Workshop Numerical Exercise

• This exercise’s objective is to train workshop participants in the use of the graphical and numerical financial simulation models of the Toolkit for PPP in Roads and Highways.

• Following completion of the exercise, the participants should be able to work on several PPP financial issues, such as the main factors defining the minimum toll rate (or minimum availability payment) required for a PPP project to attract private investors.
Instructions to Participants

- Please form groups of 3 to 10 members each
- Groups will be numbered 1 to n
- Each group will be given basic data for a proposed PPP project and will be asked questions on the financial assessment of the project
- Please choose the group member who will make a brief presentation of your group’s results, after deliberations
- Please assume that previous studies have shown that the project is economically justified, and socially and environmentally sound
Basic data to be used by the working groups:

- Concession term: 30 years
- Construction Cost: US$210 million
- Road length: 40 km
- Four-year construction, with progress rates:
  - Year 1: 15%; Year 2: 30%; Year 3: 30%; Year 4: 25%
- Operating expenses: $10 million per year (at opening year); no variable operating expenses
- Capital structure: Equity, 30%; Subsidies, 0%
- Nominal interest rate: 9% per year
- Loan grace period: 4 years
- Loan repayment period: 15 years
- Discount rate (real terms): 8%
Basic data to be used by the working groups (cont’d):

- **Initial daily traffic (opening year), vehicles/day:**
  - Group x: $\text{AADT} = 7,500 + 2,500x$, where $x$ is the group number

- **Traffic composition:** cars, 70%; trucks, 25%; and buses, 5%

- **Traffic growth:** 3% per year

- **Inflation:** 4% per year

- **Tax rate, VAT:** 10%; **Corporate tax:** 11%

- **Link to the Financial Model** [Link](http://ppiaf.org/documents/toolkits/highwaystoolkit/6/financial_models/index.html)
Financial Indicators Target (or Constraints)

Please assume that the following targets will have to be met for the project to attract private sponsors:

- Project Financial Internal Rate of Return: $\text{IRR} \geq 12\%$
- Equity Internal Rate of Return (or Return on Equity): $\text{ROE} \geq 14\%$
- Loan Life Cover Ratio: $\text{LLCR} \geq 1.2$
- Annual Debt Service Cover Ratio: $\text{ADSCR} \geq 1.2$
Questions to each working group:

1. Please estimate the minimum toll rate per average vehicle, in (a) $/veh, and (b) $/veh-km, for the project to be able to attract private sponsors.

Note: The toll rate ($/veh) can be obtained by trial and error using the “Cash Flow” sheet of the graphical financial simulation model of the Toolkit. After you have entered all the data applicable to your specific project, you can vary the toll rate so the financial indicators calculated by the model are just above the minimum required threshold.

Link to the financial models:
Questions to each working group (cont’d)

2. Please estimate the minimum car, truck and bus toll rates, in (a) $/veh, and (b) $/veh-km, for the project to be able to attract private sponsors. Please assume the following relations between toll rates:

- Average truck toll rate = 3 x car toll rate
- Average bus toll rate = 2 x car toll rate
- The toll rate in the graphical model (WATR) is:
  - \[ WATR = \left( \%C \times TRc + \%T \times TRt + \%B \times TRb \right) / 100 \]

  where WATR is the weighted average toll rate per vehicle; \%C, \%T, and \%B are the percentage of cars, trucks and buses in the traffic flow
Questions to each working group (cont’d)

3. Are the toll rates estimated under Question 2 realistic for Brazil (or your State)? If they are above road users’ affordability, you may want to consider using government subsidies to reduce the toll rate required by private investors. If the Government is willing to contribute up to 25% of the construction cost (i.e., subsidies), please estimate the minimum required toll rate per average vehicle (in $/veh-km) that would be sufficient to attract private sponsors. Note: Please disregard the minimum FIRR in this case.
Questions to each working group (cont’d)

4. Using the toll rate computed under Question 1, what is the amount of subsidy the government should provide for the project to be fiscally neutral to the government?

5. How does the project financial internal rate of return (IRR) vary with the amount of subsidies? Is IRR independent from the financial structure (i.e., proportion of subsidies, equity, and credit)?

6. Is the return on equity (ROE) directly influenced by subsidies? Ceteris paribus, what would be the impact on ROE of an increase in subsidies from 0 to 10%?
Questions to each working group (cont’d)

7. In case there is no political support to charge actual tolls to road users, alternative approaches could include shadow tolls or availability fees. Assuming there will be no capital grants (i.e., no subsidies during construction), please estimate the minimum annual required payment by the government (availability fee, or availability payment, or annuity) during the first year of operation (Please use the result from Question 1 in your calculations). How would you estimate the availability payment required in subsequent years?

Availability payment = 365 * AADT * WATR

8. What financial criteria would you include in the bidding documents, so as to facilitate the evaluation of financial proposals under a competitive selection of concessionaires?
Questions to each working group (cont’d)

9. Time permitting, please work with the numerical financial simulation model to answer the above questions. In your view, what are the pros and cons of the two models?

10. Module 5 of the Toolkit for PPP in Roads and Highways describes the five key stages to launch a PPP project. In which one (or ones) of these stages would you recommend to carry out a financial assessment of the project? [Link](http://ppiaf.org/documents/toolkits/highwaystoolkit/5/index.html)
Questions to each working group (cont’d)

11. Several assumptions have been made to run this numerical application of the Toolkit financial simulation models. Please describe the changes in assumptions (or data) that you would suggest to make them more realistic for Brazil (or your State).

12. Please make a brief presentation summarizing your group’s results and comments. Good luck!
Main Stages to Launch a PPP Project

• Stage 1: Identification, Prioritization and Selection of the PPP Project

• Stage 2: Due Diligence and Feasibility Studies: includes activities and studies to ensure the selected project is well designed and can be successfully tendered and implemented

• Stage 3: Procurement: includes prequalification of bidders and the bidding and bid evaluation process, and a section on Unsolicited Bids

• Stage 4: Contract Award: gives advice on dealing with the preferred bidder(s)

• Stage 5: Contract Management: deals with the construction and operation periods of a project including transfer back if relevant