NAME Forest Eng Course
NOM

NO. Walter Schofield, Lambe

Wed.

D. Selecting an interest rate

a. Pvt. vs. social
b. Nature of investor.
c. Mkt. conditions
d.
e. Inflation.
f. Cost of taxation

Planning: opp or cap. invt.

E. Risk

Risk is like int.

Paradox of risk

A. Road pricing

1. Public highways – gen. rev.
2. Forest roads, specific
   Primary trunk
   Feeder roads. Also permanent
   Tertiary T-imps.

User charges cont. bus.
— Collection costs
— Legal liability
— merit good

~~A. cont.~~

B. Prices as conversion factors

Managing makes log price too low

Fish etc. marketable

Nonmarketable goods
Aesthetic value

Hiking is good for poor people

Schofield

1) Defs.

2) Purposes

a) Go or no

b) Ranking or priority

c) Scale

d) When

Contexts

Projects or programs (or parts of projects)

EA ante or ex post (learning by experience)

Many fields

Limitations

Wedges between real & observed costs

Which demand

Measure problems

Intangibles – no observed mkt. price

Ripple effects of B & C

Ideological bias

Class bias

Ethnic bias (or vs. distrib)

Non-political bias

Engineering bias — (ignore demand, use requirements instead, regardless of price)

(Bombing re engineers)

Identify B & C

Benefits - contribn to objectives, msrd. by willingness to pay.

TR + CS

(Feedstock creates rents to mill sites just as water creates farm land rents?) —

Depends on how site-specific the feedstock is.

Idny bens.

- horizontal. E.g. recrn. bens.

e.g. bens. to Alta or U.S.

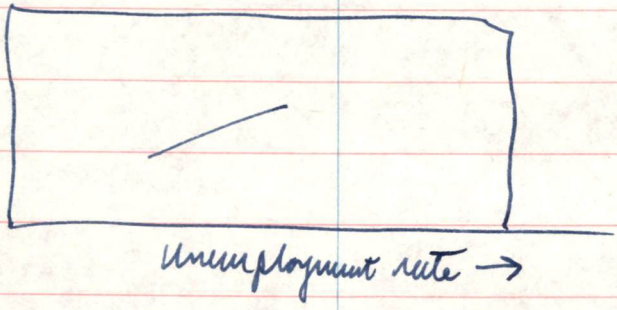
- vertical. (Multipliers?)

ΔY is respent, multipliers, assuming is a net ΔI; assuming ΔI is good, etc.

Shadow prices

A. If union wage rates are too high, use lower o.c.
If employ unemployed, no cost?

Use "synthetic response fns." to est. shadow P of unemployed (Haveman & Krutilla)



P = probability of drawing labor from idle pool

Not used in practice

B. Intangibles, how to value
1) Pvt. equivalent
2) Willingness to pay –
e.g. from recn, Clawson method
3) ~~Noise~~ Effect on l.v. -- noise, e.s.
4) Δ l earnings after trng.

Questionnaire - how much will you pay? (How much wd. you have to be paid?)

Cost-effectiveness method. Where you can't measure benefits, use physical measure (like body-counts) & min. unit cost.

"Contingency calc." Aesthetic impact of logging. Ext. value of logging, so you know cost, even if don't know benefits.

Ranking

1) Mutually exclusive

Res. of site

Res. use seems limited 15

J.S. favors max PV in all cases. Wrong. Doesn't say at what i

If budget constraint, rank by B/C ratios. (at what i?)

A.

Objectivity.
Aid rationality in some cases.
Guidelines needed where CBA needed.
Practical & useful.
Longer periods make decisions harder
Intangibles are tough. Use as finder factors

Cases: Columbia, Peace,

Shark hunting & regulations

B. Valuation

Ruby Creek, ~~dep~~ debris

Costs	Benefits
K, $300,000	100,000/yr.
Op. 150,000.	sale of wood
PV = 1,800,000, 10 yrs.	
undiscounted	
2dary	2dary
6	reduced cost by Harbor Board, collecting rocks
	50,000/yr.
	500,000
	Reduced losses to fishermen

C

Max. a program goal.

Accept the goal — e.g. 12% Δ bodyguard price.

D. Which project comes first?

Objectives & constraints

Criteria for decisions

Sensitivity

More & better roads for more objectives

Access roads

E.. Class of road

Time frame is important. Be specific
Regeneration not justified?

Fish ~~can~~ benefits can be quantified
- to fishermen, Environmentalists
speak for fish.

Leave-strips only benefit environmental groups.

Minority report.
- CBA is old stuff
Indulgences can be priced
- CBA favors developer, bec. of measmt. bias.
(but i.e. hurts developer)
- burden of proof shd. be on those who wd.
change.

INTEREST, INFLATION AND RISK

T.A. Lambe, P.Eng.

School of Public Administration

University of Victoria

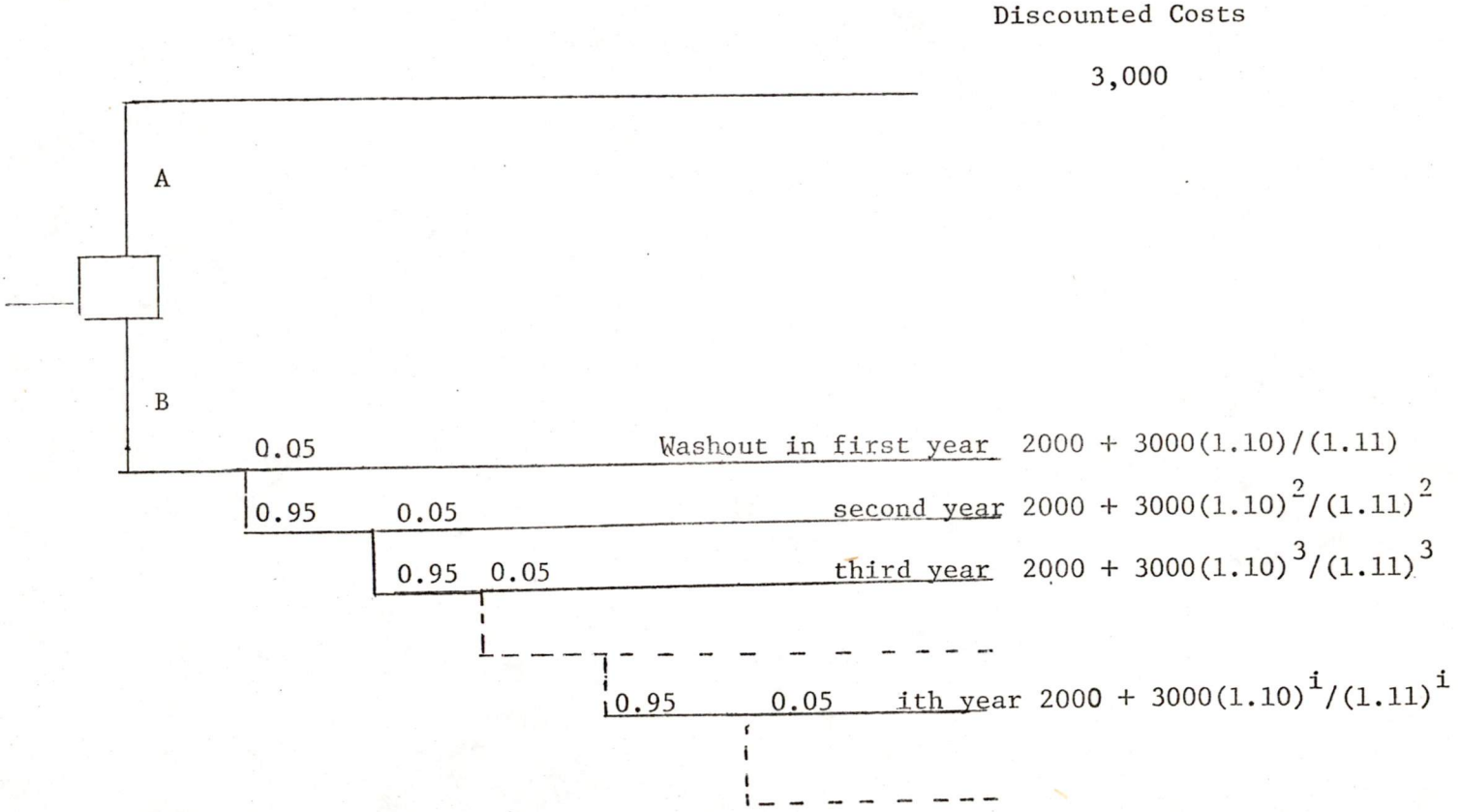
February, 1976.

1. A Problem: A road designer has the choice of installing a 30-inch culvert for $2,000, or a 48-inch culvert for $3,000. With the smaller pipe, there is a 5 percent chance at the beginning of each winter that the culvert will be washed out, in which case it will be replaced by a 48-inch pipe. The larger pipe always has adequate capacity.

The cost of installing a 48-inch pipe rises 10 percent compounded per year due to inflation. Interest on borrowed money costs 11 percent per year.

Which pipe should be installed initally to minimize the expected present value of all costs?

2. The Basic Solution



ALTERNATIVE A: Present value = 3000

ALTERNATIVE B: Expected present value

$$= 2000 + \frac{3000(0.05)}{0.95} \sum_{i=1}^{\infty} \left[0.95(1.10)/(1.11)\right]^i$$

$$= 2000 + 3000 \frac{(0.05)1.10}{1.11} \cdot \frac{1}{1 - 0.95(1.10)/(1.11)}$$

$$= 4538$$

3. Refinements

a) Constructing decision trees - by pruning branches to reveal the essential details.

b) Assigning probabilities - with the help of Bayes Formula.

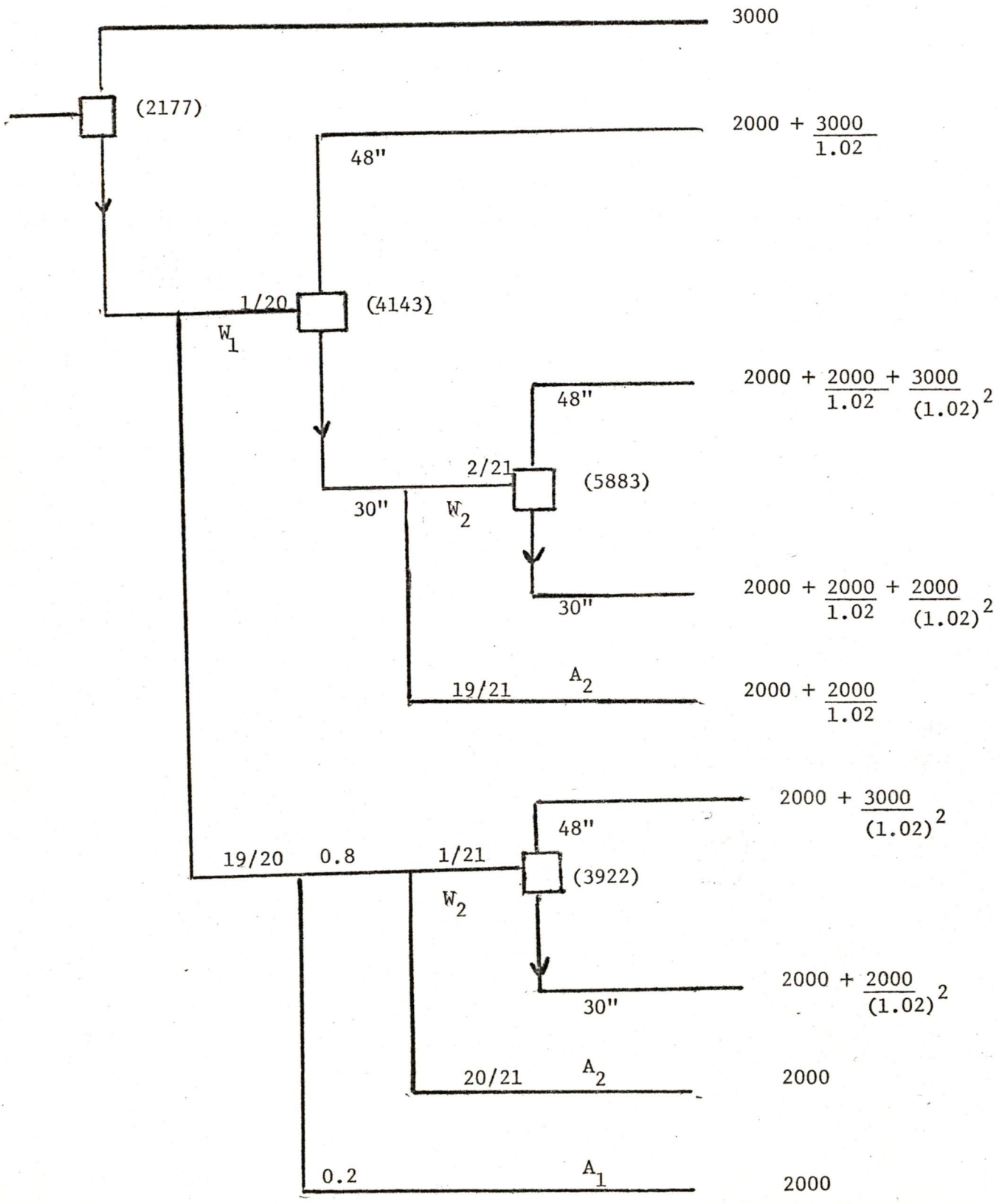
c) Discounting future costs - with the aid of the historic relationship between interest rates and inflation.

d) Modifying the problem for the chance of the road becoming obsolete.

4. REFINED SOLUTION

W_i = Washout in spring of year i

A_i = Road Abandonned in autumn of year i



G. Walter

1. Services of the Forest.

2. Clientele

a. Direct payers, user basis.
b. Pay license fees for access
c. Free access.

Demand is conditioned by whether you must pay.

3. Geography

Uniform policies are bad, bec. regions differ.

4. Non marketable aspects? Particularly now. Can market anything.

Option demand
Disputed access. 30,000 miles of forest roads, hard to control

5. Specific demand ... site-specific.

Generalized demand. Hiking, wandering.
Subject to a "distance-decay factor".
It falls off faster than specific demand

So close-in forests have rent, & repay better mgmt.

5 (cont.)

s/a, Specific Interest Area. Set more intensive mgmt.

Meantime, generalized demand gets ignored: hiking, cross country skiing, (hunting — if generalized enough)

Open access near the center causes over use. Pricing would therefore cause spreading out. I wonder.

6. Pricing the resource.

Land is the resource -- it produces all the services.

a. Great features, minimal interest. No charge open access.

b. Special interest organized group. Leave it to them. Open membership. Some potholes.

Golf Clubs are OK biz. they don't make money. !

c. Large, ill defined groups.
User charge, or access license.

d. Generalized demand.
Fee per unit harvested
or fee related to cost of access -- toll roads.