An Empirical Study of the Efficacy of Mixed-Use Development: The Seattle Experience

by: James R. DeLisle, Terry V. Grissom
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Abstract

Over the past decade mixed-use real estate has received significant attention. This attention stems from a number of factors ranging from the encouragement of such development by local planning authorities to increase density to the more recent interest in creating more vibrant, walkable and connected communities. In many respects mixed-use projects represent the intersection of real estate development and new urbanism with some suggesting that such projects constitute the best of both worlds. Indeed, in 2010 Emerging Trends[1] identified mixed-use development as the most attractive property type for institutional investors. The interest in such development is understandable especially in light of renewed interest in urban revitalization more sustainable real estate development, the market experience has been somewhat mixed with some projects doing well and others languishing. Unfortunately, little empirical research has been conducted to identify the metrics that can be used to gauge the ultimate success of mixed use projects and the critical success factors that should be incorporated in such developments. The objective of this paper is to explore these fundamental questions. The research begins with an extensive review of the literature to identify the nature and scope of issues surrounding mixed-use projects as well as provide insights into the current state of knowledge on the topic. The research then explores the mixed-use experience in Seattle where such development has been a key element of real estate activity for over two decades making it a living laboratory setting.

Mixed-Use Projects

Definition. On the surface it might appear that the definition of what constitutes a mixed-use project would be relatively straightforward. The reality however is much more complicated with the label being applied to a variety of alternative types of buildings, land uses and tenant mixes. For this study, mixed-use projects are treated as distinct from multi-use projects with which they are sometimes confused. In general, a mixed-use project can be defined as an individual project in which two or more distinct property types (e.g., office, retail, residential, hotel) are included in a single structure. In many cases these buildings feature retail or commercial uses on the first-floor which are ancillary to the residential or office uses that are often located on the upper floors. On the other hand, multi-use projects may contain the same components, but the various facilities are located in multiple structures that are somehow connected rather than in a single vertical structure. Since each of the types of projects may have multiple buildings, uses and/or tenant spaces individual projects often must be physically inspected or researched to ensure they are properly classified.

In an effort to formulate an industry-wide definition, the International Council of Shopping Centers, Inc. (ICSC), the National Association of Industrial and Office Properties (NAIOP), the Building Owners and Managers Association International (BOMA), and the National Multi Housing Council (NMHC),

[1] Jonathon Miller, Emerging Trends 2010, Urban Land Institute, Fall 2009.

collaborated on a cross-organizational effort define mixed-use developments. This effort was undertaken to resolve some of the ambiguity surrounding mixed-use development and to provide greater transparency in hopes of improving market efficiency and reducing unexpected risks associated with such projects. The definition was released at an industry-wide conference in 2006:

> *A mixed-use development is a real estate project with planned integration of some combination of retail, office, residential, hotel, recreation or other functions. It is pedestrian-oriented and contains elements of a live-work-play environment. It maximizes space usage, has amenities and architectural expression and tends to mitigate traffic and sprawl.*[2]

Evolution of Mixed-Use Development. Although mixed-use development activity surged in the past two decades leading up to the commercial market collapse in 2007, the notion of mixed-use projects is not new. Rather, mixed-use development has been an integral part of the urban landscape for centuries. This is especially true in Western Europe where mixed-use projects have been synonymous with small town living. Similarly, many large US cities were built on the backs of mixed-use projects. Some of the interest in mixed-use development was dampened by the adoption of the Standard Zoning Enabling Act which sought advocated a separation of land uses rather than an integration of uses. The rationale for separating land uses was based on recognition that some uses are incompatible with others and can create negative externalities to the detriment of individual land owners and the communities they comprise. Since the SZEA served as a model code, in many local jurisdictions land uses outside of commercial cores were often segregated into discrete commercial, industrial and residential zones. However, mixed-use development continued to emerge in Central Business Districts which by definition were multi-use areas, as well as in selected suburban nodes or targeted submarkets.

During the latter 1980s, a wave of mixed-use development activity spread across the country as a means of combatting urban sprawl that was associated with low density development. This trend was enabled in part by revisions to traditional zoning codes that allowed mixed-use projects to be developed outside of the commercial core areas to which they had previously been restricted. The underlying rationale behind revisiting mixed-use restrictions was articulated in Oregon's "Commercial and Mixed-Use Development Handbook" published in 2000 as a model code. The Handbook noted the advantages of locating stores, offices, residences, public services, and recreation spaces within buildings and/or walking distance of each other. It suggested such development patterns promote:

- Independence of movement, especially for the young and the elderly who can conveniently walk, cycle, or ride transit;
- Safety through around-the-clock presence of people;
- Reduction in auto use, especially for shorter trips;
- Support for those who work at home, through nearby services and amenities; and
- A variety of housing choices, so that the young and old, singles and families, and those of varying economic ability may find places to live.

Similar rationale has been cited in a number of jurisdictions and venues including the professional press

[2] ____, "What Exactly is Mixed-Use?" the International Council of Shopping Centers, Inc. (ICSC), the National Association of Industrial and Office Properties (NAIOP), the Building Owners and Managers Association International(BOMA), and the National Multi Housing Council (NMHC), Nov. 2006.

as reflected in the surge of articles advocating mixed-use development as something of a panacea. The majority of these articles were based on case studies or descriptive discussions of projects that had been undertaken to raise awareness of the development concept.

Research Design

Despite a proliferation of articles that have advocated mixed-use projects and the recent surge in development activity, a lot of uncertainty surrounds the specialized property sector. This is particularly true with respect to "lessons learned" which could shed light on what to do and what not to do to ensure the success of such projects. Unfortunately, due to the absence of coverage in of mixed-use projects in traditional performance measures (e.g., NCREIF Index, NAREIT), it is difficult to compare the risk/return profile of mixed-use projects against single-use projects. To address this void, the research design applied to this study contains several discrete but related lines of inquiry including::

- Literature Search. What are the major trends in mixed-use development? What have we learned through previous research? What do we know about mixed-use and what don't we know? Where are the gaps in knowledge related to mixed-use development?
- Efficacy of Mixed-Use. Does mixed-use development measure up to the high expectations that have been established for such development activity? From a public policy perspective, do such projects help create more independent, vibrant, sustainable communities and neighborhoods? From an investment perspective, do such projects create the anticipated synergies and attract the kinds of tenants at the proforma rents necessary to justify the higher costs of such developments over single use projects?
- Performance of Mixed-Use. How do mixed-use projects perform from an investment perspective? Do they create sufficient revenue streams to retain tenants whose success is dependent on customer demand? What unbiased metrics can be used to model investment performance in the absence of mandated disclosure and consistent market monitoring?

Research Challenges

As suggested earlier and as will be discussed in more detail, to this point in time little empirical research has been conducted into the efficacy of mixed-use development as an investment class. This void is particularly significant in light of the magnitude of capital that has been deployed on mixed-use projects and the extent they have been embraced as a panacea for creating self-sustaining neighborhoods and commercial cores. At the same time the void of literature is somewhat understandable in light of the significant barriers to such research including:

- Heterogeneity of Mixed-Use Projects. Mixed-use projects are extremely diverse ranging from the classic corner grocery store with living space above that were common in small town America to large-scale mixed-use projects in high-density urban centers. With respect to the combination of property types within a mixed-use building there are number of combinations and permutations that blend retail, residential, office, other commercial and hotel uses. These blended land uses can be in pairs of residential/retail or can contain a mixture of multiple uses. Due to this heterogeneity is difficult to analyze mixed-use projects at an overall level without first disaggregating the universe into more meaningful clusters.

- Ambiguity of Public Records. Many local jurisdictions provide electronic access to property tax records that provide descriptive data on individual projects. These records are typically coded by property type which suggests it would be relatively easy to identify and extract the data necessary to analyze mixed-use projects. Unfortunately, since the mixed-use designation is relatively new and not consistently applied identifying such projects is a complicated, multi-stage process. That is, mixed-use projects are often denoted by number of narrative descriptors rather than by a standardized classification code. In such cases, mixed-use projects are often not unambiguously classified and must be identified by analyzing a number of descriptive attributes which --when combined-- indicate that a potential project is indeed a mixed-use project. Indeed, to ensure that such projects are actually mixed-use it is necessary to physically verify the land use. Unfortunately, some mixed-use projects are simply not coded as such and thus are underrepresented in analysis of the overall mixed-use market. To overcome this ambiguity it is often necessary to conduct intensive analysis of public records. In the case of larger markets, this can be a daunting task depending on the level of ambiguity and the cooperation of government employees who oversee and provide access to public records.
- Data Mapping Challenges: Pins vs. Addresses. One of the challenges in analyzing mixed-use projects is the inherent difficulty in uniquely identifying the structure or building within which they are housed.In many jurisdictions public records identify the physical structure as a unique building. On the other hand each of the individual units or suites may have a distinct street address. Indeed in some cases of the corner properties the same physical structure or building let multiple addresses and multiple street names for the various units. In effect analysis of mixed-use projects requires the creation of a relational link between the building or physical structure and the individual components. This task can be complicated in the case of condominium projects which each unit has a unique tax identification number as well as a distinct street address.
- Longitudinal Data Limitations. Once a mixed-use building has been identified the descriptive data as to what constitutes the actual project overall as well as its various components must be dissected. While this might appear rather trivial is complicated by the unique design required by such facilities that affect factors such as ingress and egress, circulation corridors both horizontal and vertical, parking in terms of number and allocation to uses, building efficiency levels and load factors, design drivers, and common versus public spaces. In addition to the physical data in many jurisdictions there is no mandated reporting regarding the occupancy of commercial spaces making it difficult to determine whether or not since facilities are operated in a manner that is consistent with the mixed-use designation of the building. As a result of this data limitation in order to verify that a potentially mixed-use project actually is operated as one is necessary to conduct some primary research and to verify those results over time.
- Proliferation of Small-scale Mixed-Use Combinations. In some types of mixed-use projects (e.g., residential/retail) the subordinate use is marginal with respect to the primary use of the facility. such third-party market research and reporting services may not pierce down to the level of the retail space making it difficult to track leasing rates, occupancy levels and turnover. An example of this would be the case of the Dun & Bradstreet business data set which monitors commercial uses and report the nature of tenancy in the number of employees by establishment. While these data are available and extremely useful in primary research for commercial buildings such vendors typically do not have adequate coverage to provide an accurate picture of the commercial component of residential/retail mixed-use buildings. Similarly when compiling the retail stock of

the market or submarket emphasis is usually placed on the freestanding component of such uses. In some cases such data tracking may cover larger tenants such as a major grocery store however they often do not provide coverage of smaller neighborhood tenants. To offset this data limitation is necessary to conduct primary research is conducted on a longitudinal basis with limited short-term payoff in terms of publishable articles or results that provide decision-support.

Structured Systematic Literature Search

Background. Though mixed-use has been an organic feature of the history of urban development globally, it went by the way side with the institutionalization of zoning (at least in the US). In this context legislative context, mixed-use development has evolved as an alternative to separation and hierarchical land use patterns characteristic of planning based on zoning procedure. In this study, mixed-use projects as a distinct type of development were explored through a longitudinal investigation of the literature to investigate the variables that assist in defining the nature and character of mixed-use development. This in-depth investigation of mixed-use research which spanned from the early-70s to the present revealed a number of trends including an increase in linking mixed-use with the concept of new urbanism.

The literature search began with a broad approach that identified some 200 articles that addressed mixed-use. After reviewing these articles to understand the scope of inquiry and the potential contribution to the state of knowledge regarding mixed-use development, the number of relevant articles was reduced to 81 based on two general filters. The first filter eliminated articles that were simple descriptions of individual projects that focused on design or layout. While interesting, these articles failed to present any structural analysis. The articles retained after this filter provided description of the physical characteristics of the projects in sufficient detail to support analysis of mixed-use development as well as identification of strategic elements that distinguish mixed use projects. The second filter eliminated articles that failed to reach a required minimum of citing at least 5 deterministic variables related to mixed-use projects. This filter helped ensure that Chi-Square statistics and differential/equality test measures could be developed. The resultant analysis helps delineate mixed-use development from alternative development constructs.

Filtered Literature Results: Snapshot of Critical Factors/Concepts. Exhibit 1 presents the results of this collapsed form of the systematic literature search. As noted, the 78 retained articles yielded 33 variables. Based on theoretical constructs, taxonomy of the issues and operational pragmatics, as discussed above, the 33 variables observed in the relevant and fitting literature can be reduced to 11 clustered variables that enable a more parsimonious specification of mix use development and the formulation of models, processes and analytical constructs. These 11 consolidated variables can assist in a structured analysis and valuation of mixed-use products and assist in an empirical and quantitative analytic that is missing in the systematic literature search conducted. A synthesis of the structure systematic process conducted in this study is illustrated in the following exhibits. Exhibit 1 shows the summation and percentage of variables derived from the quantification of systematic review of the 78 articles that best fit the concerns of mixed-use development. The percentages noted are based on 491 observations of the 33 variables identified. Further synthesis of the observations enables the valid observations to be grouped and clustered into conceptually and operationally linked variables and functioning groups. The originally defined 491 can then be clustered conceptually and operationally into the eleven variables presented in Exhibit 2. The 11 variables specified in a structured systematic review of mixed-use development can be identified as elements of growth management (strategic and operational). Urban form issues, land use issues and

relationships, access measures and constructs, sustainability concerns, economic development issues, policy objectives and regulatory constraints, market constraints and measures, project and development scale, operations options and financial issues and measures.

Exhibit 1: Filtered Literature Summary

Factor	33 Concepts Cited in 78 Filtered Articles	Concepts		Factors	
		Number	Share	Number	Share
Growth Mgmt	Density/Sprawl	23	4.7%		
	Urbanism/ Suburb	17	3.5%	**40**	**8.1%**
Urban Form	Quaint Space	22	4.5%		
	Urban Form/Land Use	25	5.1%		
	Street Pattern	16	3.3%	**63**	**12.8%**
Land Uses	Number of uses	33	6.7%		
	Association of uses	37	7.5%		
	Situs/Land uses	25	5.1%	**95**	**19.3%**
Accessibility	Public Transit	11	2.2%		
	Pedestrian Access	13	2.6%		
	Parking	3	0.6%	**27**	**5.5%**
Sustain	Green Building	3	0.6%		
	Sustainable energy	7	1.4%	**10**	**2.0%**
Econ Dev	Grey/Brown/Greenfield	2	0.4%		
	Redevelopment/Renewal	5	1.0%		
	Economic external factors	13	2.6%		
	Job Generation	12	2.4%	**32**	**6.5%**
Policy	Political/Policy/Social	19	3.9%		
	Affordability	2	0.4%		
	Crime/Legal Conflict	4	0.8%	**25**	**5.1%**
Market	Tenant/Quality	5	1.0%		
	Life Style	27	5.5%		
	Behavior Response	25	5.1%	**57**	**11.6%**
Scale	Land Value/Site Assemblage	28	5.7%		
	Scale	15	3.1%		
	Retail Mass	6	1.2%		
	Amenities	5	1.0%		
	Multi vs. Single Use	15	3.1%	**69**	**14.1%**
Operations	Flexibility of use	5	1.0%		
	Facilities systems	4	0.8%		
	Management Complexity	16	3.3%	**25**	**5.1%**
Finance	Returns/Finance	29	5.9%		
	Option/Portfolio/Market	19	3.9%	**48**	**9.8%**
Total/Share		491	100.0%	**491**	**100.0%**

Based on the systematic literature search, the 11 factors and the 33 concepts embedded in them provided the following insights with respect to mixed-use development.

- Growth Management. These factors related to management of growth and other policies and practices were cited 40 times.

    - Density/Sprawl. This externality was cited 23 times in the various articles which was 4.7% of the total 491 citations for the 33 variables.
    - Urbanism/Suburbs. These concepts were cited in 17 articles as authors extending new urbanism and the differentiation between core property structure and suburban spread and use segmentation.

- Urban Form. The theoretical and operational link between these categorical concerns can be associated the literary topics of Urban Form, a factor which was cited 63 times.

    - Quaint Space. In effect, Quaint Space links design and urban form with development attraction and was cited in 22 articles that associated mixed-use developments with issues of design ambiance, physical attractiveness and spatial layout that was noted in some articles as delineating the production of quaint space. This micro-version of form and design is then differentiated from and associated with a macro specification of urban form, structure and design on land use specification and mix.
    - Urban Form/Land Use. This macro perspective of form was noted in 25 articles observed in the search. 16 articles in turn linked the layout of use mixes with the street pattern and traffic volume as issues of external form relating to use decisions.
    - Street Pattern. The street patterns variables focused on land use and mix related to street and infrastructure and traffic volume observed in designated neighborhoods.

- Land Uses. By extension, these issues of form and travel infrastructure can be linked to the articles that focused on land use analysis as the context and delineation of land use mix. This was the most commonly cited factor with 95 individual citations.

    - Number of Uses. In the selected articles, 33 identified the number of uses in a project as a key dimension in specifying a mixed-use development and its potential quality.
    - Association of Uses. The element of land use quality observed in 37 articles emphasizes the importance of the nature and association between different land uses in establishing mixed-use benefits and potential. These on site relationships are differentiation in the literature from concerns with situs analysis or the consideration of neighborhood and/or offsite land uses.
    - Situs. The focus on offsite and surround land uses as an influence on site potential is observed in 25 of the cited articles. Use measures and their associations, both on and off site can be identified as a key concern and element of mixed-use development potential. Collectively these different topics cited in the literature can be considered characteristics of land use analysis as specified by Puu (1997).

- Accessibility. Several mixed-use articles expressed concerns with public transit, pedestrian access and parking for a total of 27 citations.

    - Public Transit. The transit issues where addressed in links to public transportation in general, with a minority of the articles discussing transportation oriented developments (TOD) and the offset to the need for or cost of parking facilities (in dense built up areas).
    - Pedestrian Access. Much of the access discussion concerns focused on pedestrian access linked to walkable neighborhood developments. These issues were expressed in 13 and 3 articles respectively. Collectively these cited issues can be linked to theoretical measures of accessibility.
    - Parking. Interestingly, parking was seldom cited in the literature (3 times) in spite of the importance of reducing automobile dependency embedded in New Urbanism.

- Sustainability. Issues of sustainability in mixed-use articles were unexpectedly limited with only 10 articles citing these factors.

    - Green Buildings. Discussion on green buildings observed in only 3 articles out of the 78 cited Green Buildings.
    - Sustainable Energy. Only 7 sustainability focused articles where noted with the bulk of this discussion being linked to energy usage and cost concerns.

- Economic Development/Redevelopment. 32 articles clustered around topics of economic development, without specifically noting that topic.
    - Grey/Brown/Greenfield. The specific article categories addressed consideration of mixed-use development on brownfield, greyfield or greenfields (2 articles).
    - Redevelopment/Renewal. These articles in turn can be linked to 5 articles on redevelopment or renewal mixed-use projects expressed in 5 articles.
    - Job Generation. The redevelopment positions where often linked to or concerned with mixed-use developments (especially redevelopment and renewal) as contributing to economic development and job generating activities. This was observed in 12 of the observed articles. 13 articles identified and addressed external economic factors that influenced project valuation and development potential. These latter issues can be linked to many of the quantitative articles observed in the literature search.

- Policy. In the context of a general taxonomy of mixed-use literature, issues dealing with politics and public services can be clustered in a policy set which was cited 25 times.

    - Political/Policy/Social. A number of the articles addressed mixed-use from the perspective of political issues, policy concerns and social cost noted concerns with public housing issues or mixed income residential being cited 19 times.
    - Affordability. Interestingly only 2 of the identified articles where concerned with issues of affordability.

- Crime/Legal Conflict. Several of the articles reflected concerns with crime and/or legal conflicts (4).

- Market. The authors cited market-based phenomena and considerations 57 times.

  - Tenant/Quality. A direct link between tenant preferences (as proxies for market demand preferences that affect behavior and life style choices) and property quality was noted in 5 articles.
  - Life Style. These constructs in return were associated with the discussion furnished by the literature focused on mixed-uses linked to differentiated life style choices and property preferences. The array of life style issues were noted in 27 articles.
  - Behavioral Responses. 25 articles specifically dealt with behavioral responses to property issues, preferences and perceived needs.

- Scale. As noted many articles where rejected because they only addressed specific projects limited to physical description, however, 69 articles that complied with the filtering process discussed above also identified concerns with property attributes that were approached with an analytical perspective. These articles in turn can be tangentially linked to the issues on land use (number and associations) and directly associated (clustered) with issues of scale.

  - Land Value/Site Assemblage. 28 articles focused on land value concerns, either use residual calculations or the development on high density projects and multi-story and mixed-use developments in response to high land prices were observed.
  - Scale. A number of authors address the magnitude of project scale in 15 articles.
  - Retail Mass. In addition to scale, authors specifically noted concerns of retail mass which was cited in 6 articles.
  - Amenities. The issues of scale land value and use mix are associated in 5 articles with the access and presence of amenities.
  - Multi vs. Single Use. Several of the discussions of scale can be linked with discussions comparing single and multiple uses as observed in 15 articles.
  - The scale issues can be tied conceptually and operationally with literary observations that note use flexibility, facility layouts and operating systems and the complexity of mixed-use operations that must be addressed by management.

- Operations. Operational concerns and issues associated with mixed-use projects were manifested in several categories but were only cited 25 times.

  - Flexibility of Use. Use design flexibility was cited in 5 articles.
  - Facilities Systems. Despite the intuitive importance of these issues to mixed-use projects only 4 articles addressed facilities and system issues.
  - Management Complexity. The operational concerns linked to multiple and mixed-uses were cited in 16 articles focused on the discussion of management difficulties due to the complexity and scale associated with mixed-use projects.

- Finance. This area of research has offered the greatest area of quantification of mixed-use analysis and by its specification combines the finance and investment perspectives defining mixed-use research. These economic/financial concerns were addressed 48 times which was approximately 10% of the factor citations.

    - Returns/Finance. The issues of concern with the returns, financing and investment performance of mixed-use were directly addressed in 29 articles.
    - Option/Portfolio/Market. These 19 articles that specify development and use decisions as the exercise of pricing real options and their associated risk offer a financial economic perspective of mixed-use development. This perspective offered in the article by Grissom et al (2010) views mixed-use development as deriving benefits from a mixture of uses with the potential to enhance return or reduce risk from a portfolio of uses that are associated but offer diversification of uses operating on a given site. This perspective assists in mixed use development and the flexibility of use as a value determinant.

Longitudinal Analysis of Literature Related to Mixed-Use. While the frequency analysis of the filtered literature provides some interesting insights into the full dimensionality of the mixed-use development construct, additional insights can be gleaned by evaluating trends in the literature over time. Exhibit 2(a) presents the 491 citations in the 78 articles laid out over 4 discrete time periods: prior to 1990, 1990 to 1999, 2000 to 2006 and post-2006 to the present. The top table presents the frequency counts of observations per clustered variable per period, while the bottom table presents the percentage of each individual factor per period to show how interest has changed over time. As noted, the most active period for mixed-use research was 2000-2006, where some 41% of the citations were identified. This volume was followed in the citations observed in the post-2006 period and the 1990s with 27% and 23%, respectively.

In terms of variable trends, in the pre-90s; Scale, Operations and Finance received above “average” citations for that period. During the 1990s, Scale and Finance remained above average for the period with slightly above average interest in Urban Form and Access. The literature for the period from 2000-2006 period accounted for the largest number of citations. In this period, Scale and Finance dropped to or below average, with Growth Management, Policy, Market and Sustainability receiving above average interest. In the post-2006 period, Urban Form, Economic Development and Policy received above average citations; the latter two factors may have been affected in part by the recession and the collapse of the commercial real estate market.

Exhibit 2 (a): Changes in Mixed-Use Factors Over Time

Number by Period by Factor

Factors	Pre-90s	1990s	2000-2006	Post-2006	Grand Total
Growth Management	3	9	19	9	40
Urban Form	2	15	23	23	63
Land Uses	7	21	40	27	95
Access	2	7	9	9	27
Sustain	0	1	7	2	10
Econ Development	3	5	11	13	32
Policy	0	5	12	8	25
Market	4	11	27	15	57
Scale	9	22	23	15	69
Operations	5	5	9	6	25
Finance	6	14	20	8	48
Total	41	115	200	135	491

Market Share by Period: % of Factor Concentration

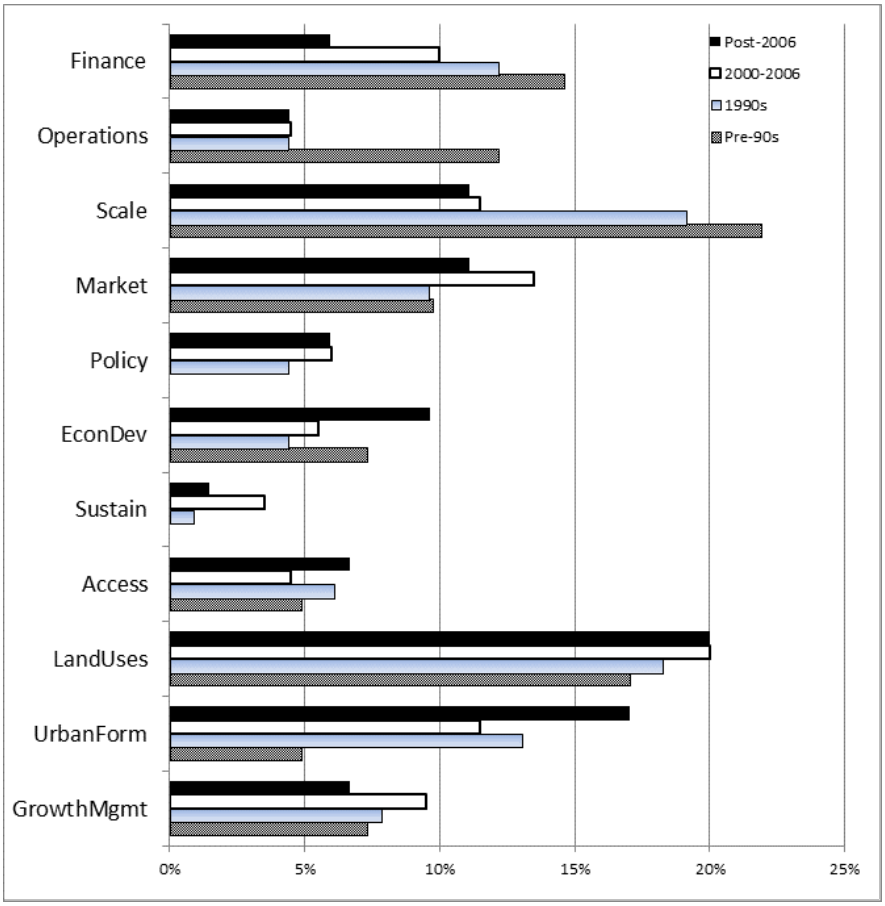
Factors	Pre-90s	1990s	2000-2006	Post-2006	Grand Total
Growth Management	8%	23%	48%	23%	100%
Urban Form	3%	24%	37%	37%	100%
Land Uses	7%	22%	42%	28%	100%
Access	7%	26%	33%	33%	100%
Sustain	0%	10%	70%	20%	100%
Econ Development	9%	16%	34%	41%	100%
Policy	0%	20%	48%	32%	100%
Market	7%	19%	47%	26%	100%
Scale	13%	32%	33%	22%	100%
Operations	20%	20%	36%	24%	100%
Finance	13%	29%	42%	17%	100%
Total	8%	23%	41%	27%	100%

Exhibit 2(b) presents the period-specific share of factor citations which adjusts for differences in the number of citations across periods. As noted, Scale was the leading factor through the 1990s, with land uses emerging as the most important factor since 2000. Exhibit 3 presents the trends in the literature related to mixed-use. As noted, Scale, Land Uses and Finance were the most important in the early period, while Land Uses, Urban Form, Scale and Market have become more important in the more recent times. This shift can be attributed in part to the recent interest in sustainable land use with the emphasis on urban form, compact and transit-oriented development underlying some of the shifts. At the same time, the weak economy and performance issues with respect to the Market demand are important factors.

Exhibit 2(b): Market Share of Factors per Period

Factors	Pre-90s	1990s	2000-2006	Post-2006	Grand Total
Growth Management	7%	8%	10%	7%	8%
Urban Form	5%	13%	12%	17%	13%
Land Uses	17%	18%	**20%**	**20%**	19%
Access	5%	6%	5%	7%	5%
Sustain	0%	1%	4%	1%	2%
Econ Development	7%	4%	6%	10%	7%
Policy	0%	4%	6%	6%	5%
Market	10%	10%	14%	11%	12%
Scale	**22%**	**19%**	12%	11%	14%
Operations	12%	4%	5%	4%	5%
Finance	15%	12%	10%	6%	10%
Total	100%	100%	100%	100%	100%

Exhibit 3: Trends in the Mixed-Use Literature

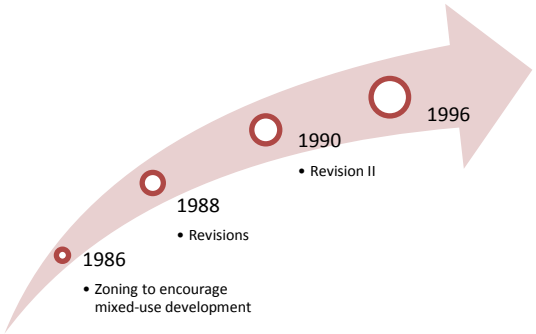


Literature Search Conclusions. The literature search shows that the mix of Land Use has been a consistent variable and area of concern in the specification of analyzing mixed use development. The Growth Management dimensions have also waned although they are likely still there but have been embedded in interest in Urban Form and Scale which is related to compact and infill development. The decline in financial concerns may be associated with and attributed to the recent cyclical patterns, although this was only inferred in one article (see Grissom et al 2010). Enhanced topical consideration has only been observed with the issues of urban form and accessibility. This in part may be a consequence of transportation cost and macro-urban location and infrastructure related to increased energy and transportation costs. More recent articles have also shown a marginal increase in job and economic development potential, general economic variables and project scale. These issue support the observation of management related to project complexity and hence the specification of mixed use project success tied to land use mix and financial potential. These issues in turn can be linked to tenant survival and duration and economic capacity as a basis for support of the appropriate mix, location and placement of mixed sue projects. Combining these features offers a foundation for testing the economic feasibility of mix use projects as they relate to urban structure and development decisions. These considerations are necessary to support the feasibility and policy analysis of mixed use projects. Unfortunately, while the literature provides some insights into the underlying drivers of mixed-use development, they provide little in terms of valid and reliable insights into performance and operational implications of such investments. To explore these factors, it is necessary to turn to empirical analysis of mixed-use projects over a sufficiently long period of time to understand the validity and reliability of such research. The balance of this paper presents a pilot study that provides insights into these critical issues.

Empirical Analysis of Mixed-Use: The Seattle Experience

Background. Over the years the City of Seattle has made a number of changes in government regulation of land use controls to encourage mixed-use development with the first major intervention occurring in 1986. Up to that point in time, the decision to develop mixed-use projects was largely based on market analysis and feasibility studies which determined if such uses were viable and if the added costs can be justified.

Exhibit 4: Seattle Government Interventions in Mixed-Use Development



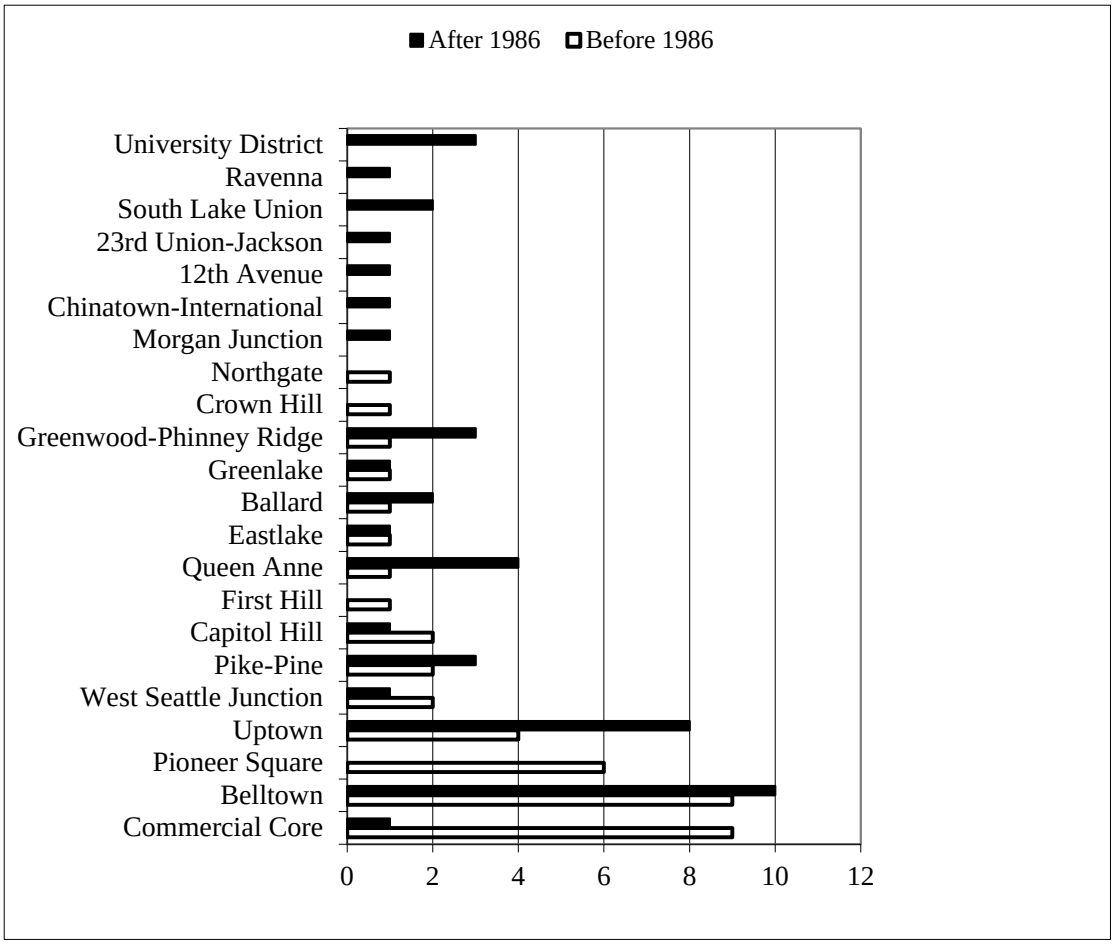
In 1988 and 1990, Seattle revised its mixed-use code to respond to concerns that had been raised by mixed-use developers. To respond to these concerns, a study was commissioned by the Department of Neighborhoods and by the Department of Construction and Land Use. The study involved three stages: focus groups interviews with architects, community representatives, leasing brokers, and lenders; a market study of virtually all projects proposed and constructed under the mixed-use regulations since 1988; and, economic modeling of the cost of meeting regulations in mixed-use buildings. The study provided a number of insights into the challenges faced by developers related to government policies faced by mixed-use projects. Namely:

- 51 projects were built under the regulations out of 146 proposed; another 12 were under construction at the time of the study.
- Many projects that were permitted were not been built because their developers could not obtain financing.
- Forty-seven percent of the commercial space in the built mixed-use projects was vacant.
- There was a correlation of vacancy with location; projects in isolated locations were likely to have high vacancies (situs, accessibility issues).
- Relatively few of the projects were built within established business cores although most of the successful mixed-use buildings appeared to be located in core locations or on main core business streets.
- Most tenants of mixed-use projects (62%) were not oriented toward serving the immediate neighborhood although the proportion of locally-oriented businesses was higher than in the overall city.

The authors made several recommendations including: 1) policies should encourage development including the production of housing that is in accordance with public policy, 2) the commercial space within such projects should be concentrated so that businesses can reinforce each other and stimulate economic viability and diversity, and 3) policies should work to produce business districts that enhance the character of neighborhoods. As a result of this study, a number of changes were introduced that affected mixed-use development until the next intervention occurred.

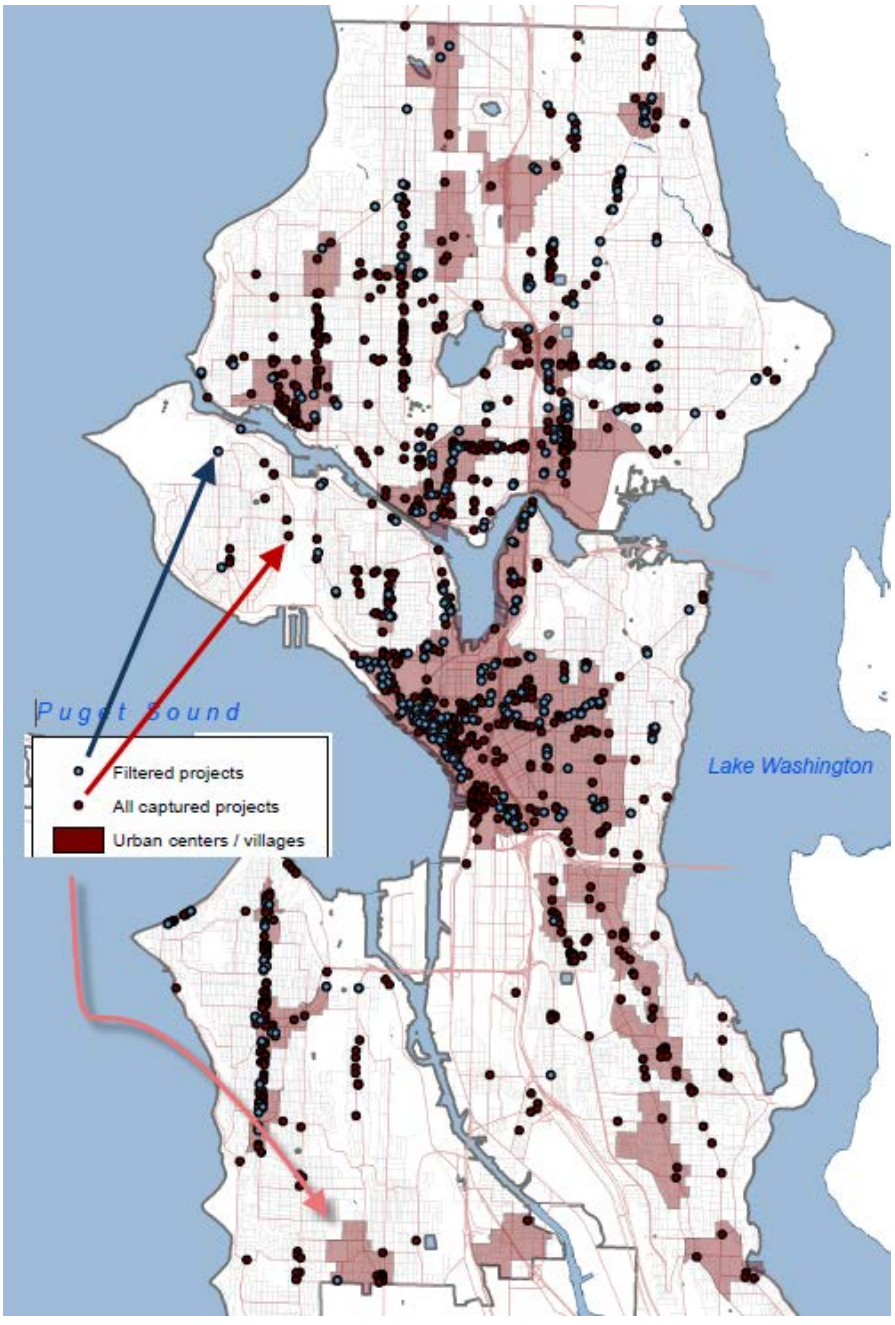
As noted in Exhibit 2, the impact of the initial 1986 intervention was to skew the location of development of mixed-use projects outside of “traditional” areas to new locations based in part on revised entitlements that can reduce land costs. In particular, of a representative sample of 42 projects built pre-1986, the majority were in the Commercial Core and the fast-growing Belltown to the north and historical Pioneer Square to the south, all of which were in the Central Business District. On the other hand, the 45 projects built after the change exhibited a major away shift from the Commercial Core and Pioneer Square while Belltown remained popular and Uptown, Queen Anne, Greenwood and University District all outside of the CBD gained favor. Thus, the “intervention” had significant impacts on market behavior and the location of mixed-use projects as developers expanded the scope of areas within which such projects would be located. In some cases, these new projects were located in Urban Villages which were set up as nuclei within the broader market while in others they were outside of such areas of concentration along major corridors and arterials which were more dependent on secondary and tertiary market support than the proximate trade area assumed by most advocates of mixed-use projects.

Exhibit 5: Pre/Post-1986 Change in Location of Mixed-Use in Seattle



Mixed-Use Database Development. In light of the significant barriers to empirical research of the efficacy of mixed-use projects this research project began with a series of pilot studies that were designed to compile some basic data of the structure of the market as well as to provide some insights into the underlying drivers of mixed-use development. The initial phase of this research focused on the Seattle Washington market. This market area was chosen in part on the basis of its long-established track record with respect to mixed-use projects. Even though all the properties are located within the limits of an individual city, they blanket the entire market. Furthermore, the are sufficient in number to allow for empirical analysis of a number of key factors that are germane to an analysis of the efficacy of mixed-use development in general, and more importantly, where such projects work and where they do not work.

Exhibit 6: Seattle Mixed-Use Projects

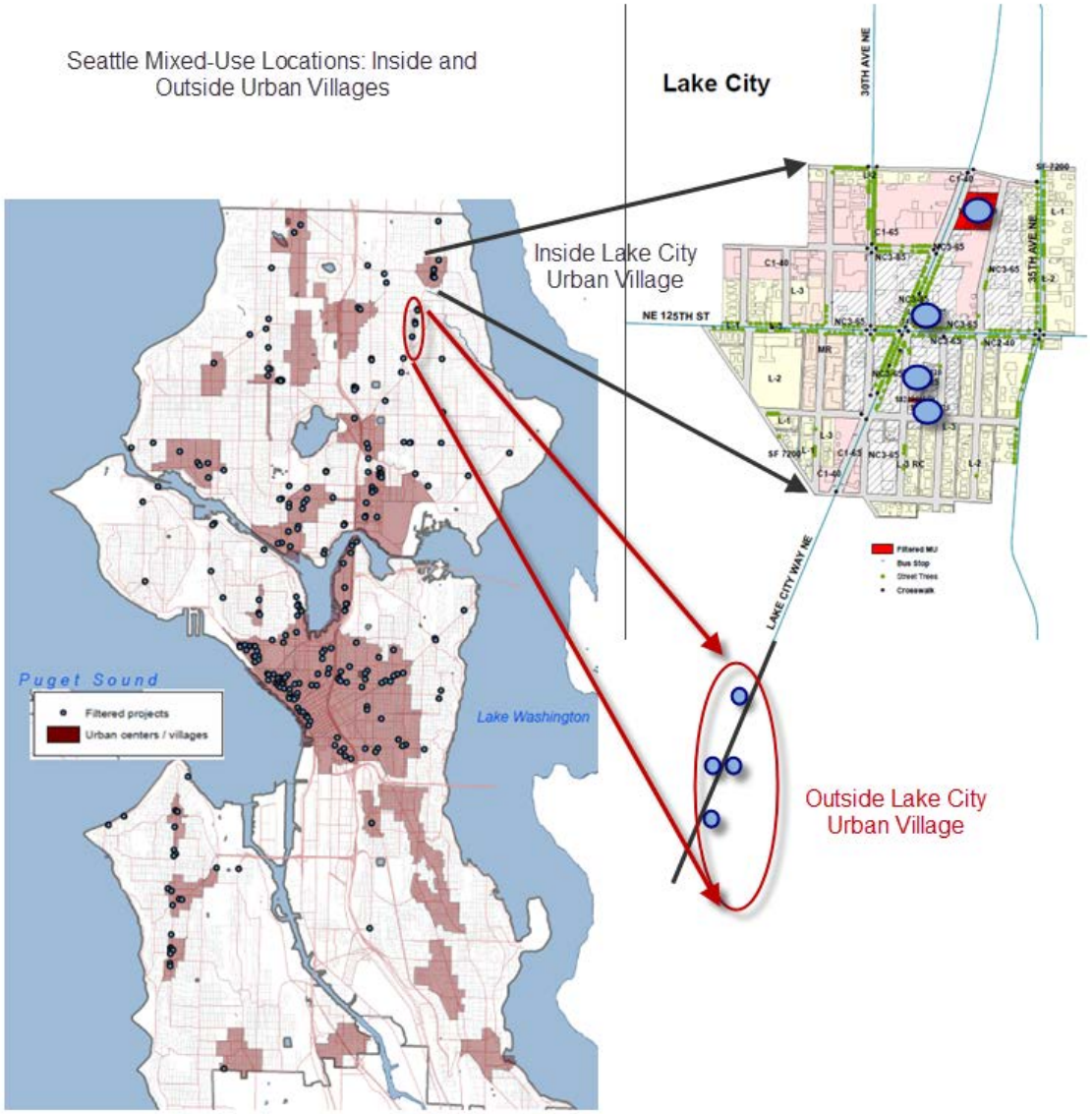


Seattle's Mixed-Use Market Structure. Exhibit 6 provides a visual snapshot of the scope of mixed-use development in the urban Seattle market. As noted, there are a large number of mixed-use projects covering the full range of types of projects. The "filtered projects" include the residential/retail projects that are the focus of this study. At this stage of the data reduction, they include both condominium and for rental apartment projects.

As noted, mixed-use projects are scattered throughout the market with the concentration in the central core as well as an extension along major arterials The red dots with blue outline are all the projects that were retrieved from the assessor's data using various descriptors that might suggest the projects were actually mixed-use. These data were then filtered through primary research to reduce the set to actual mixed-use projects that fit the selection criteria.

In addition to identifying the location of mixed-use properties, the map indicates whether they reside within an Urban Center/Village or whether they are outside of such designated areas. Briefly, the City of Seattle contains some 21 distinct urban villages which are designated as defined areas that are bound together to create distinct neighborhoods. In effect, these neighborhoods are communities within the community and have a strong sense of identity as well as a distinctive commercial core or centroid.

Exhibit 7: North District/Lake City Urban Village Mixed-Use Projects



As noted in Exhibit 7, the filtered mixed-use projects that were verified are located across the greater Seattle City limits. Many of the projects are located within designated Urban Villages, and a number within areas that are delineated as the "commercial core" of those villages. However, a number of projects are also located outside of Urban Villages, either in scattered locations or along axial paths as in the case of the projects located along Lake City Way NE that are south of the designated village boundaries.

A stratified sample of the residential/retail mixed-use projects was selected for the in-depth analysis of mixed-use projects. Exhibit 8 presents a breakdown of the 77 residential/retail mixed-use projects that are the focus of this study by location. As noted, 20 of the projects are condominium and 57 are rental apartment and commercial projects. In 2004, there were 295 commercial tenants in the buildings, a figure that declined to 250 by 2006.

Exhibit 8: Breakdown of Selected Residential/Retail Mixed-Use Projects

Neighborhoods in Seattle	Number of Pins (Unique Buildings)	Condos	Rental/ Apartments	Tenants in 2004	Tenants in 2006
Admiral	3		3	11	10
Aurora-Licton/Greenwood/Phinney	3	1	2	8	7
Ballard	3	1	2	11	12
Broadview-Bitter Lake-Haller Lake	2		2	5	9
Capitol Hill	4		4	6	8
Central Area	2	1	1	3	4
Downtown	17	10	7	128	103
Eastlake	3		3	6	4
Fremont/Wallingford	3		3	7	5
Greenwood/Phinney	1	1		1	2
Morgan Junction	1		1	4	3
North District/Lake City	5		5	20	15
Outside of Neighborhoods	8	2	6	16	17
Queen Anne	9	1	8	25	18
University	8	1	7	26	18
Wallingford	3	1	2	11	9
West Seattle Junction	2	1	1	7	6
Grand Total	77	20	57	295	250

Mixed-Use Tenant Database Development. Once the 77 mixed-use projects were identified, attention shifted to analysis of the tenants who occupied the commercial spaces that anchored the residential/retail projects. In 2004, these data were compiled by utilizing the reverse telephone directory.[3] The process of compiling the tenant data included several steps:

- Address Matching. The initial building database was compiled by isolating the unique tax identification numbers (i.e., PINS) based on mixed-use descriptors contained in the King County Property Tax Assessor's records. Once verified as a mixed-use building through a combination of cross-checking and personal inspection, the street addresses were extracted for each building. This resulted in a one-to-many relationship with buildings containing from a low of 1 commercial space or address per PIN to a high of 22 in some of the larger urban projects located in the downtown area.
- Tenant Lookup. Given the list of addresses, the reverse directory was used to identify the tenant names and business descriptions for each of the 303 addresses or spaces. The business description was based on self-report data using reference materials provided by the Superpages. In some cases, tenants identified up to 5 business categories to provide more precise information to the market regarding the particular types of business lines they offered on site.
- NAICS Classification. Using the business categories and some additional primary research and verification the tenants were classified using the 2002 NAICS codes. The classification ranged from the 2-digit general categories to the more precise 5 digit categories. For example, NAICS 44

[3] Superpages in Seattle, on-line reverse directory listing 2004, 2006

referred to Retail establishments while NAICS 44511 broke that down to "Supermarkets and Other Grocery (not including Convenience)" establishments. Exhibit 9 presents a breakdown of the 303 tenants and the selected NAICS Codes and business descriptions.

Exhibit 9: Mixed-Use Selected 2004 NAICS Tenant Categories.

NAICS	Type	Descriptions	Number
0	Nonclassified	Nonclassified	9
23	Other	Construction	9
3	Other	Manufacturing	2
42	Other	Wholesale Trade	14
442	Retail	Furniture and Home Furnishings Stores	7
443	Retail	Electronics and Appliance Stores	4
444	Retail	Building Material and Garden Equipment and Supplies	1
44511	Retail	Supermarkets and Other Grocery (not Convenience)	7
44512	Retail	Convenience Stores	0
4452	Retail	Specialty Food Stores	2
4453	Retail	Beer, Wine, and Liquor Stores	0
446	Retail	Health and Personal Care Stores	1
448	Retail	Clothing and Clothing Accessories Stores	4
451	Retail	Sporting Goods, Hobby, Book, and Music Stores	8
452	Retail	General Merchandise Stores	0
453	Retail	Miscellaneous Store Retailers	16
48	Professional Service	Transportation	2
51	Professional Service	Information	9
522	Professional Service	Credit Intermediation and Related Activities	6
523	Professional Service	Securities, Commodity Contracts, and Other Financial	11
524	Professional Service	Insurance Carriers and Related Activities	3
53	Professional Service	Other Real Estate and Rental and Leasing	16
5411	Professional Service	Legal Services	8
5413	Professional Service	Architectural, Engineering, and Related Services	9
5414	Professional Service	Specialized Design Services	6
5415	Professional Service	Computer Systems Design and Related Services	4
5416	Professional Service	Management, Scientific, and Technical Consulting	10
54	Professional Service	Other Professional, Scientific, and Technical Services	9
56	Professional Service	Administrative Support, Waste Mgmt and Remediation	8
61	Personal Service	Educational Services	7
6211	Personal Service	Offices of Physicians	6
6212	Personal Service	Offices of Dentists	5
62131	Personal Service	Offices of Chiropractors & Other Alternative Medicines	6
621	Personal Service	Other Health Care	12
624	Personal Service	Social Assistance	7
71	Personal Service	Arts, Entertainment, and Recreation	7
7221	Restaurants	Full-Service Restaurants	27
7222	Restaurants	Limited-Service Restaurants	6
7224	Restaurants	Drinking Places (Alcoholic Beverages)	1
8121	Personal Service		21
8123	Personal Service	Drycleaning and Laundry Services	1
81	Personal Service	Other Services	12
			303

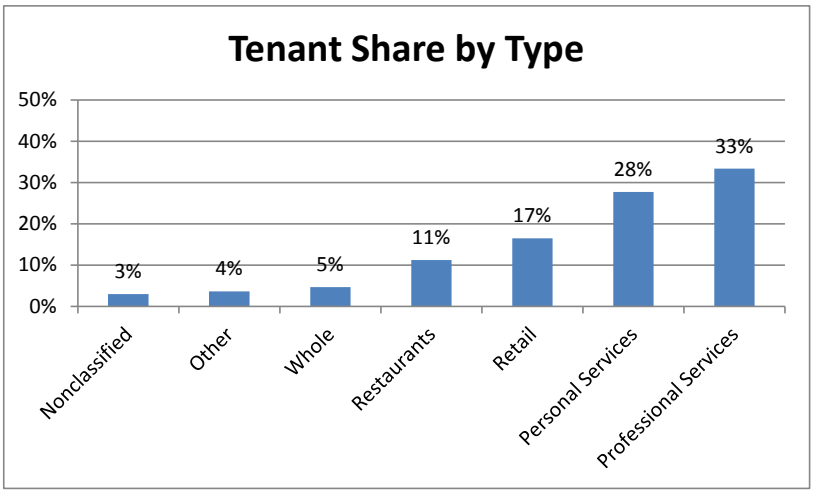
Empirical Analysis of Tenant Experiences in Mixed-Use Buildings

Phase 1: 2004 Exploratory Descriptive Analyses. Once the tenants were identified and classified, the profile of tenants in the commercial portions of mixed-use buildings was explored. As noted in Exhibit 10, there were 303 tenants in the 77 mixed-use buildings in 2004.

Exhibit 10 (a): 2004 Mixed-Use Tenant Profiles

	2004	
Type of Tenant	Number	Share
Nonclassified	9	3%
Other	11	4%
Whole	14	5%
Restaurants	34	11%
Retail	50	17%
Personal Services	84	28%
Professional Services	101	33%
Total	303	100%

Exhibit 10 (b): 2004 Tenant Share by Type



Interestingly, only 17% of the 303 tenants in the 77 buildings were classified as retail. This tenant profiled dramatically differed from one of the key underlying premises supporting mixed-use development; the creation of vibrant, walkable, self-contained neighborhoods/villages in which residents can satisfy their needs for commercial goods. The fact that 61% of the occupants were either in the personal or professional services was somewhat surprising to the authors, but was consistent with observations of what was happening in the local market. To get more insights into the types of tenants included in these general categories, some of the more "interesting" tenants were explored. As noted in Exhibit 11, these selected tenants accounted for 54% of the types of tenants in mixed-use projects. Of that total, 32% were professional tenants, followed by 12% personal services related to health and 11% personal services.

Exhibit 11: “Interesting 2004 Tenant Share by Subtype

Professional Services				32%
	Information	9	3%	
	Credit Intermediation and Related Activities	6	2%	
	Securities, Commodity Contracts, and Other Financial	11	4%	
	Other Real Estate and Rental and Leasing	16	5%	
	Legal Services	8	3%	
	Architectural, Engineering, and Related Services	9	3%	
	Specialized Design Services	6	2%	
	Computer Systems Design and Related Services	4	1%	
	Management, Scientific, and Technical Consulting	10	3%	
	Other Professional, Scientific, and Technical Services	9	3%	
	Administrative/Support and Waste Mgmt & Remediation	8	3%	
Personal Services: Health				12%
	Offices of Physicians	6	2%	
	Offices of Dentists	5	2%	
	Offices of Chiropractors & Other Alternative Medicines	6	2%	
	Other Health Care	12	4%	
	Social Assistance	7	2%	
Personal Services				11%
	Personal Services	21	7%	
	Other Services	12	4%	
Total "Interesting Tenants"				54%

The dominance of non-retail and non-restaurant tenants in mixed-use buildings has significant implications for the design of such buildings as well as how they function in the market and/or contribute to the local market area or neighborhood in which they are located. For example, restaurants and office uses have significantly different needs for venting, ceiling heights, delivery services, disposal services and other building attributes. If a project is developed without an understanding of these specialized needs and a matching of the product with the most likely space user, difficult and expensive retrofitting might be required. In some cases, the design might render a building functionally obsolescent and unable to support the spatial requirements of the intended uses and users. An example of this misfit could be the case of health-related tenants which make up some 12% of the tenant mix. On the surface, it would appear that such uses would enhance the neighborhood and provide vital support for residents. However, with the current state of the health care system and reliance on approved physicians, it is likely that many residents would be unable to use their “local” healthcare provider. At the same time, other patients from outside the market area will often rely on automobiles for travel will create a demand for accessible parking. IN some jurisdictions, on-site parking which would be demanded by patients may not have been included in the initial design since the targeted market did not rely on the automobile.

Phase 2: 2006 Tenant Profile and Turnover Analysis. In 2006 the tenant database was updated to determine if the profile of tenants had changed over the two year time period. Another objective of the data collection was to support an analysis of the tenant “turnover” or churn rates which would provide some insights into weather the spaces “worked” for the initial tenants which could provide insights into the economic viability of such spaces for tenants as well as for developers and investors who depend on rental income to cover operating expenses and provide an adequate return on investment to compensate for risk.

Exhibit 12: 2004-2006 Changes in Tenant Mix

	Number		Market Share	
NAICs Categories/Sub-Categories	**2004**	**2006**	**2004**	**2006**
Nonclassified	**9**	**6**	**3.0%**	**2.4%**
Nonclassified	9	6	3.0%	2.4%
Other	**25**	**15**	**8.3%**	**6.0%**
Construction	9	4	3.0%	1.6%
Manufacturing	2	3	0.7%	1.2%
Wholesale Trade	14	8	4.6%	3.2%
Personal Service	**84**	**71**	**27.7%**	**28.4%**
Arts, Entertainment, and Recreation	7	3	2.3%	1.2%
Drycleaning and Laundry Services	1	1	0.3%	0.4%
Educational Services	7	2	2.3%	0.8%
Offices of Chiropractors & Other Alternative Medicines	6	9	2.0%	3.6%
Offices of Dentists	5	6	1.7%	2.4%
Offices of Physicians	6	5	2.0%	2.0%
Other Health Care	12	9	4.0%	3.6%
Other Services	12	10	4.0%	4.0%
Personal Services	21	20	6.9%	8.0%
Social Assistance	7	6	2.3%	2.4%
Professional Service	**101**	**82**	**33.3%**	**32.8%**
Administrative and Support and Waste Management and	8	6	2.6%	2.4%
Architectural, Engineering, and Related Services	9	5	3.0%	2.0%
Computer Systems Design and Related Services	4	1	1.3%	0.4%
Credit Intermediation and Related Activities	6	4	2.0%	1.6%
Information	9	3	3.0%	1.2%
Insurance Carriers and Related Activities	3	4	1.0%	1.6%
Legal Services	8	12	2.6%	4.8%
Management, Scientific, and Technical Consulting Svcs	10	7	3.3%	2.8%
Other Professional, Scientific, and Technical Services	9	7	3.0%	2.8%
Other Real Estate and Rental and Leasing	16	18	5.3%	7.2%
Securities, Commodity Contracts, and Other Financial In	11	8	3.6%	3.2%
Specialized Design Services	6	6	2.0%	2.4%
Transportation	2	1	0.7%	0.4%
Restaurants	**34**	**36**	**11.2%**	**14.4%**
Drinking Places (Alcoholic Beverages)	1	0	0.3%	0.0%
Full-Service Restaurants	27	27	8.9%	10.8%
Limited-Service Restaurants	6	9	2.0%	3.6%
Retail	**50**	**40**	**16.5%**	**16.0%**
Beer, Wine, and Liquor Stores	0	1	0.0%	0.4%
Building Material and Garden Equipment and Supplies D	1	0	0.3%	0.0%
Clothing and Clothing Accessories Stores	4	4	1.3%	1.6%
Convenience Stores	0	0	0.0%	0.0%
Electronics and Appliance Stores	4	3	1.3%	1.2%
Furniture and Home Furnishings Stores	7	6	2.3%	2.4%
General Merchandise Stores	0	1	0.0%	0.4%
Health and Personal Care Stores	1	1	0.3%	0.4%
Miscellaneous Store Retailers	16	12	5.3%	4.8%
Specialty Food Stores	2	0	0.7%	0.0%
Sporting Goods, Hobby, Book, and Music Stores	8	7	2.6%	2.8%
Supermarkets and Other Grocery (except Convenience)	7	5	2.3%	2.0%
Grand Total	**303**	**250**	**100.0%**	**100.0%**

As noted in Exhibit 12, from 2004 to 2006 the number of tenants in the 303 occupied commercial spaces declined from 303 to 250. This suggested there was a significant increase in vacancy rates in the sample of mixed-use buildings surging to over 20% of the total available units. During the two year period there was a moderate increase in restaurants (e.g., 14.4% vs. 12.2%) and a decline in "other" uses (e.g.,

construction, manufacturing and wholesale) from 8.3% to 6%. The other categories were relatively stable although there were some changes within categories.

Exhibit 13: Turnover Rates by Tenant Category & Sub-Category

Categories/Sub-Categories	2006 Tenants	Vacant 2006	Adjusted Turnover	Average/ Category
Nonclassified	**6**	**3**		89%
Nonclassified	6	3	89%	
Other	**15**	**11**		71%
Construction	4	5	89%	
Manufacturing	3		67%	
Wholesale Trade	8	6	57%	
Personal Service	**71**	**17**		38%
Arts, Entertainment, and Recreation	3	4	57%	
Drycleaning and Laundry Services	1	0	0%	
Educational Services	2	5	71%	
Offices of Chiropractors & Other Alternative Medicines	9		33%	
Offices of Dentists	6		17%	
Offices of Physicians	5	1	50%	
Other Health Care	9	3	42%	
Other Services	10	2	42%	
Personal Services	20	1	24%	
Social Assistance	6	1	43%	
Professional Service	**82**	**26**		56%
Administrative and Support & Waste Management & Remediation	6	2	63%	
Architectural, Engineering, and Related Services	5	4	44%	
Computer Systems Design and Related Services	1	3	75%	
Credit Intermediation and Related Activities	4	2	83%	
Information	3	6	78%	
Insurance Carriers and Related Activities	4		75%	
Legal Services	12		50%	
Management, Scientific, and Technical Consulting Svcs	7	3	50%	
Other Professional, Scientific, and Technical Services	7	2	56%	
Other Real Estate and Rental and Leasing	18		28%	
Securities, Commodity Contracts, and Other Financial Activities	8	3	55%	
Specialized Design Services	6	0	17%	
Transportation	1	1	50%	
Restaurants	**36**	**1**		63%
Drinking Places (Alcoholic Beverages)	0	1	100%	
Full-Service Restaurants	27	0	33%	
Limited-Service Restaurants	9		56%	
Retail	**40**	**12**		55%
Beer, Wine, and Liquor Stores	1		100%	
Building Material and Garden Equipment and Supplies Dealers	0	1	100%	
Clothing and Clothing Accessories Stores	4	0	25%	
Convenience Stores	0	0		
Electronics and Appliance Stores	3	1	75%	
Furniture and Home Furnishings Stores	6	1	14%	
General Merchandise Stores	1		100%	
Health and Personal Care Stores	1	0	0%	
Miscellaneous Store Retailers	12	4	38%	
Specialty Food Stores	0	2	100%	
Sporting Goods, Hobby, Book, and Music Stores	7	1	25%	
Supermarkets and Other Grocery (except Convenience) Stores	5	2	29%	
Grand Total	**250**	**69**		**54%**

Exhibit 13 indicates the 2006 tenant profile as well as the adjusted turnover rates by category average and by sub-category. The adjusted turnover rates were calculated by adjusting the 2004 tenant roster to compensate for vacant units that were not listed in the reverse directory. This determination was made by

comparing the number of occupied spaces in 2006 to 2004; if the number was greater the number of spaces in 2004 was adjusted upward to more accurately indicate the total number of commercial spaces. As a result of this adjustment, the total commercial spaces in 2004 increased from 303 to 320 providing an implicit vacancy rate in 2004 of 5.4% (i.e., (320-303)/320). Using the same base of units, the overall vacancy rate surged to 21.5% indicating generalized weakness in mixed-use properties that were significantly greater than the overall commercial market.

Turnover = (New Tenants04-06) + (Vacant 06)/ 2004 Commercial Spaces

In comparing the turnover rates, the overall average was 54% which was fairly high for a two-year period. Among categories, the highest average was Other (e.g., construction, manufacturing and wholesale) at 71%, followed by restaurants, professional services and retail. At a sub-category levels some noteworthy facts included:

- Other. Construction had the highest turnover perhaps due to a temporary occupancy period by the contractor on the project.
- Personal Services. The performance in this category varied dramatically with general personal services and dentists at the low end of the range and educational services at the high end. Other health-related services were mixed with turnover rates ranging from 33% for alternative medicine to 50% for general physicians.
- Professional Services. As with other categories, the experience in professional services was fairly broad with specialized design at the bottom end and credit intermediation at the top. This might be attributable to the risky nature of the industries, as well as to local demand and access to clients.
- Restaurants. Full-service restaurants had the strongest performance of this category with "only" 33% turnover while limited service was at 56%. Again, this may be related to tenant credit and maturity as much as to local fundamentals of supply and demand.
- Retail. The retail category had even more varied experience with respect to turnover rates, ranging from a low of 14% for furniture and home furnishings to 100% for beer, wine and liquor stores, building supplies, general merchandise and specialty food stores.

Phase 3: Tenant Experiences by Neighborhood. The final stage of the empirical portion of this study focused on determining if there were differences in tenant turnover rates by neighborhood. One of the fundamental questions regarding mixed-use projects is why some areas seem to have significantly better performance relative to the overall sector and why some areas languish. For example, from a theoretical perspective, it would appear that the commercial spaces in mixed-use projects would perform best when located in dense urban areas such as the downtown, along with the commercial core or some of the more diverse urban neighborhoods scattered around Seattle. Interestingly, projects in the downtown area were slightly above simple averages with respect to turnover (49% vs. 47%). On the other hand, projects located in some axial markets that extend along major traffic corridors and lack a critical mass of customers in the immediate trade area. This occurred in the North District/Lake City neighborhood that was presented in Exhibit 7. It is possible that the projects in the commercial core of the neighborhood benefit from the agglomeration effects of surrounding uses, while also benefiting from high traffic counts and fairly cheap and convenient parking.

Exhibit 14: Turnover Rates by Neighborhood

Neighborhoods	Share of Tenants 2004	2004-2006 Turnover
Admiral	3%	38%
Aurora-Licton/Greenwood/Phinney	3%	64%
Ballard	4%	38%
Broadview-Bitter Lake-Haller Lake	3%	61%
Capitol Hill	2%	19%
Central Area	2%	75%
Downtown	42%	49%
Eastlake	2%	28%
Fremont/Wallingford	2%	69%
Greenwood/Phinney	1%	50%
Morgan Junction	1%	25%
North District/Lake City	6%	33%
Outside of Neighborhoods	6%	35%
Queen Anne	8%	48%
University	8%	58%
Wallingford	4%	63%
West Seattle Junction	2%	63%
Grand Total	100%	47%

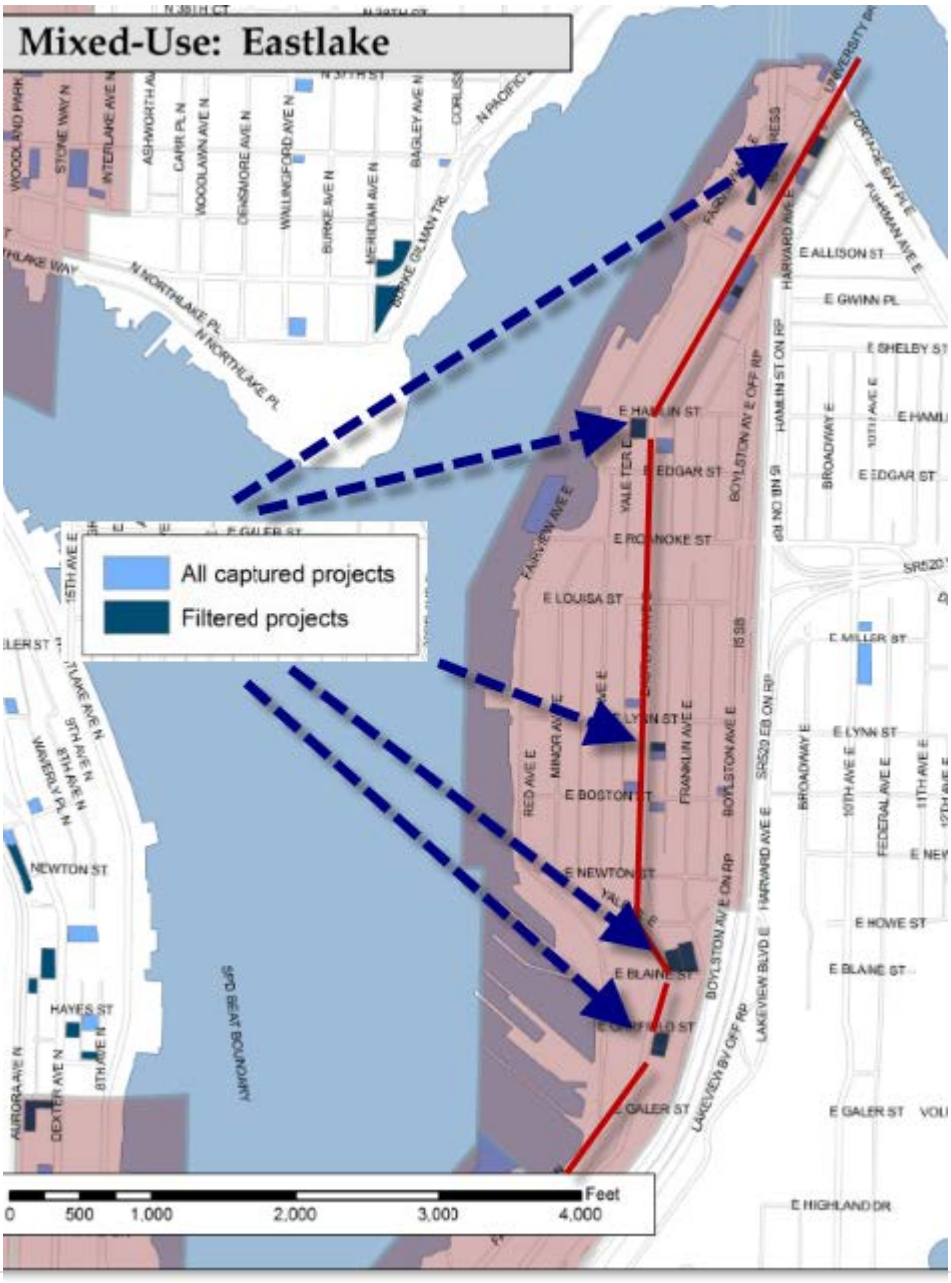
A similar phenomenon to that in Lake City may have occurred in Eastlake which is an axial location as noted in Exhibit 15. Although not indicated on the map, the Eastlake neighborhood is truly "landform-challenged" with water creating its western boundary and Interstate 5 creating its eastern boundary. Despite the truncated and elongated market area that supports mixed-use, the performance of tenants is relatively positive, at least over the short two-year window of this pilot study. Whether that experience holds up over time and across the business cycle will bear close monitoring and provide some insights into what kinds of mixed-use projects work where.

Conclusions

This study began with a recognition of the strong interest in mixed-use development that spawned a surge of development activity up until the commercial market crash in 2006. While development activity has been dramatically curtailed since that time, interest in mixed-use projects has not waned. Indeed, the recent emphasis on sustainability and the need to address global warming is likely to lead to added pressure to develop mixed-use projects as part of urban infill and densification strategies. While mixed-use projects can be successful investments and provide a number of secondary social and environmental impacts, much research needs to be conducted. In particular, the market needs additional empirical support to help guide the location, design, occupancy and operational strategies to improve the prospects of achieving goals and objectives. In this paper, we presented the results of an extensive systematic survey of the literature addressing mixed-use real estate. The objective of this analysis was to help flush out the broad range of issues embedded in mixed-use projects as well as to determine what we know from prior experience and, even more importantly, what we need to know as we move forward. The empirical portion of this paper presented the results of a pilot study into the efficacy of mixed-use development. The

results of this analysis suggest that mixed-use projects are not a panacea and may not achieve some of the social, environmental and investment goals underlying the push for such development. Of particular importance is an understanding the most likely tenants that will surface for mixed-use projects, as well as the relatively high vacancy rates and turnover rates that can be experienced by tenant category, sub-category and location. Based on this insight, it may be possible to locate, design and develop mixed-use projects that create sustainable spatial solutions by addressing current and future market demand in a financially viable way. To guide such efforts, the preliminary results of this pilot study should be replicated and extended to a broader spectrum of projects and locations as well as over a longer period of time. The approach outlined in this study may provide a roadmap for such research and help advance the state of knowledge before the next development boom begins and a wave of new projects are developed.

Exhibit 15: Eastlake Trade Area and Filtered Mixed-Use Projects



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