the hypothetical "improvement", revenues will increase, since subscribers will now be charged a one-party rate rather than the four-party rate. For Sample Company "A" this increase (1978 dollars) would be $0.55 per subscriber per month. For Sample Company "B", the average increase in rates would be $1.30 per month per subscriber. In addition, Company "B" charges a mileage rate depending on the distance at which the subscriber is located from the boundary of a "Base Rate Area" (Refer to Appendix 12.3 in final report for definition of "BRA"). Consequently, the average increase to this mileage charge due to the upgrading would be an assumed $5.00 per month per subscriber.

When the subscriber population and the changes in rates were considered, revenue cash flows could be calculated for each company, as illustrated in the accompanying graphs.

These graphs also show the annualized "Net Incremental Revenue Requirement" which is created by the improvement program. Financial schemes were then developed to attempt to defray or minimize this "requirement", as explained in Section 6.0 of the final report.

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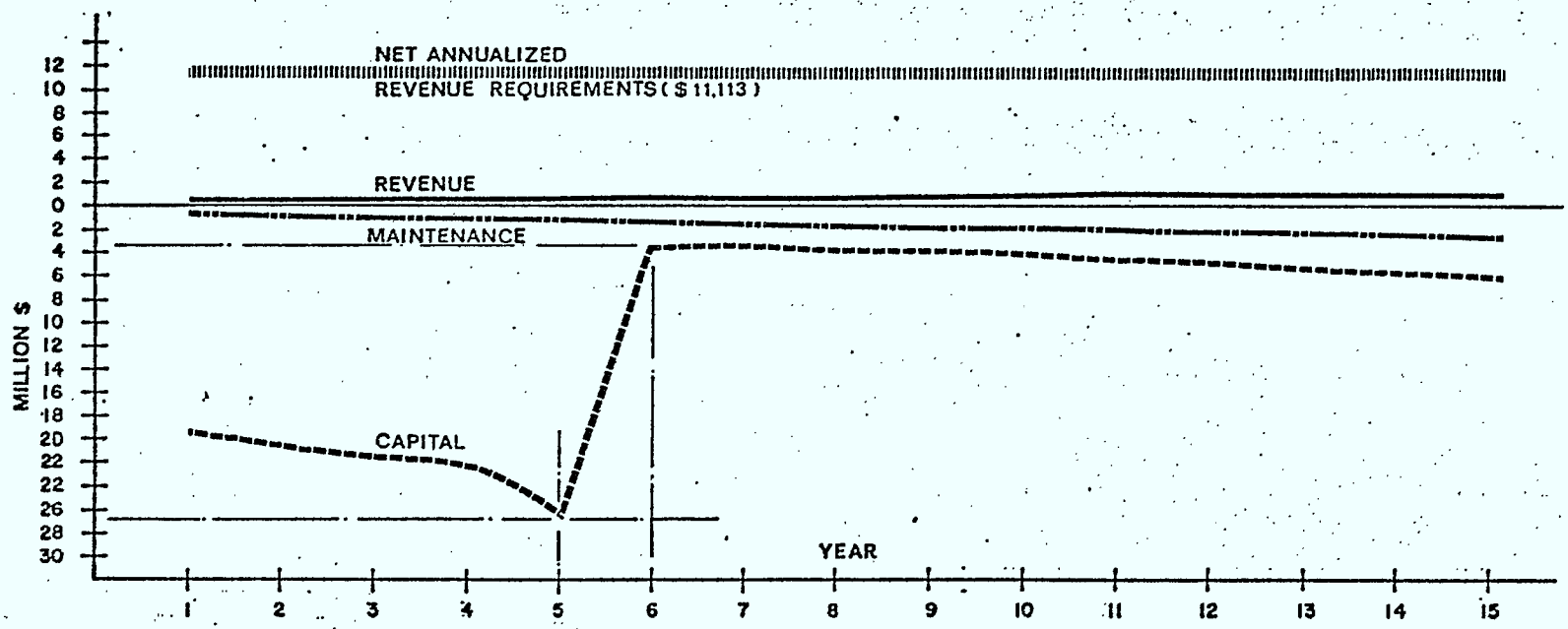
CASH FLOWS

COMPANY 'A' 5 YR CONVERSION



LEGEND

1- NET INCREMENTAL REVENUE REQUIREMENTS (ANNUALIZED REVENUE SHORTFALL RESULTING FROM THE PROGRAM)

2- REVENUE – ADDITIONAL REVENUES RESULTING FROM UPGRADED SERVICE

3- ADDITIONAL MAINTENANCE

4- REQUIRED CAPITAL (EXPENDITURES IN STUDY YEAR)

CASH FLOWS

COMPANY 'B' 5 YR CONVERSION

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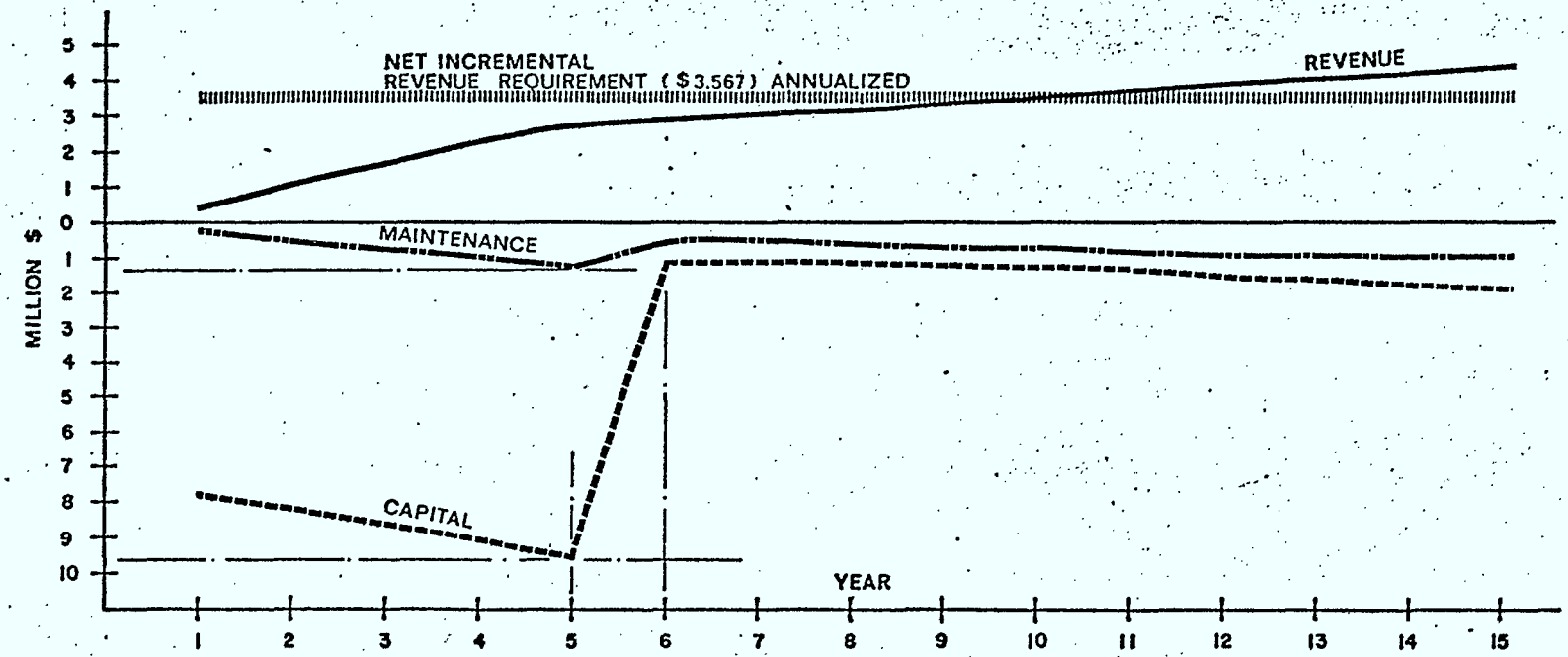


LEGEND

1- NET INCREMENTAL REVENUE REQUIREMENTS (ANNUALIZED REVENUE SHORTFALL RESULTING FROM THE PROGRAM)

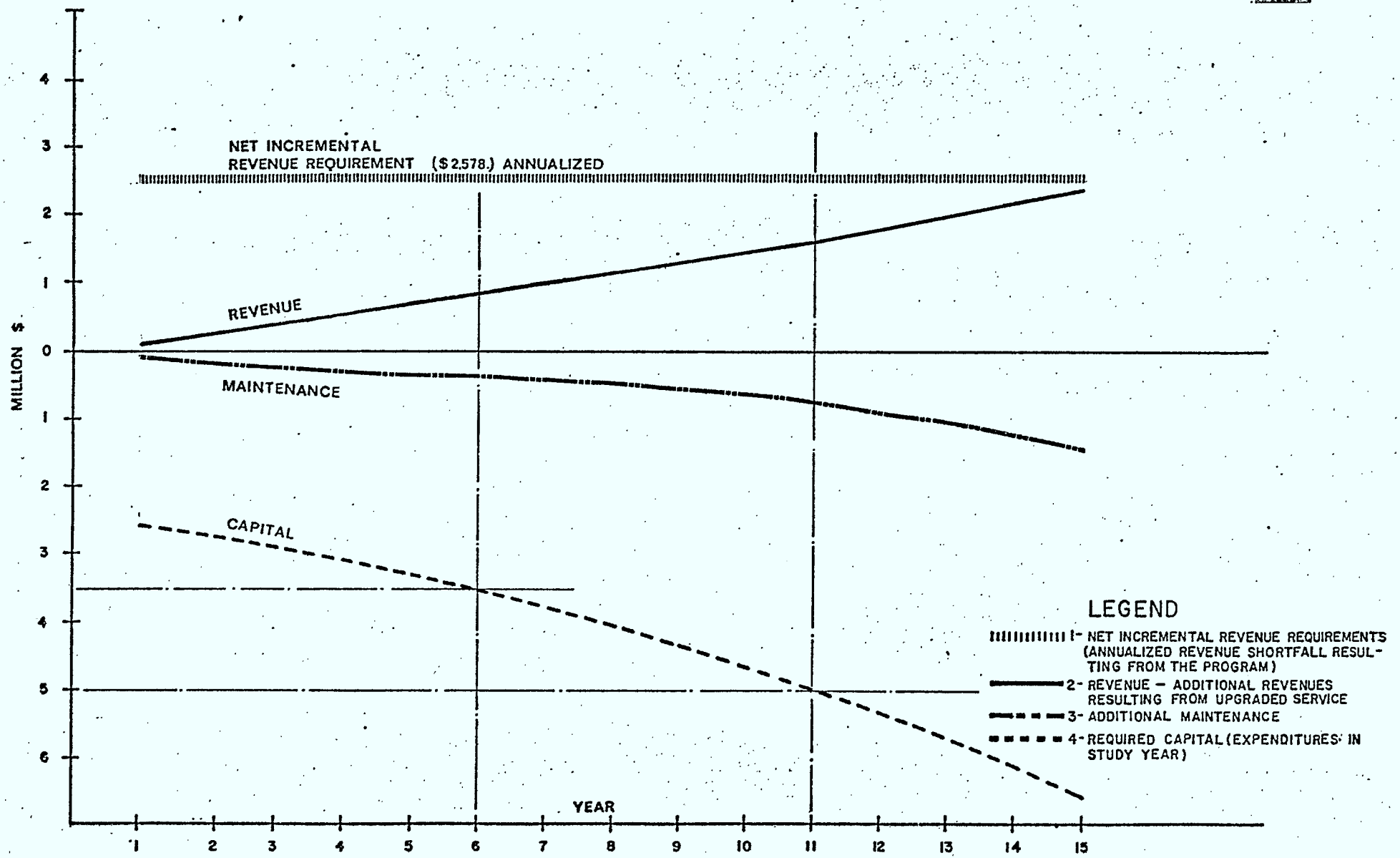
2- REVENUE – ADDITIONAL REVENUES RESULTING FROM UPGRADED SERVICE

3- ADDITIONAL MAINTENANCE

4- REQUIRED CAPITAL (EXPENDITURES IN STUDY YEAR)

CASH FLOWS

COMPANY (B) 15 YR CONVERSION



4.0 FINANCIAL INCENTIVES

Once the improvement effort had been quantified and a revenue "shortfall" had been calculated for each company, the study set out to list and analyze various schemes which might be used to provide financial incentives to Canadian Telcos to accelerate their investment in improved rural service programs.

Canadian Telcos vary greatly with respect to their financial strength, corporate form, and regulatory environment. Therefore these companies were considered in four different groupings(1):

Large, Financially Strong Private Telcos

Number of Companies : 9
Percentage of Telephones : 81%
Rural Telephones : 65% of 4-party and Multi-party (MP)

Government Owned Telcos

Number of Companies : 6 (3 provincial)
Percentage of Telephones : 18%
Rural Telephones : 28% of 4-party and Multi-party (MP)

Rural Cooperatives and Small Private Telcos

These two groups, together represent:
Percentage of Telephones : 1%
Rural Telephones : 8% of 4-party and Multi-party (MP)

---

(1) Data as of December 31, 1977

4.0 FINANCIAL INCENTIVES (Cont'd)

The two sample companies were selected from the first two groups; however the methodology of this study is equally applicable to the other two groups.

4.0 FINANCIAL INCENTIVES (Cont'd)

4.1 GENERAL APPROACH

The "incremental" cost of improving rural service from universal four-party to one-party will generally exceed the resulting net incremental revenues by substantial amounts. At present, Telcos can only make up this shortfall through cross-subsidy.

Therefore, the alternate solution proposed in this study was to investigate various financial incentive and subsidy schemes which would

i) Eliminate or reduce the shortfall

ii) Where required, help Telcos obtain needed capital and technical resources.

Furthermore, we investigated the institutional or regulatory constraints on the ability of financial incentives to motivate telcos to further improve rural service to urban levels.

4.0 FINANCIAL INCENTIVES (Cont'd)

4.1 GENERAL STRATEGY (Cont'd)

The incentive schemes and institutional changes which were considered can be grouped under the following headings:

COST REDUCTION PLANS

i) Higher C.C.A. rates
ii) Investment tax credits
iii) Government guaranteed debt
iv) Subsidized loans
v) FST elimination on designated plant
vi) Free or low cost technical and managerial aid

REVENUE INCREASE PLANS

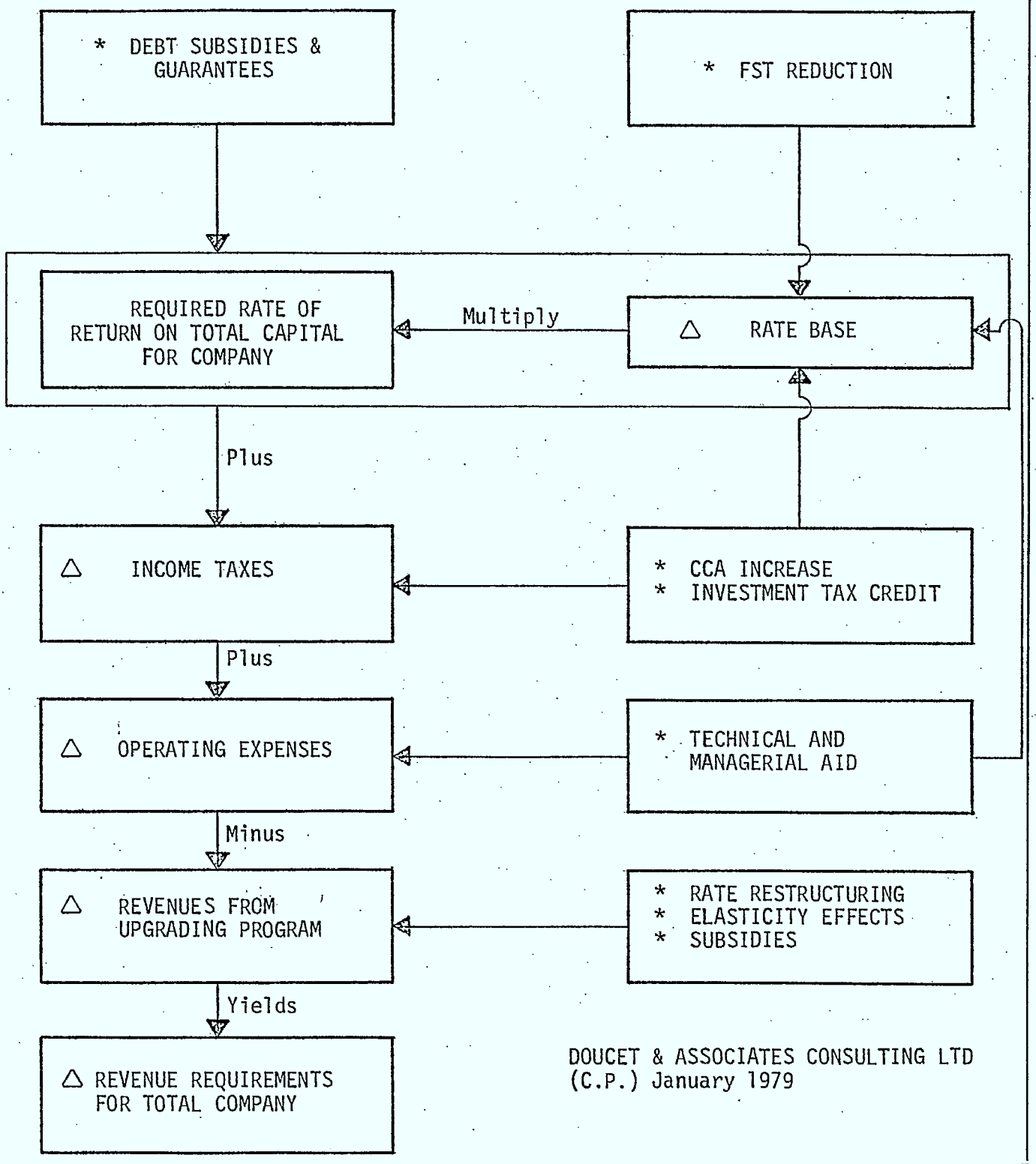
i) Rate structure modification
ii) External grants to Telcos
iii) External grants to rural subscribers

REGULATORY REFORM

i) Elimination of lags
ii) Permit financial incentives to have a positive effect on shareholder returns.

The relationship between the various incentive schemes and a telco's Net Incremental Revenue Requirements resulting from the rural improvement are illustrated in the accompanying diagram.

RELATIONSHIP BETWEEN INCENTIVES (*)
AND REVENUE REQUIREMENTS



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4.0 FINANCIAL INCENTIVES (Cont'd)

4.2 CRITERIA FOR CHOICE OF INCENTIVE

In selecting a financial incentive or combination of incentives for a particular telco group, it was deemed important to consider several criteria. These can be summarized as follows:

CRITERIA FOR CHOICE OF INCENTIVE

i) Compatibility with responsibilities, objectives and constraints of all affected parties;

ii) Minimization of administration costs;

iii) Flexibility over time and between companies;

iv) Permanency:
- long term capital commitment is required
- upgraded service commitment is involved

v) Avoidance of undesirable side-effects:
- no conflict with other programs or objectives

vi) Promotion of desirable side-effects:
- positive effect on employment, etc... in related industries

4.0 FINANCIAL INCENTIVES (Cont'd)

4.2 CRITERIA FOR CHOICE OF INCENTIVE (Cont'd)

vii) Visibility of total cost: - easy to monitor both cost and effectiveness

viii) Maximum impact should be sufficiently large to be effective;

ix) Effectiveness in inducing positive response from Telco and Regulatory Agency;

x) Adaptibility to an integrated communications policy (i.e. broadband and telephone services)

4.0 FINANCIAL INCENTIVES (Cont'd)

4.3 INSTITUTIONAL CONSTRAINTS ON FINANCIAL INCENTIVE PLANS

The financial impact of many of the incentive plans discussed may be positive or neutral (or conceivably negative) depending on the regulatory environment within which the company operates. A positive impact means that implementation of the incentive scheme will result in the firm being able to raise its returns on equity capital by investing resources in rural service improvement. A neutral impact means that the firms can expect to be fully compensated for the costs of rural improvement but can not expect to gain from increasing their investment in this area of their operations.

Under the present system of regulation practised in most jurisdictions in Canada, it is virtually impossible to devise a plan which provides positive financial incentives to financially healthy telcos which are earning returns on rate base at, or close to, their "allowed" levels.

4.0 FINANCIAL INCENTIVES (Cont'd)

4.3 INSTITUTIONAL CONSTRAINTS ON FINANCIAL INCENTIVE PLANS (Cont'd)

Financial incentive plans may have a positive effect under one or more of the following conditions:

eg. Bell — not as bad as it may seem

i) A firm is chronically in a state where it is earning less than its allowed return.

ii) A distinction is made between the allowed return for rate-setting purposes and the allowed return which would trigger regulatory review and possible revenue reductions.

iii) Revenue requirements are established using deemed costs rather than actual costs.

iv) The revenue requirement for rural service is segregated from that for other services.

With the exception of the undesirable situation where telcos are chronically unable to earn their cost of capital under present regulation, the incentive plans discussed may generally be neutral in a financial sense. They will help to reduce the risk of losses resulting from rural improvement and may facilitate acquisition of capital and program implementation, but they are unlikely to result in overall financial gains for complying telcos.

4.0 FINANCIAL INCENTIVES (Cont'd)

4.3 INSTITUTIONAL CONSTRAINTS ON FINANCIAL INCENTIVE PLANS (Cont'd)

However, even if they are financially neutral, the plans may not be behaviourably neutral. Telco managers are generally motivated to provide good service at reasonable rates as well as to improve shareholder returns. Therefore they will tend to control costs even when the effect is to reduce the revenue burden on customers rather than increase the return to equity. One way to control costs has been to move slowly in the direction of providing high-cost rural improvement. Cost-reduction schemes which are conditional on acceleration of rural improvement may thus be strongly motivating even when they are financially neutral.

Incentive plans instituted by the Federal Government may be administered in several ways, each of which involves a different division of responsibility and authority among the parties involved. The plans considered in this study fall into three categories:

i) Plans which involve unconditional grants or subsidies to telcos

contribution?

ii) Plans which involve conditional grants or subsidies to telcos

iii) plans which involve direct subsidies to subscribers

4.0 FINANCIAL INCENTIVES (Cont'd)

4.4 INCENTIVES FOR EACH TELCO GROUP

Various schemes were discussed in relationship to the four groups previously identified:

- Large Telcos and Their Subsidiaries
- Small, Independent Telcos
- Cooperative Corporations
- Provincial Crown Corporations

A separate analysis was undertaken for each group. This included a consideration of the following:

i) Present Constraints on Rural Improvement

ii) Cost Reduction Plans

iii) Revenue Increase Plans

iv) Rate Restructuring

v) Comparison and Analysis of Options

A detailed description is provided in Section 6.0 of the final report.

4.0 FINANCIAL INCENTIVES (Cont'd)

4.5 SCENARIOS SELECTED TO ASSESS VARIOUS INCENTIVE SCHEMES

In order to assess the financial impact of various proposed incentive schemes on a particular Telco, several scenarios were analyzed. CASE 1 considered the financial impact upon a company when it undertakes the rural improvement program without any incentive or subsidy plans. This then provided the total "revenue shortfall" resulting from the upgrading program. In the subsequent CASES, (Nos. 2 to 10) some of the more feasible incentive plans which are considered in the study were incorporated. All these analyses consider only the incremental investment, expenses, and revenues which apply to the improvement effort.

The following describes each scenario that was assumed for the purpose of testing the relative impact of the incentives:

CASE 1: This considers the full incremental revenue requirement in the absence of any incentive scheme.

INCENTIVE PLANS AND ASSUMED PARAMETERS

CASE 2: The Federal Sales Tax of 9% is removed from all capital purchases.

CASE 3: In lieu of the standard capital cost allowance (CCA) of 8% applicable to telephone plant, the maximum rate of 100% is used (Company "B")

4.0 FINANCIAL INCENTIVES (Cont'd)

4.5 SCENARIOS SELECTED TO ASSESS VARIOUS INCENTIVE SCHEMES (Cont'd)

CASE 4: This is similar to CASE 3 but an arbitrary CCA of 16% is used instead.

CASE 5: An investment tax credit (ITC), arbitrarily set at 50%, is applied to all capital expenditures for Company "B". No corresponding reduction is made in the CCA cost base (cf Case 8).

CASE 6: The cost of debt for both Telcos is arbitrarily reduced by 5%.

CASE 7: The capital costs are reduced by 12%.

CASE 8: The total capital costs are reduced by 50%. (see Section 3.7 of final report) This is also equivalent to receiving an investment tax credit of 50% with an equal reduction in the CCA cost base (cf Case 5).

CASE 9: Total maintenance costs are reduced by 25%.

CASE 10: Total maintenance costs are reduced by 50%.

These scenarios were tested for two different time frames. The first assumed that conversion from four-party to one-party would occur over a five-year period, and the second considered a fifteen-year duration.

4.0 FINANCIAL INCENTIVES (Cont'd)

4.5 SCENARIOS SELECTED TO ASSESS VARIOUS INCENTIVE SCHEMES (Cont'd)

The following tables show the change which results in the company's "Net Incremental Revenue Requirement" when the various incentives are provided. The Summary Table (5.6.4) gives an indication of the relative importance of an incentive for each company.

4.0 FINANCIAL INCENTIVES (Cont'd)

4.5 SCENARIOS SELECTED TO ASSESS VARIOUS INCENTIVE SCHEMES (Cont'd)

SAMPLE COMPANY "A"

RESULTS FOR A 5-YEAR CONVERSION PERIOD

CASE	NPV ($000)	NET INCREMENTAL REVENUE REQUIREMENTS		
		TOTAL COMPANY (1)	PER SUBSC. TOTAL (2)	PER SUBSC. UPGD'D (3)
CASE 1 (NO INCENTIVE)	-86,408	11,113	202	229
CASE 2 (NO FST 9%)	-82,868	10,658	194	219
CASE 3 (CCA 100%)	-NOT APPLICABLE BECAUSE COMPANY NOT TAXABLE			
CASE 4 (CCA 16%)	-NOT APPLICABLE BECAUSE COMPANY NOT TAXABLE			
CASE 5 (ITC 50%)	-NOT APPLICABLE BECAUSE COMPANY NOT TAXABLE			
CASE 6 (COST OF DEBT REDUCED 5%)	-61,546	7,915	144	163

(1) Expressed in ($000/year)

(2) Expressed in ($/year/subscriber) based on total rural subscriber population (Refer to Sec. 5.4.1)

(3) Expressed in ($/year/subscriber) based on upgraded rural subscriber population (Refer to Sec. 5.4.1)

4.0 FINANCIAL INCENTIVES (Cont'd)

4.5 SCENARIOS SELECTED TO ASSESS VARIOUS INCENTIVE SCHEMES (Cont'd)

SAMPLE COMPANY "B"

RESULTS FOR A 5-YEAR CONVERSION

CASE	NPV ($000)	NET INCREMENTAL REVENUE REQUIREMENTS		
		TOTAL COMPANY (1)	PER SUBSCR. TOTAL (2)	PER SUBSCR. UPGD'D (3)
CASE 1 (NO INCENTIVE)	-13,382	3,567	100	113
CASE 2 (NO FST 9%)	-12,482	3,328	92	106
CASE 3 (CCA 100%)	- 7,053	1,880	52	60
CASE 4 (CCA 16%)	-11,104	2,959	83	94
CASE 5 (ITC 50%)	+ 5,210	-1,389	-39	-44
CASE 6 (COST OF DEBT REDUCED 5%)	-11,267	3,004	84	95

1) Expressed in ($000/year)
2) Expressed in ($/year/subscriber) based on total rural subscriber population (Refer to Sec. 5.4.1)
3) Expressed in ($/year/subscriber) based on upgraded rural subscriber population (Refer to Sec. 5.4.1)

4.0 FINANCIAL INVENTIVES (Cont'd)

4.5 SCENARIOS SELECTED TO ASSESS VARIOUS INCENTIVE SCHEMES (Cont'd)

SAMPLE COMPANY "B"
RESULTS FOR A 15-YEAR CONVERSION PERIOD

CASE	NPV ($000)	NET INCREMENTAL REVENUE REQUIREMENTS		
		TOTAL COMPANY (1)	PER SUBSC. TOTAL (2)	PER SUBSC. UPGD'D (3)
CASE (NO INCENTIVE)	-9,674	2,578	71	142
CASE 2 (NO FST 9%)	-9,157	2,440	67	134
CASE 3 (CCA 100%)	-5,859	1,561	44	88
CASE 4 (CCA 16%)	-8,334	2,221	62	124
CASE 5 (ITC 50%)	+3,765	-1,004	-28	- 56
CASE 6 (DEBT -5%)	-8,428	2,247	62	124
CASE 7 (CAP. -12%)	-8,294	2,221	61	122
CASE 8 (CAP. -50%)	-3,924	876	25	50
CASE 9 (MAINT.-25%)	-9,297	2,478	69	138
CASE 10 (MAINT.-50%)	-8,919	2,377	66	132

1) Expressed in ($000/yr)

2) Expressed in ($/yr/subscriber) based on total rural subscriber population (Refer to Sec. 5.4.1)

3) Expressed in ($/yr/subscriber) based on upgraded rural subscriber population (Refer to Sec. 5.4.1)

4.0 FINANCIAL INCENTIVES (Cont'd)

4.5 SCENARIOS SELECTED TO ASSESS VARIOUS INCENTIVE SCHEMES (Cont'd)

RESULTS FOR A 5-YEAR CONVERSION PERIOD

CASE	COMPANY "A"		COMPANY "B"	
	TOTAL INCREM'L REVENUE REQ'MTS $000/YR.	INCREM'L REVENUE REQ'MTS $/SUBSCR. TOTAL/YR	TOTAL INCREM'L REVENUE REQ'MTS $000/YR.	INCREM'L REVENUE REQ'MTS $/SUBSCR. TOTAL/YR
CASE 1	11,113	202	3,567	100
CASE 2	10,568	194	3,328	92
CASE 3	N/A	N/A	1,880	52
CASE 4	N/A	N/A	2,959	83
CASE 5	N/A	N/A	-1,389	-39
CASE 6	7,915	144	3,004	84

4.0 FINANCIAL INCENTIVES (Cont'd)

4.5 SCENARIOS SELECTED TO ASSESS VARIOUS INCENTIVE SCHEMES (Cont'd)

The tables below show the relative quantitative effects of the incentives within Company "A" and Company "B".

incentive	None	FST 9% removed	CCA 100%	CCA 16%	ITC 50%	Cost of debt -5%
case no:	1	2	3	4	5	6
COMPANY "A" shortfall	$11,113.	$10,658.	NA	NA	NA	$ 7,915.
Revenue Reqts Per Yr/Tot. Subsc	$ 202.	$ 194.	-	-	-	$ 144.
Impact of Incentive (cf. 1)	-	- 4%	-	-	-	-29%
Revenue Reqts Per Yr/Upgd subs.	$ 229.	$ 219.				$ 163.
Impact of Incentive (cf. 1)	-	- 4%				-29%
COMPANY "B" shortfall	$ 3,567.	$ 3,328.	$ 1,880.	$ 2,959.	-$1,389.	$ 3,004.
Revenue Reqts Per Yr/Tot. Subsc	$ 100.	$ 92.	$ 52.	$ 83.	-$ 39.	$ 84.
Impact of Incentive (cf. 1)	-	- 8%	-47%	-17%		-16%
Revenue Reqts Per Yr/Upgd subs.	$ 113.	$ 106.	$ 60.	$ 94.	-$ 44.	$ 95.
Impact of Incentive (cf. 1)	-	- 8%	-47%	-17%	-	-16%

4.0 FINANCIAL INCENTIVES (Cont'd)

4.6 SUMMARY OF INCENTIVE SCHEMES

The analyses presented in Section 6.0 of the final report identify some of the more feasible incentive schemes for a particular telco group. These are summarized as follows:

4.6.1 Large Telcos and Their Subsidiaries

a) Direct subsidies to qualifying subscribers, administered on a pass-through by the telcos, or direct subsidies to the telcos.

b) An investment tax credit equal to the estimated present value of the future revenue shortfall created by an upgrading program.

c) A more favourable regulatory environment which gives the telcos an opportunity to realize allowed returns through forward-looking policies.

4.0 FINANCIAL INCENTIVES (Cont'd)

4.6 SUMMARY OF INCENTIVE SCHEMES

4.6.2 Small, Independent Telcos

a) Direct Subsidies, as for the large telcos.

b) Free, or low-cost, technical aid available from a central planning and engineering group.

c) Availability of government guarantees on debt securities offered to the private sector.

4.6.3 Cooperative Corporations

The same incentives, as in the case of the small telcos, would apply.

4.6.4 Crown Corporations

Direct subsidies, the form of which would be subject to Federal-Provincial negotiation.

5.0 CONCLUSIONS AND RECOMMENDATIONS

5.1 FULFILLMENT OF OBJECTIVES

This preliminary study has succeeded in meeting its stated objectives in four ways:

5.1.1 It has developed and tested a methodology for estimating the incremental revenue and capital requirements due to improvement

5.1.2 It has identified a large number of financial incentive plans, and analyzed each one in terms of its applicability to different kinds of telcos, institutional constraints, ease of administration, flexibility, maximum impact, and qualitative characteristics.

5.1.3 It has further demonstrated its ability to calculate the impact of these incentive plans over a wide range of parameters.

5.1.4 It has confirmed a readiness among telcos to enter into dialogue with the federal government regarding the global problems of telecommunications, and in particular improved rural telephone communications.

5.0 CONCLUSIONS AND RECOMMENDATIONS

5.2 TELCOS' PARTICIPATION AND FEEDBACK

After submitting the "Preliminary Report", the researchers returned to the two Sample Companies for comment on the proposed financial schemes. The informal discussions that ensued are documented in Section 7.0 of the main report. However, some of the concerns which were reviewed might be highlighted here:

5.2.1 Why is it desirable to accelerate rural service improvement?

5.2.2 Why is telephone service improvement not considered in the full context of communications?

5.2.3 The investment of Federal Government funds should produce the greatest social benefits possible. Therefore an incentive should also provide a stimulus to new industry and for new technology.

5.2.4 Is it desirable to extend improved services to areas that are not economically viable in view of prohibitive costs to offer these services?

5.2.5 Must the "incentive" be directed to upgrading all the rural subscribers irrespective of costs, or merely for the more financially viable or more needy cases?

5.0 CONCLUSIONS AND RECOMMENDATIONS (Cont'd)

5.2 TELCOS' PARTICIPATION AND FEEDBACK (Cont'd)

5.2.6 What is the minimum service level acceptable for "rural" areas?

5.2.7 Can an "incentive" be provided for a very specific undertaking (eg. contractual statement of works) rather than a general territory or population?

5.2.8 The upgrading effort commits a Telco to a permanently higher level of service; therefore incentives must likewise be permanent. Furthermore, the incentive in the form of a "grant" should be given "up front".

5.2.9 Any incentive or grant should not be tied into the tax system.

5.2.10 Grants should reflect estimates of future costs and revenues and should guarantee permanency of support.

5.2.11 Flexibility should be a key characteristic of conditional grants.

5.2.12 Any incentive plan should strive to avoid duplicating existing administrative structures.

5.2.13 Subsidies must account for the vast regional differences that exist within a company.

5.2.14 Telcos expressed a lack of interest in administering rebates to subscribers, in REA-type financing, or in a centralized pool of technical expertise.

3.0 RESEARCH APPROACH (Cont'd)

3.3 ECONOMIC EVALUATION

It was assumed that any "improvement" that would qualify for an "incentive" plan was the effort beyond whatever a company had already planned in its normal program. Thus only the costs and revenues associated with the improvement aspects of a new program were analyzed. The economic evaluation followed an "incremental" approach in assessing the impact upon the company's financial picture when it undertakes an upgrading program.

The accompanying flow chart (opposite page) illustrates the basic methodology, however a detailed description can be found in the final report.

5.0 CONCLUSIONS AND RECOMMENDATIONS (Cont'd)

5.3 SUGGESTED FURTHER RESEARCH

The main report provides a full listing of areas that would require further investigation prior to government's decision on a policy for rural service upgrading. These may be summarized as follows:

i) Increase the number and type of telcos sampled to provide an accurate national representation;

ii) Expand the sample size for "typical" switching centres;

iii) Establish market price-demand relationships;

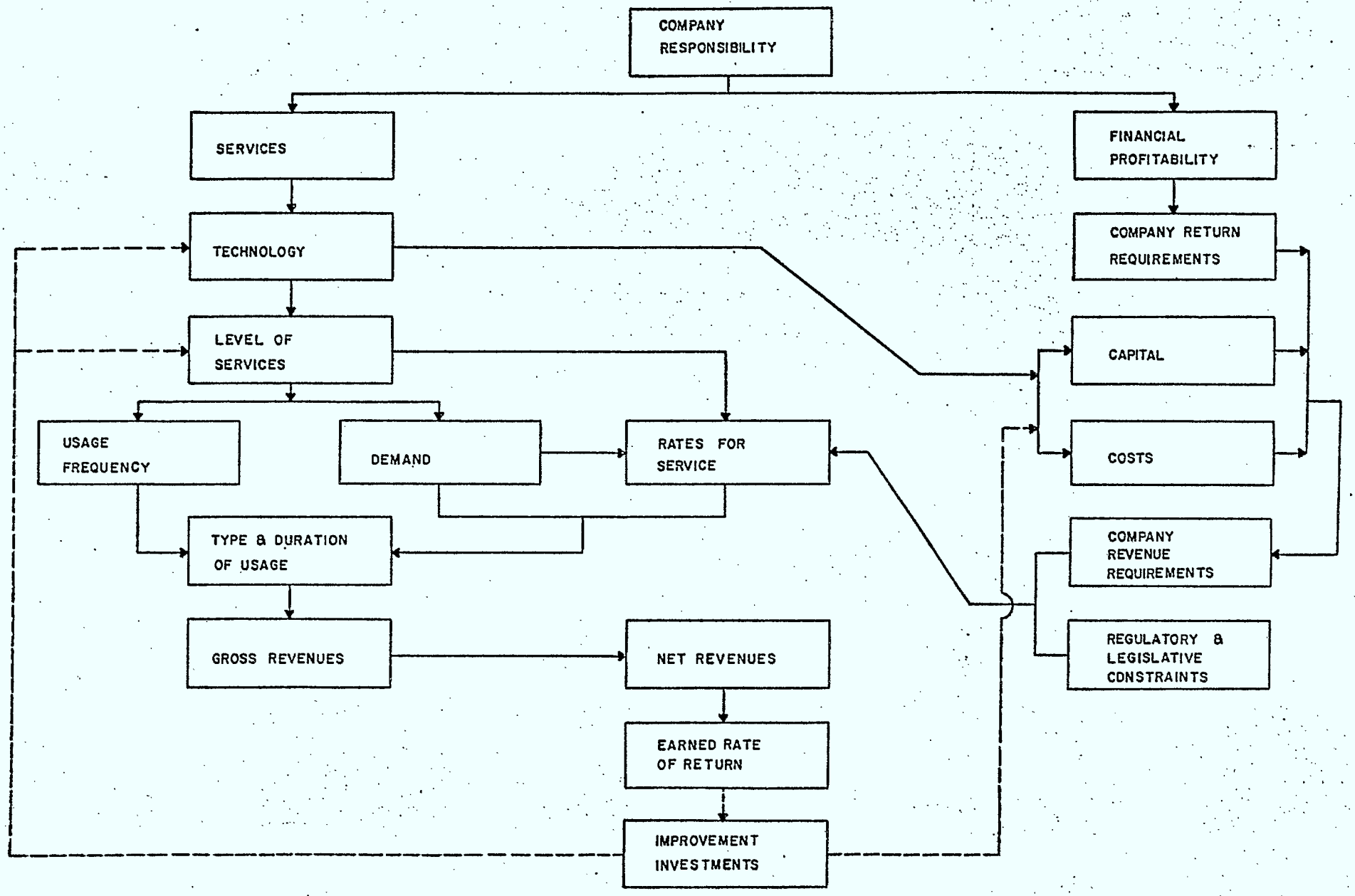
iv) Quantify the "dormant demand" for improved services;

v) Analyze social and economic factors implicit with rural service upgrading;

vi) Assess the impact of upgrading upon revenues, especially from toll calling;

vii) Review Regulatory constraints in each province;

TYPICAL TELCO'S RESPONSIBILITIES
RELATIONSHIP DIAGRAM



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(M.J.P.) January 1979

5.0 CONCLUSIONS AND RECOMMENDATIONS (Cont'd)

5.3 SUGGESTED FURTHER RESEARCH (Cont'd)

viii) Coordinate incentive schemes with objectives of Regulators;

ix) Determine relative desirability of incentives in view of Telcos' objectives and constraints;

x) Review assumptions of this study with telcos, regulators, and governmental bodies;

xi) Input results of other D.O.C. studies;

xii) Study an integrated service plan for communications;

xiii) Determine ways to ensure the "permanency" of incentives;

xiv) Involve D.O.C. and Telcos directly in dialogue on the problem of rural service upgrading;

xv) Assess the impact within other industries when financial incentive is provided for rural service upgrading (eg. job multiplier effects; new technology transfer; etc.)

xvi) Review the complexity of the mechanism associated with financial incentive schemes. The "Relationship Diagram" on the opposite page may serve as an initial illustration of the problem.

D.G.S.P.

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