



## **Proper Consideration Future of Future Net Salvage in an Appraisal of Value**

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October 2007

### **Preface**

In recent years, this author has seen several appraisals where the appraisers adjusted their indicator of value downward to reflect the present worth of an anticipated future net salvage (FNS) liability. The purpose of this paper is to address the value considerations that an appraiser should and should not give to FNS in an appraisal of value, with emphasis on the Cost Approach. Specifically, this paper addresses this issue in the context of the appraisal of tangible personal property (TPP).

### **Summary of Conclusion**

In adjusting the indicator of value for a FNS liability, the appraiser is indirectly making the assumption that a willing buyer, in an arms-length transaction, is not knowledgeable of the asset's operating costs, expenses and revenues. Moreover, such an adjustment to the indicator of value:

1. Is inconsistent with the concept of Fair Market Value,
2. Compromises the integrity of the appraisal, and
3. Results in a distorted indication of value.

### **Salvage Defined**

Before addressing the issue at hand, a few definitions and background are in order. The following definitions are taken from the current issue of *Public Utilities Depreciation Practices*, published by the National Association of Regulatory Utility Commissioners (NARUC); herein referred to as the NARUC Manual.

#### **Cost of Removal**

The costs incurred in connection with the retirement from service and the disposition of depreciable plant.

#### **Gross Salvage**

The amount recorded for the property retired due to the sale, reimbursement, or reuse of the property.

#### **Net Salvage**

The gross salvage for the property retired less the cost of removal.

The term “*Future*” is often prefixed to the above salvage terms to refer to the salvage/cost of removal at the anticipated retirement date of the property. Future Net Salvage (FNS) is

therefore the net of anticipated gross salvage less cost of removal at the anticipated time of the physical retirement of the subject property. To the extent that gross salvage does not offset the cost of removal, FNS will be negative (i.e., an expense). Conversely, if the gross salvage exceeds the cost of removal, FNS is positive (i.e., revenue).

### **Accounting for FNS in an Appraisal of Value**

Future Net Salvage is not a new concept. It has long been recognized as a common and normal expense/revenue associated with the disposal of all property. At the time of final retirement, gross salvage is realized as business revenue and cost of removal is realized as a business expense. FNS is a recognized cost of doing business; and as such, a prudent business will adjust its current pricing to reflect the anticipated FNS as well as all other costs of doing business.

In our analysis of the proper consideration of FNS we use the following definition of Fair Market Value as defined by the American Society of Appraisers:

*Fair Market Value* is the estimated amount, expressed in terms of money, that may reasonably be expected for a property in an exchange between a willing buyer and a willing seller, with equity to both, neither under any compulsion to buy or sell, and both fully aware of all relevant facts, as of a specific date.

### **Sales Comparison Approach to Value**

In the sales comparison approach to value, recent sales of comparable property between an informed and willing buyer and seller are analyzed to yield an estimate of value. Inherent in the definition of fair market value and in the sales comparison approach is the assumption that the buyer is knowledgeable of all relevant facts associated with the property. The buyer understands the implications of salvage; and therefore, the purchase price adequately reflects any anticipation of FNS. To assume otherwise, is inconsistent with the concept and definition of fair market value. It is, therefore, not necessary to separately identify or consider FNS in the Sales Comparison approach to value.

### **Income Approach to Value**

The Income Approach is predicated on the economic principle that the value of a property is the present worth of its future net benefits. For an income producing property, the income approach is generally achieved using a Discounted Cash Flow (DCF) model to compute the present value of all future cash flows. As discussed above, gross salvage and cost of removal are normal business cash flows, and therefore FNS must be accounted for in an Income Approach.

There are two aspects of FNS: 1) the anticipated FNS itself; and 2) the recovery of FNS reflected in the business' pricing. The owner of a business is knowledgeable of the business and the property which sustains the business. The owner understands that the prices charged for products and services must capture all costs of producing the products and services – including the realization of future gross salvage revenues and future cost of removal expenses.

If an appraiser desires to separately quantify FNS in an appraisal, the appraiser must give include both the revenue and expense aspects of FNS. If the owner/business is prudent, then the anticipated FNS expenses will be offset by the fees and prices charged by the business. The resulting impact to value is, therefore, negligible.

While salvage incomes and expenses must be captured in an income approach, it is generally not necessary to separately identify or quantify salvage. The reason for this is simple: total revenues of the business include the contribution of gross salvage; and total expenses of the business include the cost of removal. Thus, when the Income Approach utilizes either projected net income or separately projects total income and expenses, FNS is inherent in these cash flows and it is, therefore, not necessary or common practice to separately quantify it.

It is conceivable, however, that salvage inequities may exist such that the business' recovery of anticipated salvage does not match the anticipated future salvage expenses. To the extent that such inequities exist and to the extent that they are significant, the appraiser should consider them in the Income Approach.

### **Cost Approach to Value**

The Cost Approach is premised, in large part, on the *Principle of Substitution* and the *Age-Life concept*; commonly called the *Age-Life Ratio*.

The Principle of Substitution holds that a willing buyer would not pay more for a property than it would cost today to duplicate the functionally of the subject property. Inherent in this statement is the fact that the buyer and seller are knowledgeable of all the facts and circumstances associated with the subject property. The *Principle of Substitution* is commonly satisfied by using the reproduction or replacement cost (RCN) of the subject property as the starting point of the appraisal of value.

The *Age-Life* principle is satisfied in the determination of the depreciation of the subject property. In the Cost Approach, the depreciation of the subject property is equated to the percentage of the remaining productive life of the property. For example:

*If a 15-year old property is expected to have another 5 years of productive service; then the cost approach assumes that depreciation has consumed 75% (15/20) of the value of the property. In other words, the subject property has 25% of its useful value (and productive life) remaining.*

In this example, the value of the subject property could be estimated as 25% of the RCN of the property. This remaining value percentage is typically referred to as the *Percent Good* factor and is equal to 1 minus the age-life ratio. With a bit of basic algebra, the percent good factor is given by the following variation of the age-life formula:

$$\text{Percent\_Good} = \frac{\text{Remaining\_Life}}{\text{Age} + \text{Remaining\_Life}}$$



In the application of the cost approach, individual revenues and expenses associated with specific items of property are not directly quantified; their impact to value is reflected in the remaining productive life of the property; and therefore, reflected in the resulting percent good factors. For example, the appraiser is not required to separately identify the revenues from sales of products or services, normal maintenance, property taxes, the cost of new plant to replace the subject property, or other operating expenses; even though these cash flows do impact value. All of these, and other, operating cash flows establish the remaining productive life of the property.

**FNS is Inherent in the Cost Basis Used in a Cost Approach**

As noted in the above section regarding the Sales Comparison Approach, the premise of Fair Market Value inherently assumes that the buyer is fully knowledgeable of the property. The buyer understands the implications of the salvage value of the property; and hence, the purchase price adequately reflects the property’s FNS.

Consider the following example:

*A prudent buyer needs to purchase a particular device and is analyzing the economics of the available alternatives. There are two models available to choose from. Both models have exactly the same functionality and operating costs; however, one of the models has a significant FNS expense at the end of the life. Both are expected to be in service 5 years. Model-A costs \$1000, fully installed, and zero FNS at the end of model-A’s life; whereas model-B has a FNS expense of \$500 at the end of its life. Both models have the same operating cost and are expected to generate the same revenues. The table below summarizes the attributes of the two models. Ignoring taxes, what is the highest price that a prudent buyer would pay for model-B?*

	<u>Model-A</u>	<u>Model-B</u>
Cost of Capital:	8%	8%
Service Life:	5-years	5-years
Installed Cost:	\$1,000	???
Annual Operating Expense:	\$100	\$100
Annual Revenue:	\$400	\$400
Future Net Salvage	\$0	\$500

The solution is simple. Since both models are identical in every way except for FNS, model-B has an additional expense that model-A does not have, FNS. The FNS expense will be realized in year 5, at the end of the service life. Given that model-A cost \$1000, the highest price that a prudent buyer would pay for model-B is \$1000 less the present worth of the \$500 FNS. At 8% for 5 years, the present worth of the FNS is approximately \$340. Thus, the maximum price a prudent buyer would pay for model-B is \$660. Alternately, this can be seen in the economic analysis provided below.

A common method to evaluate the economic benefit of investment alternatives is to compare the economic value added to the business of each alternative. The alternative that adds the

highest value is considered best. A streamed-lined version of the economics associated with purchasing each model is provided in the table below.

Model-A

Cash Flow Item	Present Worth	Year				
		1	2	3	4	5
Installed Cost:	(\$1,000)					
Annual Operating Expense:	(\$399)	(\$100)	(\$100)	(\$100)	(\$100)	(\$100)
Annual Revenue:	\$1,597	\$400	\$400	\$400	\$400	\$400
Future Net Salvage:	\$0					\$0
<b>Net Value Added to Business:</b>	<b>\$198</b>					

Model-B

Cash Flow Item	Present Worth	Year				
		1	2	3	4	5
Installed Cost	(\$660)					
Annual Operating Expense	(\$399)	(\$100)	(\$100)	(\$100)	(\$100)	(\$100)
Annual Revenue	\$1,597	\$400	\$400	\$400	\$400	\$400
Future Net Salvage	(\$340)					(\$500)
<b>Net Value Added to Business</b>	<b>\$198</b>					

A common method to evaluate the economic benefit of investment alternatives is to compare the economic value added to the business of each alternative. The alternative that adds the highest value is considered best. A streamed-lined version of the economics associated with purchasing each model is provided in the table above.

From the above analysis, we see that if the buyer selects model-A, it will create \$198 in value for the corporation. Moreover, we see that when model-B’s cost is \$660 it yields exactly the same value to the business as model-A, \$198 in this case. We also note that any increase to model-B’s installed first cost of \$660 results in a dollar-for-dollar decrease to the net value added to the business. Thus, it is clear that given the availability of model-A, a prudent buyer would not pay more than \$660 for model-B.

This analysis demonstrates how a FNS liability factors into the economic business decision making process. It clearly demonstrates that the installed first cost, i.e. the historic cost in appraisal terminology, reflects the anticipated FNS. Furthermore, it demonstrates that higher FNS liability results in a lower purchase price, all other things being equal.

Regardless of whether the appraiser’s cost basis is replacement cost or reproduction cost, the cost basis reflects the anticipated FNS. As the starting point of value in a Cost Approach, a reduced cost basis directly results in a reduced value. Thus, FNS is inherently captured in a Cost Approach to value. Any additional adjustment to value for FNS will distort the value conclusions.

Consider that our prudent buyer in the above example decided to purchase model-B. The fair market value, at the time of the purchase, is the total purchase price of \$660. If an appraiser were to make an adjustment for FNS in his cost approach, the value conclusion would be \$320. The replacement cost is \$660; depreciation is negligible; and the FNS adjustment would be \$340 (the PW of the FNS liability at 8% for 5 years). This yields a value indication, at the time of purchase, of \$320 (660-340) – significantly below the \$660 true value which was established by the market as evidenced in the purchase price. Clearly, making a FNS adjustment within the Cost Approach contradicts accepted appraisal practice.

In summary, adjusting the cost approach indicator of value, compromises the integrity of the cost approach and distorts the resulting indication of value.

### **Including FNS Expenses in a Cost Approach Ignores Revenues in Anticipation of FNS**

If an appraiser desires to separately quantify FNS in the Cost Approach, the appraiser must give consideration to both the revenue and expense aspects of FNS that were discussed earlier in the Income Approach section. The premise of fair market value assumes that the buyer is fully aware of all relevant facts associated with the property. This requires the appraiser to assume that the buyer anticipates that his revenues will be sufficient to offset any anticipated FNS.

Adjusting the cost-indicator of value to reflect the present worth of anticipated FNS includes only the FNS expense; and ignores the anticipated revenues that the business will realize to offset FNS expenses. Including only the expense aspect of FNS is inconsistent with the concept of fair market value and distorts the cost-indicator of value.

## **Special Considerations**

Under rare circumstances, due to cash flow inequities, consideration of FNS may be warranted in a Cost Approach. Appraisers should, however, exercise extreme caution before adjusting a cost-indication of value to account for any cash flow inequity. Free market forces eventually bring into balance all cash flow inequities, including FNS; thereby often eliminating the need to separately consider them. Before making an adjustment to the indicator of value, the appraiser should exercise due diligence to ensure that a significant inequity does in fact exist.

### **Salvage Recovery for Regulated Utilities**

The same economic principles regarding the recovery of FNS that apply to non regulated companies also apply to regulated utilities. Regulators recognize that a public utility must be allowed to recover all of its costs, including FNS. The NARUC Manual, cited earlier, specifically addresses this issue starting on page 18, under the heading Salvage Considerations:

*“Under presently accepted concepts, the amount of depreciation to be accrued over the life of an asset is its original cost less net salvage. Net salvage is the difference between the gross salvage that will be realized when the asset is disposed of and the cost of retiring it. Positive net salvage occurs when gross salvage exceeds cost of retirement, and negative net salvage occurs when the cost of retirement exceeds gross salvage. Net salvage is expressed as a percentage of plant retired by dividing the dollars of net salvage by the dollars of original cost of plant retired. The goal of accounting for net salvage is to allocate the net cost of an asset to the accounting periods, making due allowance for the net salvage, positive or negative, that will be obtained when the asset is retired. This concept carries with it the premise that property ownership includes the responsibility for the property’s ultimate abandonment or removal. Hence, if current users benefit from its use, they should pay their pro rata share of the cost involved in the abandonment or*

*removal of the property and also receive their pro rata share of the benefits of the proceeds realized.*

*This treatment of net salvage is in harmony with generally accepted accounting principles and tends to remove from the income statement any fluctuations caused by erratic, although necessary, abandonment and removal operations. It also has the advantage that current consumers pay or receive a fair share of costs associated with the property devoted to their service, even though the cost may be estimated.”*

### **Appraisal Treatment of FNS for Regulated Utilities**

While typically insignificant, a FNS adjustment may be warranted for regulated utilities. For a non regulated business, the appraiser must assume that the business is prudent and their pricing structure adequately captures the anticipation of FNS. For a regulated utility, however, an inequity could exist between the timing of FNS recovery, as set by regulators in anticipation of FNS, and the utility’s actual realization of FNS.

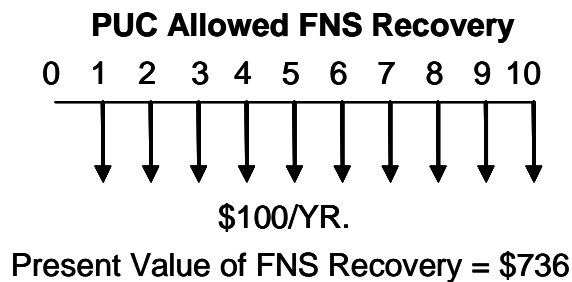
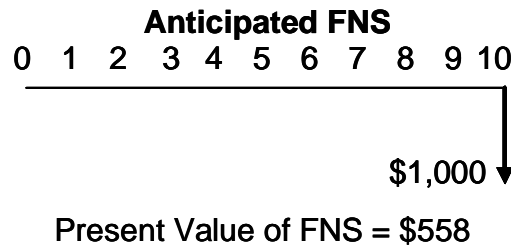
Just as a prudent business would do, Public Utility Commissions (PUC) set the rates of the utility to include the anticipation of FNS. PUCs typically strive to match revenues with expenses. In other words, if the utility anticipates a FNS expense of \$1000 at the end of an assets life, the PUC will factor an additional \$1000 into the rates that the utility is allowed to charge its customers. Therefore, without significant indications to the contrary, separate consideration of FNS in an appraisal for a regulated utility is not generally warranted. For the sake of completeness, however, let’s consider one possible exception.

Most PUCs do not discount the anticipated FNS. Typically, they simply spread the anticipated FNS, in nominal dollars, over the productive service life of the property. For instance, if a utility is expecting a FNS expense of \$1000 and the asset is anticipated being in service for 10 years; most PUCs will allow the utility to recover an additional \$100 per year (\$1000/10yrs) for 10 years to cover the anticipated FNS.

The PUC accomplishes this by appropriately adjusting the regulated depreciation rates to achieve an additional \$100 per year. The depreciation rates are directly offset by the rates (pricing) that the PUC allows the utility to charge for its services. Thus, the utility is allowed to recover, in advance, the full cost of anticipated FNS from its customers.

Because most PUCs do not take into account the cost of money in setting the rates for salvage, an inequity may exists between the present worth of the FNS and the present worth of the recovery of the FNS. The difference between the present worth’s of these two cash flows is the FNS adjustment amount the appraiser may make in the appraisal of a regulated utility.

The graphic below illustrates the time-lines of the FNS expense and the associated recovery of the FNS. The upper time-line reflects the utility’s anticipation of \$1000 FNS at the time of physical retirement, i.e., 10-years into the future. The lower time-line reflects the PUC’s allowed recovery of the FNS.



@ 6% discount rate

At an assumed 6% discount rate (cost-of-money), the present value of the anticipated FNS is \$558 on the day the property is installed. Where as, the PUC allowed recovery of the FNS is \$736. Thus, in this typical example, were the appraiser to adjust the indicator of value; the appraiser would increase the value by \$178 (736-558). Were the utility not regulated, the appraiser should assume that the revenues exactly offset the expenses, and no FNS adjustment should be made.

**Premature Replacement of Plant & Equipment**

It is sometimes argued that premature replacement of equipment, i.e., the replacement of equipment prior to the end of its potential service life, warrants a FNS adjustment to the cost approach indicator of value. Often, technological obsolescence is cited as a driver of premature replacements that warrant a FNS adjustment. This argument is based on the premises that the premature replacement was not anticipated. While I strongly disagree with this premise, it is a mute point.

Businesses only replace existing equipment when it is economic to do so; especially in the case of premature replacement with new technology. When considering the economics of replacing a property, a business must consider all costs of replacement, including gross salvage and cost of removal of the existing property. It is had to imagine that a company faced with a significant cost of removal, would exclude such costs in its economic justification analysis. Ignoring the cost of removal would violate standard economic theory and practice.

The premature replacement of plant and equipment, like all replacements is driven by economics. If it is more profitable to replace the equipment than it is to maintain it, than the prudent thing to do is replace the equipment. Inherent in that decision is that the benefits of replacement outweigh the cost of replacement. Net salvage is but one of many costs of replacement that must be considered. In appraising the property, the appraiser must assume that the business is prudent and that the economic benefits of premature replacement

outweigh the costs. Thus, there is no net liability associated with FNS that warrants an adjustment to the indicator of value.

The book, *Engineering Economy – A Manager’s Guide to Economic Decision Making*<sup>1</sup>, third edition, American Telephone And Telegraph Company – Construction Plans Department, (a.k.a. *Engineering Economy*), illustrates the common practice of considering FNS when deciding to whether to replace plant and equipment.

The *Engineering Economy* was initially published in 1952 and updated in 1962 and again in 1977. The preface reads, in part, as follows:

*The basic purpose of this book is to provide all managers with guidelines for performing an economy study...*

*The primary objective of this text is to enable the manager to identify the economic choice among alternatives involving different amounts of capital expenditures, expenses and revenues. A secondary objective, essential to the first, is to provide the basis for a thorough understanding of the discipline of engineering economy. Continuing changes in accounting and service classifications, tax regulations, technology, valuation methods, and competitive thrusts make fundamental conceptual understanding a managerial requirement.*<sup>2</sup>

In the chapter *The Nature of Costs* the *Engineering Economy* states:

*To remain financially healthy, a business must recover all of its costs – both capital and operational – from revenues. Economic selection studies examine the costs and savings in alternative plans which affect the amount of revenue needed to run the business.*<sup>3</sup> [Emphasis added]

This chapter goes on to further describe and characterize various costs of a business. The next chapter, *Capital Repayment and Depreciation*, discusses the recover of a business costs. It identifies Gross Salvage<sup>4</sup>, Cost of Removal<sup>5</sup>, and Future Net Salvage<sup>6</sup> as normal business costs that 1) must be recovered, and 2) that must be considered in an economic analysis of alternative construction plans.

The following is but one of several examples taken from the *Engineering Economy* illustrates the consideration of FNS in any economic study involving the replacement of plant.<sup>7</sup>

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<sup>1</sup> *Engineering Economy – A Manager’s Guide to Economic Decision Making*, Third Edition, American Telephone And Telegraph Company – Construction Plans Department, McGraw-Hill Book Company, 1977.

<sup>2</sup> Ibid. Page ix

<sup>3</sup> Ibid. Page 137

<sup>4</sup> Ibid. Page 153

<sup>5</sup> Ibid. Page 154

<sup>6</sup> Ibid. Page 154

<sup>7</sup> Ibid. Page 262

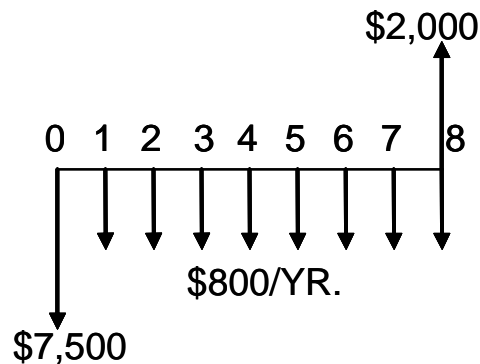
Suppose the firm has an old truck which was bought several years ago for \$6,000, and is now wearing out. The firm estimates that it has two alternatives:

*Alternative A: Sell the old truck now for \$1,800, and buy a new truck for \$7,500. Upkeep and taxes for the new truck will be \$800 each year during its life.*

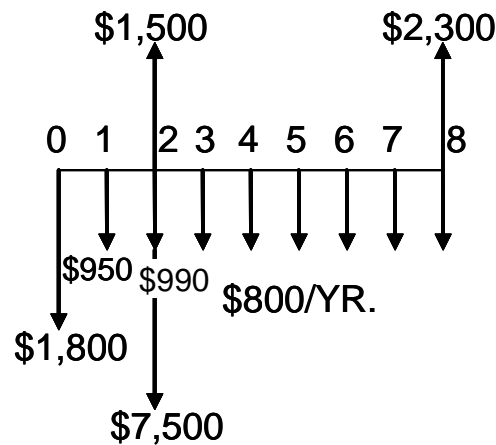
*Alternative B: Keep the old truck for 2 more years, with upkeep and taxes of \$950 in the first year and \$990 in the second. At the end of the second year, sell the old truck for \$1,500 and buy a new one for \$7,500. At that time the upkeep and taxes for the new truck will also be \$800 per year.*

*...the truck being considered is a special truck, which will be needed for only 8 more years. If the truck is brought now, it is estimated to have a salvage value of \$2000 in 8 years. If it is brought 2 years from now, it is estimated to have a salvage value of \$2,300 upon retirement. Figure 11-2A illustrates this situation...*

**Alternative A (Buy new truck now)**



**Alternative B (Keep old truck 2 years, then buy new truck)**



In the above example, each alternative has a different FNS expectation. Alternative-A, calls for the immediate replacement of the existing truck, and reflects a FNS expectation of \$1800. While the \$1800 FNS could have been shown as a credit (inward cash-flow) to the plan that retires the truck, the analyst in this case chose to show it as a missed charge against the plan that keeps the truck<sup>8</sup>. Similarly, the \$1500 FNS anticipated in year-2 of Alternative-B is shown as a credit to this plan.

The important point, is not how or where the FNS is shown for economic analysis purposes<sup>9</sup>, the important point is that FNS must be considered in the economic justification analysis of the various replacement alternatives. Thus, the premise that the premature replacement of equipment (i.e., prior to the end of its potential service life) warrants a FNS adjustment to the cost approach indicator of value is unfounded. To do so, would impair the integrity of the cost-indicator of value.

**Conclusion**

Future Net Salvage has long been recognized as a common and normal business expense/revenue associated with the disposal of property. There are two aspects of FNS that an appraiser must consider: 1) the anticipated FNS expense; and 2) the recovery of FNS reflected in the business’ pricing. Under the premise of Fair Market Value, the appraiser must assume that the owner of a business is knowledgeable of the business and the property which sustains the business; and therefore, the owner understands that the prices charged for products and services must capture all costs of producing the products and services – including FNS.

Under normal market conditions, anticipated FNS will be offset by the recovery of FNS; and therefore, FNS typically would not be a consideration in any appraisal of value. If an inequity

<sup>8</sup> Ibid. Page 263

<sup>9</sup> Showing the FNS as a charge against one plan versus a credit to the other plan does not impact the economic outcome of the analysis. In other words, the difference between the present worth’s of the alternative remains the same.



exists or the appraiser is simply compelled to separately address the value implications of FNS, then the appraiser must consider both the FNS expense and the fees received in anticipation of FNS. To selectively include one aspect of FNS, without including the other, would compromise the integrity of the appraisal and impair the resulting indicator of value.

In the economic selection of alternative replacement plans, all costs, including FNS, are commonly considered. Therefore, if the business elects to replace a property (prematurely or not), the appraiser must assume that the incremental revenues or savings more than offset FNS costs. Hence, replacement, including premature replacement, does not warrant an adjustment to value due to FNS costs.

Free market forces ultimately ensure that a business' FNS costs are matched by offsetting revenues or expense savings. It is therefore not necessary or generally accepted practice to include FNS cash-flows in an appraisal of value.

In the Sales Comparison approach to value, the observed sales include all value influences, therefore any adjustment to value for FNS is inappropriate. In the Income Approach, if the level of detail warrants salvage consideration, the appraiser must ensure that both the FNS liability and the revenues that will be received to offset the FNS liabilities are considered.

In the Cost Approach, if the appraiser adjusts the indicator of value for FNS expenses without an offsetting adjustment for FNS revenues, then the appraiser is indirectly making the assumption that a the buyer is not knowledgeable of the asset's operating costs, revenues and expenses. Making such an adjustment is:

1. Is inconsistent with the premise of Fair Market Value,
2. Compromises the integrity of the Cost Approach, and
3. Results in a distorted indication of value.

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