



# Department of Local Government Finance

## **Cost Approach Problem and Answer Packet**

2025 Level II Tutorials



# Problem #1

- A commercial building contains a total of 5,200 square feet. Of this total, 3,900 square feet of the area has a wall height of 16 feet. The remaining 1,300 square feet of the area has a wall height of 14 feet. What is the average wall height for this structure?





# Problem #1 Answer

- $3,900 \text{ divided by } 5,200 = 75\%$
- $1,300 \text{ divided by } 5,200 = 25\%$
  
- $16' \times .75 = 12'$
- $14' \times .25 = 3.5'$
  
- $12' + 3.5' = 15.5'$  rounded to 16 ft.





## Problem #2

- A commercial building measures 200 feet by 500 feet. What is the PAR of this structure?





# Problem #2 Answer

- $200 + 200 + 500 + 500 = 1,400$  (perimeter)
- $200 \times 500 = 100,000$
- $1,400$  divided by  $100,000 = .014$
- $0.014 \times 100 = 1.4$  or a PAR of 1





# Problem #3

- A structure has 2,500 square feet of area of which 1,500 square feet is general office and 1,000 square feet is utility storage area. The walls of the structure are Type 1. The building measures 100 feet by 25 feet.
- Figure the adjusted base rate for this structure using the GCM schedule.





# Problem #3 Answer

- Step 1 – Figure the PAR
  - $100 + 100 + 25 + 25 = 250$
  - $100 \times 25 = 2,500$
  - $250 \text{ divided by } 2,500 = 0.10 \times 100 = 10$





# Problem #3 Answer

- Step 2 – Percentage of each use
  - 1,500 divided by 2,500 = 60% (General Office)
  - 1,000 divided by 2,500 = 40% (Utility Storage)







# Problem #3 Answer

- Step 3 – Go to appropriate Schedule in Appendix G and select the correct base rates.
  - General office - \$162.57
  - Utility storage - \$ 96.63





# Problem #3 Answer

- Step 4 – Figure adjusted rates for each use.
  - $\$162.57 \times .60 = \$97.54$
  - $\$ 96.63 \times .40 = \$38.65$





# Problem #3 Answer

- Figure new adjusted base rate by adding the individual rates together.
- $\$97.54 + \$38.65 = \$136.19$





## Problem #4

- A fire-resistant building with exterior walls of brick measures 100' x 180'. Twenty-five percent of the building is used as industrial office space, and the remainder of the building is used as light warehousing. The office space has a wall height of 12 feet and the warehouse space has a wall height of 18 feet.
- What is the average wall height?
- What is the adjusted base rate?





# Problem #4 Answer

- Area:  $100 \times 180 = 18,000$  sq. ft
- Perimeter:  $100 + 100 + 180 + 180 = 560$  linear feet
- $560 / 18,000 = .03 \times 100 = \text{PAR } 3$
  
- $12' \times 25\% = 3'$
- $18' \times 75\% = 13.50'$





# Problem #4 Answer

- $3' + 13.50' = 16.5'$  rounded to  $17'$  so the average wall height is 17 feet.
- Since the office walls are 12 feet, you need to make a positive 5-foot adjustment on it.
- Since the warehouse walls are 18 feet, you need to make a negative 1-foot adjustment on it.





# Problem #4 Answer

- Industrial Office: base rate is \$103.13, adjustment is 5' x \$2.02 for a total of \$113.23.
- Light Warehouse: base rate is \$64.88, minus adjustment of 1' x \$1.14 for a total of \$63.74.





# Problem #4 Answer

- $\$113.23 \times 25\% = \$28.31$
- $\$63.74 \times 75\% = \$47.81$
- $\$28.31 + \$47.81 =$  adjusted rate of  $\$76.12$  for the building.







# Problem #4 Answer

- When you are using an average wall height, you must take into consideration the original wall heights of each part of the building and make wall height adjustments as necessary to the base rate.





## Problem #5

- A structure has 3,000 square feet of area, of which 1,800 square feet is fire resistant. The remainder of the building is constructed with fireproof steel. The PAR is 8. The exterior walls are Type 1. The building is used as a bank. What is the amount of adjustment, per square foot, necessary to account for the fireproof steel framing?





# Problem #5 Answer

- $1,200 \text{ square feet} / 3,000 \text{ square feet} = 40\%$
- Fireproof steel frame adjustment:  $\$14.11 \times 40\% = \$5.64$





# Problem #6

- A parking lot of 20,000 square feet is paved with 2 inches of asphalt over an 8-inch base. It is located in Greene County and is in average condition with a quality grade of C-1.
- It has 200 linear feet of metal guardrail on one side, which is also in average condition, with a quality grade of C. Both were installed in 1993.
- What is the total true tax improvement value?





# Problem #6 Answer

- Since the square footage of the parking lot is 20,000, the base rate is \$2.57, and then you add \$0.40 for the 3” of base, so you start with a rate of \$2.97. However, the lot is a C-1 grade, so you need to account for that.
- $\$2.97 \times 0.95 = \$2.82$  for our base rate.
- Now you need to account for the location multiplier, 0.91, so  $\$2.82 \times 0.91 = \$2.57$  (our adjusted rate)





# Problem #6 Answer

- You take  $\$2.57 \times 20,000 = \$51,400$  for the replacement cost.
- Next is the depreciation. The lot is 32 years old and in average condition, so the depreciation percentage is 80%.
- $\$51,400 \times .80 = \$41,120$  and  $\$51,400 - \$41,120 = \$10,280$  remainder value
- Or  $\$51,400 \times .20 = \$10,280$  remainder value





# Problem #6 Answer

- Taking the remainder value to the nearest \$100, our asphalt has a true tax value of \$10,300.
- The guardrail has a base rate of \$23.76, and since it is a C grade, you do not have to make any grade adjustment.
- You do need to make the adjustment for the location. Taking the  $0.91 \times \$23.76$ , gives you an adjusted rate of \$21.62.
- Then just take the 200 linear feet  $\times \$21.62 = \$4,320$ .





## Problem #6 Answer

- Looking up the depreciation for the guard rail, it is also 80%, so  $\$4,320 \times .80$  and subtracting (or  $.20$  and not subtracting, whichever is easier for you) gives us a remainder value for the guard rail of  $\$860$ , rounded to  $\$900$  for the true tax value.
- Adding our paving to the guardrail amount, you should have a total true tax improvement value of  $\$11,200$ .









# Class Problem #7

- This is a fast-food restaurant built on a slab in Carroll County in 2005. It contains 1,902 square feet and has a perimeter of 202 linear feet. It also has a commercial heating/air conditioning package that heats and cools the entire 1,902 square feet. It is a quality grade of C and is in average condition. The exterior walls are brick.
- There is 18,000 square feet of asphalt paving on a 2" over 8" base. It was put down at the same time as the construction date of the building. It is a quality grade of C +1 and is in average condition.
- What is the total improvement value of this property?



IMPROVEMENT DATA AND COMPUTATIONS

Walls	Roofing
Brick	Built - up
Stone	Metal
Concrete	Slate / Tile
Frame or Metal	Shingle
C.B. or Tile	
	Insulation

**Level II Cost Approach**  
**Class Problem # 7 Answer (Back of PRC )**

Paving = under 20,000 sq. ft. \$2.81 + \$.40 for  
 3 " base = \$3.21

\$3.21 X 105% for C + 1 Grade = \$3.37 base rate.

\$3.37 X 92% L/M = \$3.00 adj. rate X 18,000 sq. ft.  
 = \$54,000

Actual Age 20

Effective Age 20

Framing	B
Wood Joist	
Fire Resistant	
Fire Proof Steel	
Reinf. Concrete	
Flooring	B
Concrete	
Wood	
Tile or Carpet	
Finish Type	B
Unfinished	
Semifinished	
Finished Open	
Finished Divided	
Use	B
Store	
Office	
Apartment	
Vacant or Aband.	
Heating & Air Conditioning	B
No Heating	
Central Warm Air	
Hot Water or Steam	
Unit Heating	
Central Air	
Package or Unit Air	
Sprinkler	
Plumbing Fixtures	# TF
Full Bath	
Half Bath	
Extra Fixtures	
TOTAL	0

Circle One →	1 or A	2 or B	3 or C	4 or D
Pricing Key	Fast Food			
S. F. Area	1,902			
Effective Perimeter				
P. A. R.				
Number of Units				
Average unit size				
Floor	Hgt.	Rate	Hgt.	Rate
Basement				
1st		\$199.52		
2nd				
3rd				
4th				
Frame Adj.	±			
Wall Hgt. Adj.	±			
Base Price	\$199.52			
B. P. A. %	100%			
Sub-total	\$199.52			
Unit Finish				
Interior Finish				
Div./Pin Walls				
Lighting				
Heating/Air Cond.				
Sprinkler				
S. F. Price	\$199.52			
Area	1,902			
Sub.-total	\$379,490			
Plumbing				
Special Features				
Exterior Features				
TOTAL BASE	\$379,490			
Location Multiplier	92%			
Grade Factor	100%			
Replacement Cost	\$349,130			

Other Fixtures	G/F	ES	SS
Wash Fountain			
Circular 36"			
Circular 54"			
Semi-circular 36"			
semi-circular 54"			
Industrial Gang Sinks			
4' long, 4 man			
8' lone, 8 man			
Shower-Column			
Circular, 5 per			
semi-circular, 3 per			
Corner, 2 per			
Shower Multi-Stall			
Circular, 5 per			
Semi-circular, 3 per			
Corner, 2 per			
No. Fixtures			
Gang Shower Heads			
Drinking Fountains			
Refrigerated Water Coolers			
.....with Hot & Cold Water			
Emergency Shower/eye Wash			

SPECIAL FEATURES		ID	Use	Story Height	Const. Type	Grade	Year Const.	Eff Age	Cond.
Description	Value								
		01	Fast Food	1	Br	C	2005		Av
		02							
		03	Paving	2"/8"	Asph	C+1	2005		Av
		04							
		05							
		06							
		07							
		08							
		09							
		10							
		11							
		12							
		13							
		14							
		15							
		16							
		17							
		18							
Data Collector / Date									

SUMMARY OF IMPROVEMENTS													
Base Rate	Features	L/M	Adj. Rate	Size or Area	Replacement Cost	Norm. Depr.	Remainder Value	Obsol. Depr.	True Tax Value				
\$3.37		92%	\$3.10	18000	\$55,800	80%	\$11,160		\$11,200				
					\$349,130	65%	\$122,200		\$122,200				
Appraiser / Date					Total True Tax Improvement Value				<b>\$133,400</b>				





# Practice Problem #1

- The Walgreen company owns and operates a drug store which was constructed in LaGrange County. The building has 15,400 square feet with a perimeter of 450 feet. The drug store was built in 2013. The building is fire resistant construction and is wall type #1. The interior finish meets the criteria of the GCM General Retail model. There are a total of five commercial plumbing fixtures in the building. The building is totally sprinkled and has an average quality attached commercial canopy of 900 square feet. It has been determined the building is in average condition and is classified as a C+1 quality grade. The drug store is frame constructed.
- There is a 28,000 square feet asphalt paved parking area surrounding the building. It was constructed when the building was built and the asphalt is 2" on 5" base. The asphalt paving is C quality grade and is in average condition.
- What is the total true tax value of the improvements?



**Level II Cost Approach**

**Practice Problem #1 (Walgreen's Drug Store)**

Walls		Roofing	
Brick	Built - up		
Stone	Metal		
Concrete	Slate / Tile		
Frame or Metal	Shingle		
C.B. or Tile			
	Insulation		

Framing		B	
Wood Joist			
Fire Resistant			
Fire Proof Steel			
Reinf. Concrete			
Flooring		B	
Concrete			
Wood			
Tile or Carpet			
Finish Type		B	
Unfinished			
Semifinished			
Finished Open			
Finished Divided			
Use		B	
Store			
Office			
Apartment			
Vacant or Aband.			
Heating & Air Conditioning			
No Heating			
Central Warm Air			
Hot Water or Steam			
Unit Heating			
Central Air			
Package or Unit Air			
Sprinkler			
Plumbing Fixtures	#	TF	
Full Bath			
Half Bath			
Extra Fixtures			
TOTAL		0	

Plumbing - \$1,600 x 5 = \$8,000

Canopy - \$28.06 x 900 = \$25,250

Actual age 12  
 Effective age 11  
 Life Expectancy 45

Circle One →	1 or A	2 or B	3 or C	4 or D
Pricing Key	GCM Gen Retail			
S. F. Area	15,400			
Effective Perimeter	450			
P. A. R.	3			
Number of Units				
Average unit size				
Floor	Hgt.	Rate	Hgt.	Rate
Basement				
1st		\$81.89		
2nd				
3rd				
4th				
Frame Adj.	[ ± ]			
Wall Hght. Adj.	[ ± ]			
Base Price	\$81.89			
B. P. A. %	100%			
Sub-total	\$81.89			
Unit Finish				
Interior Finish				
Div./Pm Walls				
Lighting				
Heating/Air Cond.				
Sprinkler	\$3.53			
S. F. Price	\$85.42			
Area	15,400			
Sub.-total	\$1,315,470			
Plumbing	\$8,000			
Special Features	\$25,250			
Exterior Features				
TOTAL BASE	\$1,348,720			
Location Multiplier	94%			
Grade Factor	105%			
Replacement Cost	\$1,331,190			

Other Fixtures			
Wash Fountain	G/F	ES	SS
Circular 36"			
Circular 54"			
Semi-circular 36"			
semi-circular 54"			
Industrial Gang Sinks			
4' long, 4 man			
8' lone, 8 man			
Shower-Column			
Circular, 5 per			
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No. Fixtures			
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.....with Hot & Cold Water			
Emergency Shower/eye Wash			

SPECIAL FEATURES		SUMMARY OF IMPROVEMENTS																	
Description	Value	ID	Use	Story Height	Const. Type	Grade	Year Const.	Eff Age	Cond.	Base Rate	Features	L/M	Adj. Rate	Size or Area	Replacement Cost	Norm. Depr.	Remainder Value	Obsol. Depr.	True Tax Value
		01	GCM Gen Retail	1	Fr	C+1	2013		Av						\$1,331,190	14%	\$1,144,820		\$1,144,800
		02																	
		03	Paving	2"/5"	Asph	C	2013		Av	\$2.57		94%	\$2.42	28000	\$67,760	80%	\$13,550		\$13,600
		04																	
		05																	
		06																	
		07																	
		08																	
		09																	
		10																	
		11																	
		12																	
		13																	
		14																	
		15																	
		16																	
		17																	
		18																	
Data Collector / Date									Appraiser / Date										
Total True Tax Improvement Value																<b>\$1,158,400</b>			

