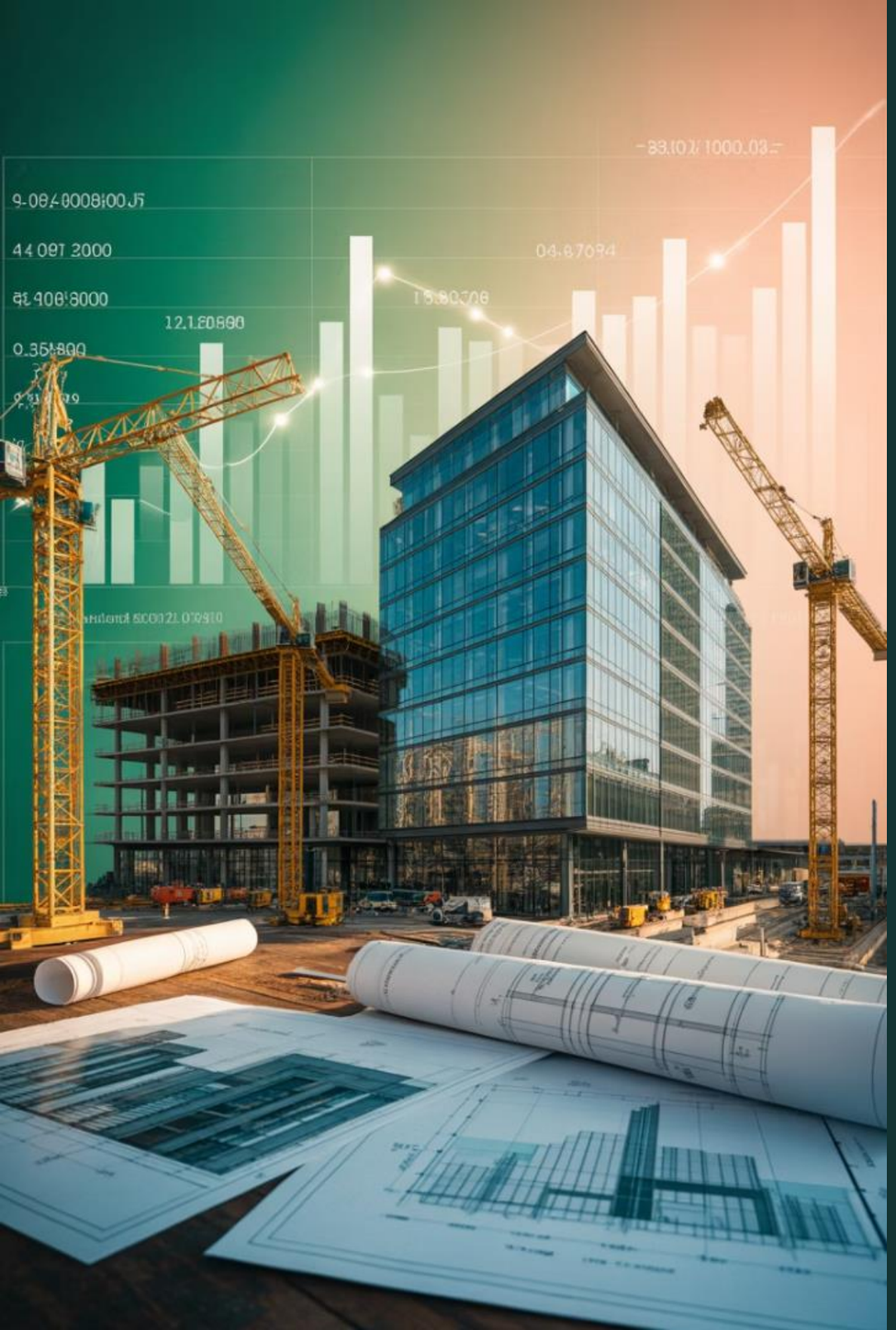


Investment Analysis of Real Estate Development Projects

Real estate development is a make-or-break activity for entrepreneurs and firms with tremendous social consequences. Investment analysis is crucial - projects that pass financial screens get built, those that don't remain dreams.

The Development Decision-Making Process

Urban Economics

Analysis of the real estate space market and demand factors

Financial Economics

Capital market and real estate asset market analysis

Physical Analysis

Architectural and engineering disciplines shape the physical design

Legal/Political

Regulatory approvals and entitlements process

Two Development Approaches

Site Looking for a Use

The site is already controlled by the developer. Analysis is essentially a highest and best use study.

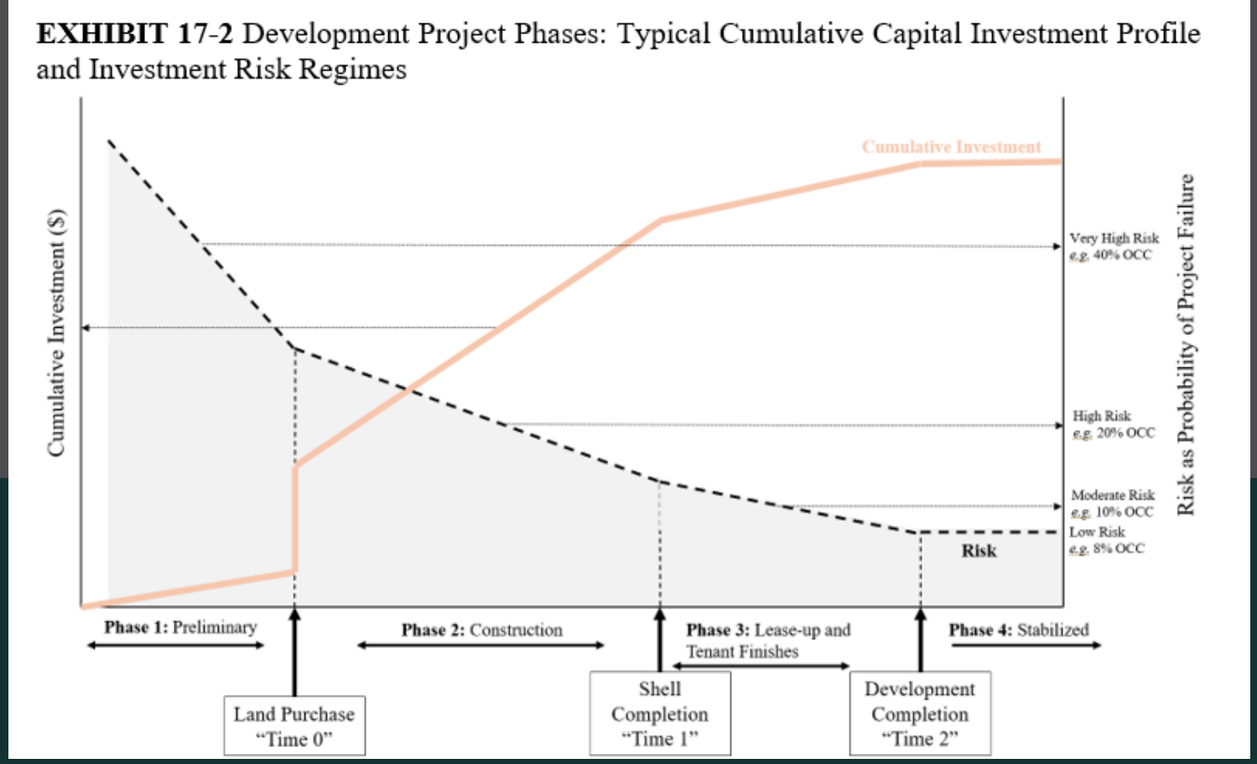
- Common when developers "inventory" land
- Typical for local public sector authorities
- Requires market analysis to determine optimal use

Use Looking for a Site

The developer knows what to build but needs the right location.

- Common for large development firms
- Typical for retail firms like McDonald's
- Focuses on underserved locations
- Often involves "build-to-suit" projects

Development Project Phases



Preliminary Phase

Most creative and entrepreneurial phase. Involves land assembly, permits, and project design.

Construction Phase

Bulk of financial expenditures occur here, paying for building construction.

Lease-up & Tenant Finishes

After shell completion, spaces are customized for tenants who will occupy them.

Stabilized Operation

Project is fully leased and operating at long-run steady-state profitability.

The Preliminary Phase

1 **High Risk, High Creativity**

This phase may take months to years and involves the most entrepreneurial work.

2 **Land Assembly**

Often involves optioning and assembling separate land parcels.

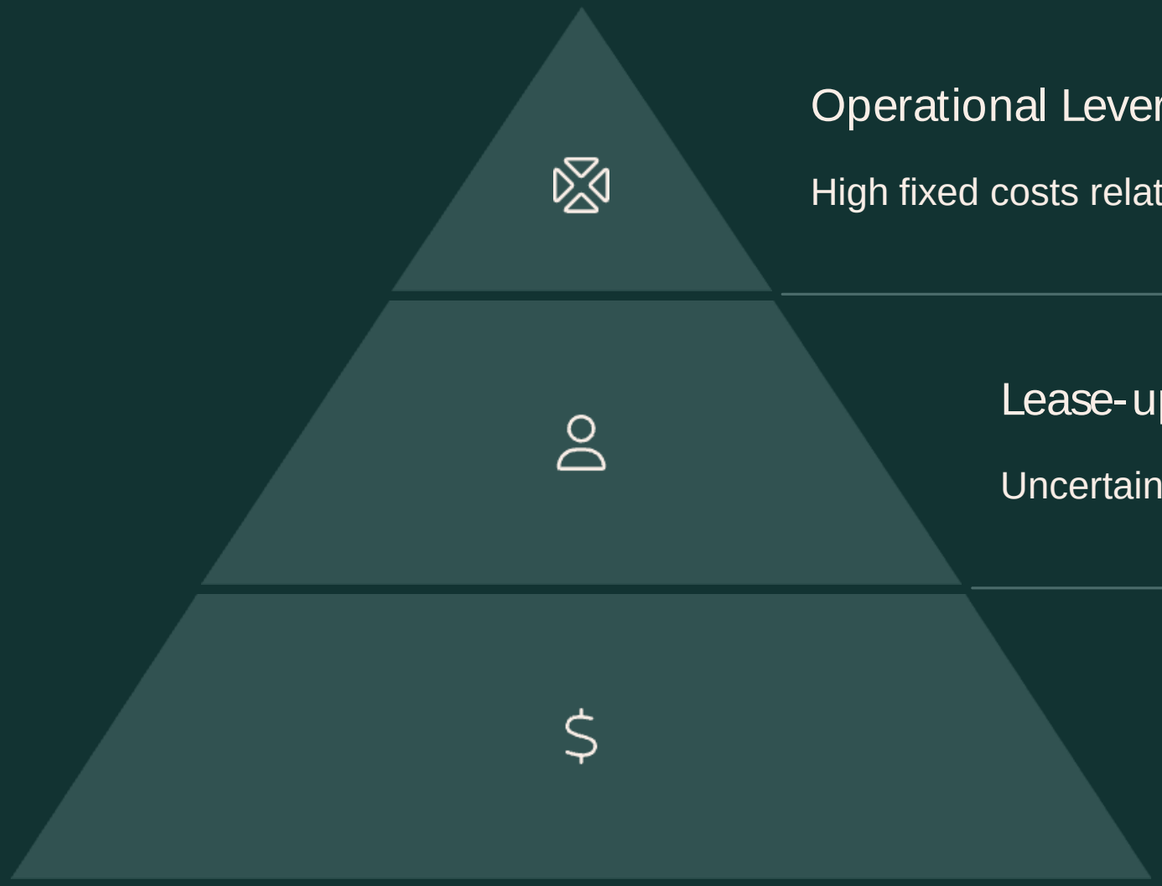
3 **Entitlements**

Obtaining necessary permits, sometimes including variances or special provisions.

4 **Project Design**

Includes highest and best use analysis and determining optimal density (FAR).

Construction Phase Risk



Operational Leverage

High fixed costs relative to variable revenues

Lease-up Risk

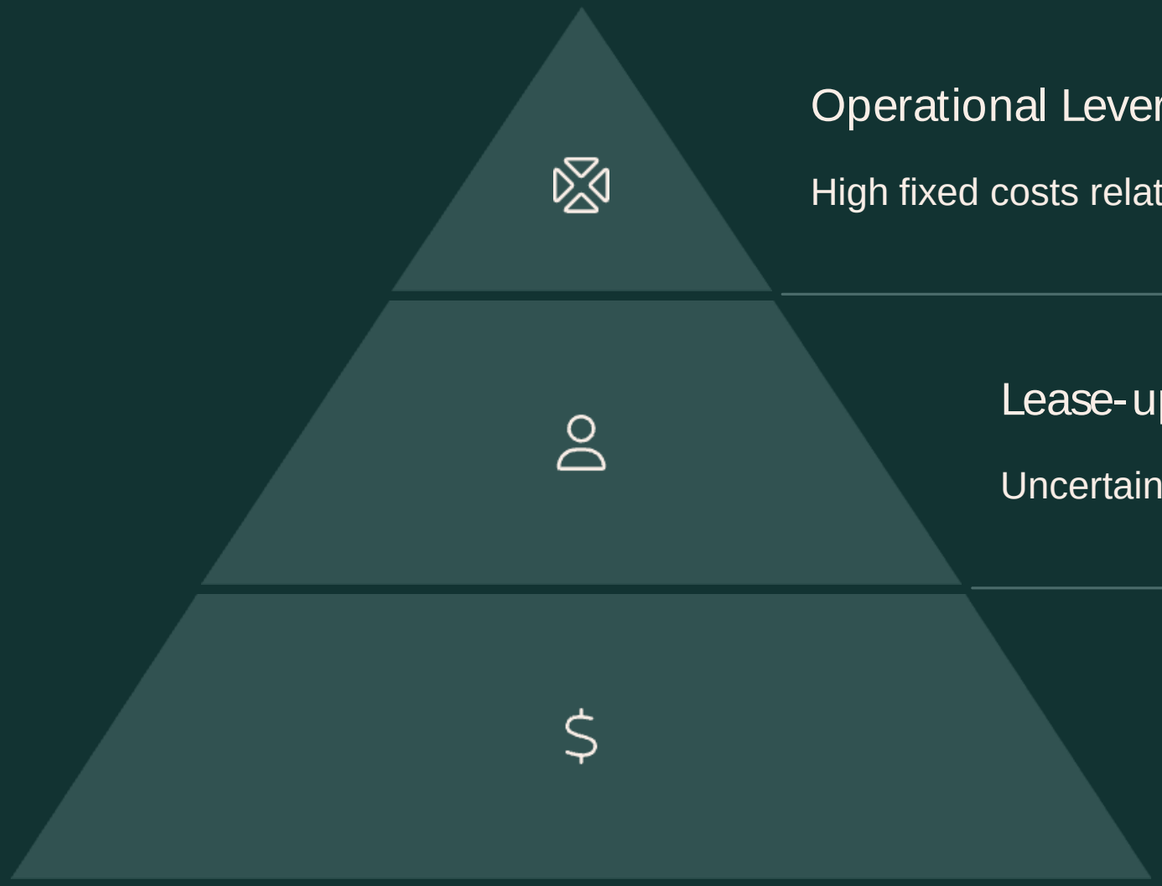
Uncertainty about occupancy rates and timing

Cost Commitment

Construction costs must be paid regardless of project outcome

Even with no financial leverage and fully preleased projects, development investments contain inherent operational leverage. This creates creates risk that requires high expected returns, often around 20% per annum.

Construction Phase Risk



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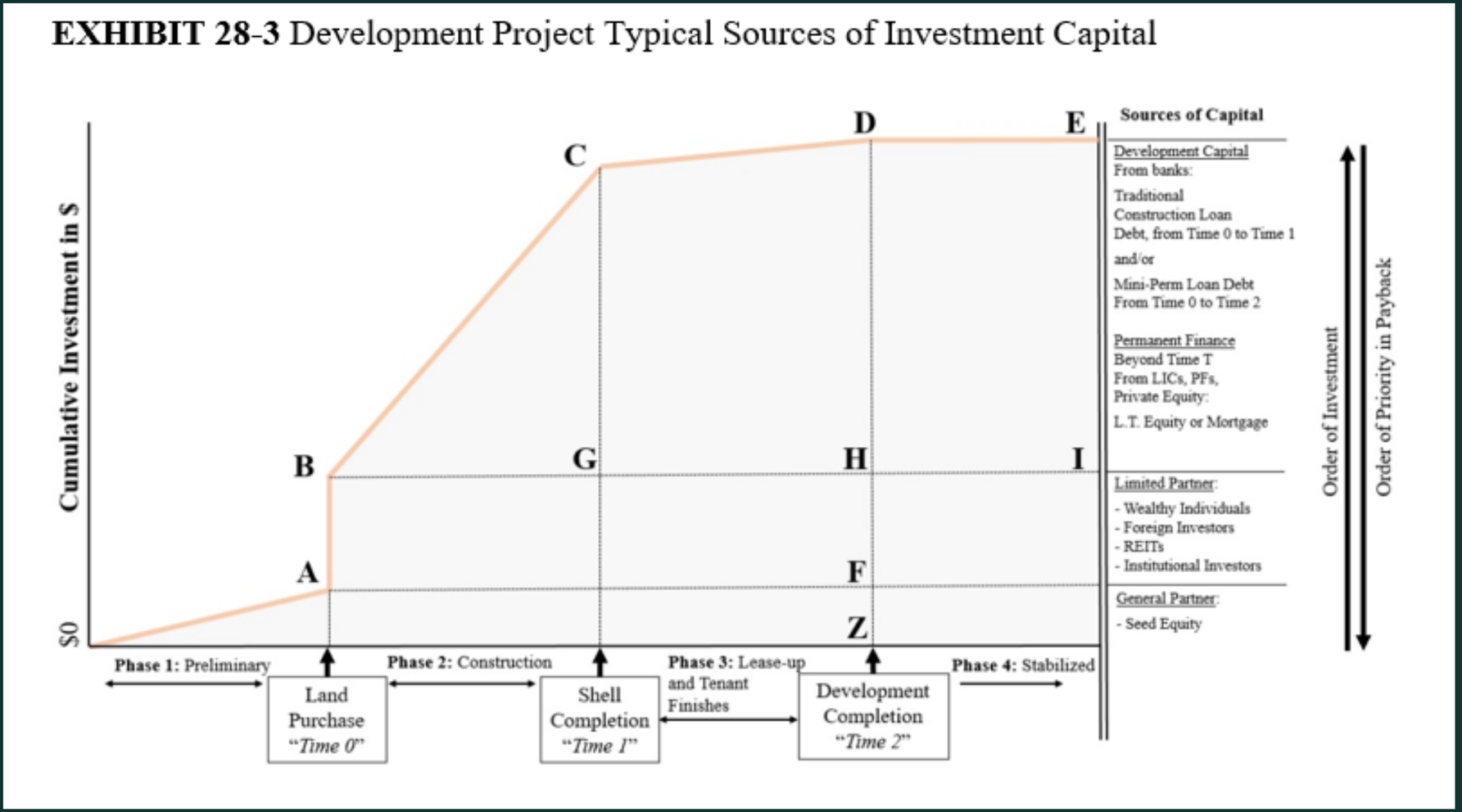
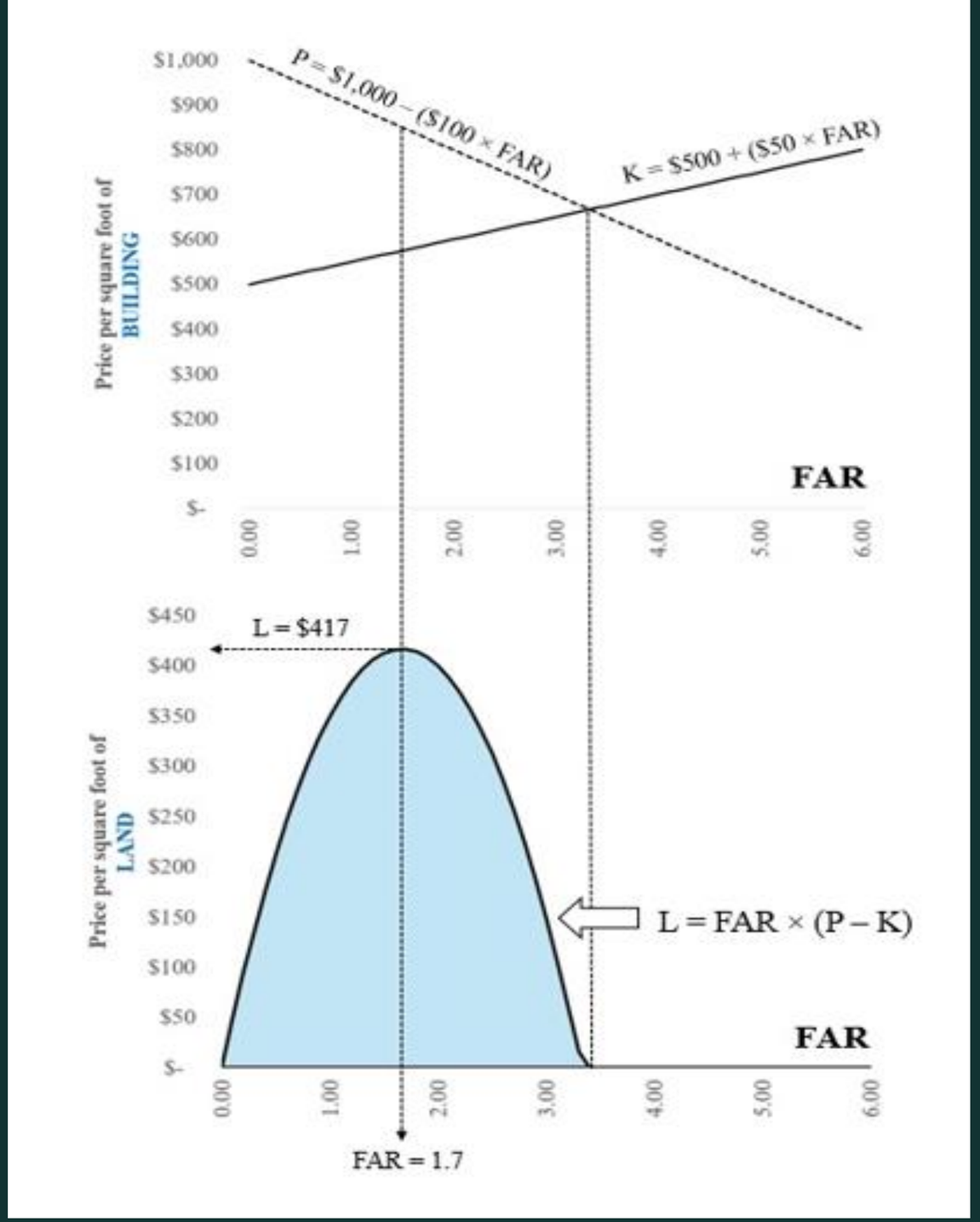
Sources of Capital During Development



The order of investor payback seniority is typically the reverse of the order of investment. Riskier investments get paid back last but receive higher potential returns.

Determining Optimal Floor Area Ratio (FAR)

To understand what maximizes land value, note that, as a general rule, as you increase the FAR, the price you can get for the property tends to *decrease*, even as the costs of development tend to *increase*, in both cases *per building square foot*. There are various reasons for this, related to construction costs, building efficiency (net rentable floor area divided by gross building floor area), and the value per square foot tenants are willing to pay in rent. However, this cost of density is offset by the obvious economic advantage of density, which is the greater productivity of the land. The more rentable square feet per land square foot (greater FAR), the greater the value of the land site, other things equal. To a point, FAR can be increased without increasing building height by increasing the proportion of the land site covered by the building footprint. But while this may not increase construction cost per built square foot, it will often reduce the rent per square foot that tenants are willing to pay.



Building codes will dictate the change in construction costs as the height increases, starting with wood for shorter structures and steel for most larger structures except for the use of mass timber and flexible building codes.

Construction Loan Mechanics

Loan Commitment

Bank provides specified maximum amount based on construction budget and schedule.

Draw-Down Process

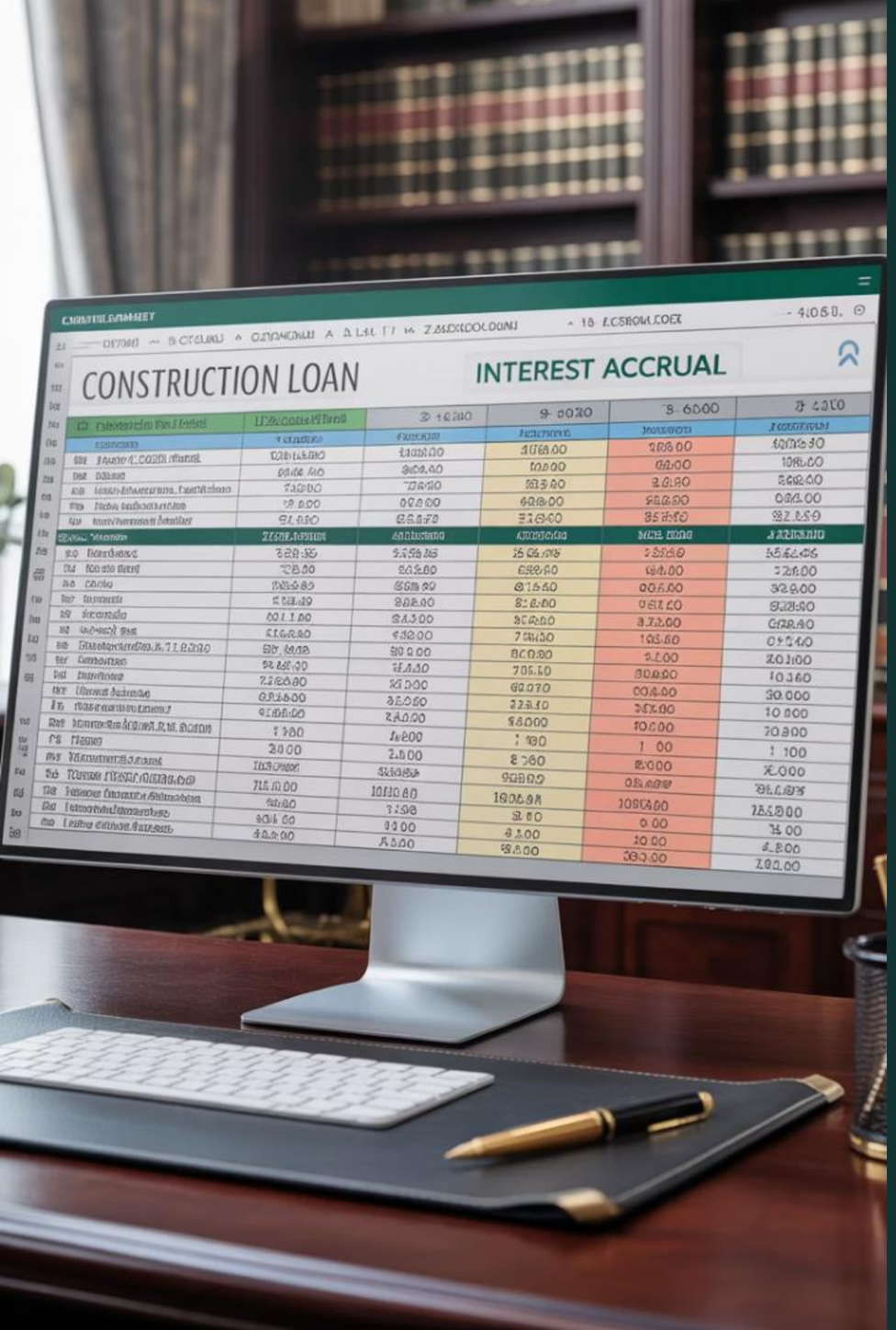
Funds are drawn as needed to pay for construction. Lender verifies physical progress.

Interest Accrual

Interest accrues on drawn funds and compounds over time, adding to loan balance.

Take-Out Financing

Construction loan is paid off at completion with permanent financing or sale.



Construction Loan Interest Accrual Example

Month	New Draw	Current Interest	New Loan Balance
1	$500,000	$3,333	$503,333
2	$750,000	$8,356	$1,261,689
3	$1,500,000	$18,411	$2,780,100

This example shows how interest compounds during construction. The loan balance ($2,780,100) exceeds direct costs ($2,750,000) due to accrued interest. This financing cost is a separate item in the construction budget.

Construction and Absorption Budget Components

Hard Costs

- Land acquisition
- Site preparation
- Building materials
- Labor costs
- Equipment rental
- Tenant finish

Soft Costs

- Loan fees
- Construction interest
- Legal fees
- Architectural fees
- Engineering fees
- Marketing costs

Lease-up Costs

- Leasing commissions
- Tenant improvements
- Working capital
- Marketing expenses
- Operating deficits

The Trend Toward Greener Development

Energy Efficiency

LED lighting, occupancy sensors, and reduced plug loads through monitoring

Renewable Energy

Solar panels, wind turbines, and natural gas fuel cells

Water Conservation

Reduced flow rainwater capture, and gray water recycling

Sustainable Materials

Local and recycled materials, renewable wood, and non-toxic products

Sustainable development promotes environmental and social improvement. Today's market standards require higher energy and water efficiency, with many tenants insisting on these features.

Simple Financial Feasibility Analysis (SFFA)

Front-Door Analysis

Starts with land and construction costs to determine required minimum rent. Used for site-looking-for-a-use projects.

Back-Door Analysis

Starts with expected market rents to determine affordable site acquisition cost. Used for use-looking-for-a-site projects.

Borrow-to-the-Hilt Assumption

Assumes developer will take out maximum permanent loan the completed project will support.

SFFA is widely used in practice but only assesses feasibility, not investment desirability. It relies on mortgage market information rather than complete capital market analysis.

SFFA Front-Door Procedure

Site acquisition costs	
+ Construction cost	
= *Total expected development cost*	
Loan to Value ratio	
= *Permanent mortgage*	
× Annualized mortgage constant	
= *Cash required for debt service*	
× Lender-required Debt-Coverage-Ratio	
= *Required Net-Operating-Income*	
+ Expected landlords' operating expenses	
= *Required Effective Gross Income*	
+ Expected occupancy rate	
= *Required gross revenue*	
÷ Leasable square foot	
= ***Rent required per square foot***	Order of calculations ↓

Front-Door SFFA Example: Office Rehab

$1.24M

Total Costs

Site, shell, and rehab costs

$992K

Mortgage Amount

At 80% LTV ratio

$152K

Required NOI

With 1.2x debt coverage

$10.27

Required Rent/SF

To achieve feasibility

With market rents around $10/SF, this rehab project appears feasible. The analysis used conservative assumptions for vacancy and operating expenses.

SFFA Back-Door Procedure

Total leasable square foot*
× Expected average rent per square foot
= *Project Potential Gross Income*

- Vacancy allowance
= *Expected Effective Gross Income*

- Projected landlords' operating expenses
= *Expected Net Operating Income*

÷ Debt Service Coverage Ratio
÷ Annualized mortgage constant
÷ Maximum loan to value ratio
= *Maximum supportable total project costs*

Q: Can it be built for this?

- Expected construction costs (other than site)
= ***Maximum supportable site acquisition cost***

Q: Can we acquire the site for this or less?

* equals the building efficiency ratio times the gross area

Back-Door SFFA Example: New Office Building

1. **Market Rent**
   $12/SF with 8% vacancy
2. **NOI Calculation**
   $265,440 after expenses
3. **Mortgage Analysis**
   $2,048,735 supportable with 9% interest
4. **Land Value**
   $591,647 supportable for site acquisition

With the seller asking $500,000 for the site and supportable land value of $591,647, this project appears financially feasible.

Other Development Evaluation Methods

Profit Margin Ratio

Expected project value divided by total costs. Developers often target 20% margin.

Enhanced Cap Rate on Cost

Applies higher cap rate to development costs to account for extra risk.

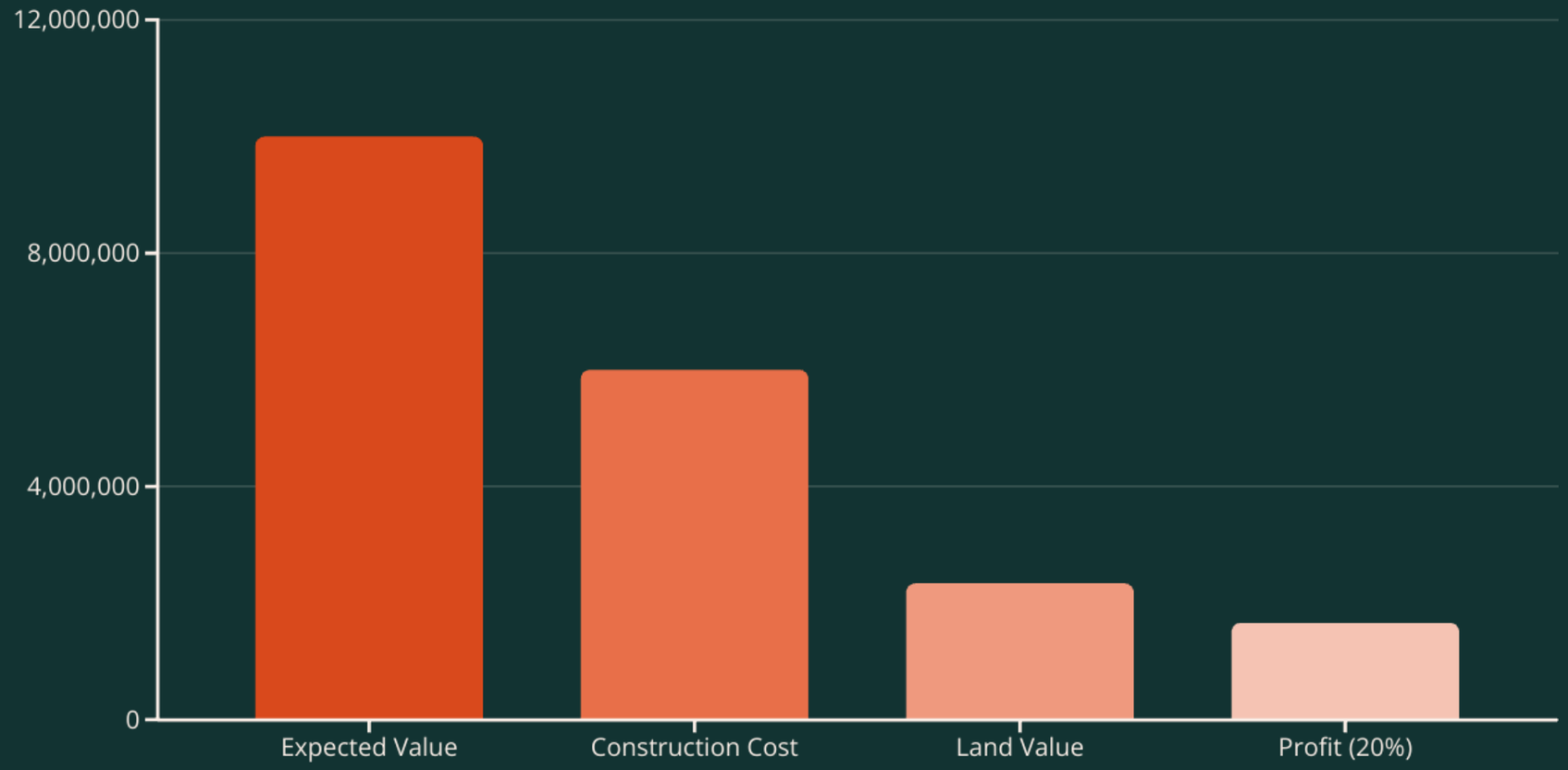
Blended Long-Run IRR

Calculates single IRR over development and 5-10 year operational phase.

Net Present Value (NPV)

Most rigorous approach but rarely used explicitly in practice.

Other criteria for Feasibility: Profit Margin Method Example



With an expected property value of $10M, construction costs of $6M, and a target 20% profit margin, the supportable land value is $2.33M. This method ignores time value of money and risk adjustments.

Problems with Ad Hoc Approaches

Ignores Time Value

Most methods don't properly account account for present value discounting

Overrelies on Debt

SFFA assumes maximum debt financing, unrealistic for larger developers

Blends Risk Profiles

Mixes different investment phases with different risk characteristics

Lacks Opportunity Cost

Fails to quantify the opportunity cost of capital rigorously

These ad hoc procedures have practical utility but don't provide complete or correct financial economic evaluation of development projects.

Why NPV Should Be Used

Wealth Maximization

NPV rule is grounded in the principle of wealth maximization. It ensures developers cover their cost of capital.

Successful developers implicitly apply NPV principles even if they don't explicitly use the formula.

Market Relevance

As Wall Street and institutional investors become more involved in real estate, rigorous methods consistent with corporate finance become necessary.

NPV allows proper comparison with other investment opportunities in a portfolio context.

Key Takeaways

Real estate development is a complex, iterative process requiring expertise across across multiple disciplines. While current practice relies on simplified feasibility methods, rigorous NPV analysis provides the most accurate evaluation. Development projects contain unique risks requiring higher returns, and sustainable building practices are increasingly important.