

The Real Estate Development Matrix

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Abstract

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In this paper, the real estate development process is organized around a 56-cell, stage-task matrix, which describes the entire real estate development process in seven stages from the land banking stage to the redevelopment stage. In each stage, there are eight categories of tasks that need to be addressed. The main thesis of this interdisciplinary development model is that there are discrete stages in the process, and in each stage the real estate developer must (1) complete different tasks using specialized skills and thereby accepting certain risks and (2) employ various capital structures with different risk-return characteristics to create or “capture” the value increase in that stage. The seven stages in the model are: land banking, land packaging, land development, building development, building operation, building renovation, and site redevelopment. Each stage in the process begins with the acquisition tasks and ends with the disposition tasks. Each stage must also address, to some extent, the following categories of tasks (many of which are done simultaneously): financing, market research, approvals, environmental, improvement construction, and transportation and accessibility concerns. As with all real world applications of conceptual models, the lines separating the stages and the categories can be fuzzy.

The Development Matrix can be used as a descriptive, normative, or predictive model. As a pedagogical tool, the Development matrix can help the student understand the process, risks, and value creation in real estate development.

I. INTRODUCTION

A. Why Do We Need a Development Matrix?

The real estate development process is a complex, time-consuming, capital intensive, multi-disciplinary, externality-generating, public-private endeavor. Unfortunately, the conceptual models used to describe this process are usually very simple.

While easy to grasp, these models lead to confusion, frustration, duplicity, and extraordinary risk-taking as participants in the process have very different understandings of the development process.

This paper suggests that this behavior is due in part to the lack of understanding about the nature of the development process and a clear roadmap that can help stakeholders and participants discuss “where we are, where we are going, and how we get there.”

B. A Way to Discuss the Development Process

In the same way that the United States Green Building Council’s LEED Rating system has given the public and private sectors a language or rhetoric for discussing the environmental aspects of constructing buildings, the Development Matrix will give the development community and those impacted by the development a way to discuss the stages of development and the required tasks in each stage of development.

Sustainable development and green building techniques are best understood and analyzed in the context of the life-cycle of the building, rather than at the beginning of building construction. The most important analysis of the sustainable nature of a development is made when the development is seeking various public approvals prior to the construction of horizontal (infrastructure) or vertical (building) improvements.

C. Multiple Players in the Development Process

Defining a real estate developer is difficult although, like an entrepreneur, everyone knows one when they see one. In fact, the “developer” in the real estate process is really many different people playing many different roles in the in the process of creating value throughout the lifetime(s) of the property.

D. What Kind of Model is This?

The Development Matrix is an attempt to describe the complex, multidisciplinary nature of the real estate development process. The Matrix lays out *what happens* and *who does it*. Along those lines, the Matrix predicts *what happens when* in the development process. Finally the Matrix indicates *what should happen, who should do it, and when it should be done*. Thus, the Development Model is descriptive, predictive, and normative

E. Outline of the Paper

The next section of the paper is a review of the development process as described by James Graaskamp and of some of the most popular text books on real estate development, finance and appraisal. This is followed by a description of the seven stages of development and the eight task categories in each stage. The stages and tasks are then combined into a 56-cell development matrix. Finally the paper is summarized and the next steps are discussed.

I. Review of the Literature

The review of the literature begins with James Graaskamp's early work¹ and then examines several of the most well know and popular text books on development , finance and valuation in terms of how the real estate development process is described and explained.

A. Grasskamp's Early Work on Real Estate Development: "The Fundamentals of Real Estate Development"²

In this article, Graaskamp sets the stage for the discussion of complexities and nuances of the real estate development process. He writes:

"Unlike many mass-production industries, each real estate project is unique and the development process is so much a creature of the political process that society has a new opportunity with each major project to negotiate, debate, and reconsider the basic issues of an enterprise economy, i.e., who pays, who benefits, who risks, and who has standing to participate in the decision process. Thus the development process remains a high-silhouette topic for an articulate and politically sophisticated society."³

Graaskamp expands his definition of real estate development to include the entire economic and physical life of the development as it is planned, built, renovated and redeveloped. He writes:

"The creation and management of space-time in earth is termed real estate development. Real estate developments range from a simple cave to complex technology of the Park Avenue skyscraper. Like a manufactured product, a

¹ In 1973, Ohio State University Professor Ronald L. Racster invited University of Wisconsin Professor James A. Graaskamp to Columbus, Ohio to address a group of real estate practitioners about land development. Graduate student Norman G. Miller corresponded with Professor Graaskamp, and his presentation, "A Land Investment Seminar," was scheduled for December 1, 1973 at the Christopher Inn in Columbus, Ohio.

Dr. Racster assigned me, an eager graduate student, to be Dr. Graaskamp's personal assistant for the day. I was unprepared for Dr Graaskamp's physical condition and totally unprepared for his presentation on land development. His explanation of the land development process was a watershed day for me, and his critical thinking about the stages of the process, the tasks involved, and the skills required in each stage became an integral part of my real estate self-identity. Through several panel discussions like this one, I became friends with Jim, and, in the process, I became even more respectful of his critical thinking and its influence on my future career. Over the last 39 years, I have lost my notes from that lecture, but recently Dr. Elaine Worzala found Graaskamp's archived notes for this seminar and sent me a copy. Reading his notes again was like having a conversation with an old friend. I think of him every day as I thrash through the stages of real estate development and deal with the risks and returns on a real-time basis. The correct citation of his notes is:

James A. Graaskamp Collection of Teaching Materials.
V. Industry Seminars and Speeches Sponsored by Other Universities.

10. "Land Investment Seminar," sponsored by R.E. Educational Services, Inc., Columbus, OH, December 1, 1973 at the Christopher Inn.

² Stephen P. Jarchow editor, "The Fundamentals of Real Estate Development," [Graaskamp on Real Estate](#). Washington, DC: ULI The Urban Land Institute, 1991. This article is reprinted with permission from Development Component Series, Washington, DC: ULI 1981

³ Ibid, p. 228. In the same article, Graaskamp famously describes the first real estate development: "Someone rolled a rock to the entrance of a cave and created an enclosed space for his family – a warmer, more defensible shelter, distinct from the surrounding environment. This can be called the first real estate development. Since then real estate activity has taken many forms to meet the needs of man and his society. Once based on need and custom real estate is now based on social economics and statute."

real estate project is part of a larger physical system programmed to achieve long-term objectives, but each real estate project is also a small business enterprise of its own. Thus, the development process is a continuum of construction technology, financing, marketing skills, administrative controls, and rehabilitation required to operate the real estate enterprise over many years.”⁴

Graaskamp’s view of the real estate development process appreciates the complexities of and multiple stakeholders in the process as well as the long term nature and on-going management of the real estate enterprise. Graaskamp’s work has been alternatively described as being both too theoretical and too pragmatic. To be sure, he was both and a visionary as well.

C. The Development Process Described in Major Texts

At the end of this paper is an annotated bibliography which describes how seven popular text books on real estate development, finance, and development define the development process. The Appraisal Institute simply states that the development of any project has three phases: 1. permitting, 2. construction, and 3. absorption⁵. Other texts mostly describe the process in four broad steps: 1. acquire the site; 2. obtain necessary approvals; 3. Construct the building, 4. Lease-up and operate or sell the building. Even texts that are dedicated entirely to real estate development and are much more detailed, still focus primarily on building (or vertical) development.

D. Summary

The expansive and nuanced work of Graaskamp is certainly not reflected in the current text books on development, financing, and valuation. However, as our society is dealing with urban in-fill, redevelopment and urban-mixed use projects, we are faced with the need to expand our development models to reflect Graaskamp’s long term view of the real estate development process. The following sections of the paper lay out a seven-stage process that begins with a “land banking stage” and concludes with a “redevelopment stage” which is really a feed-back loop to begin the process all over again. The proposed model views the property over its life-cycle and sees development as an iterative process.

⁴ Ibid, p. 230

⁵ The Appraisal of Real Estate⁵ Thirteenth Edition, Appraisal Institute, Chicago, Illinois, 2008. p. 370.

III. Seven Stages of Real Estate Development

This model of the real estate development process considers the overall life-cycle of a real estate project. In each stage, the developer achieves certain tasks by spending money, using unique talents and skills, and in the process taking risks to increase the value of the property. In each stage, the developer buys one thing and sells another. In each stage, the developer must answer the following questions:

- Can I do what's got to be done?
- Do I have the necessary skills, resources, time, and team support?
- Can I take the risk of failure? and
- Can I create real value?

Following is a brief description of the seven sequential stages.

A. Stage 1: Land Banking Stage

The “Land Banker” acquires or holds undeveloped or “raw” that he believes will become attractive for future development through general and broad market trends or perhaps. Land bankers can be active in the pursuit of opportunistic “land buys”. Although many land bankers can be advertent land owners such as estates or government agencies or public utilities. This is a relatively passive investment position. Good examples of “land bankers” are public utilities, universities, and inheritors of the “family farm.” When the market conditions are right, the land banker then sells the land to a “land packager”. The land banking stage and the redevelopment stage are really the same except that the land banker usually has “green fields” and the redeveloper has “brown fields.”

B. Stage 2: Land Packaging Stage

The “Land Packager” buys the raw land from the passive land banker and then improves the value of the land through conceptual land planning, zoning changes, financing schemes, or other “paper enhancements” like title insurance, accurate surveys, or environmental studies. Examples of land packagers are land planning firms, politically skilled lawyers, and governmental agencies who attempt to obtain government approvals of land they own. This “packaged land” is then sold to the “land developer”.

C. Stage 3: Land Development Stage

The “Land Developer” buys the land with the paper enhancements from the land packager and then improves the land so it can be sold as finished building pads to building developer. This usually involves the construction of horizontal infrastructure such as roads and utilities as well as common improvements such as water dentition and recreational facilities. A good example of the land developers are master-planned community developers who construct the roads, utilities, and recreational amenities and then sell building lots to home builders.

D. Stage 4: Building Development Stage

The “Building Developer” buys the finished pad from the land developer and then does the vertical development by constructing the building improvements.

During construction, the building developer may also attempt to lease the building so the finished building can be sold to the building operator. Home builders are a good example of building developers. On the commercial side, building developers are often called “merchant builders.”

E. Stage 5: Operating Stage

The “Building Operator” leases up the property, manages the property, and develops a building operating history so it can be sold to other building operators during its economic life or sold to a building renovator at the end of its economic life. The biggest building operators are usually referred to as institutional investors which may include pension funds, insurance companies, or public real estate investment trusts.

F. Stage 6: Renovation Stage

The “Property Renovator” buys the property with substantial economic and/or physical depreciation and creates value by curing these deficiencies then re-positioning and operating the building until the property is ready for redevelopment. The unique skills and risks for building renovators are usually found in companies that specialize in “historic renovation.” Currently, many shopping center developers are looking for old centers that need to be fixed-up and re-marketed to different retail tenants.

G. Stage 7: Redevelopment Stage

The “Property Re-developer” buys the property with such serious physical or functional deficiencies that the improvements must be torn down and/or re-developed for another use. This essentially begins the real estate development process all over again. In every major city, government-sponsored redevelopment agencies are probably the largest players in the stage even though they didn’t exactly “buy” their holdings from building renovators. Usually the municipalities acquire the properties through tax foreclosures and assign them properties to the agencies to be sold.

These stages of development can be shown graphically below in schematic diagrams in Exhibit 1:

Exhibit 1
 Diagrams of the REAL ESTATE DEVELOPMENT PROCESS



Again, it is important to note that in each stage, tasks are completed, capital is committed, risks are taken, and value is created. Most individual developers do not have the skills or capital to do all the phases. Usually, only fools would attempt to undertake all of the phases in the ill-fated quest to capture more and more value by taking more and more risks. Large development companies may have many different skills and product types, but usually there is a core set of competencies that have enabled them to become large real estate developers. However, there is a strong attraction to taking additional risks to capture additional returns, so we see home builders becoming land developers and land developers becoming land packagers without critically analyzing the new risks and competencies that are required. Also we see building operators, intentionally and sometimes unintentionally, becoming building developers.

IV. Eight Categories of Tasks in Each Stage of Development

The tasks that need to be accomplished in each stage of development can be divided into eight major categories. Whether these are the right eight categories, or if there should be more or less categories, will continue to be examined and discussed as the development matrix evolves. The categories may overlap, and the distinctions may be fuzzy and blurred. However, it is important to note that each stage begins with the acquisition tasks and ends with the disposition tasks. The other tasks are not done in any particular order and many are done simultaneously. The categories are:

- I. Acquisition
- II. Financing
- III. Market Studies and Marketing Strategies
- IV. Environmental
- V. Approvals and Permits
- VI. Improvements
- VII. Transportation and Accessibility
- VIII. Disposition

To clarify, the acquisition tasks may determine “to pass on” or “not buy” potential development property, but the process of evaluating the property as a possible acquisition is important. In the same manner, the disposition tasks may lead to the decision to “not sell” the property, and to carry forward into the next stage of development. Again, it is important to evaluate the disposition of the property and the capturing of the value created. Even if a developer does not want to sell the property, he must undertake the acquisition tasks for the next stage and objectively answer the question, “Would I buy this property if I didn’t already own it?”

Each task category requires specific skills and talents. However, the “professions” are not necessarily organized along these task categories. For example, lawyers and engineers are used in every category of tasks as are appraisers.

A. Acquisition

Each stage of development begins with the Acquisition Tasks. The developer must determine if the subject property (or land parcel) provides an opportunity to create value by completing the required tasks and then “selling” the property to the next stage of development. The developer must determine if he has the abilities, resources, and temperament (physical, human, and financial) to assemble a team to accomplish the required tasks as well as the wherewithal to bear the risks associated with these tasks.

Often the Acquisition Tasks are broken down into four categories: feasibility studies, underwriting requirements, contract negotiations, and closing conditions.

- Feasibility: Do the anticipated future benefits exceed the expected future costs?
- Underwriting: Can capital be attracted to this development given the risks and returns of the development?
- Contract: How are title, control, monies, and associated risks transferred from the seller to the buyer?
- Due Diligence: Are the assumptions about development (legal, physical, economic, market) valid or have they been verified?
- Closing: Have all of the required conditions to close been met, and have all of the required documents been prepared, reviewed, and executed?

B. Financing

The financing tasks require the developer to determine the amount and type of capital required to fund the initial acquisition, the interim holding costs, the completion of the required tasks, and eventual disposition of the development. The developer then must determine the most efficient method to raise the required capital and then actually raise the capital. The financing tasks can be divided into three categories: financial projections, financial management and projections, and capital formation and accumulation.

- Projections: What are the amounts and timing of expected capital expenditures, holding costs, and operating expenses as well as sales, rents, and other income?
- Financial management and reporting: How will the future capital flows be managed and to whom and in what form will they be reported?
- Capital formation and accumulation: Given the risk, returns, and timing of the capital flows of the development, what is the appropriate capital structure and how can capital sources be secured?

C. Market Studies and Strategies

The marketing tasks require the developer to determine what are the current and future market conditions for the expected end-uses(ers) of the property. The developer then must determine the most appropriate marketing strategy given the current and future market conditions. In implementing the marketing strategy, the developer must determine the appropriate marketing mix. The marketing tasks can

be broken down into three categories: projected economic conditions, market strategy, and advertising and promotion (the marketing mix).

- Projected Market Conditions:
 - What are the existing rents, vacancies, and occupancies?
 - What is the future demand for the various land uses?
 - What are the competitive properties that are under development or permitted for future development?
- Market Strategies:
 - What amount of various land uses should be developed on the site?
 - How and by whom should they be brought to market?
- Promotion and Advertizing:
 - How, when, to whom should the development be promoted and advertised?

D. Environmental Tasks

The developer must determine how the past, present and future environmental conditions of the site and surrounding areas affect the development of this particular site and set of uses. In doing so, the developer must consider how the atmospheric, surface, and subsurface conditions affect the development of the site. Also the developer must determine what effect the historic and cultural traditions of the site and surrounding area may affect the development of the site? Finally the developer must determine if an Environmental Impact Study required. Given these consideration and determinations, the developer must resolve, remediate, or accommodate them in a timely and cost effective manner. These environmental consideration and tasks can be broken down as follows:

- Environmental Studies:
 - Phase I – Survey of Site Conditions;
 - Phase II – Testing of environmental site conditions; and
 - Phase III -- Remediation of certain environmental conditions.
- LEED Ratings:
 - What kind of Leadership in Energy Efficient Design (LEED) ratings can be achieved throughout the development process?
- Atmospheric, surface and sub-surface conditions:
 - These conditions should be known and the effect of these conditions should be evaluated prior to closing.
- Cultural and historic conditions:
 - Are there historic events or cultural traditions or religious considerations that can effect the development of the site?

E. Approvals and Permits

In every stage that there are the required approvals and permits needed to operate, improve, or modify the property during the development. The developer must not only determine what approvals and permits are necessary, but he must also acquire these approvals and permits in a timely and cost effective manner. The approvals may be at the federal, state or municipal level and they also may be from regional authorities or private individuals or organizations.

- Federal: For example,
 - U.S. Environmental Protection Agency,
 - U.S. Department of Defense,
 - U.S. Department of Transportation
- State: For example,
 - Department of Environmental Services, Department of Transportation,
 - Fish and Wildlife Administration
- Regional and Intergovernmental Authorities: For example,
 - Chesapeake Bay Authority,
 - Potomac River Watershed Authority,
 - The Greater Washington Council of Governments
- Local: For example,
 - Zoning commission approvals,
 - Building code authorities,
 - police and fire protection departments
- Private: For example,
 - ingress-egress easements,
 - boundary disputes,
 - building crane agreements

F. Improvements

The “improvement” tasks require the developer to determine what improvements (public or private; horizontal or vertical) need to be planned, designed, engineered, and construction. With that determination, the developer must be able to plan, design, engineer and or construct these improvements in a timely, efficient and cost-effective manner.

- Planning and design:
 - Can the desired, permitted, or required improvements be built on or in the space allocated for those improvements, i.e., can you put 10 pounds of sugar in a 5- pound bag?
 - Can the desired improvements be designed to meet market standards of acceptability?

- Are the talents of the requisite planners and architects available to the developer?
- Engineering:
 - Can the planned or designed improvements be built in an attractive, timely, and cost-effective manner?
 - Can the planned or designed improvement be engineered to meet the current and future standards for sustainability and safety?
- Construction:
 - Can the improvements be built on-time and on-budget?
 - Are the general and sub-contractors available to take on this project?
 - Are the necessary materials available and affordable?

G. Transportation/Accessibility

The transportation and accessibility tasks require the developer to determine not only what transportation systems (public and private) the space users (tenants, customers, suppliers) will use to get to the property, but also to determine how tenants, customers, and suppliers will get around the site once they have reached it. In some cases these off-site transportation systems, and in all cases the on-site accessibility systems, must be designed, engineered, and constructed.

- Off-site:
 - What are the transportation systems available to bring people and goods to the property?
 - What changes or improvements to those systems are required to enable goods and people to the site?
 - Can these changes or improvements be permitted, designed and constructed in a timely and cost effective manner?
- On-site:
 - How will goods and services and people access their destination once they are on site?
 - Are roads, trails, walkways, elevators, escalators, and storage areas adequate to handle the expected traffic among buildings and within buildings?
 - Can these improvements be designed and constructed in a timely and cost-effective manner?

H. Sales and Disposition

The sales and disposition tasks require the developer to complete the seller's due diligence, to market the property for sale, to negotiate and execute a sales contract, and finally, to negotiate any necessary development agreements. The developer may decide not to sell the property at this stage and continue on to the next stage of development. In this case, the disposition exercise is then blended into the acquisition tasks for the subsequent stage of development.

- Seller's Due Diligence:
 - What do we have?
 - What is it worth?
 - Who wants to buy it?
 - How do we affect a sale?
- Marketing:
 - How is the property presented to potential, qualified buyers?
 - What is the appropriate pricing strategy?
- Sales Contract:
 - Price and terms
 - Conditions to close
 - Post-closing conditions
- Development Agreements (effective post-closing)
 - What must occur? (construction specifications)
 - When must they occur? (milestones)
 - What happens when they don't? (guarantees, self-help, bonds)

V. The 56-cell Development Matrix

A. Stages are Horizontal; Task are Vertical

If the seven stages of the development process are the horizontal axis and the eight categories of tasks are the vertical axis, a 56-cell matrix is formed as shown in Exhibit 2A. Exhibit 2B provides more detail of the various components of each task category.

Exhibit 2A

Development Matrix	1. Land Banking	2. Land Packaging	3. Land Dvpmt	4. Building Dvpmt	5. Building Operations	6. Building Renovation	7. Site Redevelopment
I. Acquisition	I. 1.	I. 2.	I. 3.	I. 4	I.5.	I. 6.	I.7
II. Financing	II.1.	II.2.	II.3.	II.4.	II.5.	II.6.	II.7.
III. Market Studies & Marketing Strategies	III.1.	III.2.	III.3.	III.4.	III.5.	III.6.	III.7.
IV. Environmental Studies	IV.1.	IV.2.	IV.3.	IV.4.	IV.5.	IV.6.	IV.7.
V. Approvals and Permits	V.1.	V.2.	V.3.	V.4.	V.5.	V.6.	V.7
VI. Improvements	VI.1.	VI.2.	VI.3.	VI.4.	VI.5.	VI.6.	VI.7.
VII. Transportation/Accessibility	VII.1.	VII.2.	VII.3.	VII.4.	VII.5.	VII.6.	VII.7.
VIII. Sales and Disposition	VIII.1.	VIII.2.	VIII.3.	VIII.4	VIII.5.	VIII.6.	VIII.7.

Exhibit 2B

Development Matrix	1. Land Banking	2. Land Packaging	3.Land Dvpmt	4.Building Dvpmt	5.Building Operations	6. Building Renovation	7. Site Redevelopment
I. Acquisition	I. 1.	I. 2.	I. 3.	I. 4	I.5.	I. 6.	I.7
a. Feasibility	Ia.1.	Ia.2.	Ia.3.	Ia.4.	Ia.5.	Ia.6.	Ia.7.
b. Underwriting	Ib.1.	Ib.2.	Ib.3.	Ib.4.	Ib.5.	Ib.6.	Ib.7.
c. Contract	Ic.1.	Ic.2.	Ic.3.	Ic.4.	Ic.5.	Ic.6.	Ic.7.
d. Due Diligence	Id.1.	Id.2.	Id.3.	Id.4.	Id.5.	Id.6.	Id.7.
e. Closing	Ie.1.	Ie.2.	Ie.3.	Ie.4.	Ie.5.	Ie.6.	Ie.7.
II. Financing	II.1.	II.2.	II.3.	II.4.	II.5.	II.6.	II.7.
a. Projections	IIa.1.	IIa.2.	IIa.3.	IIa.4.	IIa.5.	IIa.6.	IIa.7.
b. Management & Reporting	IIb.1.	IIb.2.	IIb.3.	IIb.4.	IIb.5.	IIb.6.	IIb.7.
c. Capital formation & accumulation	IIc.1.	IIc.2.	IIc.3.	IIc.4.	IIc.5.	IIc.6.	IIc.7.
III. Market Studies and Marketing Strategies	III.1.	III.2.	III.3.	III.4.	III.5.	III.6.	III.7.
a. Conditions	IIIa.1.	IIIa.2.	IIIa.3.	IIIa.4.	IIIa.5.	IIIa.6.	IIIa.7.
b. Strategies	IIIb.1.	IIIb.2.	IIIb.3.	IIIb.4.	IIIb.5.	IIIb.6.	IIIb.7.
c. Promotion/Advertising	IIIc.1.	IIIc.2.	IIIc.3.	IIIc.4.	IIIc.5.	IIIc.6.	IIIc.7.
IV. Environmental Studies	IV.1.	IV.2.	IV.3.	IV.4.	IV.5.	IV.6.	IV.7.
a. Phase I, II, III	IVa.1.	IVa.2.	IVa.3.	IVa.4.	IVa.5.	IVa.6.	IVa.7.
b. LEED	IVb.1.	IVb.2.	IVb.3.	IVb.4.	IVb.5.	IVb.6.	IVb.7.
c. Soil Conditions	IVc.1.	IVc.2.	IVc.3.	IVc.4.	IVc.5.	IVc.6.	IVc.7.
d. Cultural & Historical Conditions	IVd.1.	IVd.2.	IVd.3.	IVd.4.	IVd.5.	IVd.6.	IVd.7.
V. Approvals and Permits	V.1.	V.2.	V.3.	V.4.	V.5.	V.6.	V.7
a. Federal	Va.1.	Va.2.	Va.3.	Va.4.	Va.5.	Va.6.	Va.7.
b. State	Vb.1.	Vb.2.	Vb.3.	Vb.4.	Vb.5.	Vb.6.	Vb.7.
c. Regional Authorities	Vc.1.	Vc.2.	Vc.3.	Vc.4.	Vc.5.	Vc.6.	Vc.7.
d. Municipal	Vd.1.	Vd.2.	Vd.3.	Vd.4.	Vd.5.	Vd.6.	Vd.7.
e. Private	Ve.1	Ve.2.	Ve.3.	Ve.4.	Ve.5.	Ve.6.	Ve.7.
VI. Improvements	VI.1.	VI.2.	VI.3.	VI.4.	VI.5.	VI.6.	VI.7.
a. Land Planning	VIa.1.	VIa.2.	VIa.3.	VIa.4.	VIa.5.	VIa.6.	VIa.7.
b. Architectural Design	VIb.1.	VIb.2.	VIb.3.	VIb.4.	VIb.5.	VIb.6.	VIb.7.
c. Engineering	VIc.1.	VIc.2.	VIc.3.	VIc.4.	VIc.5.	VIc.6.	VIc.7.
d. Construction	VId.1.	VId.2.	VId.3.	VId.4.	VId.5.	VId.6.	VId.7.
VII. Transportation/Accessibility	VII.1.	VII.2.	VII.3.	VII.4.	VII.5.	VII.6.	VII.7.
a. Off-Site	VIIa.1.	VIIa.2.	VIIa.3.	VIIa.4.	VIIa.5.	VIIa.6.	VIIa.7.
b. On-site	VIIb.1.	VIIb.2.	VIIb.3.	VIIb.4.	VIIb.5.	VIIb.6.	VIIb.7.
VIII. Sales and Disposition	VIII.1.	VIII.2.	VIII.3.	VIII.4	VIII.5.	VIII.6.	VIII.7.
a. Seller Due Diligence	VIIIa.1.	VIIIa.2.	VIIIa.3.	VIIIa.4.	VIIIa.5.	VIIIa.6.	VIIIa.7.
b. Marketing	VIIIb.1.	VIIIb.2.	VIIIb.3.	VIIIb.4.	VIIIb.5.	VIIIb.6.	VIIIb.7.
c. Contract	VIIIc.1	VIIIc.2.	VIIIc.3.	VIIIc.4.	VIIIc.5.	VIIIc.6.	VIIIc.7.
d. Development Agreements	VIIId.1.	VIIId.2.	VIIId.3.	VIIId.4.	VIIId.5.	VIIId.6.	VIIId.7.
e. Closing	VIIIe.1.	VIIIe.2.	VIIIe.3.	VIIIe.4.	VIIIe.5.	VIIIe.6.	VIIIe.7.

B. Developers Work Down and Professionals Work Across the Matrix

A developer must *work down a column* or stage to create value in the process. A professional must identify his skills in the task categories and then *work across the row* to determine how she fits or profits in the development process. See Exhibits 3 and 4. Every cell represents a capital expenditure, and every cell represents a risk as well as a profit center and an opportunity to create value.

Exhibit 3
Developers Work Down the Matrix

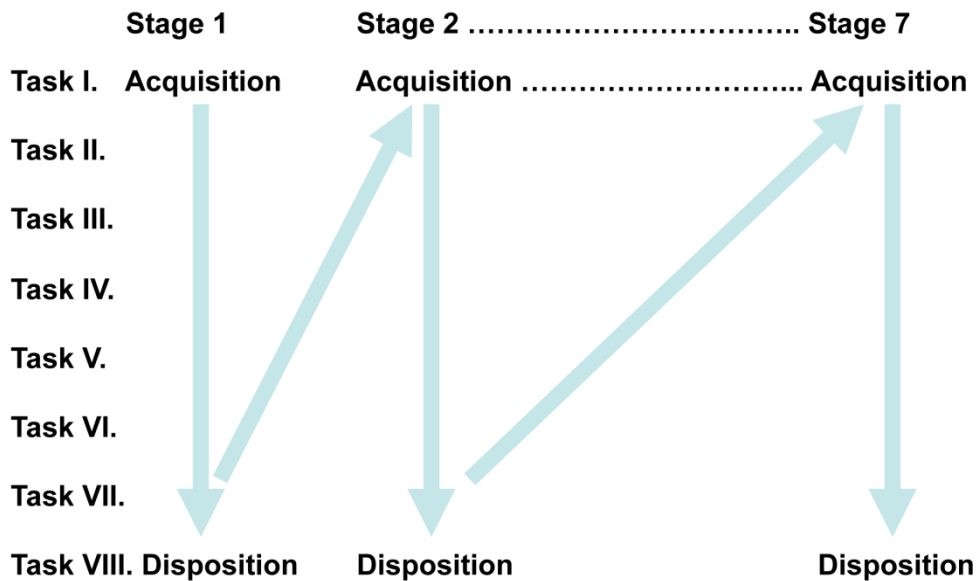
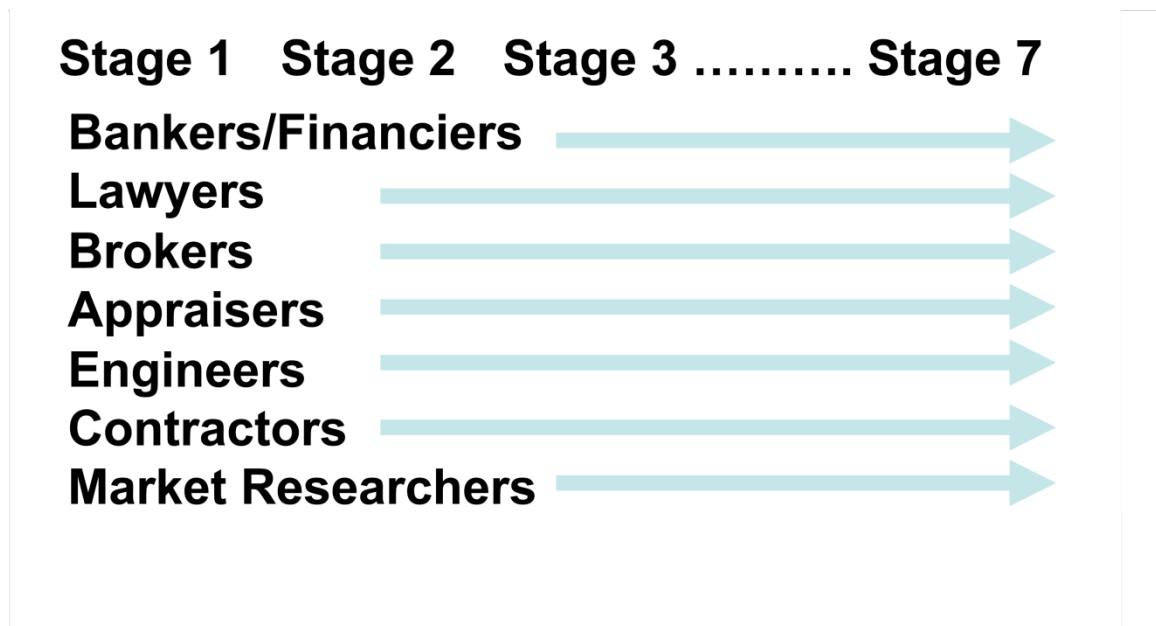


Exhibit 4
Real Estate Professionals Work Across the Matrix



This matrix representation of the development process is a model that can be used for descriptive, normative, or predictive purposes. It can be used to describe to the various stakeholders where a project is currently and where it can be after certain tasks are performed. It can also explain what tasks should be or need to be performed to create value and move the property through the development process. Finally, it can be used to discuss what future events need to occur to create value or how various future events will effect value creation.

The relative importance of the tasks vary from stage to stage, and the teams needed to complete these task must be re-formed from stage to stage. For example, the architectural and planning tasks are very different in the packaging stage, Cell VI. 2., where conceptual designs are the most important from the architectural and planning tasks in the building construction stage, Cell VI. 4. where detailed construction drawings are required.

Along the same lines, the marketing strategies to sell finished building lots, Cell III. 3. are very different from the marketing strategies to lease a completed building, Cell III. 5.

This matrix will also enable citizens, neighbors, and government officials to understand that a land packager selling to a land developer or a land developer selling a building pad to a building developer are not simply “flipping “ the property to make quick profits at the community’s expense. Rather they are creating value by first, spending money to accomplish certain tasks and, second, incurring the corresponding risks that move the property to the next stage of the development process.

From a pedagogical perspective, the Development Matrix can help college professors see the multi-disciplinary nature of the real estate development process. Thus the finance professor’s capital allocation decisions, the engineering professor’s design considerations, and the political science professor’s analysis of local politics are all part of the value creation in the development process.

C. The Conditional Cells Vary by Product Type

The marginal cells in the matrix are the seven stages and eight tasks, and the conditional cells are the 56 cells that they define in two ways. For example, Cell VI. 2. is defined as the construction tasks for the land packaging stage. Good examples of this may be a conceptual land plan of a master planned community in Florida or the land use plan of an urban redevelopment area.

In fact, the description of each cell is not just two dimensional, but it must include the product types as a third dimension as the requirements are different for residential, office, retail, warehouse, apartment, hotel, and mixed-use developments. Each conditional cell should be explained both conceptually and with real-world examples for any given product type.

While actual, real-world examples of tasks that are addressed in each cell are imperative for a complete understanding of the Development Matrix, good examples for specific property types are hard come by given the confidential nature, as well as the lapse of time, between the actual event and the disclosure of the documentation. To obtain comprehensive complete examples, the author has endeavored to create a “Wiki book” version of the Development Matrix. The thinking was that the Wiki book Development Matrix could be used to link the reader to examples that were available on internet websites. This methodology would enable the reader to access examples not only for stage-task cells, but also for different property types or land uses for each cell.

Jayne Magee, Ph.D., an associate professor at Lakeland Community College who developed a wiki book to teach digital composition to freshman English students⁶, collaborated with the author to set up a rough version of the Development matrix as a wiki book at bpworkks.com. Readers can see this work-in-progress at:

jhuesjrealestateprogram.pbworks.com/w/page/51965103/frontpage

Hopefully this wiki book of the Development Matrix can be used to present various examples of specific property types, and to describe and explain the development process with all of its complexities, nuances, risks, and value creation.

⁶ Writingfromlife.pbworks.com

VI. Summary and Next Steps

A. Summary

In this paper, the author argues that the real estate development process should be described more in the James Graaskamp tradition which addressed the long life, complexities, and multiple stakeholders in the overall process. The author expands Graaskamp's original four-stage model (land banking, land packaging, land development, and building development) to include building operations, property renovation, and property redevelopment.

The real estate development process is organized around a 56-cell, stage-task Development Matrix, which describes the entire real estate development process in seven stages from the land banking stage to the redevelopment stage. In each stage, there are eight categories of tasks that need to be addressed. The main thesis of this interdisciplinary development model is that there are discrete stages in the process, and at each stage the real estate developer must (1) complete different tasks using specialized skills and thereby accepting certain risks and (2) employ various capital structures with different risk-return characteristics to create or "capture" the value increase in that stage.

The seven stages in the model are: land banking, land packaging, land development, building development, building operation, building renovation, and site redevelopment. Each stage in the process begins with I. the acquisition tasks and ends with VIII. the disposition tasks. Each stage must also address, to some extent, the following categories of tasks (many of which are done simultaneously): II. financing, III. marketing, IV. environmental issues, V. approvals and permits, VI. physical improvements, and VII. transportation and accessibility concerns. As with all real world applications of conceptual models, the lines separating the stages and the categories are fuzzy.

B. Next Step(s)

The next step in the Development Matrix project is to provide conceptual explanations for the 56 cells, as well as to provide specific example of various property types in each cell. Using a wiki book format, this paper will be expanded so that specific examples can be provided by professionals throughout the real estate development process. The author intends to use this wiki book in his classes next year. Students will be asked to find examples and insert them into the wiki book with embedded links to the internet or to upload specific files in the Development Matrix

Annotated Bibliography

1. The Appraisal of Real Estate. Thirteenth Edition, Appraisal Institute, Chicago, Illinois, 2008

The Appraisal Institute in its signature publication, The Appraisal of Real Estate, states simply:

“The development of any project considers three phases of development: (1) the permitting stage, (2) the construction stage, and (3) the absorption stage.”

2. William B. Brueggeman, Ph.D. and Jeffrey D. Fisher, Real Estate Finance and Investments, Tenth Edition, Richard D. Irwin Publishing Company, 1997. Chapter 15: Financing Construction Projects,” p. 478-479.

In their classic real estate finance text, Brueggeman and Fisher describe the real estate development process as a four or five step process:

“Essentially a developer (1) acquires a site, (2) develops the site and constructs the building improvements, (3) provides the finish-out and readies the space for occupancy by tenants, (4) manages the property after completion, and (5) may eventually sell the project.”

3. David M. Geltner, Norman G. Miller, Jim Clayton, and Piet Eichholtz. Commercial Real Estate Analysis and Investments, Second Edition, Tengage Learning. United States. 2007. Page 759.

In their virtuoso work, the authors describe the development process in three phases:

“The three phases of the development decision process are: Phase 1, land optioning and assembly, permitting and development design; Phase 2, construction, Phase 3, lease up and tenant finishes: and Phase 4, stabilized operation.”

4. Stephen P. Jarchow editor, "The Fundamentals of Real Estate Development," Graaskamp on Real Estate. Washington, DC: ULI The Urban Land Institute, 1991. This article is reprinted with permission from Development Component Series, Washington, DC: ULI 1981.

5. Peter Linneman, Ph.D. "Real Estate Finance and Investments: Risks and Opportunities. 3rd Edition. 2011 by Peter Linneman.

In Chapter 8, Development and Pro Forma Analysis, Linneman describes a six-step planning and construction process in the context of a case study on Celina Gardens:

“The planning and construction process entails many steps, including feasibility analysis, the design process, the planning process, the approval

process, site preparation, infrastructure installation, and physical construction. Upon completion of construction in 2004, the second business begins. Specifically, the topic changes his business of operating a building.”

6. John McMahn, Professional Property Development, McGraw Hill, 2007

McMahan suggests that the developer adds value by “riding the risk curve” and shouldering the development risks that most investors are not willing to assume. He describes the development process as four stages: (1) planning and design, (2) entitlements, (3) financing, leasing, construction, and (4) operations.

7. Mike E. Miles, Gayle L. Berens, Mark J. Eppli, Marc A. Weiss, Real Estate Development: Principles and Process, Fourth Edition, Urban Land Institute, 2007

In this book which is entirely dedicated to real estate development, the authors begin by clarifying many characteristics of the real estate development process:

“First, the development process is hardly straight forward or linear.”

“Second, development is an art.”

“Third, at each and every stage, developers should consider all remaining stages of the development process.”

“Fourth, the development process requires interaction among the different functions (construction, finance, management, marketing, and government relations, in each of the eight stages as well as the interaction of functions over time).”

[Fifth,] “although the model for development is based on reality, it also represents an ideal version of the process and gives an elegant means of imparting the information. “

The book is organized around an eight-stage real estate development:

Stage One: Inception of an idea (Chapter 10)

Stage Two: Refinement of the idea (Chapter 12)

Stage Three: Feasibility (Chapter 16)

Stage Four: Contract negotiation (Chapter 19)

Stage Five: Formal Commitment (Chapter 19)

Stage Six: Construction (Chapter 20)

Stage Seven: Completion and Formal Opening (Chapter 20)

Stage Eight: Property, Assets, and Portfolio management (Chapter 21)

8. Howard A. Zuckerman and George D. Blevins, Real Estate Development Workbook and Manual. Prentice Hall Inc. Englewood, New Jersey. 1991

At the end of this book, the authors include a 7.5 foot (90 inches) long “real estate development procedural matrix” which organizes the book’s sixteen chapters into 63 events and 28 decision nodes. This matrix includes inputs from property management, finance, development, marketing, and design/construction as it

describes the development process: (1) from site acquisition; (2) to building construction; (3) to lease-up and finally to (4) operations and sale.

About the Author:

Daniel B. Kohlhepp, Ph.D., MAI



Daniel B. Kohlhepp is academic director and faculty in charge of the Accelerated Master of Science in Real Estate (MSRE) Program at the Johns Hopkins Carey Business School Edward St. John Real Estate Program. He teaches the two-semester practicum course in which students prepare a feasibility and investment analysis for an urban, mixed-use project. He also leads a seminar series in contemporary topics which include the various stages in the development process, sustainable and green building development, entrepreneurship, and healthcare real estate. The course also includes speakers and field trips. Dr. Kohlhepp also provides the academic supervision of the required, eight-week, full-time summer internship.

Dr. Kohlhepp recently retired from his eight-year tenure with Crescent Resources, LLC. as the president of both its Commercial Division and the LandMar Group, LLC. In the Commercial Division, Dr. Kohlhepp was responsible for 18 major commercial developments in seven states that included mixed-use, office, warehouse/distribution, and retail projects. Committed to green building and sustainable development, he enrolled eight office projects totaling almost 2 million square feet in the United States Green Building Council's Leadership in Energy Efficient Design (LEED) Program. The LandMar Group, LLC, was a master-planned community developer with 28 projects in Florida and southern Georgia.

In 2006, he completed the development of Potomac Yard, a 300-acre, mixed-use, urban in-fill project in Northern Virginia. During the development of Potomac Yard, Dr. Kohlhepp and his team were awarded the Northern Virginia NAIOP Best Transaction of the Year (2001), Trenchless Technology's Project of the Year (2003), Arlington Chamber of Commerce Chairman's Award (2003), *Washington Business Journal's* Best GSA Lease Award (2004), and the Arlington Chamber of Commerce ABBIES "Green" Award (2005). In 2006, the U.S. Green Building Council awarded LEED Gold Certification to One & Two Potomac Yard, a 654,000 square-foot, twin-tower, office project within Potomac Yard. In 2007, One and Two Potomac Yard was awarded the "Best Commercial Project" and the "Best Building High-rise" by the Virginia Sustainable Building Network and the Northern Virginia NAIOP, respectively.

Dr. Kohlhepp's most recent publication is "Challenges and Lessons Learned at Arlington Potomac Yard," which appears as Chapter Eight in [Future Office: Design, Practice and Research](#), edited by Chris Grech and David Walter and published by Taylor and Francis in 2008. He is currently on the Editorial Board of *The Journal of Sustainable Real Estate*, and he was recently featured in *Commercial Real Estate Career Education and Resource Guide*, Second Edition, which was published by the Homer Hoyt Institute in 2009.

After teaching on the faculties of the University of Oklahoma and Pennsylvania State University where he specialized in real estate investment analysis, Dr. Kohlhepp left academia in 1979 to become a developer in Oklahoma City. In 1984, Dr. Kohlhepp moved to Washington, D.C., to enter the real estate investment advisory business, and in 1989 he sold his company, Potomac Realty Advisors, to Baltimore-based USF&G Corporation. He was responsible for all development and investment activities for a \$1.5 billion portfolio containing office, retail, multifamily, industrial, and golf course communities. In 1992, Dr. Kohlhepp started Kohlhepp Realty Advisors, which specialized in real estate portfolio valuation and management for institutional and government regulatory clients.

In 2007 the Homer Hoyt Institute recognized Dr. Kohlhepp as a Hoyt Fellow. In 2009, He was elected to the board of directors of the Homer Hoyt Institute's School of Advanced Studies in Real Estate and the Hoyt Advisory Services.

Kohlhepp is the president of Granite Road, LLC, areal estate development and investment company, and he is a principal in the Real Estate Counseling Group of America. Born and raised in DuBois, Pennsylvania, Dr. Kohlhepp earned his B.S. and M.B.A. degrees from Penn State University and his Ph.D., with a major in Real Estate and Urban Analysis, at The Ohio State University.