Department of Local Government Finance

Income Approach to Value Problems and Answers

2024 Level I Tutorials

Development of Allowable Expenses

Given below is the statement of expenses for a business as prepared by the owner's accountant. They are actual bank withdrawals and are assumed to be correct. In your analysis of the statement for appraisal purposes, you have decided that some items can be used as stated, others need to be eliminated, and some need to be pro-rated. Indicate with an "X" which items you would use as stated, pro-rated (over more than one year), or would eliminate from your reconstructed operating statement.

		As Stated		Pro-Rate		Eliminate	
A.	Management Fees						
B.	Advertising						
C.	Maintenance Personnel Salaries						
D.	Maintenance Personnel Benefits						
E.	Debt Service on Mortgage						
F.	Water and Sewage Fees						
G.	Electricity						
H.	Gas for Heating						
I.	New Roof						
J.	Miscellaneous Repairs						
K.	Supplies						
L.	Casualty Insurance--3 year policy						
M.	Liability Insurance						
N.	Snow Removal						
O.	Income Tax						
P.	Donation, Christmas Gift Expense						
Q.	Real Estate Taxes						

Development of Allowable Expenses

Indicate with an "X" which items you would use as stated, pro-rated (over more than one year), or would eliminate from your reconstructed operating statement.

		As Stated	Pro-Rate	Eliminate
A.	Management Fees	X		
B.	Advertising	X		
C.	Maintenance Personnel Salaries	X		
D.	Maintenance Personnel Benefits	X		
E.	Debt Service on Mortgage			X
F.	Water and Sewage Fees	X		
G.	Electricity	X		
H.	Gas for Heating	X		
I.	New Roof		X	
J.	Miscellaneous Repairs	X		
K.	Supplies	X		
L.	Casualty Insurance--3 year policy		X	
M.	Liability Insurance	X		
N.	Snow Removal	X		
O.	Income Tax			X
P.	Donation, Christmas Gift Expense			X
Q.	Real Estate Taxes			X

Income Approach
Problem # 1
Determination of Net Operating Income

You are trying to determine the value of a small retail center containing 4,500 square feet of Net Leasable Area. There are three leasable spaces in the building, and at present two of the spaces are leased. You have determined the following information:

1.) Market rent for this type of space is $22 per square foot.
2.) The owner has $3,000 per year in miscellaneous income.
3.) The market vacancy rate is 4% and the market collection loss rate is 1%.
4.) Operating Expenses from the reconstructed operating statement are $30,500.
5.) The Reserve for Replacements is $5,000.

Determine the Net Operating Income (NOI) for the subject property.

Potential Gross Income (PGI)	
Vacancy and Collection Loss	
Miscellaneous Income	
Effective Gross Income (EGI)	
Operating Expenses	
Reserves for Replacements	
Net Operating Income (NOI)	

Income Approach
Problem # 1 Answer
Determination of Net Operating Income

Potential Gross Income	$99,000
Less: Vacancy and Collection Loss	($4,950)
Add: Miscellaneous Income	$3,000
Effective Gross Income	$97,050
Less: Operating Expenses	($30,500)
Less: Reserve For Replacements	($5,000)
Net Operating Income	$61,550

Net leasable area of 4,500 Square feet times $22/Square Foot	$99,000
Vacancy loss rate of 4% plus Collection loss rate of 1% times PGI	($4,950)
Add miscellaneous income (given)	$3,000
Effective Gross Income (EGI)	$97,050
Less expenses (given)	($30,500)
Less reserves for replacements (given)	($5,000)
Net Operating Income (NOI)	$61,550

Income Approach
Problem # 2 (A)
Gross Rent Multiplier Problem

The subject property is a single family dwelling which is rented for $475 per month.
The market rent is also $475 per month. Develop a GRM from the following data and use it to calculate a possible indication of value.

Sales

	1	2	3	4	5
Sale Price	$60,000	$72,000	$65,000	$62,000	$68,000
Monthly Rent (EGI)	$425	$520	$460	$450	$490
GRM					

The subject property is a single family dwelling which is rented for $475 per month.
The market rent is also $475 per month. Develop a GRM from the following data and use it to calculate a possible indication of value.

<center>Sales</center>

	1	2	3	4	5
Sale Price	$60,000	$72,000	$65,000	$62,000	$68,000
Monthly Rent (EGI)	$425	$520	$460	$450	$490
GRM	141.2	138.5	141.3	137.8	138.8

GRM = Sales Price divided by the Monthly Rent (EGI)

Median is 138.8

Possible indication of value: Market rent of $475 times 138.8 = $65,930 rounded to $65,900

Income Approach
Problem # 2 (B)
Gross Income Multiplier Problem

The subject property produces Gross Annual Effective Gross Income of $72,000. Analysis of rents and sales of comparable properties rendered the following. Based upon this information calculate a Gross Income Multiplier (GIM) and then calculate indication of value for subject property.

Sale	Sale Price	EGI	Gross Income Multiplier
1	$675,000	$75,000	
2	$600,000	$68,000	
3	$720,000	$85,700	
4	$750,000	$87,500	
5	$650,000	$73,000	

Gross Income Multiplier Range

Estimated value of subject property:

Value using Low range (Low range is the lowest of the GIMs)

Value using High range (High range is the highest of the GIMs)

Value using Median

Income Approach
Problem # 2 (B) Answer
Gross Income Multiplier Problem

The subject property produces Gross Annual Effective Gross Income of $72,000. Analysis of rents and sales of comparable properties rendered the following. Based upon this information calculate a Gross Income Multiplier (GIM) and then calculate indication of value for subject property.

Sale	Sale Price	EGI	Gross Income Multiplier
1	$675,000	$75,000	9.0
2	$600,000	$68,000	8.8
3	$720,000	$85,700	8.4
4	$750,000	$87,500	8.6
5	$650,000	$73,000	8.9

Gross Income Multiplier Range
8.4
8.6
8.8
8.9
9.0

GIM = Sale Price divided by the EGI

Possible indicated range of value:
Subject property EGI of $72,000 times low range = 8.4
Subject property EGI of $72,000 times high range = 9.0
Subject property EGI of $72,000 times median range = 8.8

$604,800
$648,000
$633,600

Income Approach
Problem # 3(a)
Belle River Office Building
Determine PGI, EGI, and NOI

You are appraising an office building in the Belle River complex. The building is three stories high and contains 20,000 square feet on each floor. The net leasable area on each floor is 17,500 square feet. There are three offices on each floor, but the square footage per office varies with the client. The leases have been entered into at various times over the past four years. The current rent roll is as follows:

First Floor	Area	Total Rent Paid
Thomas and Associates	3,750	$ 69,375
Katz, Katz, and Doggz	8,250	$ 123,750
Kelley Engineering	5,500	$ 88,000
Second Floor		
Second Job Agency	4,000	$ 72,000
Paperman Publishing	9,200	$ 142,600
Vacant	4,300	$ -
Third Floor		
Silverman and Goldman	8,000	$ 128,000
Leland Entertainment	3,000	$ 51,000
Media Heaven Ad Agency	6,500	$ 110,500

In researching the market, you have found that recently negotiated office rent in the same type location is running $20.10 per square foot.

What is the Potential Gross Income for your subject property?

The market collection loss for office space in this area is 1.2%. Using this rate develop a vacancy and collection loss rate for the subject building.

Using the above information, what is the Effective Gross Income of the subject?

Income Approach
Problem # 3(a) Answers
Belle River Office Building - Determine PGI, EGI, and NOI

PGI
17,500 sq. ft. NLA on each floor; complex has 3 floors.
17,500 x 3 =52,500 sq ft.

Market Rent is $20.10 per sq. ft.
$20.10 x 52,500 =$1,055,250

Vacancy Rate
There is one vacant office of 4,300 sq. ft.
4,300 ÷ 52,500 =8.2%

Vacancy and Collection Loss Rate (V&C)
Vacancy Rate is 8.2% and the Collection Loss Rate is 1.2%.
8.2% + 1.2% =9.4%

EGI
PGI = $1,055,250 and the V&C = 9.4%
No Miscellaneous Income is listed.

PGI $1,055,250
- V&C -$99,194
+ Misc. Inc. $0
= EGI $956,056

The property management company of Bell River Complex (from slide 5) has furnished you with this operating statement. Upon further analysis, you have determined that the operating statement is incorrect for ad valorem purposes. Reconstruct the operating statement using information from slide 6 (PGI, V&C, and EGI), remove any improper expenses listed below, and find the correct NOI for the property.

Belle River Office Building
Operating Statement as filed

Potential Gross Income	$ 785,225.00	
Less: Vacancy and Collection Loss 8.2%)	$ (64,388.00)	
Add: Miscellaneous Income	$0.00	
Effective Gross Income		$ 720,837.00
Less operating expenses:		
Management Fees (10% of EGI)	$ (72,084.00)	
Property Taxes	$ (28,457.00)	
Lawn Care	$ (2,300.00)	
Supplies/Maintenance	$ (7,248.00)	
Maintenance Salaries/Benefits	$ (28,340.00)	
Common Lighting	$ (1,345.00)	
Water and Sewer	$ (6,573.00)	
Electricity	$ (11,965.00)	
Gas	$ (15,996.00)	
Liability Insurance	$ (7,100.00)	
Debt Service	$(173,900.00)	
Snow Removal	$ (1,100.00)	
Income taxes	$ (61,230.00)	
Donation to City Festival	$ (500.00)	
Christmas party for tenants	$ (1,345.00)	
Casualty Insurance (3 year policy)	$ (845.00)	
Membership in trade association	$ (1,500.00)	
Flower fund	$ (734.00)	
Total operating expenses		$(422,562.00)
Less Reserve for Replacements		$ (22,500.00)
Net Operating Income		$ 275,775.00

Income Approach Problem # 3(b) Answer
Belle River Office Building - Determine PGI, EGI, and NOI

First Floor		Area	Market Rent	PGI	
Thomas and Associates		3,750	$20.10	$75,375	
Katz, Katz and Doggz	17,500	8,250	$20.10	$165,825	
Kelley Engineering		5,500	$20.10	$110,550	
Second Floor					
Second Job Agency		4,000	$20.10	$80,400	
Paperman Publishing	17,500	9,200	$20.10	$184,920	
Vacant		4,300	$20.10	$86,430	
Third Floor					
Silverman & Goldman		8,000	$20.10	$160,800	
Leland Entertainment	17,500	3,000	$20.10	$60,300	
Media Heaven Advertising Agency		6,500	$20.10	$130,650	
Total Net Leasable Area =	52,500			$1,055,250	PGI

NLA Vacancy Rate		
4300/52500		8.2%
Collection Rate Loss	➕	1.2%
V & C Rate Loss =		9.4%

PGI		$1,055,250
VAC & COLL LOSS	✖	9.4%
V&C $ Amount =		$99,194.00

POTENTIAL GROSS INCOME	$1,055,250	PGI
LESS: VACANCY LOSS AND COLLECTION LOSS	($99,194)	
ADD: MISCELLANEOUS INCOME	$0	
EFFECTIVE GROSS INCOME	$956,056	EGI
LESS: OPERATING EXPENSES		
MANAGEMENT FEES (10% OF EGI)	($95,606)	
LAWN CARE	($2,300)	
SUPPLIES/MAINTENANCE	($7,248)	
MAINTENANCE SALARIES/BENEFITS	($28,340)	
COMMON LIGHTING	($1,345)	
WATER & SEWER	($6,573)	
ELECTRICITY	($11,965)	
GAS	($15,996)	
LIABILITY INSURANCE	($7,100)	
SNOW REMOVAL	($1,100)	
CASUALTY INSURANCE 3 YR POLICY--PRO RATE 845/3	($282)	
MEMBERSHIP IN TRADE ASSOCIATION	($1,500)	
RESERVE FOR REPLACEMENTS	($22,500)	
NET OPERATING INCOME	$754,201	NOI

Income Approach
Practice Problem # 1
Developing NOI and Cap Rates

Potential Gross Income	$150,000
Vacancy and Collection Loss	10%
Operating Expense	$25,000
Christmas Gift	$2,500
Property Value	$800,000
Loan to value ratio	0.4

The above is given to you, develop the NOI and the Overall Capitalization Rate.

Net operating Income _____

Overall Cap Rate _____

Income Approach
Practice Problem # 1 Answer
Developing NOI and Cap Rates

PGI	$150,000
V & C Loss ($150,000*10%)	-$15,000
Misc Inc	$0
Effective Gross Income	$135,000
Operating Expense (Given)	-$25,000
Net operating Income	$110,000

Net operating Income	$110,000
Overall Cap Rate (Income/Value=Rate)	13.8%

Income Approach
Practice Problem # 2
Developing PGI, EGI, and NOI and Value of Subject

40000 square feet
Of this, 8000 square feet is common area
Market Rent $20/square foot of net rentable area
Vacancy and Collection loss 6%
Operating Exp and Reserve for Replacement 18%
CAPITALIZATION RATE IS 10%

THE ABOVE IS GIVEN PER PROBLEM---DEVELOP PGI, EGI, & NOI AND THE VALUE OF THIS SUBJECT PROPERTY

Potential Gross Income   _____
Vacancy and Collection Loss   _____
Misc Income   _____
Effective Gross Income   _____
Operating Expenses & Reserves for Replacements   _____
Net Operating Income   _____

WHAT IS THE VALUE OF THIS PROPERTY   _____

Practice Problem # 2 Answer
Developing PGI, EGI, and NOI and Value of Subject

POTENTIAL GROSS INCOME	32,000(NLA)	x	$20(Market Rent)	=	$640,000 **PGI**
VACANCY & COLLECTION LOSS	$640,000(PGI)	x	6%(V&C Loss)	=	-$38,400
MISC. INCOME	$0				$0
EFFECTIVE GROSS INCOME					$601,600 **EGI**
OPERATING EXP AND RESERVE FOR REPLACEMENT	$601,600(EGI)	x	18%(Exp. & R.R.)	=	-$108,288
NET OPERATING INCOME					$493,312 **NOI**

IF THE CAPITALIZATION RATE IS 10%

WHAT IS THE VALUE OF THIS PROPERTY?

THE NET OPERATING INCOME FROM ABOVE IS	$493,310	
CAPITALIZATION RATE IS	10%	
ESTIMATED VALUE OF PROPERTY	$4,933,100	I ÷ R = V

Income Approach
Practice Problem # 3
Developing an Expense Ratio

Using the below information, calculate an expense ratio for each of the four properties.

SC	EGI	EXPENSES	RESERVES		SC
Riverton	$469,775	$135,330	$15,000		
Eagle Ridge	$392,440	$117,500	$12,000		
Chatham	$518,760	$148,000	$18,000		
Hyde Park	$318,780	$88,020	$10,800		

What is the Median expense ratio?

Income Approach
Practice Problem # 3 Answer
Developing an Expense Ratio

Given the above information develop an expense ratio to use on our subject property.

SC	EGI	EXPENSES	RESERVES	Total Expense	Exp Ratio
Rieverton	$469,775	$135,330	$15,000	$150,330	32.0%
Eagle Ridge	$392,440	$117,500	$12,000	$129,500	33.0%
Chatham	$518,760	$148,000	$18,000	$166,000	32.0%
Hyde Park	$318,780	$88,020	$10,800	$98,820	31.0%

The Median Expense Ratio is   32.0%

Income Approach
Practice Problem # 4 (A)
Gross Rent Multiplier Problem VIF Formula

SALES

	1	2	3	4	5
Sale Price	$45,000	$56,000	$48,000	$53,500	$58,000
Monthly Rent	$425	$520	$450	$490	$525
GRM					

MONTHLY EGI OF SUBJECT PROPERTY $475

MEDIAN

USING THE MEDIAN GRM PROVIDE AN INDICATION OF VALUE TO THE NEAREST $100.

Income Approach
Practice Problem # 4 (A) Answer
Gross Rent Multiplier Problem VIF Formula

	SALES					GRM Rank
	1	2	3	4	5	105.9
Sale Price	$45,000	$56,000	$48,000	$53,500	$58,000	106.7
Monthly Rent	$425	$520	$450	$490	$525	107.7
GRM	105.9	107.7	106.7	109.2	110.5	109.2
						110.5

MONTHLY EGI OF SUBJECT PROPERTY $475

MEDIAN   107.7

USING THE MEDIAN GRM PROVIDE AN INDICATION OF VALUE TO THE NEAREST $100.

Indication of value $475   Times   107.7 $51,200

(ROUND TO THE NEAREST $100)

Income Approach
Practice Problem # 4 (B)
Gross Income Multiplier Problem

Sale	Sale Price	Effective Gross Income	Gross Income Multiplier
A	$650,000	$75,000	
B	$590,000	$68,000	
C	$695,000	$85,700	
D	$750,000	$87,500	
E	$620,000	$73,000	

Ranges from _____ to _____

GIVEN YEARLY EGI	RANGE	VALUES
$72,000		
$72,000		

Median

PROVIDE THE HIGH AND LOW RANGE VALUES BASED ON THE GIM.

Income Approach
Practice Problem # 4 (B) Answer
Gross Income Multiplier Problem

Sale	Sale Price	Effective Gross Income	Gross Income Multiplier
A	$650,000	$75,000	8.7
B	$590,000	$68,000	8.7
C	$695,000	$85,700	8.1
D	$750,000	$87,500	8.6
E	$620,000	$73,000	8.5

Ranges from   8.1 to 8.7

$72,000	LOW	8.1	$583,200
$72,000	HIGH	8.7	$626,400
Median		8.6	$619,200

ROUNDED TO NEAREST $100

Level I

- This concludes the income approach problems and answers packet and is a reminder that should you have questions you can email these questions to the Department.

- Please send emails to Level1@dlgf.in.gov