

REAL ESTATE DAMAGES

Analytical Tools and Their Application to High-Profile Case Studies

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## **Introduction to Analytical Tools**

*Diminution in Value* is the difference between the before and after values of properties that have been damaged or taken. There are literally hundreds of Detrimental Conditions (DCs) that may impact real estate values. These include environmental contamination, construction defects, geotechnical issues, eminent domain, economic declines, proximity issues, natural disasters and many others. While identifying, categorizing, and analyzing these numerous DCs may seem overwhelming, the task becomes manageable when the fundamental stages and value effects are considered in a logical sequence.

The fundamental tools for a DC analysis are the DC Matrix, the DC Model, The Bell Chart and the Three DC Approaches to Value.

### **DC Matrix**

The DC Matrix outlines the three stages of analysis and related issues that should be considered for every DC, along with each valuation issue. (See Figure 1) They are:

1. Assessment Stage -- This is the stage where the damage is assessed, usually by engineers, contractors or other qualified experts.
2. Repair Stage -- If repairs are required, they take place during this stage, and could involve remediation, reconstruction, preventative construction measures and so forth.

3. Ongoing Stage -- There may be continuing issues or aftermath issues associated with the DC. If so, this stage reflects those factors related to this period.

Within each stage, the following value issues are considered:

1. Cost -- This includes all the direct costs, related costs and contingencies related to each phase. In addition, the party responsible for the payment of those costs should be considered as it relates to the impact on value.

2. Use -- DCs may impact or restrict the use of a property. During each stage, the use or utility of the property should be considered, as compared to the use during the Unimpaired Stage.

3. Risk -- There may be risks, as perceived by the market, associated with each stage. The risks considered for each stage are the Uncertainty Factor, Project Incentive and Market Resistance, respectively.

#### **Detrimental Condition Model**

Just as each DC is analyzed on a case by case basis, there are a variety of impacts that they have on value. The DC Model illustrates the fundamental issues graphically. (See Figure 2). The first step with any DC analysis is to consider the value of the property as if there is no DC. This is reflected as Point A. Upon the occurrence or discovery of the DC, the value may fall to Point B.



Some DCs require an assessment, such as conducting soils or engineering study. The value during this period is often the lowest, as a potential buyer would likely require a significant discount as an enticement to purchase a property where the extent of damage is uncharacterized.

While there are a variety of patterns that could accompany the Assessment Stage, the model reflects a simple increase to Point C. If repairs are required, the value will generally increase upon their completion, as reflected at Point D. Point E reflects the value of the property after considering the cost, responsibility and use issues of the Ongoing Stage.

Like any value issues, the risk that is associated within the Ongoing Stage could have a variety of impacts. To illustrate this concept, Market Resistance (Risk) is reflected with multiple arrows, at Point F. Of course, any issue within any stage could have a similar negative, positive or neutral impact on value, which can only be determined on a case-specific basis.

### **The Bell Chart**

As The Bell Chart sets forth, all DCs may be placed into one of ten standard categories. Damages are benchmarked against the Unimpaired Value. (See Figure 3). In determining the impact on value, it is critical that a distinction be made between the DC and unrelated issues. For example, market conditions may be responsible for a change in value that is unrelated to the condition being studied. In addition to the

DC categories, the chart illustrates some of the various value patterns resulting from DCs.

### **The Three DC Approaches to Value**

The impact of DCs on property values is ultimately an empirical question that requires the application of one or more of the three traditional approaches to value (See Figure 4):

1. The Cost Approach utilizes data with and without the costs and losses associated with a DC.

This approach deducts the costs or losses associated with each stage from the Unimpaired Value. Generally, only those costs and losses that are the responsibility of the property owner would be included, as only these would impact the market value. (As a practical matter, if market resistance were applicable, it would likely be determined from the Sales Comparison or Income Capitalization Approaches).

2. The Sales Comparison Approach utilizes market data with and without the DC.

One of the most useful applications of this approach is paired-sales analysis. This could be between the subject property, or similarly impacted properties, termed Test Areas (at Points B, C, D, E or F) and unimpaired properties, which are termed Control Areas (Point A). Or, an analysis could be made between the Unimpaired Value of the subject property before and after the DC. For example, the value diminution of a property that has been assessed but not repaired would be

Point A - Point C.

3. The Income Capitalization Approach utilizes income and risk factors with and without the

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DC.

This approach to value focuses on the impact that a DC has on (1) the income (both short term and in perpetuity) and (2) risk (the capitalization rate, discount rate or both). The risk rate itself is a combination of both the mortgage and equity risks.

The DC Stages and Value Issues, DC Model and Bell Chart, coupled with the three  $\text{snrane}^{\sim}$  to value, provide a fundamental framework for the analysis of DCs.

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## **Durham Woods**

### **Reading & New Durham Roads**

### **Edison, New Jersey**

#### **Class IV- Gas Pipeline Explosion**

On March 23, 1994, a 36 inch diameter, underground methane gas pipeline exploded. The pipeline was operated by Texas Eastern Transmission Corp., and had last been inspected in 1986. The explosion created a crater 60 feet deep and sent a 300-foot fireball into the air that could be seen by residents of New Jersey, New York and Pennsylvania. Homes shook for a 10-mile radius, and were likened by many to a nuclear disaster. It took workers two and one-half hours to turn off the gas flow. 1,500 tenants were forced to flee their homes, the Red Cross intervened and the area was declared a Federal Disaster Area. The disaster prompted new federal legislation regarding pipeline operations. While the tragedy occurred near midnight, there was only one related death (a heart attack suffered by a fleeing person), and the balance of the victims successfully escaped.

The complex contains 63 buildings, of which eight (containing 128 units) were completely destroyed. A total of 96 units in six buildings were damaged. Insurance proceeds paid for the reconstruction of the damaged and destroyed units at a cost of \$12.25 million. The apartment building owners eventually were able to re-lease the rebuilt units. An adjoining condominium development, called Talmadge Village, was in the

approved planning stages at the time of the disaster. As it is generally much easier to rent properties associated with tragedies as opposed to selling them, the development was converted to an apartment complex in order to keep the project progressing.

### **Simpson & Goldman Murders**

#### **Bundy Avenue**

#### **Los Angeles, California**

#### **Class IV - Crime Scene**

The murders of Nicole Brown Simpson and Ron Goldman occurred on the walkway to a West LA condominium in June 1994. The property is a well-designed, tri-level condominium that contains 3,405 square feet, four bedrooms, three bathrooms and a rooftop patio.

Nicole Simpson purchased the property in January 1994, for an effective price of \$652,000. Shortly thereafter she listed the property for rent for \$4,800 per month in an effort to relocate.

The condominium was listed for sale shortly after the crime for \$795,000. Over the last two years various written offers have been presented; however, none were consummated. The property suffered from an extended marketing period of approximately two and one-half years to date, far

beyond the typical six-month time frame for residential properties in the area. The property was scheduled to be auctioned in January 1997; however, it was sold prior to the public auction for a price less than the \$595,000 asking price.

**Menendez Brothers**

**Elm Street**

**Beverly Hills, California**

**Class IV- Crime Scene**

On March 20, 1996, a jury convicted Lyle and Erik Menendez of first-degree murder for the August, 1989 slayings of their parents in their Beverly Hills mansion. The property contains 9,063 square feet, six bedrooms and eight bathrooms for a total of 23 rooms. Amenities include a pool, tennis court, and guesthouse. Tourist buses still stop at the house today, eight years after the incident.

The murders occurred approximately one year after the parents purchased the home for \$4 million. The living room where the murders occurred was completely renovated and no physical trace of the crime remains. The house was placed on the market in April 1991 and was listed for sale for approximately one and one-half years before a buyer came forward in October 1992. The property sold for \$3 million.

By 1992 the property was worth approximately \$4.2 million with no stigma. The \$3 million sales price indicated that there was an approximate 35% discount attributed only to stigma. In

addition, the property suffered from an extended marketing period of approximately one and onehalf years, which is significantly longer than a typical six-month time frame.

### **Manson Family Murders**

#### **Cielo Drive**

#### **Benedict Canyon**

#### **Los Angeles, California**

#### **DC Class IV - Crime Scene**

On August 9, 1969, the followers of Charles Manson committed the murder of actress Sharon Tate and others. Throngs of curiosity seekers found the home and visited the property for years after the crime.

The crime occurred in a small farmhouse-style home off Benedict Canyon Road in an area north of Beverly Hills, California. The house was built in 1941 on a site that has an outstanding view of the Los Angeles basin. It contained 2,324 square feet, three bedrooms, four bathrooms, a guesthouse and a pool. In 1991, the original house was demolished, the site was re-graded and a

new large Mediterranean home was built. The grading has dramatically altered the appearance of the site. Research indicates that today, over 25 years after the crimes, there is little or no residual stigma associated with the property. Aided by the remote location of the site and the extensive grading, curiosity seekers have long forgotten about the property. The current property owner stated that he did not receive any discount due to stigma when he purchased the property, and local residents state that the issue rarely arises. Apparently time has cured the stigma associated with this property.

### **Luby's Cafeteria**

**Highway 190**

**Killeen, Texas**

### **Class IV- Crime Scene**

In October of 1991, a man drove his truck through the window of a cafeteria-style restaurant called Luby's, shot and killed 23 innocent people and then turned the gun on himself.

As a result of Luby's management style, and in spite of the tragedy, the City of Killeen petitioned Luby's to not abandon the site, but rather to re-open the facility. The restaurant management extensively remodeled the property, and approximately five months later reopened the restaurant. Employees were compensated for the "down time" of the restaurant. Both the local and corporate management maintains an open and cooperative attitude towards the media and other

inquires, and today the restaurant enjoys "business as usual". According to a company spokesperson, the key to this situation was that they were not focused on stock values, but rather on how they could genuinely help the community. The company's CEO, Pete Erben, flew to the site within hours of the incident, and immediately put \$100,000 towards assisting the victims and their families. Luby's management indicated that they have no intention of selling the property. While there is no memorial on the site, there is a memorial commemorating those who died in this incident at a nearby community center. The Luby's incident is considered by many to be a "text book case" on properly handling a tragedy.

#### **Heaven's Gate Mansion**

**Colina Norte**

**Rancho Santa Fe,**

**California**

#### **Class IV- Mass Suicide**

On March 26, 1997, police discovered 39 bodies of former "Heaven's Gate" members within the mansion. The first police to arrive at the scene were overcome by the odor created by decaying bodies and body fluids. The cult members believed that they were discarding their "vehicles" to return to a spaceship that followed the Hale-bopp Comet.

The house is the site of the largest mass-suicide in the history of the United States. The property is a two-story, single-family residence that contains 9,011 SqFt of livable area, seven bedrooms, seven bathrooms, a two-car garage, a limousine garage, sauna, pool, spa, tennis court, and has a view amenity. The site contains 3.11 acres. The house is very private and is not visible from the public streets or from the entry gate. The Heaven's Gate members rented the house, and the lease specifically limited occupancy to seven people. The owner purchased the property on June 24, 1994 for \$1,375,000. As of date of the tragedy, the property was listed for sale for \$1,595,000. The house was cleared of the bodies and all belongings by county authorities but significant physical damage remained. The physical damage amounted to well over \$100,000 and is the insurance claim is still unresolved as of six months after the incident. This created significant "carrying costs" of the property. A false rumor was generated that local homeowners would pay full value for the house and bulldoze it.

## **World Trade Center**

### **Bombing**

#### **Towers 1 & 2**

#### **New York, New York**

#### **Class IV - Terrorist Bombing**

In February 1993, a bomb-loaded vehicle was detonated on the second level within the underground parking structure beneath

the World Trade Center in New York City. The blast was so powerful, that a crater was formed that penetrated six levels downward. Five people died in the tragedy. Although the blast occurred underground approximately between the two towers, there was no permanent damage to the towers themselves.

Despite the tragedy, leasing activity largely went unchanged. For example, Bank of America, who had commenced lease negotiations for six floors before the explosion, continued with talks and consummated a lease after the bombing. Some tenants did not renew their leases, but it is unknown if this was related to the bombing. The property management instituted new and advanced security measures and provided seminars to building tenants regarding them. The most noteworthy effect was that currently all visitors must show photo ID at a "Visitor's Reception" counter and verify that they have legitimate business within the building. They are then issued a card, which is scanned by a guard at the elevator.

## **Hollywood Boulevard Sinkhole & Subsidence**

### **MTA Subway Tunnels**

#### **Hollywood, California**

#### **Class V & VII - Tunneling**

The Los Angeles Metropolitan Transit Authority broke ground in 1983 for the construction of the Red Line, which will connect downtown LA with North Hollywood. The first phase was completed January 30, 1993 with the second phase completed in July 13, 1996 at Western and Wilshire Boulevards. The next scheduled opening is for November, 1998 at Hollywood and Vine. In August of 1994, the construction crew punched-through one of two tunnel segments, 80 feet below Hollywood Boulevard. Subsidence was anticipated to be 1/2"; however, 2" resulted. The second tunnel segment was punched-through 21 days later, which resulted in 5" to 6" of subsidence with a maximum subsidence of 10". The cause was attributed to a variety of factors, including water content in the soil and the alleged use of improper materials in the support shield of the tunnel. The most significant damage occurred in the 6500 block of Hollywood Boulevard between Vine and the El Capitan Theater, with several buildings incurring severe damage such as storefronts separating from the main portion of the structures. The most damage occurred at Hudson Street to an apartment building and a three-story retail/office building. On June 22, 1995 alleged faulty and "unrealistic" design work triggered the dramatic 80-foot-wide sinkhole within the 6300

block off Hollywood Boulevard. Transit officials were forced to shut down the street again on June 27th, after discovering a cluster of serious cracks in the tunnel near the giant sinkhole. The problem was brought under control within a few months after it occurred; however, it left visible signs, such as boarded-up buildings, for a longer period. As of September, 1997, the apartment and retail/office buildings in the 6500 block area, continue to have braces.

This area was also impacted by the lingering affect of an economic recession, which accounts for some of the declines in value; however, the dramatic decline in value significantly exceeds the typical declines within the market. In 1992, prior to the tunneling event, ground-level retail lease rents were \$1.50/SqFt to \$2.50/SqFt NNN. In 1997 they ranged from \$0.50/SqFt to \$1.25/SqFt. Second story office space leased for \$1.00 Gross previously and dropped to approximately \$0.50/SqFt. Ground-floor retail values were approximately \$175 to \$200/SqFt in 1992, and in 1997 they are approximately \$125/SqFt. Land values were approximately \$100/SqFt in 1992, and in 1997 they ranged from a low of \$40/SqFt to \$60/SqFt. In 1992, retail occupancy was approximately 90%; however, in 1997 they dropped to 25% for ground-floor retail to 50% for second floor office.

Further compounding the problem of restitution and remodeling is the fact that many of the buildings are within the Historic District, preventing their demolition. Many structures that

should have been demolished have been restored at significantly higher costs.

The MTA is currently involved with helping existing businesses remain solvent, through subsidizing rents, interest free loans, and in general offsetting damages by way of monetary

compensation.

## **Exxon Valdez Oil Spill**

### **Bligh Reef**

### **Prince William Sound**

### **Alaska**

#### **Class VIII - Oil Spill**

At 12:04 am, on March 24, 1989, a oil tanker loaded with 1,264,155 barrels of North Slope crude oil, ran aground on Bligh Reef in the northeastern portion of Price William Sound, Alaska. Approximately one-fifth of the cargo, 11.2 million gallons, spilled into the ocean. Containment efforts were started almost immediately; however, after three days of calm seas, strong northeasterly winds arose and dispersed the oil beyond any hope of containment. Some oil formed a floating sheen, while some mixed with sea water, creating a thick emulsion known as mousse, which does not bunl and is very difficult to clean up. The sheen and mouse spread over a 470-mile trajectory form Price William Sound to the Alaska Peninsula. 790 miles of Prince William Sound coastline were oiled, of which 200 miles were heavily oiled. In the Kenai Peninsula-Kodiak region, more than 2,400 miles of coastline were oiled. The damage to wild life was high. From 100,000 to 300,000 birds and 2,650 sea otters were killed, and fishing was severely impacted. The cleanup efforts took three years, involved more than 11,000 people and 1,400 marine vessels. On June 10, 1992, the Federal government issued a letter

officially stating that the clean-up effort was concluded. The clean-up effort cost \$2.1 billion.

The Exxon Valdez spill caused enormous wildlife destruction; however, the direct impact on real estate values was less severe. The vast majority of impacted coastlines were uninhabited wilderness areas, and inhabited areas were quickly "boomed off", so damage to these areas was minimal or non-existent. Unlike many environmental disasters, the spill did not impact subterranean soils or the groundwater. As such, property remediation efforts were limited to the coastline surfaces, which were easily accessed and the verification of complete cleanup was much more assured. Additionally, because the contamination involved crude oil on the surface, rather than refined petroleum with chemical additives in the soils, bioremediation (natural disintegration) and evaporation assisted greatly in restoring the coastline surfaces. As nearly all the impacted coastline were wilderness areas, the real estate damages related to the temporary disruptions of logging, recreational uses, fishing, subsistence lifestyles (living off the land) and mining. The impact on property values was computed on a case-by-case basis. They were based on the level of oil on the coast and the disruption (if any) to each of the above uses. The large amounts of moneys spent in the clean-up efforts actually created a stronger demand for some real estate, as many people came from out-of-state to live and work by the many new remediation-related jobs created

by the spill.

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**Love Canal**

**Bounded by Colvin, 100th Street, Frontier, & 95th Street**

**Niagara Falls, New York**

**Class VIII & X- Environmental Contamination**

The Love Canal was given its name by a 19th century industrialist by the name of William T. Love. In 1893, Love started construction of a 10-mile canal from the Lake Erie side of the Niagara River to the Lake Ontario side. The plan was that the 110 foot drop would bypass Niagara Falls and the hydro-power would produce direct current electric to power the "model city" he envisioned. Only about a mile of the canal was ever dug, and the project was abandoned due to the discovery of alternating current, which could travel long distances over power lines. The abandoned canal filled with rain and runoff water and became a local swimming hole in the summer and a ice rink in the winter. During the period of 1942 to 1953, Hooker Chemical Company and others disposed 21,800 tons of toxic chemicals, including acid chlorides, sulfur compounds, trichlorophenol (TCP), and bentyl alcohol in the canal. The site was later covered with a clay "cap" and sod, and sold for \$1 to the local school board. It was common knowledge that the site harbored dangerous chemical contaminants, yet school board built the 99th Street elementary school directly on top of the old covered canal. In the 1950's, hundreds of middle-class homes were built in the immediate area.

In the 1970's local residents became alarmed at health problems, sludge, fumes and phosphorous rocks that would make a fiery impact when thrown by children. The Love Canal Homeowner's Association became very vocal and the situation received high-profile media attention. On August 7, 1978, President Jimmy Carter declared a "Federal State of Emergency" for the area, and the government offered to pay full-price for all homes in the impacted areas, referred to as Rings 1, 2 and 3. (Ring 1 was the worst area and directly on or near the canal, Ring 2 is not considered fit for residential use, and Ring 3 was the least impacted). The Love Canal Area Revitalization Agency (LCARA) was created to facilitate the buying of over 789 homes. This high-profile incident was the "epicenter" of the explosion of environmental legislation, particularly CERCLA, the \$1.6 billion "superfund act" which was passed on December 12, 1980. The school was demolished, as were all the homes in the immediate area of the old canal (Ring 1). The canal itself is currently covered, fenced-off and a remediation unit treats the underlying areas. Many homes to the east (Ring 2) still stand but are mostly abandoned, and there are plans to demolish all of them and build light-industrial buildings. The Lasalle public housing project to the west was demolished and the site is currently vacant. Housing to the north (Ring 3) were largely abandoned; however, many are being refurbished and resold by the LCARA. This area (Ring 3) is currently called Black Creek Village. The homes in

Ring 3 sold over recent years at a 20% discount; however, the discount has gradually been reduced and in 1997, 19 years later, they are sold for full value. Home outside of the EPA study area (Rings 1, 2 and 3) were not considered impacted in value. While hundreds of families made an exodus, seven families in Ring 2 never left the area and still reside there today.

## **Three Mile Island**

### **Londonderry Township**

### **Susquehanna River, Pennsylvania**

#### **Class VIII - Nuclear Power Plant Disaster**

The Three-Mile Island (TMI) nuclear power plant started construction in 1968. The plant has two units. Unit 2 began commercial operation in December, 1978. On March 28, 1979, a valve malfunctioned and river water used to cool the nuclear core flowed out of the reactor's system. The core overheated and some radioactive material (within prescribed limits) was released into the atmosphere. The core temperature reached 5,000 degrees F. TMI came within one hour of a "Group 1" accident - a complete meltdown with failure of the backup safety system -- a near impossibility calculated at 1 chance in 200 million reactor years. Local residents were advised to evacuate the area. The full extent of damage was not known until mid-1982 when a remote camera showed that about 90% of the 37,000 fuel rods were damaged. Cleanup was completed 14 years after the accident. The subsequent cleanup took the efforts of over 1,000 people and cost \$973 million. Reactor Unit 1 was never damaged and still operates today. Some new research alleges that cancer levels are up to 10 times higher for people that are living downwind of the reactor.

The areas immediately nearby TMI are predominately farmlands that are scarcely populated. Interviews with numerous local residents indicated that there are mixed reactions related to

real estate values. The local farms are predominately owned by families who have long-term ties to the area. Many of these residents indicated that they never left the area, even during the period of the initial accident. However, one developer indicated that it was virtually impossible to sell property in the immediate area, and only after waiting approximately one and one-half years after the accident were they able to sell a spec-built home at a 30\_/0 discount. In more nearby urban areas, particularly Harrisburg, real estate values remained level or even increased. This phenomena was attributed to the fact that only 200 workers being displaced by the accident, but new demand was created by the over 1,000 new workers being employed for the 14-year cleanup. At the time of the last field-inspection (1997), virtually all parties agreed that the incident no longer impacts real estate values. Some people stated that their concerns with TMI are receding, while their concerns over the noise from local airport (Harrisburg International) is increasing.

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**Manoa Landslide**

**Manoa Subdivision**

**Generally Bounded By**

**Patsy Drive, Kahaloa Drive**

**and Woolsey Place**

**Oahu, Hawaii**

**Class IX & X - Hillside Slippage**

Two landslides, the Paty-Alani and the Hulu-Woolsey, damaged and destroyed 150 homes in a large residential neighborhood known as Manoa, which was established in 1951. It is considered a premier area, with many of the homes having views of downtown Honolulu and the ocean. The ground movement was first noticed in 1981 and continues today. The slow-moving slippage has caused the ground to move several feet over a period of several months or even years. As a result, homes have sunk, tilted, crumbled or fallen down the hillside, and some streets have been closed as a result. The city began remediation efforts in 1986. At first, the city spent several million dollars to stabilize numerous homes at a cost of \$10 to \$15 million; however, it later opted to stabilize the homes by reinforcing the soils. This effort is ongoing. Most agree that the slippage is caused by heavy rains, which in turn caused water and sewer lines to saturate the soils; however, the source of the water is disputed. Some contend that the slippage was caused by heavy rains, which in turn caused water and sewer lines to saturate the soils, and that water and sewer lines were not installed and maintained properly, causing the slippage and thereby saturating the soils.

Many homes in the area have suffered from cracked walls and floors. However,

discounts

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Mt. St. **Helen's**  
**Cascade Mountain Range**  
**North of Highway 30, East of**  
**Highway 5**

**Washington**

**Class IX & X - Volcanic Eruption**

Donnant since 1857, on May 18, 1980 at 8:32 am, Mt. St.  
Helen's erupted after a 5.0 magnitude

;earthquake. It had the most destructive force of any volcano in the  
and caused the world's largest recorded landslide. The blast  
blew 1,300 feet of the mountain  
down the Toutle River Valley below. Widespread destruction,  
encompassing 150,000 square

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miles, was caused by hot gasses, glassier and debris avalanches, mudflows and flooding. The majority of damage occurred in about 10 seconds. Until Mt. St. Helen's, only two known casualties within the United States (one in Hawaii and one in Alaska) have been attributed to volcanoes; however, this disaster caused 57 deaths. Some that perished simply ignored warnings to stay out of the ten to six-mile "Red Zone", while others were in areas that were destroyed by the unexpected lateral blast of the mountain and resulting floods. 98 cabins at the base of the mountain and around Spirit Lake, along with the Boy Scout and Girl Scout camps, the YMCA camp and other resorts and campgrounds were covered by debris as much as 400 feet deep. 221 homes along the Toutle River were completely or partially destroyed by mudflows and flooding. 185 miles of highways and 15 miles of railroads were destroyed or completely damaged, and 4 billion board feet of lumber were lost. The loss to wildlife was staggering, and included nearly 7,000 deer, elk and bears, and 12 million salmon fingerlings. The property damage and cleanup costs totaled \$ 1.1 billion.

The immediate destructive areas of the eruption, called the blast zone, spanned northerly 18 miles from the mountain, far beyond the six to ten mile "Red Zone" that was initially predicted. Every property within the blast zone was completely destroyed. Even though these homes and cabins were buried under 400 feet of debris, some of them later sold for \$500 to \$750, which was considered a "novelty value". The government eventually condemned these

properties and paid the owners the market value for the land, but not the improvements. Some of these improvements were insured, and those that were not were a complete loss. The down-river areas were impacted by the flooding and dramatic change in the flood zones. When the floods subsided, many homes had been lifted from their foundations, and the changes in topography created a land surveyor's nightmare. Many property owners simply did not know where their property boundaries were. Other properties that were well outside of the flood plain were now within two-year flood plains. These properties, while still standing after the explosion and flooding, lost much or nearly all of their value because of the risk of future flooding. Some homes are gone, some have been rebuilt and others still stand partially buried in mud. The impact on real estate varied greatly. For some, there was a complete loss of value, and for others the damage amounted to the cost of cleanup. Some areas actually benefited somewhat from the eruption, as the volcanic ash added nutrients to some agricultural lands located east of the volcano.

#### **Northridge Earthquake**

#### **Los Angeles Region, California**

#### **Class IX - Earthquake**

At 4:31 AM, on Monday January 17, 1994, the most expensive earthquake and one of the most expensive natural disasters in U.S. history shook the Southern California region. Although this earthquake is considered "moderate" with a magnitude of 6.8 on the Rickter Scale, the location of the epicenter in a highly populated

suburb of Los Angeles caused 57 deaths, injured approximately 1,500 people and caused more than \$10 Billion in damage. Of the 66,546 buildings inspected, 6% were "red tagged" (severely damaged) and 17% were "yellow tagged" (moderately damaged). Some of the most traveled freeways in the nation were closed for several

months and 11 major roads providing access to Los Angeles were damaged. Many residents and business were displaced to adjacent (less damaged) areas, while repair projects were completed.

When the earthquake occurred, real estate values in the San Fernando Valley were generally declining due to the regional economic downturn. Immediately following the earthquake, most pending escrows of real estate sales in the San Fernando Valley were postponed until damage assessments could be completed. Values of damaged properties were negatively impacted for a short-term period while they were repaired. Non-damaged properties experienced no long-term loss in values. Adjacent areas, such as the Conejo Valley to the east, experienced an upsurge in occupancy for short-term housing (apartments and rental homes) while displaced homeowners sought temporary residences as repair projects were completed. Residential buyer confidence experienced a short downturn with little or no long-term implications. The investor market of large commercial properties required more time to reinstate buyer confidence. Marketing time was extended during repair efforts, yet no permanent effect has been observed. Research indicates that the negative impacts on real estate directly from the Northridge Earthquake were short-lived and were related to costs of repairs (and related costs, if any). The market generally reacts on the basis that earthquakes are random in nature and impact Southern California as a whole.

The perceived likelihood of an earthquake reoccurring in Northridge is the same as any other community in Southern California.

### **Sundance Avalanche**

#### **Near Sundance Resort**

#### **Utah County, Utah**

#### **DC Class IX - Avalanche**

In the winter of 1976 an avalanche in Utah's Rocky Mountains destroyed the "Grizzly Adams" cabin used in the filming of Jeramia Johnson. The cabin was located in an exclusive area associated with the Sundance Ski Resort, owned by the actor Robert Redford.

Numerous subsequent avalanches have occurred in this area, including one 1986 Class 4 Avalanche (Class 5 is the worst). The only residence damaged in this incident was to a 6,500 SqFt cabin owned by the real estate author Robert G. Allen (Nothing Down). The cabin was condemned. Due to destruction of trees and other natural defenses, the avalanches continued with increased frequency and impact.

In 1996, another avalanche (Class 3) impacted a total of four cabins within the "No Money Down," finger or path (named after the previous 1986 slide). One house was not hit by the avalanche, but by the shock waves. The house was blown off its foundation and ended up in a pile of rubble. The area is now considered a "frequent return interval", with eminent future exposure to avalanche hazard.

The cabins ranged in value from approximately \$1 million to \$3 million, and were either completely destroyed or significantly damaged. All four cabins have been condemned. Sales in

the area are very limited. The insurance company that owned one condemned cabin recently sold the damaged property for a substantial discount. The new owner received a building permit in 1997 for a "three season residence". Utah County has placed the site within the "modified procedural or operational" classification. In other words, the residence may not be occupied in the winter, and the property must be rebuilt if it is destroyed. Other homeowner's are in litigation.

The County has yet to implement an avalanche hazard zone classification, similar to Flood Zone Maps, which would alert buyers of the danger. Utah County is currently considering implementing the international hazard zoning for this area. Red zones would not permit any new structures or the rebuilding of existing structures. Blue zones would permit limited construction for private residences. Yellow and White zones would permit public and private improvements. There are currently no disclosure laws in Utah regarding avalanches; however, prudent agents are notifying parties if information is available.

### **Jarrell Tornado**

### **Williamson County, Texas**

### **Class IX DC - Tornado**

\_Following a tornado warning at 3:30 PM on May 27, 1997 at 3:42 PM, a  
Texas with winds of 261 mph. This was an extremely rare event, as the  
the highest for tornadoes. (F0 is "light" and F5 is "incredible"). The  
Virtually everything in the path of the tornado was destroyed. Trees w

grass was pulled from the ground, 300 head of cattle were lost and dozens of homes were destroyed over one-half mile.

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The tornado passed just west of downtown Jarrell and struck the Double subdivision. The destroyed homes lost the value of the structure, or in some cases, the entire property. Volunteers, insurance claims and governmental disaster relief funds paid for the damage. Typically with tornado damage, aside from the costs of repairs, properties do not suffer any extended diminution in value. The prevalence of tornadoes in "tornado alley" (an area from Illinois down to Texas that is prone to tornadoes) is a natural nature are random and are an inherent risk associated with the many benefits of living in the area. As a result, property owners' generally have the attitude that impacted properties are more likely to be destroyed again in the future, as compared with any other property in the area. In other words, as the entire region is perceived to have a risk of tornado damage, the risk is applied to areas that have been impacted as with those that are not. As a result of particularly harsh and repeated tornado damage, research is on going to determine the impact on real estate values.

## **April Fools Tidal Wave**

### **Downtown Hilo**

### **Island of Hawaii**

### **DC Class IX & X - Tidal Wave**

Tidal waves, or tsunamis (pronounced su-naw-mes) are large rapidly moving waves triggered by a major disturbance such as earthquake, volcanic eruption or submarine landslide. In deep waters, the waves are only a few feet high, travel at 600 mph and cannot be detected by a ship at sea or are seen by aircraft. On April 1, 1946 a tidal wave, which originated in the Aleutian Islands, struck Hawaii and killed over 170 people, mostly in Laupahoehoe and Hilo where the wave heights averaged 30 feet. The maximum wave height was 55 feet at Pololu Valley on the northern tip of the island. Much of downtown Hilo was demolished, and a schoolyard clock, frozen at 5:01 and now a memorial, marks the exact time of the destruction. Another tidal wave hit Hilo on May 23, 1960; however, warning systems were more advanced and six people were killed.

As mentioned, much of the downtown areas of Hilo were completely destroyed. Much of the eastern areas of downtown Hilo have never been rebuilt to this day. Remnants of many empty blocks of old streets, gutters and sidewalks still exist. A major tourist attraction, Lili'uokalani Gardens replaces an area that was once improved with various structures. After the 1946 tidal wave, the debris was bulldozed into large piles, soaked with kerosene and burnt.

Over the years, the buried burnt debris has decomposed, and has caused considerable soil subsidence problems throughout the area. For example, many parking lots have large open holes and depressions. A civil defense warning system and evacuation routes are located throughout the area, and the threat of another tidal wave still exists today. In addition to the continuing threat of tidal waves, Hilo is also in a Class 2 Volcano Zone (1 is most dangerous and 9 is least). Recent lava flows came within four miles of the city.

### **Alaskan Good Friday Earthquake**

#### **North of Prince William Sound**

#### **Vicinity of College Fiord**

#### **Alaska**

#### **Class IX & X - Earthquake**

On Good Friday, March 27, 1964 at 5:36 PM, a 9.2 Richter scale earthquake centered west of Valdez hit Alaska. It was the largest earthquake in North American history and the most violent in the recorded history of the world. Huge areas of Alaska rose and fell as much as 13 feet, and large cracks in the earth opened up. A 35,000 square mile area sank between one and five and a half feet, causing serious flood damage to numerous coastal towns. 33 people were missing and presumed dead, and 78 people were killed, for a total of 111 lives lost. Although 150 miles from the epicenter, Anchorage suffered the most extensive damage, as the city straddles the fault line.



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Deep crevasses and fissures occurred throughout the city, entire city blocks broke off towards the coastline, and many homes tumbled into the ocean. The earthquake lasted approximately four minutes, and caused large tidal waves, as high as 90 feet, that amplified the destruction of some coastal towns and villages. Numerous boats and barges were destroyed, and the vast Alaskan fishing industry was virtually wiped out, as was much of the transportation infrastructure. The earthquake and subsequent tidal wave caused approximately \$1 billion in damage.

In Anchorage, 215 homes were totally destroyed and 157 commercial buildings were destroyed or condemned. 50% to 60% of the water lines, 15% of the sewer lines and 50% of the cities' streets, curbs gutters and sidewalks were severely damaged. Two major slides occurred. One dropped a full block of 4th Avenue, the main business street, 20 to 30 feet down into the earth. The other landslide destroyed Turnagain-by-the-sea, a high-priced housing area that overlooks Knik Arm, which threw the homes into the Cook Inlet. In Seward, a oceanfront community south of Anchorage, the earthquake ignited several oil storage tanks. The town lost 95% of its railroad, which impacted all of Alaska as it served as the railhead of the Alaskan railroad. The city had a mile-long area collapse into the sea. On top of the earthquake

damage, the town suffered enormous destruction from subsequent tidal waves. Numerous homes and businesses were swept away into the ocean, and one family clung to their roof for 14 hours as recurring tidal waves ripped the house from the foundation and . That residential area is vacant today, as are much of the destroyed downtown areas, which are used for recreational parking. This disaster has shown a variety of impacts. The only residential development within the damaged zone has been housing that is rented to low-income occupants. Some homes located off the coastline now enjoy outstanding ocean front views, and as a result of the tragedy, their values were enhanced. Although the same risk for another tidal wave exists today as in 1964, a \$60 million ocean research and aquarium facility began construction in 1996 on lower-risk areas of the coast.

The tidal waves also hit Valdez (a small town later made famous by the Exxon Valdez Oilspill). Much of the town was destroyed; however, several homes and businesses did survive the waves. Later, the entire town was uprooted and moved to a new town site that was not impacted, just a few miles today. Every building that wasn't destroyed was eventually moved to the new town, and the old original town site is currently vacant with only some concrete remnants. The local visitors center offers tourists a walking tour map of the various homes and businesses that were moved from the old town site. The entire town suffered a significant loss, either by the cost of

destroyed buildings, or by the cost of relocating them to the new town site. Only the few homes and structures that exist near the old town site suffer from any residual market resistance.

The moving of entire towns is not an isolated incident. A village was damaged by the earthquake and tidal waves, and was moved to an entirely new island, Evens Island.

**Royal Gardens Subdivision**

**Kapa'ahu**

**Island of Hawaii**

**Class X - Volcano Eruption**

A 1987 lava flow from the Kilauea Volcano within the Hawaii Volcanoes National Park buried much of the Royal Gardens Subdivision under 40 feet of lava. The volcano destroyed numerous homes and a newly constructed multi-million dollar Park Visitor Center and Museum near the Poupou-Kauka ancient villages (1275 AD). The 1987 lava flows spared an ancient temple used for human sacrifices, but it was subsequently destroyed by 1997 lava flows. The lava flowed slowly, and the destruction occurred over several weeks or even months. Efforts to divert the lava flow with concrete berms were entirely ineffective.

The subdivision is located in a Zone 2 Volcano area (1 is the most hazardous, 9 is least). Housing in the area has always been inexpensive by Hawaiian standards, and people were able to buy a house with an ocean view for about the price of a car. While some homes were spared, the areas infrastructure was destroyed by the lava flows. Some people still reside in these homes; however, they have no water, electricity, gas or telephone. The roads are partly over old lava flows. Lots in the subdivision sell for nominal amounts of \$500; however, there is little chance of ever rebuilding on them.

**McDonalds**

**San Ysidro Blvd**

**San Ysidro, California**

**Class X- Crime Scene**

In  
October 1984, a man walked into a McDonald's Restaurant and shot  
and killed 21 people

before he was shot and killed. McDonalds donated the restaurant to  
the City within 90 days of

the incident. A long debate ensued amongst local leaders as to what  
to do with the property. The

community expressed a strong desire to demolish the improvements  
and erect a memorial. Due

to  
lack of action by the City, one night McDonalds bulldozed the  
improvements beginning at 10

p.m., and by the next morning nothing was left but dirt and two  
palm trees. McDonalds then

acquired another site one-quarter mile away and constructed a new  
restaurant, which still exists

today.

Various ideas were presented for possible uses such a park; however, this u

non-conforming within the business-area location. Therefore, the memorial w  
be located in an other part of the City, with proceeds from the subject sit  
>g,subject site stood vacant for approximately six months. The city listed  
\$425,000 and then for \$300,000, but there were no legitimate inquiries.

Finally, a local community college offered to build an education annex if the site was donated. The school had a competition for an on-site memorial and design, and two and one-half years after the tragedy, an educational annex was constructed, with a small memorial on-site.

**Jeffrey Dahmer**

**25th Street**

**Milwaukee, Wisconsin**

**Class X - Crime Scene**

Jeffrey Lyle Dahmer was arrested on July 22, 1991 for suspicion of murder. Dahmer stored and consumed his victim's remains within his apartment unit. He was subsequently convicted of murder and sent to prison, where he later died in a prisoner attack.

A private party owned the 24-unit apartment where he had lived and committed his crimes. After the discovery of his crimes, most of the renters in the other units quickly moved and within a year, the vacancy within the apartment building rose to 83%. Although the owner realized the building had diminished in value, he did not want to demolish it, nor did he want to discount the apartment for liquidation.

The apartment was located in an blighted urban area where the crime rate was high and drughouses and absentee landlords were common. These neighborhood conditions negatively impacted the nearby Marquette University, which has an enrollment of 10,000 students. In 1991, the neighborhood became part of a

revitalization program under a non-profit organization called Campus Circle, which was in the start-up process at the time of Dahmer's arrest. Within one year of its inception, Campus Circle had acquired approximately 100 properties ranging from abandoned single-family residences to a 59-unit apartment building. By 1994, it had constructed a \$35 million retail and residential development two blocks from the University, and a community-oriented police station was constructed on 21 st Street. As a result of this redevelopment activity, the drug houses disappeared, crime dropped 44 percent, and the enrollment at the University increased notably. Despite the progress made in this redevelopment activity, the Dahmer apartment building was a daily reminder to the local residents and the University of the crimes that were committed there. As would be expected, its presence had a significant negative impact upon the Campus Circle project and the University. Many members of the community, the victims families and Campus Circle desired to demolish the Dahmer apartment building and build a small playground, which are sometimes called "tot-lots".

Similar apartment buildings in the area had sold for \$9,000 to \$10,000 per unit. The former apartment building owner was aware of the surrounding redevelopment and the special motivations of Campus Circle. It was finally sold to Campus Circle on August 7, 1992 for \$325,000, or \$13,500 per unit. This is reportedly \$3,000 to \$4,000 per unit above market.

This premium was paid due to their major financial investment in the neighborhood and school, as well as to address the desires of the victim's families. In November, 1992, the improvements were demolished. The planned "tot-lot" development had a cost of \$150,000 and the City was to

maintain the park; however, for various reasons the park was never started and the site remains vacant. Current plans include the use of the site for a parking lot for the telephone company's offices across the street. There are no plans for a memorial on the site.

This situation is unusual and stands in contrast to most crime scene situations. Technically, the property sold for a premium; however, it was purchased in an effort to demolish the building and thereby enhance the neighborhood. In recognizing the high vacancy rate caused by the crimes and the special motivations of the buyer to acquire the property and promptly demolish it. It is apparent that the apartment building was negatively impacted by the crime scene stigma; however, in this instance the prior owner profited from the situation.

To this day, the site is a negative reminder to the community of the tragedy. The site has apartment buildings on both sides of the vacant lot. One tenant commented that he rented his apartment without knowing about the history of the vacant lot next door, and now places a large picture in the windowsill to shut off the view. Generally the tenants commented that they rent their apartment knowing that they can leave at any time.

**Oklahoma Federal Building**

**5th Street and Harvey Avenue**

**Oklahoma City, Oklahoma**

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**DC Class X - Terrorist Bombing**

In April, 1995, a powerful bomb left in a rented vehicle destroyed the Federal Building on. This tragedy took the lives of 168 people, injured 600 others and destroyed a nine-story building. Timothy McVeigh was convicted of the attack.

Although the Federal Building received the focus of media attention, the blast destroyed numerous other buildings to the north, east and west, including the YMCA, the Regency Towers Apartments, several churches and the post office. Many of these building were later repaired or rebuilt.

Soon after the rescue efforts were completed the balance of the Federal Building was demolished, the site was fenced and the a grass lawn was planted. Traffic on 5th Street has been permanently closed and plans have been made to erect a memorial on part of the site. The parking structure and terrace were not damaged, and the parking structure is stilled used today by the courthouse to the south.

The incident fundamentally altered the future building plans of the Federal Government. The Government purchased numerous destroyed properties to the north, and is planning a low-rise building complex that will be a model for future Government buildings.

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