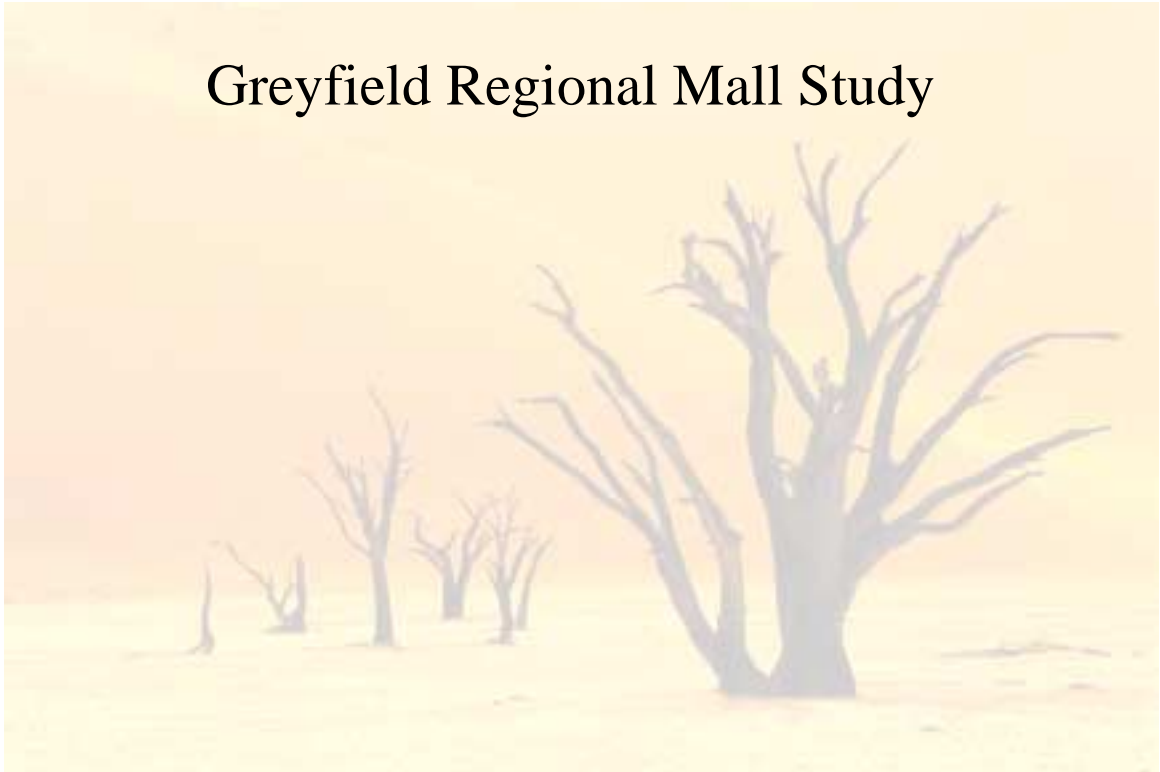CONGRESS FOR THE NEW URBANISM

# Greyfield Regional Mall Study

PwC

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**Summary & Significant Findings**

This study identifies and describes characteristics of older, economically obsolescent regional malls in the United States (US) – referred to as "*Greyfield malls*."  Our report presents our findings and focuses on the following tasks:

1. Estimate the number of existing and potential Greyfield malls in the US.
2. Estimate the amount of outstanding debt and depreciation of Greyfield malls.
3. Identify real estate-related characteristics of Greyfield malls.
4. Describe local economic and demographic characteristics around Greyfield malls.

The authors recognize that the majority of regional and super regional malls in the US are currently financially viable and healthy, operated by experienced management in the public real estate investment trust markets and also in the private real estate market. PricewaterhouseCoopers believes in the long term outlook for well located and managed regional malls.  Yet we also believe that there are a minority of regional malls where redevelopment is a prudent financial and social decision.

Theoretically, the redevelopment of Greyfield mall sites can benefit non-Greyfield malls through redevelopment and construction of mixed-use commercial and residential projects on Greyfield mall sites.  Redevelopment of Greyfield mall sites replaces obsolete properties with urban synergies and increases households in trade areas.   In economic terms, supply will be reduced (redevelopment of Greyfield mall sites), with demand increasing (through new households).

We believe the redevelopment of Greyfield regional mall sites may create the following benefits:

- Reallocation of land use, existing infrastructure, and non-productive urban locations into high density residential and mixed commercial use providing an increased property tax base to local governments.
- Temporary boost to local employment through construction and redevelopment activities of Greyfield mall sites and permanent employment in new offices, retail and residential property management.
- An increase in retail demand from new households moving to redeveloped Greyfield mall sites.
- Economic renewal for Greyfield sites located in blighted areas with potential positive value impacts on surrounding land uses and properties.
- Opportunities for alternative highest and best uses recognizing that the residual value of Greyfield mall sites is primarily land.
- Traffic mitigation for inner city Greyfield sites located on major transportation corridors with public transportation.

This study uses several industry association data sources.  As a caveat, retail data and information is not to the maturity in quality, timeliness, and quantity found in other commercial real estate property sectors such as office and warehouse.  We understand the

limitations of the data and have taken appropriate steps to apply conservative estimates based on retail industry information sources.  The majority of publicly available retail data through the International Council of Shopping Centers (ICSC), National Research Bureau (NRB), and the Urban Land Institute (ULI) is survey based, similar to the body of literature on consumer behavior.

Our models estimate that Greyfield malls represent approximately 7% of existing regional malls in the US, with an additional 12% of regional malls potentially moving towards Greyfield status over the next 5 years.  However, recent announcements from publicly traded anchor tenants[1] can accelerate specific non-Greyfield malls into Greyfield mall status sooner than expected.

There are approximately 1,689 to 2,076 regional and super regional malls in the US depending on the source of information and the definition of a regional mall.  We classified regional malls into 4 categories: [1] Greyfield, [2] Vulnerable, [3] Viable, and [4] Healthy.  A Vulnerable regional mall is similar to a Greyfield

> *A foundational determinant of a Greyfield mall is lack of productivity, generally measured in total sales per square foot generated at the mall.*

mall in several critical factors although does not meet all the conservative characteristics as of 1999.

Table 1 presents our estimate of the number of Greyfield regional malls in the US as of 1999.  One critical variable distinguishing Greyfield and non-Greyfield malls is sales per square foot although other variables as size, age, occupancy, tenant mix, and trade area demographics confirm differences between Greyfield and non-Greyfield regional malls.  Based on statistical analysis of the data, discussions with industry leaders, and our conservative methodologies, we used $150 per square foot sales or less to initially identify a Greyfield mall[2].

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[1] See Form 10-Q for the period ending October 28, 2000.  JC Penney *"….finalized a plan to close 45 underperforming stores."*  See Notes to Interim Financial Information.   See also AP Business Writer, December 29, 2000 *"Montgomery Ward to Close Stores, File Again for Chapter 11 Bankruptcy."*  According to the AP Newswires, *"…Montgomery Ward announced that it would be shutting down its 250 stores in 30 states."*

[2] Our analysis also supported a $174 sales per square foot or less figure to identify Greyfield malls.  However, we generally use the $150 sales per square foot in this report.  We also reviewed a figure of $130 sales per square foot or less to estimate the number of Greyfield malls – a figure that we believe *truly* underestimates the actual number of Greyfield malls.

Table 1
National Greyfield Mall Estimates, 1999

| Decision Criteria | Universe of 1,689 malls[3] | Universe of 2,076 malls[4] |
|---|---|---|
| Regional malls, 35+ stores with <$150 per square foot sales[5] | 114 | 140 |
| Additional Greyfield malls over the next 5 years (12% of existing malls) | 203 | 249 |
| Outstanding Debt ($ Billions)[6] | $2.066 | $2.537 |
| Outstanding Depreciation ($ Billions)[5] | $0.852 | $1.046 |
| Redevelopment Costs, 0.5 FAR[7], $100 per square foot, ($ Billions) | $11.1 | $13.7 |

Source:  PricewaterhouseCoopers, 2000

Although our study uses sales per square foot to originally classify regional malls into 4 categories, we performed several statistical tests to validate and confirm significant differences between Greyfield and non-Greyfield regional malls on other factors.  Our analysis reveals several significant findings relative to the real estate and demographic characteristics of Greyfield malls:

- The majority of Greyfield mall sites are privately owned.

- Greyfield malls have significantly lower occupancies than non-Greyfield malls.

- The average Greyfield mall gross leaseable area (GLA) is under 0.5 million square feet (msf), significantly smaller than non-Greyfield malls (averages for Viable and Healthy regional malls are 0.650 msf and 0.906 msf respectively).

- Greyfield malls are, on average, 8 to 10 years older than non-Greyfield malls.

- Greyfield malls compete with an average of 22 other retail centers, i.e., neighborhood and community centers, other regional malls, within five miles (2.33 msf of competing space).

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[3] This study estimates the number of regional malls in the US between 1,689 and 2,076 properties in 1999. A query of the *NRB Shopping Center Directory 2000* for regional malls with 35 stores or more indicated 1,689 centers.  Further details of this estimate are found in the "Data" section.  A count of major malls at the International Council of Shopping Center's web page http://www.icsc.org/dmm/dmm.html (Directory of Major Malls) of malls greater than 350,000 square feet indicated 2,093 centers. The Directory of Major Malls, (http://www.directoryofmajormalls.com) lists over 3,466 major shopping centers and malls for the US and Canada.

[4] See footnote 1 also.  A query of the NRB Shopping Center Directory 2000 for regional malls with 35 stores or more indicated 1,689 centers and 387 regional malls without data on the number of stores.   Thus 2,076 = 1,689 + 387.

[5] The $150 per square foot is based on industry surveys of real estate investors that use $150 to identify Class C and D regional malls.

[6] Based on a 550,000 mall, built in 1973 at a cost of $15.818 million (300,000 square feet anchor space at $30.18/square feet, 200,000 square feet of inline at $28.14 per square foot, and 50,000 common space at $21. 52 per square foot), with an 80% loan at 2 points over prime, expanded in 1987 (100,000 square feet at $50 per square), and renovated in 1989 (220,000 square feet at $20 per square foot), with a 39 year straight line depreciation.

[7] Floor area ratio

- Greyfield malls are more often located in moderate and low-income neighborhoods than non-Greyfield malls.

## Introduction

The objective of this engagement was to provide the Congress for New Urbanism (CNU) with an academically sound, independent, and unbiased research "*white paper*" on the real estate and demographic characteristics of Greyfield regional malls in the US as of 1999. Subsequent phase studies may focus on redevelopment strategies for Greyfield mall sites and necessary public policy initiatives required to address ideas on regulatory reform supporting urban redevelopment activities for these Greyfield retail sites.

Why are there Greyfield malls? According to life cycle theories, real estate properties without necessary maintenance, renovations, and other capital expenditures may depreciate in value due to functional obsolesce. Eventually the total value of a Greyfield mall may simply be land value less structure demolition expenses.

A typical Greyfield mall is 32 years old with the last major expansion or renovation approximately 13 years ago. On average, identified Greyfield malls have 22 competing retail centers within five miles with an aggregate 2.33 million square feet of competition. Another reasonable explanation for the existence of Greyfield malls is new retail formats in newer centers have captured market share. In summary, there are a variety of reasons malls declines: from changes in trade area competition and demographics, to poor management and tenant behavior (see Exhibit 1).

This study includes a literature review, discussion of our data sources and methodology, a brief presentation of our results, and a conclusion.

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**Exhibit 1**
*Potential Reasons for a Mall Decline*

- Changes in accessibility, infrastructure, and transportation corridors that effectively make older inner city and first-ring suburban malls less competitive.
- Changes in urban economics - shifts in population, capital, and attention to increasingly distant suburbs.
- Alterations in retail format over time - introduction of power centers and category killers.
- Competition from newly constructed centers within 3-5 miles.
- Changes in surrounding area household demographics - age of population, racial composition, household income.
- Changes in the level of tenant commitment - unwillingness to sign long-term leases, creation of encumbrances that make it difficult to redevelop the property.
- Poor facility management, lack of revenue to support necessary maintenance.
- Other forces, i.e., anchor tenant bankruptcies/mergers, environmental stigma.
- High private ownership may signal lack of capital to invest in renovations and/or expansions.

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## Literature Review

The following provides a brief review of shopping center research literature. Most of the articles focus on regional malls, location theories, sales, rent, and values. Each article is briefly summarized, focusing on the conclusions of the authors. Following the article description, we relate the findings to the current study of Greyfield malls.

Eppli and Benjamin (1994) provide a review of shopping center research over the last century. The authors point to two broad areas of shopping center research. The first is

patterned after Christaller's central place theory that has broadened to include studies of consumer shopping patterns and the behavior of retailers. The second class of research is based on Hotelling's research on competition in a spatial context. The authors also provide insight into two smaller, more focused areas of research. These include studies on the effects of anchor tenants on non-anchor tenants, and studies concerning the theoretical basis of shopping center valuation. The articles that follow generally fall into one of these two broad groups or subgroups.

Eppli and Shilling (1996) explore a combination of Christaller and Hotelling theories in determining the importance of location to a regional shopping center. The authors conclude that distance is of little importance in explaining retail sales. However, agglomeration has substantial effects on mall sales. They find that gravity models are able to explain a large portion of retail sales variation. The results confirm the theory that the drawing power of a mall varies directly with the size of the center. Therefore, the size of a center may be a better determinant of overall success than the relative location to the trade area. For the Greyfield malls this research, in conjunction with several other studies described below, may explain a loss of mall sales as a result of newly constructed competition. As new centers are created around a trade center, retail sales increase, but the large majority of these sales are going to the newly constructed centers and not the older malls. In addition, this research shows that smaller malls are not as competitive as larger centers in a trade area. Declining sales may be partially explained by the fact that Greyfield malls tend to be smaller than non-Greyfield malls as well as large, newly constructed power centers and category killers.

Ownbey, Davis and Sundel (1994) explore location variables and their impact on gross rents for neighborhood shopping centers. The authors attempt to explain the superior performance of centers based on location alone. The authors form a multivariate model of location variables based on the professional opinions of appraisers, investors, lenders, leasing brokers and sales brokers. This research may also explain the development and existence of Greyfield malls. As a city expands toward the suburbs, inner city and first ring suburbs lose locational value. The author's conclusions about location variables, malls, and neighborhood centers can reasonably be inferred to regional and super-regional malls.

Sirmans and Guidry (1993) study the determinants of shopping center rents. They conclude that the "customer drawing power" of a center as well as its architectural design, location, and the general economic conditions in which the center operates explains a significant portion of the variation in rents. Customer drawing power is a function of total area, age, and type of anchor tenant. Larger centers have greater drawing power, as do newer centers, and centers with large, national anchors. This article is important in the Greyfield mall study. The authors' conclusions about the determinants of shopping center rents apply directly to these malls. These malls tend to be older, smaller, architecturally obsolete, in poor locations with declining economic conditions, and tend to be malls in which anchor tenants are not top-tier. This study helps support the fact that these Greyfield malls typically see lower rents, tenant mix changes, and lower overall sales.

Gatzlaff, Sirmans and Diskin (1994) examine the effect of anchor tenant loss on shopping center rents. They conclude that non-anchor tenant rents decline by an estimated 25% after the loss of an anchor. The model indicates that rental rate declines occur primarily as a result of an increase in vacant space (33%, not including the space vacated by the anchor). This research also supports what can be inferred from the Greyfield mall data. These malls tend to have different anchor tenants than more successful malls, indicating a loss in anchor tenants at one point in the shopping mall's life. As a result of this loss, Greyfield malls have suffered rental rate declines, loss of income, and a likely turnover in tenant mix, all of which have led to the overall economic decline of the mall.

Wong and Norman (1994) propose a model for determining the optimal time of mall renovation. The model is constructed on the theory that rental income decreases over time as the mall ages. The model attempts to minimize the difference between the cost of the renovation and delaying the renovation. The model shows that mall renovation is particularly sensitive to changes in general economic conditions such as interest rates, costs associated with renovation and rental rates. This research provides support for declines in rental income over time as well as the tendency for mall owners to delay capital expenditures when the mall is fluctuating around the optimal time of renovation.

Baen (1999) examines the effects of technology on retail sales and the resulting impacts on commercial property values. He indicates that e-commerce is causing a leakage of traditional retail sales, and that this has profound impacts to percentage rents and retail property values. He concludes that traditional malls and retailing are being challenged by e-commerce, and that their continued profitability and value as investment grade real estate may some day be compromised. This newer research leads us to believe that the number of Greyfield malls in the United States will increase at an accelerated pace as a direct result of the Internet and other technological advances.

Borsuk (1997) deals with the implications of information technology (infotech) on retail real estate. He claims that infotech requires developers and investors to examine any property owned or considered for purchase and consider its adaptive use potential. However, he points to challenges of adaptive use redevelopment, citing conversion costs, zoning restrictions, community objections and unfavorable federal tax laws. The tax code stretches deductions over long periods of time, limits rehabilitation credits to a small class of structures, does not permit expensing of demolition costs, and does not recognize that infotech causes extraordinary obsolescence to buildings. This research once again points to the fact that technology will increase the incidence of Greyfield malls. Furthermore, the author argues that redevelopment may be difficult without changes in current tax laws or a similar outside force.

In addition to these academically published studies, numerous stories have been written in the popular press about the decline of malls. Many of these focus on efforts undertaken to renovate or redevelop declining or Greyfield malls.

**Data**

The authors of this study recognize the limitations of retail real estate data. However, as mentioned in the summary section, conservative methodologies were applied to databases to arrive at our results. The following sources were used in this study:

- National Research Bureau (NRB), *Directory of Shopping Centers*, 2000 CD ROM edition – database of over 37,500 retail centers in the US including information on age of property, gross leaseable area, retail property type, ownership, tenants, renovations and expansions, acreage, and other descriptive data. Information is provided through surveys of mall owners and management.
- FW Dodge, *Pipeline*, 4th Quarter 1999 edition – database of national retail supply (projects in the planning, construction, or abandoned phases), for the top 110 metropolitan statistical areas in the US including information on location (zip code, latitude and longitude, downtown versus suburban), size, cost, and ownership.
- *ArcView 3.2 and CACI* – geographic information system (GIS) and demographic database for US, data on numerous demographic and economic variables at the block group level for the years 1980, 1990, 1999, and 2004; to be used in analyzing demographic and socio-economic trends.
- PricewaterhouseCoopers' (PwC) internal expertise, experience, and information files on regional mall valuations and asset advisory consulting projects.
- Retail resources and publications from the Urban Land Institute (ULI), International Council of Shopping Centers (ICSC), and extensive retail industry library directed by Management Horizons, a consulting division of PwC.
- Academic journals, industry publications and online research databases.

**Methodology**

The study was divided into two parts. The first part of the study focused on describing the current retail landscape, with an emphasis on regional and super-regional malls. The second portion of the study estimated a range of potential Greyfield malls.

Using information from the National Research Bureau's 2000 CD-ROM edition, we summarized the national retail landscape by center type and total square footage. This first portion of the study then turned exclusively to regional and super-regional malls, which were the focus of the study.

This research involved gathering information on every regional and super-regional mall in the United States. The National Research Bureau (NRB) Shopping Center Database 2000 indicates that there are 2,847 regional and super-regional malls in the United States. Of the 2,847 malls, approximately 147 are in the planning or construction phases. This leaves 2,700 malls to consider in the study.

We ran additional analysis on the NRB database in order to establish a list of centers that included only regional and super-regional malls. Data from the International Council of Shopping Center's (ICSC) SCORE publication indicates an average of 56 stores per regional mall in the US. Based on the 56 store per mall average and distributions, we eliminated any property in the database with fewer than 35 stores. The elimination of

NRB classified regional malls with less than 35 stores resulted in a universe of 1,689 malls in the US. There are also 387 centers in the NRB database (classified as regional or super-regional centers) that do not have data on the number of stores. Therefore, we established a range for the number of regional and super regional malls in the US to be between 1,689 and 2,076 (1,689+387). NRB data extracted for each regional mall is listed in Table 2.

Table 2
Information Collected from NRB Data Base

| | |
|---|---|
| • Mall name | • Non-anchor gross leaseable area |
| • Address | • Center type |
| • City | • Lease rates |
| • State | • Sales/square foot |
| • Zip | • Center cost |
| • County | • Parking spaces |
| • MSA | • Marketing code |
| • Latitude | • Mall hours |
| • Longitude | • Enclosed/open |
| • Owner | • Levels |
| • Phone | • Mall shape |
| • Fax | • Indication of construction |
| • Number of stores | • Year open |
| • Percent occupied | • Year of last renovation |
| • Acres | • Year of last expansion |
| • Gross leaseable area | • Geographic region |

In order to analyze detailed demographic and economic data, each regional mall was geocoded at the street level and/or at the zipcode centroid using ArcView 3.2. Geocoding identifies the latitude and longitude of each regional mall. Demographic data was collected from CACI for trade areas surrounding the properties at a 1 mile and a 10 mile radius for 1980, 1990, 1999 and 2004 where appropriate. Demographic data partially included ACORN[8] classifications, number of households, population and population densities, income characteristics, racial composition, and the number of retail centers and total GLA in a 5 mile radius around each regional mall. Once property, trade area, demographic, and economic data was collected for all regional malls, the next step in the process focused on decision criteria to identify Greyfield malls.

*Greyfield Decision Criteria.* Real estate industry professionals use various parameters to classify regional malls. One classification system used in the industry is grading malls from Class A to Class D, with Class A malls the highest quality and Class D the lowest. Although disagreement on this classification scheme is found in the industry due to lack of standardization of regional malls, retail investors and tenants still distinguish between

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[8] The ACORN stands for "A Classification of Residential Neighborhoods". It is a market segmentation system that identifies distinctive consumer groups and classifies neighborhoods into these groups. Similar neighborhoods are grouped together; divergent neighborhoods are separated. ACORN identifies over 226,000 neighborhoods, or census block groups, by one of 43 market segments: 40 residential markets and 3 nonresidential groups. Each neighborhood is profiled by 61 characteristics of consumer behavior--such as income, home value, occupation, education, household type, age--and then sorted into one of 43 market types.

various regional malls generally by single measures as size, age, sales per square foot, anchor tenants, and trade area demographics.

One measure used to classify regional malls in the industry is sales per square foot. Each class is generally associated with range of sales per square foot. Class A malls have $300+ sales per sq ft, Class B $200 - 299 sales per square foot, Class C $100 – 199 sales per square foot, and Class D malls sales per square foot less than $100. Based on industry publications and interviews with major regional mall investors, we concurred that a cutoff of $150 sales per square foot is a *reasonable* and *justified* benchmark to identify potential Greyfield malls[9]. Thus, regional malls below $150 sales per square foot were initially identified as Greyfield malls, and from $150 to $199 per square foot were Vulnerable. Although initially identified by sales per square foot, further statistical tests were still required to confirm differences between regional mall categories. The $150 sales per square foot figure is also supported by industry surveys. According to the Korpacz Real Estate Investor Survey®, a widely accepted industry survey of institutional real estate investors, regional malls are classified per inline sales per square foot as follows:

Table 3
Regional Mall Classes – Sales per Square Foot

| Class | Inline Retail Sales PSF |
|---|---|
| A+ | $400 and up |
| A | $300 to 399 |
| B+ | $250 to 299 |
| B | $200 to 249 |
| C+ | $150 to 199 |
| C | $100 to 149 |
| D | Less than $100 |

Source: Korpacz Investor Survey, PricewaterhouseCoopers

The NRB data includes fields for sales per square foot based on unaudited survey responses. There are 698 regional mall properties in the NRB database that included sales per square foot. The distribution of sales per square foot is illustrated in Exhibit 2 with an indicator for Greyfield malls[10].

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[9] We used multivariate discriminant analysis, ANOVA tests, and Independent T tests to further determine if the use of the $150 per square foot criteria produced robust results indicating significant differences between group means. Our statistical results supported the use of $150 per square foot as a benchmark.

[10] A reviewer recommended we use an alternative cutoff sale per square foot of $130. The $130 sales per square foot figure is derived from the sample mean of $262 sales per square foot (see Exhibit 3) less a standard deviation of $88 per square foot (Z score of –1.5). Again, we believe the $130 sales per square foot underestimates actual Greyfield malls and is financially impractical to sustain a regional mall.

## Exhibit 2
## Sales per Square Foot Distribution



Std. Dev = 88.45
Mean = 262
N = 698.00
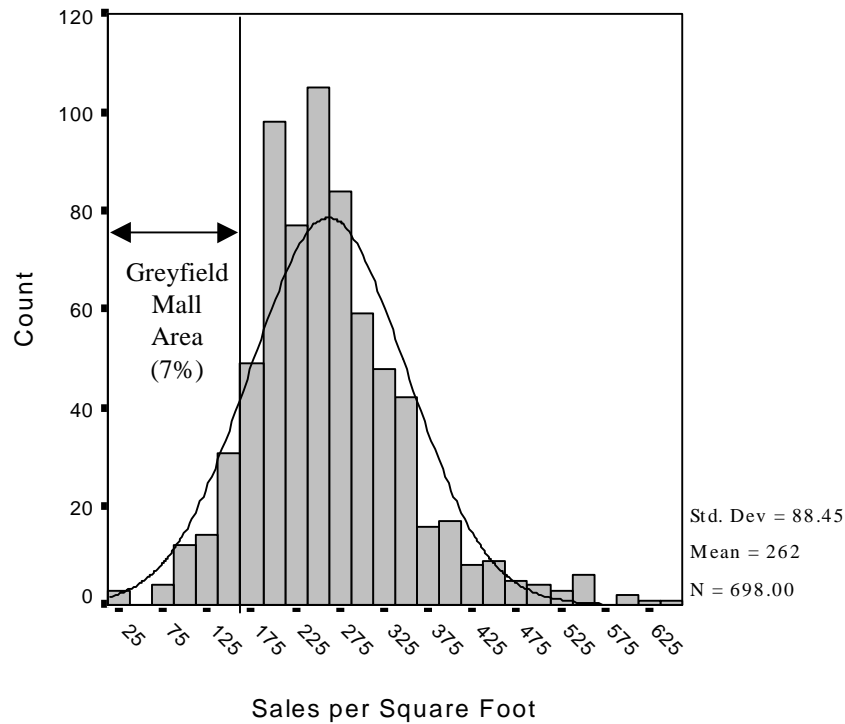
We recognize industry survey differences in regional mall sales per square foot figures. They can be explained by sample bias, definitions (anchor tenants included or not), survey respondent errors, types of regional mall (festival, traditional, upscale), and ages of regional malls. For example, average retail sales per square foot according to the ICSC in 1999 were $182.26[11], $251 sales per square foot in October 2000[12], and according to the Urban Land Institute (ULI) $180.78. Once again differences can be explained by sample size (ICSC's sample size was 213, ULI had sample included 96 centers), time of survey (ICSC was 1999, ULI was 1997), and definitions. We used the NRB due to availability and the larger samples size (698 regional mall centers reported sales per square foot)[13].

The issue is not reconciliation between various industry publications concerning regional mall sales per square foot figures, rather differences across regional malls and the trend of sales per square foot as a regional mall ages. There is a consensus, with academic studies and published data, that sales per square foot generally, on an inflation-adjusted

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[11] International Council of Shopping Centers, *The Score/1999, Shopping Center Operations, Revenues, & Expenses*, Table 35, IV. Retail Sales, page 158.

[12] Source: Monthly Mall Merchandise Index, International Council of Shopping Centers, Volume 10, Number 12, December 2000. Figure is year to date.

[13] A paired T test using NRB sales per square foot data for the years 1998 and 1999 was conducted resulting in no significant differences in reported 1998 and 1999 figures.

basis, decline over time as a mall ages[14].  For example, Exhibit 3 clearly shows declining sales per square foot for regional malls less than 800,000 square feet over the life cycle of the mall.  Note also that Exhibit 3 illustrates that smaller regional malls, similar in size to our Greyfield description, have approximately $150 sales per square foot.

Other variables were investigated as benchmarks. Occupancy was analyzed assuming that Greyfield malls had lower occupancies than non-Greyfield malls.  Occupancies for Greyfield and Vulnerable regional malls are relatively equal (84% and 82% respectively). Occupancy levels and sales per square foot were also tested.  Correlations between sales per square foot and occupancy were very low (0.164) indicating no significant relationship.  A possible explanation is Greyfield malls "*buy*" occupancy through low rents thus reducing vacancies without increasing sales.   We also investigated if the age of a mall could indicate Greyfield malls. Yet, correlations between the age of regional mall to sales per square foot were zero[15].

### Exhibit 3
### Sales/SqFt versus Mall Age
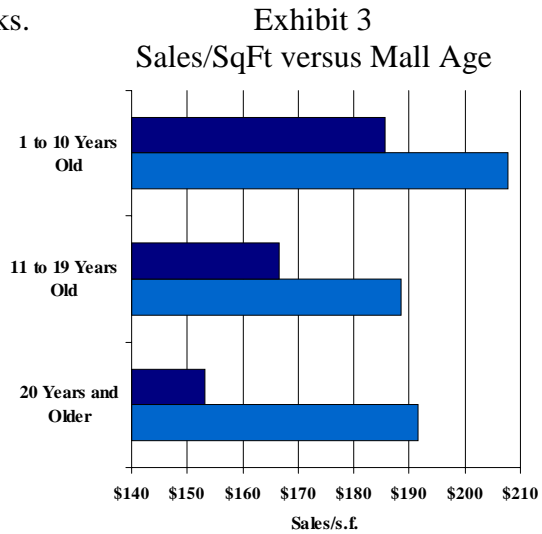


Source:  ICSC, The Score 1999

Therefore the age and occupancy of a mall do not segment regional malls to the degree of sales per square foot.

At the recommendation of a reviewer, we also analyzed population density to sales per square foot.  The hypothesis is malls in semi-rural areas may have lower sales per square foot yet exhibit qualities of a Viable or Healthy A mall.  If the hypothesis is true, then changes in sales per square foot can be partially explained by population density, and sales per square foot should increase as population density increases resulting in positive correlations.  However, our analysis showed that correlations between sales per square foot to population density at 1-mile (0.252) and 10 miles (0.359) were significantly different from 0 at the 1% level, but do not result in as high a linear relationship as expected.  Therefore, we can reject this hypothesis.

We then developed the following criteria based on sales per square foot for classifying Greyfield, Vulnerable, Viable and Healthy malls.  Maintaining our conservative philosophy, we expanded the ranges in Table 3 to classify regional malls into the four categories found in Table 4.  Thus, Healthy malls included A+, A, and B+; Viable malls

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[14] ICSC, *The Score/1999, Shopping Center Operations, Revenues, & Expenses*, page *195 "U.S. Enclosed Malls – Less Than 800,000 Sq. Ft*" (sample size of 107).  See also Urban Land Institute, Dollars & Cents of Shopping Centers 1997, Table 4-10 and Table 4-11.

[15] In fact, there was consistently little correlation between sales per square foot, age, year of last renovation, year of last expansion, and occupancy.  This statement does not negate the previous statement that sales decline over time.  In the first example, we are testing the correlation of the age of a mall and the sales of a mall as of 1999.  In the second example, we would need to test annual sales per square foot of a particular mall to the age of the same mall.

B, Vulnerable malls C+, and Greyfield malls C and D.  In accordance with our conservative methodology, we provide sales per square foot ranges in the table.

Table 4
Regional Mall Classification Ranges & Distributions 1999

| Description | Sales/SqFt High Range Estimate | % of All Regional Malls |
|---|---|---|
| Healthy | $250 + | 54.0% |
| Viable | $200 - 249 | 27.3% |
| Vulnerable | $150 - 199 | 12.0% |
| Greyfield | < $150 | 6.7% |

Source:  PricewaterhouseCoopers, NRB

The database of 2,076 regional malls, including NRB and CACI data, was exported from Excel into SPSS 10.0 for further statistical analysis.  General descriptive, correlations, means testing, and nonparametric tests were performed on the data. Tests performed in SPSS focused on property characteristics, as well as economic and demographic characteristics, and the distribution of these statistics among Greyfield and non-Greyfield properties.  Comparisons of various economic and demographic statistics for Greyfield malls at a one and ten-mile radius tested for significant differences in neighborhood characteristics at these distances.   In addition, we tested for difference in the number of competing retail properties within a five-mile radius and aggregated gross leaseable area between Greyfield and non-Greyfield malls.

Finally, we utilized information from the PricewaterhouseCoopers regional mall internal valuation and consulting files to establish the theoretical life cycle of a mall in order to calculate outstanding debt and depreciation.  We analyzed several older regional mall valuations in order to estimate loan to value ratios, land values to building and improvement values as a function of age of the retail property.  The prototype Greyfield mall, developed from our internal regional mall valuation databases, was used to estimate debt and depreciation as reported in Table 1.

**Results**
In order to estimate the number of Greyfield, Vulnerable, Viable, and Healthy malls, we extrapolated the respective percent in the sample to the range of regional malls (1,689 or 2,076).  Thus, the estimated number of Greyfield malls is 1,689 x 6.7% = 114, and 2,076 x 6.7% = 140 as found in Table 1.

Group mean tests, independent T tests, and discriminant analysis were conducted in order to validate the sales per square foot classifications. If regional malls classified by sales per square foot is not a useful measure, then differences will not exist across groups with other independent variables as age, year opened, year last expanded, and other property descriptives.  Thus our hypothesis states that sales per square foot *is* a discriminating variable to identify classes of regional malls. Table 5 presents summary descriptives for Greyfield, Vulnerable, Viable, and Healthy malls from the sample of 698 malls.

Table 5
Descriptive Statistics by Mall Classifications

| Classification | Variable | Mean | Standard Deviation |
|---|---|---|---|
| *Greyfield* | Acres | 45.96 | 20.45 |
| | GLA | 498,125 | 165,177 |
| | Occupancy | 84.56 | 17.65 |
| | Sales | 114.3 | 30.6 |
| | Year Open | 1968 | 11.40 |
| | Expansion | 1988 | 8.14 |
| | Renovation | 1991 | 5.30 |
| | Stores | 62.7 | 23.8 |
| *Vulnerable* | Acres | 54.49 | 32.06 |
| | GLA | 539,655 | 201,852 |
| | Occupancy | 82.85 | 15.84 |
| | Sales | 174.4 | 13.8 |
| | Year Open | 1971 | 10.27 |
| | Expansion | 1990 | 5.61 |
| | Renovation | 1992 | 4.20 |
| | Stores | 71.1 | 25.7 |
| *Viable* | Acres | 60.59 | 28.52 |
| | GLA | 650,246 | 275,248 |
| | Occupancy | 90.14 | 9.75 |
| | Sales | 219.2 | 15.6 |
| | Year Open | 1976 | 10.04 |
| | Expansion | 1990 | 6.31 |
| | Renovation | 1993 | 4.70 |
| | Stores | 84.2 | 29.9 |
| *Healthy* | Acres | 70.50 | 36.59 |
| | GLA | 906,301 | 381,402 |
| | Occupancy | 93.68 | 8.48 |
| | Sales | 321.3 | 73.0 |
| | Year Open | 1973 | 11.08 |
| | Expansion | 1999 | 5.98 |
| | Renovation | 1999 | 4.20 |
| | Stores | 123.7 | 48.3 |

The next analysis involved comparing group means, specifically between the Greyfield mall group to the Vulnerable, Viable, and Healthy regional mall groups.  A group means test is necessary in order to validate significant differences between groups.  Table 6 clearly shows that significant differences exist between Greyfield mall characteristics and Viable and Healthy mall groups (cells with bold numbers indicate differences).  However, with the exception of number of stores and acres, there is not a significant difference between Greyfield and Vulnerable malls which supports the argument for further numbers of Greyfield malls in the future.  Each independent sample test included the number of stores, occupancy, acres, gross leaseable area, data opened, last expansion year, and last renovation year.  T statistics and significance levels are provided.

Table 6
Independent T Test Results – Greyfield Malls to Other Groups

| Variable | Vulnerable | Viable | Healthy |
|---|---|---|---|
| # Stores | **-1.858** | **-5.157** | **-14.030** |
| | **.066** | **.000** | **.000** |
| Occupancy | 0.485 | **-1.835** | **-3.063** |
| | .630 | **.074** | **.004** |
| Acres | **-1.856** | **-4.006** | **-6.917** |
| | **.066** | **.000** | **.000** |
| Gross Leaseable Area | -1.272 | **-4.861** | **-13.123** |
| | .206 | **.000** | **.000** |
| Year Opened | -1.619 | **-4.360** | **-3.517** |
| | .109 | **.000** | **.001** |
| Year Last Expanded | -1.002 | -1.183 | -1.619 |
| | .323 | .245 | .116 |
| Year Last Renovated | -0.927 | **-2.033** | **-1.980** |
| | .357 | **.047** | **.054** |

Note: Equal variances not assumed, each box contains T test and significance levels.

*Greyfield Mall descriptives.* An analysis of the top ACORN classifications in the trade area surrounding a Greyfield mall property provides valuable insights of the demographics. For example, the majority of Greyfield malls are in 6C neighborhoods described as newly formed households with moderate incomes. These neighborhoods offer affordable housing, consisting of older, single-family homes and duplexes in urbanized areas. The next highest ACORN neighborhood was 2E described as established and stable with moderate-income households, middle-aged and older married couples. The Middle Atlantic, Pacific, South Atlantic, and East North Central regions account for 68% of all Greyfield malls in the United States.

**Conclusion**

This study estimates that approximately 7% of existing regional malls are Greyfield malls with an additional 12% of regional malls vulnerable to future Greyfield mall status. Through the use of retail industry data, real estate investor surveys, and extensive statistical analysis, we have confirmed significant differences between regional mall categories - primarily between Greyfield to Viable and Healthy regional malls. This study also shows that the majority of Greyfield malls are in moderate-income neighborhoods with older, affordable housing. Finally we believe that redevelopment of Greyfield malls into high density residential and mixed use offers benefits to existing Viable and Healthy regional malls.

Redevelopment of real estate assets is not a new concept. Office properties are converted into condominiums, warehouses into R&D office, old warehouses in central business districts redeveloped as residential lofts, and even large retail centers into mixed use properties. There are already examples of Greyfield malls in the process of redevelopment found in local communities across the US.

This study is not sounding an alarm, nor does it say there is an immediate danger to well managed and well located regional malls. The authors believe in the long-term viability of regional malls, even in the age of the Internet and e-tailing. Consumers are social, and

thus retail centers as regional malls will continue to serve the entertainment, social, and consumer needs in the foreseeable future.

However, we do believe that this study supports the definition and identification of Greyfield malls. The authors encourage further analysis of the Greyfield mall phenomena in order to develop necessary public policy initiatives and retail industry responses.

## References

Bailey, Richard. 1998. Mall over: a retail hybrid helps to revitalize an inner suburban ring in Chattanooga, Tennessee. *Urban Land* July, 1998: 46-49, 84-85.

Baen, John S. Ph.D. 1999. The effects of technology on retail sales, commercial property values and percentage rents. University of North Texas: unpublished working paper.

Borsuk, Mark. February 1997. The challenge of information technology to retail property. *Urban Land.* Washington, DC: The Urban Land Institute.

Eppli, Mark J. and John D. Benjamin. 1994. The evolution of shopping center research: a review and analysis. *The Journal of Real Estate Research.* 9.1: 5-32.

----- and James D. Shilling. 1996. How critical is a good location to a regional shopping center? *The Journal of Real Estate Research* 12.3: 459-468.

Gatzlaff, Dean H., G. Stacy Sirmans and Barry A. Diskin. 1994. The effect of anchor tenant loss on shopping center rents. *The Journal of Real Estate Research* 9.1: 99-110.

International Council of Shopping Centers. 2000. *The SCORE 1999: ICSC's Handbook on Shopping Center Operations, Revenues, & Expenses.* New York, NY: International Council of Shopping Centers.

Ownbey, Kenton L., Kyle Davis and Harvey H. Sundel. 1994. The effect of location variables on the gross rents of neighborhood shopping centers. *The Journal of Real Estate Research* 9.1: 111-123.

Sirmans, C.F. and Kisandra A. Guidry. 1993. The determinants of shopping center rents. *The Journal of Real Estate Research.* 8.1: 107-115.

Trachtenberg, Jeffrey A. (1990). When a mall's biggest retailers fall, surviving shops get an unpleasant jolt. *The Wall Street Journal.* October 25, 1990: B1.

ULI - The Urban Land Institute. 1995. *Dollars and Cents of Shopping Centers: 1995.* Washington, D.C.: The Urban Land Institute.

ULI - The Urban Land Institute. July 1995. *Shopping Center Renovation and Expansion: Info Packet No. 371.* Washington, D.C.: The Urban Land Institute.

ULI - The Urban Land Institute. June 1997. *New Urbanism/Neotraditional Planning: Info Packet No. 338.* Washington, D.C.: The Urban Land Institute.

Wong, K.C. and George Norman. 1994. The optimal time of renovating a mall. *Journal of Real Estate Research* 9.1: 33-47.