

Appendix C

EXPLANATION OF TABLE AND CHART — PRESENT WORTH OF PROJECTED REVENUE

CLAUDE A. ROTHROCK

Engineer of Preliminary Location and Design,
Ohio Department of Highways

The accompanying table and chart are for illustrative purposes. The table is one of a series extending from a discount rate of 1 percent to that of 8 percent — each based on an original unit of revenue or traffic growing at 5 percent a year in a straightline increase. The tables are computed to show the year-by-year growth and present worth for a 30-yr period.

In practice, the year-by-year growth would ordinarily be computed by forecasting each component that enters into the composite forecast, because each state or local project might have different rates of traffic growth and revenue earnings.

Projections of traffic on a national basis show an expected growth of 4.7 percent from 1956 to 1976 and an expected growth of 4.9 from 1956 to 1986, deviating slightly from a straightline growth.

When there is a consistent and continuous growth the computation of continuous compounding and continuous present worth may be the ideal approach, but in traffic and revenue growths there are seasonal fluctuation and erratic growths which do not justify such refinement in the mechanics of computing.

PRESENT WORTH OF PROJECTED REVENUE: INTEREST RATE 6%

Year	Traffic or Revenue ¹	PW Factor	PW	Accumulated PW Factor
1	1.05	0.9434	0.9906	0.9906
2	1.1	0.8900	0.9790	1.9696
3	1.15	0.8396	0.9655	2.9351
4	1.2	0.7921	0.9505	3.8856
5	1.25	0.7473	0.9341	4.8197
6	1.3	0.7050	0.9165	5.7362
7	1.35	0.6651	0.8979	6.6341
8	1.4	0.6274	0.8784	7.5125
9	1.45	0.5919	0.8582	8.3707
10	1.5	0.5584	0.8376	9.2083
11	1.55	0.5268	0.8165	10.0248
12	1.6	0.4970	0.7952	10.8200
13	1.65	0.4688	0.7735	11.5935
14	1.7	0.4423	0.7519	12.3454
15	1.75	0.4173	0.7303	13.0757
16	1.8	0.3936	0.7085	13.7842
17	1.85	0.3714	0.6871	14.4713
18	1.9	0.3503	0.6656	15.1369
19	1.95	0.3305	0.6445	15.7814
20	2.0	0.3118	0.6236	16.4050
21	2.05	0.2942	0.6031	17.0081
22	2.1	0.2775	0.5828	17.5909
23	2.15	0.2618	0.5629	18.1538
24	2.2	0.2470	0.5434	18.6972
25	2.25	0.2330	0.5242	19.2214
26	2.3	0.2198	0.5056	19.7270
27	2.35	0.2074	0.4874	20.2144
28	2.4	0.1956	0.4694	20.6838
29	2.45	0.1846	0.4513	21.1351
30	2.5	0.1741	0.4353	21.5704

¹ Traffic or revenue figures show growth in place at end of year computed on a straight-line growth of 5%. No consideration is given to extra value of revenue flowing in during year. "Continuous compounding" might be used to obtain the "true" value but refinement is unjustified, inasmuch as receipts of revenue are not uniform throughout the year, and more especially due to the fact that the error of estimate of revenue may greatly exceed the small error introduced by ignoring present worths of daily receipts.

