Special Issues in Land Valuation

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Abstract

Appraisers encounter many situations in which the value of land must be estimated. Land value may need to be determined in the context of a sale or exchange, financing, taxes, financial feasibility, condemnation, and contribution to improved properties. This article explores situations presenting special land valuation challenges and unique issues.

Introduction

This article explores unique issues that can present challenges and affect a land valuation. The challenges discussed here include contaminated sites, situations when the highest and best use is not the current use, excess land versus surplus land, plottage value, development rights or entitlements, tax increment financing (TIF) districts, and ecological land.

Contaminated Sites

The valuation of contaminated properties typically involves specialized terms, definitions, and techniques. The following terms are from Advisory Opinion 9 of the Uniform Standards of Professional Appraisal Practice (USPAP).

Environmental Risk: The additional or incremental risk of investing in, financing, buying and/or owning property attributable to its environmental condition. This risk is derived from perceived uncertainties concerning:
1) the nature and extent of the contamination;
2) estimates of future remediation costs and their timing;
3) potential for changes in regulatory requirements;
4) liabilities for cleanup (buyer, seller, third party);
5) potential for off-site impacts; and
6) other environmental risk factors, as may be relevant.

Impaired Value: The market value of the property being appraised with full consideration of the effects of its environmental condition and the presence of environmental contamination on, adjacent to, or proximate to the property. Conceptually, this could be considered the “as-is” value of a contaminated property.

Remediation Cost: The cost to cleanup (or remediate) a contaminated property to the appropriate regulatory standards. These costs can be for the cleanup of on-site contamination as well as mitigation of off-site impacts due to migrating contamination.

Remediation Lifecycle: A cycle consisting of three stages of cleanup of a contaminated site: before remediation or cleanup; during remediation; and after remediation. A contaminated property’s remediation lifecycle stage is an important determinant of the risk associated with environmental contamination. Environmental risk can be expected to vary with the remediation lifecycle stage of the property.

Source, Non-source, Adjacent and Proximate Sites: Source sites are the sites on which contamination is, or has been, generated. Non-source sites are sites onto which contamination, generated from a source site, has migrated. An adjacent site is not contaminated, but shares a common property line with a source site. Proximate sites are not contaminated and not adjacent to a source site, but are in close proximity to the source site.

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Unimpaired Value. The market value of a contaminated property developed under the hypothetical condition that the property is not contaminated.¹

The value of a site, once remediated, does not necessarily equal the unimpaired value of that site because the site may still suffer from stigma or other lingering issues to which the market is responding.

According to Advisory Opinion 9 of USPAP,

The relevant property characteristics may include, but are not limited to:
1) whether the contamination discharge was accidental or permitted;
2) the status of the property with respect to regulatory compliance requirements;
3) the remediation lifecycle stage (before, during or after cleanup) of the property as of the appraisal date;
4) the contamination constituents (petroleum hydrocarbons, chlorinated solvents, etc.);
5) the contamination conveyance (air, groundwater, soil, etc.);
6) whether the property is a source, non-source, adjacent or proximate site;
7) the cost and timing of any site remediation plans;
8) liabilities and potential liabilities for site cleanup;
9) potential limitations on the use of the property due to the contamination and its remediation; and
10) potential or actual off-site impacts due to contaminant migration (for source sites).²

The appraiser should consider and report the presence of any known contaminated portion of the site or hazardous substances and other adverse conditions that affect the subject property or the neighborhood in which the property is located. Given that the contamination is known to exist, the appraiser would need to invoke a hypothetical condition in order to value the property as if uncontaminated. If the contamination is uncertain or suspected, the appraiser could appraise the property under an extraordinary assumption that it is not contaminated.

Some matters about which the appraiser should note and comment on include, but are not limited to, the following:

- The proximity of the property or its neighborhood to a contaminated site
- The proximity of the property to groundwater contamination, chemical or petroleum spills, or other hazardous substances that are expected to impact the area for more than one year
- The proximity of the property to other properties that may affect the value or marketability of the subject property including, but not limited to, nearby industrial sites, wastewater treatment facilities, airport approach paths, floodplains, landslide areas, and the like

The appraiser should consider the impact on value that results from the following three effects:

- Cost effects, which include but are not limited to clean-up or remediation costs, monitoring costs, legal costs, additional operating expenses, additional financing costs, and the like.
- Risk effects, which involve the extent to which the contamination may be defined and readily quantifiable, difficult to readily quantify, or unknown and undefined. A risk allowance or adjustment would need to be made and would increase for each scenario in the same order as listed. These risk effects are reflected in the stigma that is sometimes associated with contaminated sites by market participants and users.
- Use effects, which involve limitations on the utility of a site due to contamination or remediation. Use effects may or may not limit the highest and best use of the site. For example, the highest and best use may be limited if a deed restriction or covenant is imposed. On the other hand, subsurface contamination may be capped with few, if any, limitations on highest and best use. If there are limitations, the impacts could affect the maximal productivity of the site and hence its value.

In summary, the value of a contaminated site is affected by cost effects, risk effects, and use effects. Therefore, the valuation of contaminated

² USPAP, 2020–2021 ed.
sites is a serious issue that requires a high level of competence. The issues may not be readily apparent to either the market participants or an appraiser who lacks competency. With respect to feasibility, the remediation costs and who pays them in relation to the unimpaired value is a significant consideration.

Some government websites include information regarding the sale of contaminated sites. An appraiser could investigate the nature of the contamination, the buyer’s or seller’s estimate to cure or remediate the contamination, and possibly the amount that would have been paid if the land was not contaminated.

Valuation Methodologies for a Known Contaminated Site
The value of a contaminated site can be determined by deducting the diminution in value caused by the contamination from the unimpaired value of the site. The first step of this process is to value the site “as if clean” (hypothetical condition). The second step is to deduct the estimated costs of cleanup and allowance for use effects and risk effects (which are collectively known as “diminution costs”). This equals the value “as contaminated.” Issues regarding contaminated sites are discussed in Examples 1–5.

Example 1: The Feasibility of Known Remediation Costs Needs to Be Analyzed
The market indicates that a parcel will be worth $1,000,000 after it undergoes remediation to remove contaminated soil. The remediation is estimated to take 12 months at a cost of $900,000. Market research indicates that investors require a 13% rate of return to remediate parcels impacted by contamination. Based on this information, is the remediation economically feasible?

In this case, remediation would not be economically feasible. The present value of $1,000,000 is approximately $885,000 when discounted at 13%. Because the cost of remediation is greater than the value, it does not make economic sense to remediate the site. However, regulatory issues may require compliance. Some appraisers would say that the land value is −$15,000. Others might say it has no value with a $15,000 liability. On the other hand, suppose a grant that reimburses 50% of the remediation costs is available. In this case, the current market value of the parcel in its “as is” condition is greater than the cost to cure. The remediation is now feasible. The indicated value is $435,000 ($885,000 − $450,000).

Example 2: The Cost of Groundwater Remediation Is Secured by a “Deep Pocket” Corporate Indemnification
In this case, the cost of remediation to cure groundwater contamination from underground storage tanks (USTs) is known and is the responsibility of a prior owner (e.g., a major oil company) to fund and clean up. There may be little or no impact on value, especially if the remediation work is to be completed in the near future. However, it may be more difficult to obtain financing, given that some lenders will not lend on contaminated property notwithstanding these circumstances.

Example 3: Remediation Has Been Completed and a “No Further Action” (NFA) Letter Has Been Issued by the Appropriate Regulatory Agency
In this case, there may be no impact on value except for the possible capitalized cost of ongoing monitoring and provided the market is not concerned with new regulatory requirements prompting withdrawal of the NFA letter.

Example 4: Residual Contaminants Still Exist in the Subsurface, but the Site Has Been Capped and a Restrictive Covenant Has Been Recorded on the Site
In this case, the residual contaminants are likely to impact marketability and result in stigma (the fear of potential future liability and cleanup costs). Capping the site and restrictive covenant may limit the highest and best use and require future monitoring and maintenance costs.

Example 5: Contaminants Affect the Subject Site and Have Migrated to Adjoining Site(s)
In this case, the previous owner or user who caused the problem is not able to indemnify. The cleanup costs are unknown but suspected to exceed the site’s “as if clean” value. In this case, the value of the site could be negative (or $0 with a liability) if the estimated costs of cleanup exceed the value as if clean.
Situations When the Highest and Best Use Is Not the Current Use

Highest and best use is not necessarily always a current use. Highest and best use can be a future use, such that a future use value would need to be discounted to present value dollars.

Example 6: Highest and Best Use Is Not the Current Use

The appraiser is valuing a parcel of land for which the highest and best use is either agricultural use or residential development. Application of the best unit of comparison supports residential development on the subject site as the highest and best use. However, market analysis found that a residential building moratorium, which resulted in an undersupply, was recently lifted and a large amount of supply is being brought to market. Absorption after the lifted moratorium is estimated to be 400 units per year and is expected to remain stable. One hundred units are currently available. Recent land sales add another 1,910 units. Under these circumstances, approximately five years of supply are on the market (2,010 units / 400 units per year = 5 years).

In forecasting the property's capture, the appraiser concludes that the existing competition is superior and that it would be absorbed prior to the development of the subject property.

Suppose that land values are projected to increase by 3% annually despite the moratorium. The appraiser further projects that development of the subject property will not occur for five years. A 14% discount rate is deemed appropriate for risk and holding costs during the interim.

The subject property will be worth 3% more per year, compounded, when it is ready for development in five years. However, the present value of the future value would have to be determined using the 14% discount rate. If the present value for residential development is less than the present value for continued agricultural use, then the highest and best use is continued agricultural use. However, there may be a point in time when the value for residential development exceeds continued agricultural use, in which case the agricultural use is an interim use pending future residential development. The highest and best use conclusion should also state the timing for the use and the market participants.

When the highest and best use of vacant, unused land is to hold it as an interim use for future development, the land is regarded as speculative land. Such land would not be purchased by a current user—i.e., a developer who intends to develop the site today for the future highest and best use. Speculative land markets can be among the most volatile and often involve buyers and sellers who are less than fully informed.

Excess Land vs. Surplus Land

Both excess land and surplus land refer to land that is part of an existing ownership but is not needed to support the highest and best use of the property as improved. Surplus land is additional land that allows for future expansion of the existing improvements but cannot be developed separately and does not have a separate highest and best use; it is associated with an improved site that has not been developed to its maximum productivity according to its highest and best use as if vacant. For an improved site, excess land is that is not needed to serve or support the existing improvements. For a vacant site or a site considered as if vacant, excess land is the land not needed to accommodate the site's primary highest and best use. Such land may be separated from the larger site and have its own highest and best use, or it may allow for the future expansion of the existing or anticipated improvement. The following examples discuss how an appraiser should determine whether land should be considered excess land or surplus land.

Example 7: Surplus Land

A retail building has 10,000 square feet of surplus land that is paved for overflow parking. The surplus land cannot be parceled off and sold separately, and it is not economically feasible to expand or replace the building. Although land sells for $15 per square foot in the vicinity, the building owner is able to earn an extra net rent of $2,400 during the month of September, when the city rents the spaces as overflow parking for its annual Harvest Festival. Overall capitalization rates in the market range around 8.00%.

If the land cannot be sold or used as part of an expanded building, it does not contribute $150,000 to the value of the property (10,000 sq. ft. × $15 per sq. ft.). The owner can earn $2,400 per year after expenses from the surplus land. Capitalizing this amount at 8.00% equals $30,000. The value of the surplus land is based on the income being forecasted to be earned over a long period of time or the capitalization reflecting that the income is not earned. Otherwise, it would be more appropriate to discount the earned income at an appropriate yield rate.
Example 8: Excess Land vs. Surplus Land
An appraiser has been asked to appraise a 91.83-acre parcel that has been improved with a 1,900-sq.-ft. frame house with three bedrooms and 1½ bathrooms. The property is also improved with an older barn that is nearing the end of its economic life and a relatively new equipment shed of pole (post and beam or post-frame) construction that can house a farm tractor and implements. The current zoning ordinance is the only law controlling the subdivision of land in this location. The ordinance requires that a parcel have a minimum size of 7.0 acres and a minimum of 300 feet of frontage along a public roadway. The ordinance also requires each subdivided lot to have a well drilled on it (generating a minimum of five gallons of potable water per minute) as well as soils testing to determine that both a primary and a secondary location exist for the construction of an on-site sewage disposal system. An examination of market data demonstrates that a typical rural residential buyer in this market area desires a site with 7 to 15 acres. For the purposes of this example, assume that a property must have at least 50 tillable acres in order for the agriculture to be financially feasible. Refer to the sketch shown in Figure 16.1.

Scenario 1:
The property owner is an active farmer who has completed all of the previously described requirements and recorded a plat similar to the sketch shown in Figure 16.1. The lots can be transferred to a third party at any time the property owner elects. The current owner plat ted the lots as a defensive technique against fluctuating commodity prices for corn and soybeans, which are the primary crops grown on the land. The property owner is currently farming the entire property. In the past year, the price of the commodities has dropped, causing the owner to lose money on farming operations and have a need to recapitalize. Demand for similar lots in this

Figure 16.1 Subject Property
market area is high, with a shortage of lots available for sale. The typical exposure time for similar lots is 90 to 120 days. According to the local MLS, there is currently a 6-month supply of lots available, with few lots being offered for sale by owner (FSBO). Rural residential lots are currently selling for a price per acre that is approximately three times the price per acre for agricultural land.

The highest and best use of the property as though vacant and as improved is to continue the agricultural use for Lots 1 and 5 and to sell Lots 2, 3, and 4 to third-party buyers for use as rural residential building sites. The sale of the lots is maximally productive due to strong demand and a sale price per acre that is substantially higher than the agricultural land value. Lots 2, 3, and 4 have a separate highest and best use; as a result, they represent excess land and should be valued separately.

Scenario 2:
The plan shown in Scenario 1 is simply a concept plan; in other words, it is a sketch on a piece of paper given to the appraiser by the property owner. A survey has not been prepared, soils testing has not been done to determine if suitable locations exist for on-site septic systems, and wells have not been drilled to determine if there is water of sufficient quantity and quality to support residential dwellings on the proposed lots. Additionally, the market demand for similar lots is currently very low in this market area, and there is a four-year supply of lots available for purchase in the local MLS with additional but unquantified FSBO lot inventory. Commodities prices are currently high enough to allow agricultural operations to be financially feasible.

The highest and best use of the 91.83-acre property as though vacant is agricultural use. The highest and best use of the 91.83-acre property as improved is also agricultural use. The property contains surplus land because 50 tillable acres are necessary for financially feasible agricultural operations, the necessary steps to allow for subdivision development have not been completed by the current owner, and there is a lack of market demand for rural residential lots.

Scenario 3:
All of the lots other than Lot 5 have been sold to third parties, and the appraisal is limited to Lot 5 only. A residence that meets the requirements of a typical buyer for this type of property was recently constructed on Lot 5. Farming operations have ceased since the demand (and thus the prices) for corn and soybeans (which were previously grown on the site) have dropped below a value that allows farming to be financially feasible.

Based on the information provided, the highest and best use of Lot 5 as though vacant is a residential building site, and the highest and best use as improved is a rural residence. Lot 5 contains surplus land in this example because it has more than the market-expected 7 to 15 acres for a rural residential building site, but it cannot be further subdivided.

**Plottage Value**

Plottage value is the increment of value that often occurs when two or more sites are combined to produce greater utility, resulting in a higher productivity or income than could be obtained from the individual smaller sites. This term is generally used to describe circumstances in which larger sites are more valuable per square foot than smaller ones. Examples include the assembly of several land parcels for a regional mall or the acquisition of access rights for a landlocked parcel. Comparable land sales that involve plottage or the potential for it may require a negative adjustment for conditions of sale, or larger sites may be worth less per square foot or per acre than small ones. This adjustment could be labeled as “negative plottage,” “economies of scale,” or “diminished marketing ability.” It is inappropriate to conclude that the highest and best use of a site is assembly with a property owned by another if the assembly is not reasonably probable.

**Example 9: Plottage Value**

A city’s downtown area is subdivided into rectangular blocks, each consisting of 10 lots measuring 50 ft. by 100 ft. Most lots are individually owned and improved with older, two-story buildings. The buildings are legal nonconforming uses because they were developed before on-site parking regulations were imposed. The interior properties typically sell for $250,000 and the corner parcels typically sell for $300,000 to small retailers or small office users. One block had been assembled into a single ownership over the years and recently sold to a developer for $3,750,000, or $75 per square foot. The developer demolished the improvements and built a successful office tower. Other comparables support this

sale price, and fundamental demand analysis suggests that the market can support another office tower.

A developer has been quietly acquiring the properties in Block C, and now only one property remains. This remaining property is an improved lot in the middle of the block’s north side. Without the remaining lot, no plottage is achieved. Refer to Figure 16.2 for a map of the subject property.

If demolition equals salvage and no discount is indicated for a bulk sale of nine lots, what is the value of this remaining property?

Based on the comparable sales and ignoring the adjoining nine lots, the value of the subject property is $250,000.

The “quiet” developer’s nine lots are worth $2,450,000 \([4 \times \$300,000] + (5 \times \$250,000)\), less a discount for bulk sale, which is zero in this case (for the sake of simplicity). However, if the developer can acquire the tenth lot, the block becomes worth $3,750,000. This indicates that the value of the tenth lot to the developer is $1,300,000 ($3,750,000 − $2,450,000).

Assuming that it is reasonably probable, clearly the highest and best use is to join the subject property to the nine-lot ownership. But what would the market value be?

Market value is based on conventional economic theory, which predicts a unique market-driven price at the point where supply equals demand in a competitive market. Even in a monopoly (in which there is only one seller) or a monopsony (in which there is only one buyer), a unique price is predictable. But as soon as the market consists of only one seller and one buyer, which is known as a bilateral monopoly, economic theory can no longer predict a unique price and hence there is no market value. Bilateral monopoly theory predicts a minimum sale price and a maximum sale price but no unique price; it suggests that any observed transaction price depends not on supply or demand but on the negotiating or bargaining skills of the buyer and the seller.

In this case, the subject property would sell for at least $250,000 and at most $1,300,000. If the owner of the subject property plays hardball, he or she might be able to extract all or nearly all of the $1,300,000 value increment from the developer. If the developer plays hardball, he or she might convince the seller to sell for only slightly more than $250,000. Or the developer and the seller might agree to split the enhancement. Of course, if the seller lacks full information, that means his or her negotiating position is weakened.

Some appraisers would likely argue that the $250,000 conclusion is the market value and $1,300,000 is the plottage value but not the market value. They would reason that $250,000 is the value to a broad number of buyers, whereas $1,300,000 is the value to only one buyer and hence not a “market” value. In such a situation, a large number of buyers would be willing to pay more than $250,000 for the right to be able to negotiate with the quiet developer. Valuing the property at $250,000 neglects to place a value on that property right.

Some appraisers might argue that $1,300,000 is the investment value, since that is the most the quiet developer is willing to pay. However, this would be an inappropriate interpretation of the term; any owner of the nine lots would be willing to pay up to $1,300,000, not just the “quiet” developer in this case.

It would probably be appropriate for the appraiser who is required to develop an opinion of the market value of this property as a point estimate to report three values: 
- $250,000, which is the minimum, stand-alone value
- $1,300,000, which is the maximum plottage value, which reflects the contributory value of this parcel to the whole
- An amount somewhere in between in which a buyer and seller share the $1,050,000 enhancement, based on the appraiser’s estimate of the negotiating skills of the two parties and employing the expected value technique

It would probably be misleading to report only one value without at least prominently explaining the opposing point of view. It would also be misleading to refer to the
midpoint amount as the “market value,” since it would not be generated by market forces but only by two individuals, and any other two individuals with different negotiation skills would generate a different sale price.

**Development Rights or Entitlements**

**Land Development Rights**

A *development right*, also called an *entitlement* in some areas, is the right to build on, over, or beneath a property, subject to the government’s right of police power, i.e., local zoning and building codes. The right to development is fundamental to private property in the United States and was reaffirmed in the 1987 Nallan v. California Coastal Commission decision.

In some areas, appropriate zoning is relatively easy to secure or is all that is needed to improve a parcel of land. In other areas, development approvals are necessary in addition to appropriate zoning, can be costly, time-consuming, and risky to acquire, and may result in a development plan that is less than what the zoning code permits. In these areas, two physically identical parcels of land can have significantly different values.

Development rights may or may not be transferable. A *transferable development right* (TDR) is “a development right that cannot be used by the landowner, or that the owner chooses not to use, but can be conveyed to landowners in another location or leased for a period of years to then revert back to the original owner; TDRs are said to be transferred from a landowner in a sending district to the use of a landowner in a receiving district.” Examples 10 and 11 describe scenarios involving the sales of TDRs.

**Example 10: Transferable Development Rights**

A jurisdiction includes land designated as an agricultural reserve that carries rural density transfer zoning. This zoning gives strong preferences to agriculture, forestry, and other open space uses. Density in the agricultural reserve is limited to one house per 25 acres, with a minimum one-acre lot size. Properties in the agricultural reserve have transferable development rights at the rate of one TDR per five acres. These TDRs can be sold to developers who want to use them to construct houses in designated TDR-receiving areas at a greater density than what would otherwise be allowed.

**Example 11: Transferable Development Rights**

A site allows 1,000,000 square feet of office space. The site is already developed with 600,000 square feet. In some jurisdictions the extra 400,000 square feet of development rights can be sold and developed in a different location. This concept is commonplace in urban locations.

The use of development rights on land often carries requirements (i.e., mitigations) with it, including items such as the following:

- The replacement of delicate ecosystems on another parcel of land when the ecosystems are disturbed by development
- Replacement of the topsoil or reseeding the surface of a strip mine upon the completion of mining operations
- Purchase of the land for the water rights necessary to annex a land parcel to an urban area

These requirements are a common occurrence. In some cases, these items are restrictions on the property rights conveyed. In other cases, they might be defined as conditions of sale.

**Air Rights**

Air rights are another form of development rights, not unlike land development rights. Air rights involve the right to undisturbed use and control of designated air space above a specific land area within stated elevations. Examples of situations that involve air rights include developments built above public streets and buildings constructed above historic properties. Estimating the value of air rights can be straightforward and done with a comparison of sales of other air rights, but the necessary data is often hard to find. In theory, the value of the air rights would be the value of the development rights less the additional cost (present or ongoing) to develop. In many cases, the first step would be to deal with the development rights. When air rights are held by someone, there may also be separate surface rights. For example,

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5. The Dictionary of Real Estate Appraisal, 7th ed.
a building might have retail outlets on the surface that are owned separately from the offices and condominiums that have been built overhead. As another example, a highway department may have the right to build a road on the surface of land (the surface rights), while a developer has the right to construct an office building above the road (the air rights).

**Subsurface Rights**
Subsurface rights are another form of development rights. *Subsurface rights* are the rights to the use and profits of the underground portion of a designated property. Subsurface rights usually refer to the rights to extract coal, minerals, oil, gas, or other hydrocarbon substances as designated in the grant. Subsurface rights may include a right of way over designated portions of the surface. An example of below-ground development rights is a parking facility underground with an office building above, with the parking being owned separately from the office building and the underground utility easements for fiber-optic cables and mining rights.

Air, surface, and subsurface rights are not significantly different from leasehold/leased fee considerations. They might be much more difficult to calculate, but the division of a land parcel into air, surface, and subsurface components is nothing more than a division of property rights.

**Tax Increment Financing Districts**
A district within which an improvement project is planned is usually established as an area in size that is much larger than the area of the project. Anticipated tax revenue increases are leveraged to help finance the project costs. A base tax value is established when the tax increment financing (TIF) is created, and tax revenues calculated on that base tax value continue to flow to normal taxing bodies.

The tax revenues above the base tax amount (tax increment) flow to the TIF authority to pay project expenses. When the TIF expires (typically in 5 to 25 years), all tax revenues return to the normal taxing bodies. See Figure 16.3 for a timeline illustrating how tax increment financing works.

TIFs commingle public (taxing district) and private (developer) funds. TIFs are only created if an increase in tax revenue is expected because of the development beyond that which is generated by the existing use or non-use. Since TIF revenues typically result in a subsidy to a private developer, most governing authorities require that the area to be redeveloped be “blighted,” in that it would not recover if not for the subsidized redevelopment. In other words, redevelopment would not attract private investment without government intervention.

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As part of the TIF planning process, a feasibility study is often performed to ensure that tax revenues are not being inappropriately redirected to an area that would experience revitalization without public assistance. A comparison of the internal rate of return with and without the TIF revenue is a common method of performing this analysis.

**Example 12: Tax Increment Financing**
A project involves the purchase and development of land in a blighted retail district that has been in the declining stage of the neighborhood lifecycle for many years. After a thorough market analysis, the following conclusions are reached:

- The project will have a five-year holding period and then be sold.
- The property has a current market value of $4,000,000, and development costs are estimated at $8,000,000.
- The present value of the future tax revenue increases from all sources is estimated at $4,250,000, of which 80% is available to the developer.
- The terminal capitalization rate is estimated to be 6%, with a selling expense of 4%.
- Conversations with local developers indicate that a project such as this would require at least a 10% internal rate of return (IRR) to attract private investment.

Based on this data, the appraiser draws the following key conclusions:

- The reversionary sale price at the end of the holding period is $667,742 / 0.06 = $11,129,033.
- Net sales proceeds are $11,129,033 × 0.96 = $10,683,872.
- The total cash flow at the end of the holding period is $10,683,872 + $648,293 = $11,332,165.
- The total development costs to the owner/developer without the TIF would be $4,000,000 + $8,000,000 = $12,000,000.
- The effective development costs to the owner/developer with the TIF are $12,000,000 – $3,400,000 = $8,600,000.
- The internal rate of return without the TIF is 3.02%. The internal rate of return with the TIF is 10.96%.

The project would not be feasible without the TIF, despite a positive return, because the amount of the

tax increment financing (TIF). Financing arranged through the issuance of bonds to meet the cost of infrastructure improvements for redevelopment in designated inner-city TIF zones that otherwise would not be financially feasible; TIF bonds are also used to build low-income housing and acquire land for development sites. The tax increment is the difference between a district’s assessment base and its reassessment after infrastructure improvement has occurred. The revenue generated from some or all of this increment is remitted to the agency that issued the bonds and pledged toward bond debt service.

Source: The Dictionary of Real Estate Appraisal, 7th ed.

The projected net operating income for the developed project is summarized in Table 16.1.

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<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Management fee</td>
<td>4%</td>
<td>4%</td>
<td>4%</td>
<td>4%</td>
<td>4%</td>
<td>4%</td>
</tr>
<tr>
<td>All other expenses</td>
<td>$115,200</td>
<td>$118,656</td>
<td>$122,216</td>
<td>$125,882</td>
<td>$129,659</td>
<td>$133,548</td>
</tr>
<tr>
<td>Total expenses</td>
<td>$144,000</td>
<td>$148,320</td>
<td>$152,770</td>
<td>$157,353</td>
<td>$162,073</td>
<td>$166,935</td>
</tr>
<tr>
<td>Net operating income (NOI)</td>
<td>$576,000</td>
<td>$593,280</td>
<td>$611,078</td>
<td>$629,411</td>
<td>$648,293</td>
<td>$667,742</td>
</tr>
</tbody>
</table>
return is insufficient to adequately attract and compensate investors for the time and risk.

If the amount of TIF revenues being allocated to the project by the governing authority were $8,000,000, then the IRR of 32.61% is triple the amount that would be needed to attract private investment.

**Ecological Land**

An ecological site is a distinctive type of land that differs from other types of land in its ability to nurture a characteristic natural plant or animal community. An ecological site supports a native plant or animal community typified by an association of species that differs from that of other ecological sites in terms of the type or proportion of species or in terms of total production. From the appraiser’s perspective, the key is understanding that an ecological site is unique unto itself.

Appraisers who specialize in appraising ecological sites have acquired a high degree of experience and knowledge in order to develop credible opinions of value. They should develop the necessary data for analysis that cannot be found via traditional sources. However, while this topic is worthy of mentioning, it is beyond the scope of this article.

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**About the Author**

Gary S. DeWeese, MAI, is the founder of RE Strategic Solutions, a real estate consulting firm. His practice focuses on complex and unusual assignments, including public-private development, long-term ground leases, acquisition due diligence, major lease negotiation, mediation, arbitration, and litigation support. He is the former assistant treasurer–real estate and director of real estate investment of the University of California’s pension and endowment funds (one of the largest institutional investors in the United States), where he was the senior management executive responsible for both publicly traded and private direct real estate investments and head of the corporate real estate group. DeWeese has an MBA from the University of California, Berkeley, where he has also guest lectured. He is a member of and an instructor for the Appraisal Institute, for whom he also has written a number of seminars and served on course development and review teams. He has also authored numerous articles for *The Appraisal Journal* and other publications and spoken at conferences worldwide. **Contact:** garydeweese@comcast.net

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**Additional Resources**

Suggested by the Y. T. and Louise Lee Lum Library

**Appraisal Institute**

- **Education**
  - General Appraiser Site Valuation and Cost Approach
  - Residential Site Valuation and Cost Approach
- **Lum Library, Knowledge Base [Login required]**
  - Information files—Land and site
  - Information files—Value
- **Publications**
  *The Appraisal of Real Estate*, fifteenth edition