



CCIM Institute
Commercial Real Estate's
Global Standard for Professional Achievement

Financial Modeling for Real Estate Development

CCIM Ward Center

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Professional Activities



- Professor at the University of Denver
- Senior Instructor for CCIM
- Industry Consulting
- Expert Witness
- ARES
- ULI
- NAIOP
- FRICS



Direct Capitalization/Spread Analysis CCIM Development Workshop

Property Data			Development Costs			Potential Construction Financing			Market Metrics		
Land Area	Ft2	120,000	Land Cost	\$ per Ft2	\$ 9.00	Annual Interest Rate	%	5.00%	Market Cap Rate	%	6.00%
Gross Building Area	Ft2	45,000	Site Infrastructure	\$ Amount	\$ 150,000	Loan Term	Months	24	Required Development Spread	%	1.50%
Rentable Area Ratio	%	100%	Construction Hard Costs	\$ per Ft2	\$ 100.00	Loan to Total Project Cost Ratio	%	70%			
Rental Income	\$ per Ft2/Yr	\$ 18.00	Hard Cost Contingency	%	10.00%						
Parking Income	\$/Yr	\$ 2,000	Project Soft Costs	\$ per Ft2	\$ 30.00						
Other Income	\$/Yr	\$ 3,000	Soft Cost Contingency	%	10.00%						
VACL (stabilized)	%	8.00%	Interest Reserves	\$ Amount	\$ 150,000						
Operating Expenses	\$ per Ft2/Yr	\$ 3.00	Operating Reserves	\$ Amount	\$ 75,000						

Calculation of Floor Area Ratio	
Gross Building Area	_____
÷ Land Area	_____
= Floor Area Ratio (FAR)	_____

Calculation of Stabilized NOI	
<i>Rentable Square Feet (RSF)</i>	
Potential Rental Income	_____
-VACL	_____
=Effective Rental Income	_____
+Other income	_____
+Parking Income	_____
=Gross Operating Income	_____
-Operating Expenses	_____
=Net Operating Income (NOI)	_____

Calculation of Total Project Cost	
Land Cost	_____
+Site Infrastructure Costs	_____
+Construction Hard Costs	_____
+Hard Costs Contingency	_____
+Project Soft Costs	_____
+Soft Cost Contingency	_____
+Interest Reserves	_____
+Operating Reserves	_____
=Total Project Cost	_____
<i>Total Project Cost per GBA</i>	_____
<i>Total Project Cost per RSF</i>	_____

Calculation of Property Value	
Net Operating Income	_____
÷Market Cap Rate	_____
=Market Value of Property	_____
<i>Property Value psf</i>	_____

Net Cap Rate Calculations	
Net Operating Income	_____
÷Total Project Costs	_____
=Return On Total Costs	_____
-Required Spread	_____
=Required Disposition Cap Rate	_____
-Market Cap Rate	_____
=Net Cap Rate	_____
<i>Indicated Decision</i>	

Calculation of Potential Development Profit	
Market Value of Property	_____
-Total Project Cost	_____
=Potential Development Profit	_____

Calculation of Developer Equity	
Total Project Cost	_____
-Total Construction Funding	_____
=Developer Equity	_____

Calculation of Maximum Land Price	
Market Cap Rate	_____
+Required Spread	_____
=Required Return on Costs	_____
xTotal Hard and Soft Costs	_____
=Required Building Income	_____
Net Operating Income	_____
-Required Building Income	_____
=Residual Land Income	_____
÷Required Return on Costs	_____
=Developer's Maximum Land Price	_____

Calculation of Equity Multiple	
Potential Development Profit + CFO	_____
÷Cash Required from Developer	_____
=Equity Multiple	_____

Direct Capitalization/Spread Analysis CCIM Development Workshop

Property Data			Development Costs			Potential Construction Financing			Market Metrics		
Land Area	<i>Ft2</i>	120,000	Land Cost	<i>\$ per Ft2</i>	\$ 9.00	Annual Interest Rate	%	5.00%	Market Cap Rate	%	6.00%
Gross Building Area	<i>Ft2</i>	45,000	Site Infrastructure	<i>\$ Amount</i>	\$ 150,000	Loan Term	<i>Months</i>	24	Required Development Spread	%	1.50%
Rentable Area Ratio	%	100%	Construction Hard Costs	<i>\$ per Ft2</i>	\$ 100.00	Loan to Total Project Cost Ratio	%	70%			
Rental Income	<i>\$ per Ft2/Yr</i>	\$ 18.00	Hard Cost Contingency	%	10.00%						
Parking Income	<i>\$/Yr</i>	\$ 2,000	Project Soft Costs	<i>\$ per Ft2</i>	\$ 30.00						
Other Income	<i>\$/Yr</i>	\$ 3,000	Soft Cost Contingency	%	10.00%						
VACL (stabilized)	%	8.00%	Interest Reserves	<i>\$ Amount</i>	\$ 150,000						
Operating Expenses	<i>\$ per Ft2/Yr</i>	\$ 3.00	Operating Reserves	<i>\$ Amount</i>	\$ 75,000						

Calculation of Floor Area Ratio	
Gross Building Area	45,000
÷ Land Area	120,000
= Floor Area Ratio (FAR)	37.50%

Calculation of Stabilized NOI	
<i>Rentable Square Feet (RSF)</i>	45,000
Potential Rental Income	\$ 810,000
-VACL	\$ 64,800
=Effective Rental Income	\$ 745,200
+Other income	\$ 3,000
+Parking Income	\$ 2,000
=Gross Operating Income	\$ 750,200
-Operating Expenses	\$ 135,000
=Net Operating Income (NOI)	\$ 615,200

Calculation of Total Project Cost	
Land Cost	\$ 1,080,000
+Site Infrastructure Costs	\$ 150,000
+Construction Hard Costs	\$ 4,500,000
+Hard Costs Contingency	\$ 450,000
+Project Soft Costs	\$ 1,350,000
+Soft Cost Contingency	\$ 135,000
+Interest Reserves	\$ 150,000
+Operating Reserves	\$ 75,000
=Total Project Cost	\$ 7,890,000
<i>Total Project Cost per GBA</i>	\$ 175.33
<i>Total Project Cost per RSF</i>	\$ 175.33

Calculation of Property Value	
Net Operating Income	\$ 615,200
÷Market Cap Rate	6.00%
=Market Value of Property	\$ 10,253,333
<i>Property Value psf</i>	\$ 227.85

Net Cap Rate Calculations	
Net Operating Income	\$ 615,200
÷Total Project Costs	\$ 7,890,000
=Return On Total Costs	7.80%
-Required Spread	1.50%
=Required Disposition Cap Rate	6.30%
-Market Cap Rate	6.00%
=Net Cap Rate	0.30%
<i>Indicated Decision</i>	Yes

Calculation of Potential Development Profit	
Market Value of Property	\$ 10,253,333
-Total Project Cost	\$ 7,890,000
=Potential Development Profit	\$ 2,363,333

Calculation of Developer Equity	
Total Project Cost	\$ 7,890,000
-Total Construction Funding	\$ 5,523,000
=Developer Equity	\$ 2,367,000

Calculation of Maximum Land Price	
Market Cap Rate	6.00%
+Required Spread	1.50%
=Required Return on Costs	7.50%
xTotal Hard and Soft Costs	\$ 6,810,000
=Required Building Income	\$ 510,750
Net Operating Income	\$ 615,200
-Required Building Income	\$ 510,750
=Residual Land Income	\$ 104,450
÷Required Return on Costs	7.50%
=Developer's Maximum Land Price	\$ 1,392,667

Calculation of Equity Multiple	
Potential Development Profit + CFO	\$ 4,730,333
÷Cash Required from Developer	\$ 2,367,000
=Equity Multiple	2.00

Develop and Sell or Develop and Hold DCF Model

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Data Input Area

Use Data from Direct Cap/Spread Analysis & Sources and Uses if Available

Develop and Sell at EOY 2

Stabilized NOI Estimate	\$	615,200
NOI Inflation		1.00%
Projected NOI EOY 3		
Projected Market Cap Rate		6.00%
Sale Value at EOY 2		
-Selling Costs		5.00%
-Construction Loan Balance	\$	5,750,000 <i>including reserves</i>
=Net proceeds from Sale EOY 2		

Development Cash Flows

CF0	\$	(2,367,000)
CF1	\$	-
CF2		
IRR		
NPV		

Develop & Hold

Disposition Costs of Sale	5.00%
Disposition Cap Rate	6.00%

Permanent Financing Data:

LTV	75.00%
DSCR	1.25
Loan Points	2.00%
Loan Interest Rate	5.00%
Loan Amort	25

Investor Data:

Disc Rate for Development	25%
Disc Rate for Holding	14%

Inflation/Variable Rates (for Hold Scenario):

	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	YEAR 6	YEAR 7	YEAR 8
NOI Increase	NA	NA	NA	1.00%	1.00%	2.00%	2.00%	2.00%

Cash Flow in Year 3 From Permanent Financing:

Maximum Loan Amount

LTV Loan	
ADS Constant	
DCR Loan	
Max Loan	

Permanent Loan Proceeds

Max Perm Loan	
- Loan Fees	
-Construction Loan Payoff	
Additional Cash Flow in Year 3	

Before Tax Cash Flow Analysis:

Before Tax Cash Flows

	Yr1	Yr2	Yr3	Yr4	Yr5	Yr6	Yr7	Yr8
Net Operating income	\$ -	\$ -						
-Annual Debt Service	\$ -	\$ -						
=Before Tax Cash Flow	\$ -	\$ -						

Before Tax IRR & MIRR

BTIRR	CF0	CF1	CF2	CF3	CF4	CF5	CF6	CF7

Before Tax Sale

Sales Price	
Selling Costs	
-Mtg Bal	
SPBT	

Before Tax NPV

Discount Rate	
Investment Value	
NPV	

Develop and Sell or Develop and Hold DCF Model

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Data Input Area

Use Data from Direct Cap/Spread Analysis & Sources and Uses if Available

Develop and Sell at EOY 2

Stabilized NOI Estimate	\$ 615,200
NOI Inflation	1.00%
Projected NOI EOY 3	\$ 627,566
Projected Market Cap Rate	6.00%
Sale Value at EOY 2	\$ 10,459,425
-Selling Costs	\$ 522,971 5.00%
-Construction Loan Balance	\$ 5,750,000 including reserves
=Net proceeds from Sale EOY 2	\$ 4,186,454

Development Cash Flows

CF0	\$ (2,367,000)
CF1	-
CF2	\$ 4,186,454
IRR	33.0%
NPV	\$ 312,331

Develop & Hold

Disposition Costs of Sale	5.00%
Disposition Cap Rate	6.00%

Permanent Financing Data:

LTV	75.00%
DSCR	1.25
Loan Points	2.00%
Loan Interest Rate	5.00%
Loan Amort	25

Investor Data:

Disc Rate for Development	25%
Disc Rate for Holding	14%

Inflation/Variable Rates (for Hold Scenario):

	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	YEAR 6	YEAR 7	YEAR 8
NOI Increase	NA	NA	NA	1.00%	1.00%	2.00%	2.00%	2.00%

Cash Flow in Year 3 From Permanent Financing:

Maximum Loan Amount		Permanent Loan Proceeds	
LTV Loan	\$ 7,844,569	Max Perm Loan	\$ 7,156,759
ADS Constant	0.070151	- Loan Fees	\$ 143,135
DCR Loan	\$ 7,156,759	-Construction Loan Payoff	\$ 5,750,000
Max Loan	\$ 7,156,759	Additional Cash Flow in Year 3	\$ 1,263,624

Before Tax Cash Flow Analysis:

Before Tax Cash Flows

	Yr1	Yr2	Yr3	Yr4	Yr5	Yr6	Yr7	Yr8
Net Operating income	\$ -	\$ -	\$ 627,566	\$ 633,841	\$ 640,180	\$ 652,983	\$ 666,043	\$ 679,364
-Annual Debt Service	\$ -	\$ -	\$ 502,052	\$ 502,052	\$ 502,052	\$ 502,052	\$ 502,052	\$ 502,052
=Before Tax Cash Flow	\$ -	\$ -	\$ 125,513	\$ 131,789	\$ 138,127	\$ 150,931	\$ 163,990	\$ 177,312

Before Tax IRR & MIRR

BTIRR	18.90%
CF0	\$ (2,367,000)
CF1	\$ -
CF2	\$ -
CF3	\$ 1,389,137
CF4	\$ 131,789
CF5	\$ 138,127
CF6	\$ 150,931
CF7	\$ 163,990

Before Tax Sale

Sales Price	\$ 11,322,728
Selling Costs	\$ 566,136
-Mtg Bal	\$ 6,339,471
SPBT	\$ 4,417,121

Before Tax NPV

Discount Rate	14%
Investment Value	\$2,986,942
NPV	\$619,942

Sources and Uses Example

Sources		
Construction Loan	\$ 5,523,000	
Mezzanine Loan	\$ -	
Borrower Equity		
Total Sources		

Summary	
Sources	
Construction Loan	
Mezzanine Loan	
Borrower Equity	
Total Sources	
Uses	
Total Site Acquisition	
Total Soft Costs	
Total Hard Costs	
Interest Reserves	
Operating Reserves	
Origination Fee	
Development Fee	
Total Uses	

Uses	
Land	\$ 1,080,000
Total Site Acquisition	
Appraisal	\$ 10,000
Architect	\$ 25,000
Builders Risk Insurance	\$ 60,000
Building Permits	\$ 75,000
Civil Engineer	\$ 85,000
Entitlement Fees	\$ 175,000
Environmental	\$ 60,000
Geo Tech	\$ 28,500
General Liability Insurance	\$ 30,500
Impact Fees	\$ 55,000
Borrower Legal--Closing	\$ 20,000
Borrower Legal--Pre-closing	\$ 15,000
Lender Inspections (Post Closing)	\$ 18,000
Lender Legal and Other Closing	\$ 35,000
Other Professional	\$ 150,000
Other (G&A)	\$ 85,000
Other (Loan Cost)	\$ 60,000
Other (Advertising)	\$ 25,000
Real Estate Taxes	\$ 20,000
Survey	\$ 10,000
Title-Doucment Stamps	\$ 3,000
Soft Costs (subtotal)	
Soft Cost Contingency @ 15.00%	15.00%
Total Soft Costs	
Construction Cost (Core & Shell)	\$ 4,000,000
Construction Contingency @ 15.00%	15.00%
Demolition	\$ -
Environmental Remediation	\$ 5,000
FF&E	\$ -
GC Fee	\$ 125,000
General Conditions	\$ 50,000
Security	\$ 30,000
Signage	\$ 35,000
Sitework	\$ 150,000
Total Hard Costs	
Total Site, Hard and Soft Costs	
Interest Reserves	\$ 150,000
Operating Reserves	\$ 75,000
Origination Fee @ 1.50%	1.50%
Development Fee @ 4.00%	4.00%
Total Uses	

Land and Building	\$ 820,000	\$ 820,000
On Site/Off Site Work (Cost	\$ 2,316,425	\$ 2,316,425
On Site/Off Site Work (Wate	\$ 1,564,000	\$ 1,564,000
On Site/Off Site Work (GC W	\$ 433,908	\$ 433,908
Construction	\$ 21,089,638	\$ 21,089,638
3rd Party/Bank Inspections/	\$ 29,706	\$ 29,706
Other Construction Interim	\$ 938,208	\$ 938,208
Professional Fees	\$ 1,258,340	\$ 1,258,340
Permanent Financing Costs	\$ 30,000	\$ 30,000
Soft Costs Tax Credit Eligible	\$ 335,874	\$ 335,874
Soft Costs Tax Credit Ineligit	\$ 296,815	\$ 296,815
Syndication Costs	\$ 60,000	\$ 60,000
Construction Loan Eligible Ir	\$ 353,102	\$ 353,102
Interest Expense Tax Credit	\$ 563,354	\$ 563,709
Developer Fee Category	\$ 500,000	\$ 2,236,024
Developer Fee Category for	\$ 93,392	\$ 109,500
Project Reserves		\$ 462,000

Sources and Uses Example

Sources		
Construction Loan	\$ 5,523,000	70%
Mezzanine Loan	\$ -	0%
Borrower Equity	\$ 2,364,979	30%
Total Sources	\$ 7,887,979	100%

Summary	
Sources	
Construction Loan	\$ 5,523,000
Mezzanine Loan	\$ -
Borrower Equity	\$ 2,364,979
Total Sources	\$ 7,887,979
Uses	
Total Site Acquisition	\$ 1,080,000
Total Soft Costs	\$ 1,201,750
Total Hard Costs	\$ 4,995,000
Interest Reserves	\$ 150,000
Operating Reserves	\$ 75,000
Origination Fee	\$ 82,845
Development Fee	\$ 303,384
Total Uses	\$ 7,887,979

Uses	
Land	\$ 1,080,000
Total Site Acquisition	\$ 1,080,000
Appraisal	\$ 10,000
Architect	\$ 25,000
Builders Risk Insurance	\$ 60,000
Building Permits	\$ 75,000
Civil Engineer	\$ 85,000
Entitlement Fees	\$ 175,000
Environmental	\$ 60,000
Geo Tech	\$ 28,500
General Liability Insurance	\$ 30,500
Impact Fees	\$ 55,000
Borrower Legal--Closing	\$ 20,000
Borrower Legal--Pre-closing	\$ 15,000
Lender Inspections (Post Closing)	\$ 18,000
Lender Legal and Other Closing	\$ 35,000
Other Professional	\$ 150,000
Other (G&A)	\$ 85,000
Other (Loan Cost)	\$ 60,000
Other (Advertising)	\$ 25,000
Real Estate Taxes	\$ 20,000
Survey	\$ 10,000
Title-Doucment Stamps	\$ 3,000
Soft Costs (subtotal)	\$ 1,045,000
Soft Cost Contingency @ 15.00%	\$ 156,750
Total Soft Costs	\$ 1,201,750
Construction Cost (Core & Shell)	\$ 4,000,000
Construction Contingency @ 15.00%	\$ 600,000
Demolition	\$ -
Environmental Remediation	\$ 5,000
FF&E	\$ -
GC Fee	\$ 125,000
General Conditions	\$ 50,000
Security	\$ 30,000
Signage	\$ 35,000
Sitework	\$ 150,000
Total Hard Costs	\$ 4,995,000
Total Site, Hard and Soft Costs	\$ 7,276,750
Interest Reserves	\$ 150,000
Operating Reserves	\$ 75,000
Origination Fee @ 1.50%	\$ 82,845
Development Fee @ 4.00%	\$ 303,384
Total Uses	\$ 7,887,979