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ASSIGNMENT B - THE ECONOMIC USEFULNESS OF A BRIDGE

A large river is presently crossed by a service of ferries that goes from the city of R., on one side to the city of A., on the other side. It is proposed to replace the ferry service by a bridge. You will prepare a cost-benefit analysis for this project.

It takes about 45 minutes to board the ferry, to cross the river, and to unboard. A survey has showed that the average occupation rate of cars is 2.5, that of buses 33, and that of motorbikes 1.5.

The building of the bridge, planned to begin in 2010, is expected to last for 5 years. The construction cost (taxes not included) is estimated to be 136,600 $ a. The bridge is expected to open in January 2016. Yearly costs of maintenance, begining in 2016, are estimated to be 10% of this cost.

The bridge will be a toll bridge. The amount of the toll will be higher than the ferry fee, but lower than the generalized cost of using the ferry. This generalized cost includes the ferry fee and the time cost of utilizing the ferry. This is why the replacement of the ferry with the bridge is expected to lead to an increase in traffic. Projections of the traffic in 2010 with and without the bridge have been prepared.

Studies on the value of time in this country suggest 1500 $ per hour for passengers, and 4500 $ per hour for trucks.

Table 1 presents the relevant information:

Table 1 - Basic Values of the Parameters needed for the Analysis

	Cars	Trucks	Buses	Motorcycles
Time saved (minutes)	45	45	45	45
Coefficient of utilization	2.5	-	33	1.5
Value of time ($./h)	1,500	6,000	1,500	1,500
Ferry fares ($.)	1,187	4,800	4,000	180
Bridge toll ($.)	1,543	6,960	6,000	270
Traffic 2008 (1,000)	1,675	472	113	97
Traffic 2023 without bridge	3,159	792	176	151
Traffic 2023 with bridge	3,446	941	192	181

You will calculate an internal rate of return of the project with these hypothesis, but it might be useful to undertake sensitivity analysis by utilizing higher (by 20%) and lower (by 20%) values of time, and also higher (by 20%) and lower (by 20%) traffic forecasts.

Your work can be presented in Spanish.