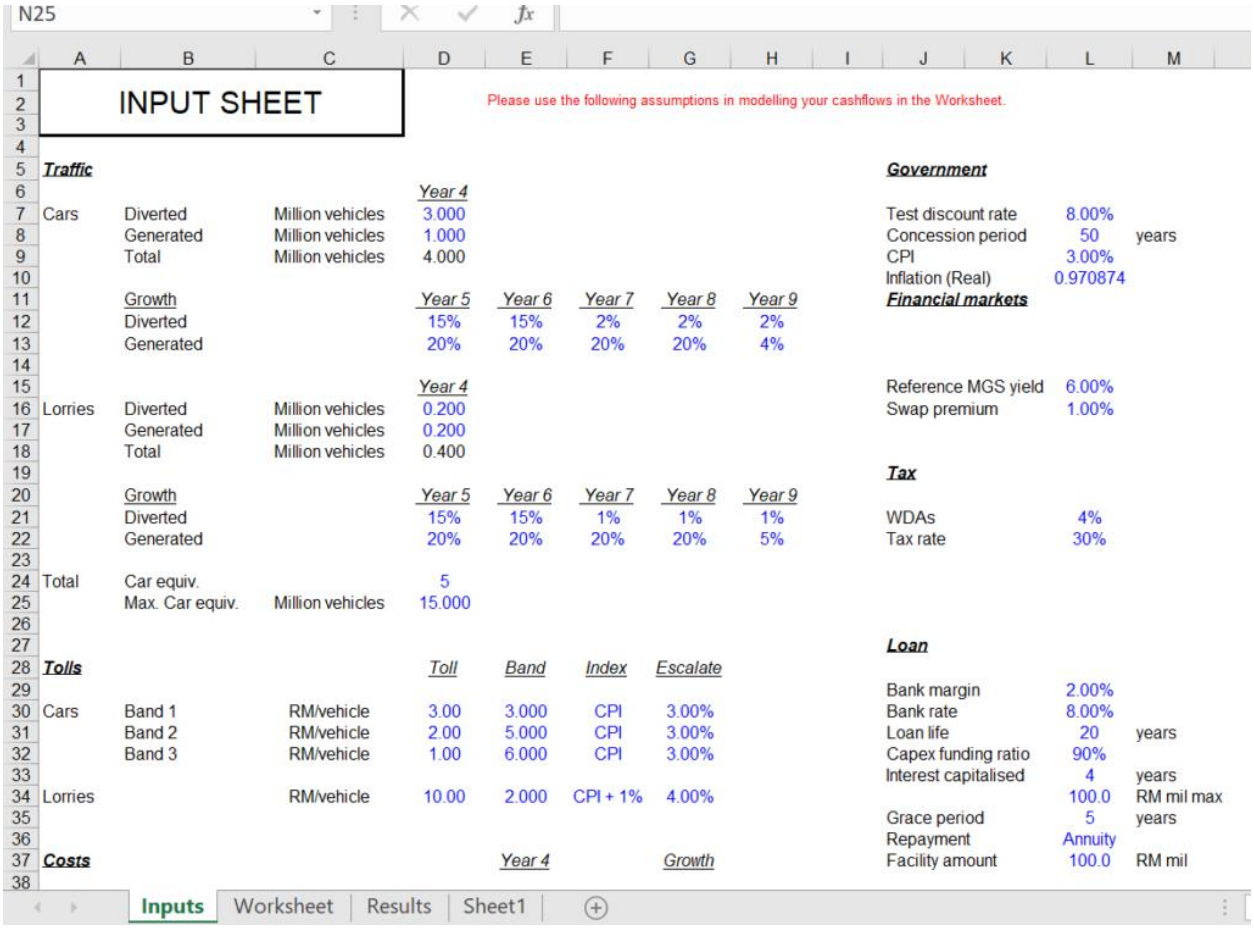
The financial modelling test will be used purely to check that your understanding of financial modelling commensurate with your experience and background. Accordingly, it is designed to exercise an experienced modeller so it is not unexpected if someone less experienced do not complete the test.

You have about 4 hours for the test. Please state and explain any assumptions you make, especially in situations where you require further clarifications. For this case, they gave you the inputs, but the layout was really horrible:



N25

INPUT SHEET

Please use the following assumptions in modelling your cashflows in the Worksheet.

Traffic									***Government***			
			Year 4									
Cars	Diverted	Million vehicles	3.000						Test discount rate	8.00%		
	Generated	Million vehicles	1.000						Concession period	50	years	
	Total	Million vehicles	4.000						CPI	3.00%		
									Inflation (Real)	0.970874		
	Growth		Year 5	Year 6	Year 7	Year 8	Year 9		***Financial markets***			
	Diverted		15%	15%	2%	2%	2%					
	Generated		20%	20%	20%	20%	4%					
			Year 4						Reference MGS yield	6.00%		
Lorries	Diverted	Million vehicles	0.200						Swap premium	1.00%		
	Generated	Million vehicles	0.200									
	Total	Million vehicles	0.400									
									Tax			
	Growth		Year 5	Year 6	Year 7	Year 8	Year 9					
	Diverted		15%	15%	1%	1%	1%		WDAs	4%		
	Generated		20%	20%	20%	20%	5%		Tax rate	30%		
Total	Car equiv.		5									
	Max. Car equiv.	Million vehicles	15.000									
									Loan			
Tolls			Toll	Band	Index	Escalate						
									Bank margin	2.00%		
Cars	Band 1	RM/vehicle	3.00	3.000	CPI	3.00%			Bank rate	8.00%		
	Band 2	RM/vehicle	2.00	5.000	CPI	3.00%			Loan life	20	years	
	Band 3	RM/vehicle	1.00	6.000	CPI	3.00%			Capex funding ratio	90%		
									Interest capitalised	4	years	
Lorries		RM/vehicle	10.00	2.000	CPI + 1%	4.00%				100.0	RM mil max	
									Grace period	5	years	
									Repayment	Annuity		
Costs				Year 4		Growth			Facility amount	100.0	RM mil	

Inputs | Worksheet | Results | Sheet1

PROJECT OPERATIONS AND FINANCING

Your project team is currently advising a private sector consortium to bid for a road concession, which the government has indicated could be as long as 70 years if necessary. You are the designated financial modeller of the project team and you have been tasked to simulate the cashflow projections using the assumptions below.

The road in question consists of 50 miles of dual carriageway with grade-separated junctions, costing RM100 million – indeed that is the firm fixed price offered by the building contractor. Construction should take 3 years with 30% of the cost incurred in the first year, 40% in the

second year and 30% in the final year.. Operations will start immediately after the completion of the construction (i.e. in year 4).

- The traffic consultants forecast that, at the Start of Operations in year 4, the car traffic would be 3 million vehicles per annum diverted from other routes, plus an additional 1 million vehicles per annum generated by the new route.
- The traffic growth rates for the diverted traffic and additional traffic will be 15% for the first 2 years and 20% for the first 4 years respectively. Beyond this, the traffic is expected to grow by 2% and 4% respectively over the remaining life of the concession.
- Lorry traffic will consist of 0.2 million vehicles per annum diverted, and 0.2 million per annum generated, subject to the same build up as for cars. Beyond the initial build-up period, lorry traffic is expected to grow at 1% and 5% respectively.
- However, due to road capacity constraints, the traffic is capped at 15 million car equivalent per annum. For the purpose of this exercise, assume that 1 lorry is 5 car equivalent.
- The toll tariffs are banded. At the Start of Operations, the car tariffs will be RM3 per car up to the first 3 million cars per annum, RM2 for the next 2 million cars per annum, and RM1 for the next 1 million; thereafter, they pay nothing.
- Lorry tariffs will be RM10 per lorry up to 2 million lorries per annum; thereafter, they pay nothing.
- The toll tariffs will be indexed to the Consumer Price Index ("CPI"), whilst lorry tolls will be indexed to CPI+1%. The CPI is projected to be 3% per annum over the Concession period.
- The consortium have entered into an innovative long-term maintenance contract with an experienced road operator, whereby they accept all the maintenance risk (including the cost of lane rentals and any other penalties imposed by the Highways Agency in respect of such maintenance) in return for an annual payment based on a simple fixed formula.
- Fixed maintenance costs (essentially weather and climate related) will be RM2 million per annum, escalating at CPI-1.5%.
  Variable maintenance costs will be determined solely by lorry traffic, adjusting for their average axle weight, which has recently been surveyed and found to be 5 tonnes. The variable charge will be RM0.10 per lorry-mile at a 5 tonne axle weight, escalating at CPI-1.5%.
- Empirical observation in the past has shown that damage to carriageways is proportional to the fifth power of axle weight, but the operator has agreed to a formula where the exponent is only 2.7. Average axle weights are expected to rise at 2% pa until reaching the statutory limit of 9 tonnes.
- The standard bid set by the government assumes a 50-year concession period (including the construction period). They will assess bids by comparing net present values ("NPVs") of total toll payments discounted at 8%.
- Capital expenditure on roads qualifies for 4% writing-down allowances against tax; interest is also deductible. The tax rate is 30% of taxable profits. The 25-year Malaysian Government Securities ("MGS") yield is currently 5%, and the long-term swap premium is 1%.

- The commercial lending banks approached by the project finance team have indicated a maximum loan tenor of 25 years, and a margin over equivalent MGS of 2%. However, despite the team's best efforts, they insist on a 100% fixed-rate swap. This effectively fixes the all-in interest rate of 8% per annum.
- But the banks are willing to fund 90% of capital expenditure ,up to the maximum facility amount of RM100 million, and are prepared to have the loan interests rolled up (ie loan interests are incurred but not paid), during the first 4 years of the Concession,. A grace period of 2 years means that repayments of loan principal amounts (calculated on an annuity basis) start only after 2 years from the Start of Operations.
  The terms and availability of bond financing in current market conditions are less certain. However, it is believed that a 30 year maturity should be achievable, at a spread over the gilt of 2%.
- The bond amount is expected to be RM100 million, borrowed as a single drawing at financial close. It is thought that the bond underwriters
  will insist that equity is subscribed in its entirety at financial close to achieve a debt:equity ratio of 9:1. Repayments (calculated on an annuity basis) would start only after 5 years of Concession Start.
- Part of the security package for the bonds will include an escrow account, pledged to the bond-holders, into which all the proceeds of borrowing and equity raising must be placed. Capital expenditure and interest on the bonds will be funded from this account during the 5 year grace period. Short-term interest rates are relatively, resulting in an expected interest rate on the account of only 3%.
- BUILDING THE MODEL
  Prepare the cash flow projections for the project on annual basis:

1. Project the traffic, taking into account the forecast growth rates and the initial buildup.
2. Project the toll levels on the basis of the indexation system.
3. Allocate traffic to each toll charging band.
4. Calculate the toll payments in each band.
5. Calculate the average toll across the total traffic, in nominal and real terms (assume CPI of 3% p.a).
6. Project the fixed maintenance cost.
7. Project the variable maintenance cost (project the average axle weights for each year over the concession, and then the traffic-related maintenance per lorry using the power law relationship with axle weights).
8. Calculate the taxable profit or loss (making provision for interest and taking into account the writing-down allowances on the capital expenditure on the declining balance of the pool).
9. Calculate income tax expense.
10. Project the capital expenditure of the project based on the construction profile given.
11. Calculate Net Cashflows Before Financing ("CFBF").
12. Calculate the loan outstanding, interest payable, and the annuity, making provision for capitalisation and then payment of interest during the grace period.
13. Calculate the project cashflows and the equity cashflows, so that you can report the Equity returns to the shareholders, together with the amount of equity required.

14. Calculate annually the Project Life Cover Ratio ("PLCR") and Loan Life Cover Ratio ("LLCR"), together with the Annual Debt Service Cover Ratio ("ADSCR") and report to the results.
    For the purpose of this exercise, the PLCR at a particular period is defined as the net present value of the CFBF over the remaining life of the concession (discounted at the relevant interest rates) divided by the principal outstanding as at that period. Similarly, the LLCR at a particular period is defined as the net present value of the CFBF over the remaining life of the loans (discounted at the relevant interest rates) divided by the principal outstanding as at that period. The ADSCR is defined as the annual CFBF divided by the annual principal and interest payments.
15. Repeat for the bond, calculating the escrow account and making provision for interest receivable in the tax calculation.
16. ASSESSING THE BASE CASE
    For the bank loan the key ratios are that the LLCR must be greater than 1.50, the PLCR greater than 1.75, and the minimum ADCSR greater than 1.25, whilst for the bond the minimum ADCSR must be greater than 1.35.
    i. Are those conditions satisfied?
    ii. Which financing is more comfortable?
    iii. Which financing route gives the higher equity return to the shareholders?
    VII. RUNNING SENSITIVITIES
    (a) The banks insist that the worst case sensitivity must show a LLCR of at least 1.00 and a minimum ADSCR of 0.90. Their worst case assumes that there is no generated traffic at all, and no growth in the diverted traffic. Report the key ratios for this sensitivity. Are their conditions satisfied?
    (b) Does the concession need to be as long as 50 years? What is the lowest concession period which will meet the requirements of the banks? And of the bondholders?
    (c) The Highways Agency object to the lorry toll being indexed to CPI + 1%. They insist that they will accept no more than CPI. Can the consortium agree to this? If not, what should the initial toll be? What is the net impact on the levelised toll?
    (d) How could the bond structure be improved to reduce the toll levels?