

any single piece of physical property are small relative to the total investment. In brief, where the properties are large enough depreciation becomes only normal wear and tear, but in any case operating expenses should be made to provide for ultimate loss in value, whether reserve funds are accumulated or all depreciation is charged to the "wear and tear account." It is on this theory that, a large property having numerous physical elements, all deterioration becoming simply "wear and tear" and a part of operating expenses, the receiver of the Third Avenue Railway in New York City declines to obey the order of the Public Service Commission and provides no depreciation fund whatever, simply removing deterioration when it occurs and charging it as maintenance in operating expenses.

It has been the too frequent practice in the past to regard wear and tear as the only elements of depreciation chargeable to the operating expense and to charge capital account in whole or in part with expenditures for age, inadequacy and obsolescence. The error of this procedure is now almost universally recognized and the injustice of such improper handling of depreciation to both the investor and the public served is clear.

Application of Depreciation.

There has been such marked development and improvement in all mechanical appliances, particularly along electrical lines, that inadequacy and obsolescence have usually come into effect before age, and, in consequence, knowledge of the depreciation of all electrical properties due to age has not yet been fully established.

The determination of depreciation due to inadequacy and obsolescence is a particularly delicate matter, it depends so largely on local conditions and especially upon individual judgment and equipoise. Inadequacy and obsolescence usually develop so quickly that very frequently the property in question becomes inadequate or obsolete within a few weeks or months, and has depreciated to scrap value almost as soon as these classes of depreciation are recognized; a space of time entirely too brief in which to apply ordinary methods of offsetting depreciation.

Information should be collected so as to make clear the cause of depreciation and the rate at which it has progressed. For example, wear and tear would probably have to become subdivided into maintenance and accident. Obsolescence might be divided so as to show whether the obsolescence was caused by city ordinance or the invention of new apparatus. In obtaining age depreciation, care must be exercised that the apparatus is abandoned through exhaustion of life, not through inadequacy or obsolescence.

In determining the total amount of deterioration due to inadequacy and obsolescence, only those elements of the property which have clearly and unequivocally so depreciated should be written off to this account. On the other hand, in determining the rate of depreciation for making provision covering inadequacy and obsolescence, the engineer should be sure to provide a rate high enough to take care of these classes of depreciation out of the operating income.

As the United States Bureau of Internal Revenue provides that reduction in value authorized for depreciation "shall include all expense items under the various heads acknowledged as liabilities," it will be seen that the proper understanding of the question of depreciation is a vital one for those connected with corporation management, because if no depreciation fund is set up nothing can be included in the cost of operation as necessary to provide for depreciation, as would be essential in a case involving rate regulation, for example. Moreover, the State public service commissions are now generally requiring depreciation accounts

and reserves on a basis to be decided by each corporation itself.

The manner of determining the amount to be set aside for annual depreciation varies, there being three general methods recognized.

a. An estimate based on a percentage of the cost of the property being depreciated. The special master in the Columbus (Ohio) case held that the amount of operating expenses chargeable to depreciation should be "5 per cent. of the total cost of the plant including real estate, real estate constituting but 7 per cent. of the total valuation." The present laws of Massachusetts provide in respect to municipally owned gas or electric plants that there shall be included an amount for "depreciation equal to 3 per cent. of the cost of the plant exclusive of land and water-power appurtenant thereto."

b. A fixed percentage of the gross earnings. This method is sometimes taken to include wear and tear and sometimes not. The practice in this regard is illustrated by the following companies:—

Name of Company	Per Cent. of Gross Revenue Expended or Appropriated for	
	Maintenance.	Depreciation.
Milwaukee companies:		
Railway departments	11.3	9.9
Gas, electric light and steam heat department	6.15	8.12
United Railways Company of St. Louis..	13.67	10.0
Union Electric Light & Power Co., St. Louis	4.95	16.0
Suburban Electric Light & Power Co.....	7.10	10.85
Detroit Edison Co. and subsidiaries.....	6.45	10.23
Omaha & Council Bluffs Street Railway Co.	10.0
Chicago street railways	6.0	8.0

c. On the basis of kw-hours output or car miles run. The New York Edison Company charges monthly for renewals and replacements, etc., one cent per kw-hour on current sold to general consumers in addition to wear and tear. In Cleveland 5 cents per car mile is provided to cover both maintenance and other deterioration. In Brooklyn the subsidiaries of the Brooklyn Rapid Transit System allow amounts varying from 2.7 cents to 4.4 cents per car mile for equipment of surface roads and from 1.4 cents to 2 cents per car mile for equipment of either elevated or partly elevated railways; from 2.2 cents to 2.4 cents per car mile for way and structures for surface roads; from 1.1 cents to 1.8 cents for elevated or partly elevated railways, to cover not only obsolescence, inadequacy, renewals and replacements, but also repairs and maintenance.

Total Depreciation.—From the cost should be deducted the absolute depreciation in order to obtain the present real or service value of the property. If it is desired to go further than this and obtain a theoretically depreciated value, the absolute depreciation must be increased by a theoretical depreciation determined by the use of estimated amounts to cover assumed deterioration for age and non-existent, but expected, inadequacy or obsolescence.

Very many authorities agree that in making an estimate of the amount of depreciation effective in any property, "used or useful," there should at least be included in the amount to be deducted an estimate of the amount of wear and tear, deferred maintenance, if any, also scrap value of property that has been worn out or superseded as well as inadequate or obsolete property provided it is still inventoried.