

Congestion: A users view of Travel Time Cost

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Traffic congestion in Dhaka is both unavoidable and unbearable. It is both costly at work and minimizes our leisure. Dhaka has to be both livable and lovable. Congestion burdens both. We have adjusted our daily lives so as to accommodate this extra burden. *What is the cost of this adjustment?* Leisure time requires sophisticated concepts to evaluate, but the monetary loss of working hours is a direct number. It is the loss of income due to the time wasted by congestion. Work hours can also be evaluated by everyone according to their job. Let us forget about the lower quality of life, which makes Dhaka less lovable, and focus upon the economic value of lost travel time. To bring the question to life, let a specific but a well-known road be in our eyes.

The broad road from Malibag to Kuril, past Rampura, Badda and Bashundhara, has every technical specification to permit smooth travel. And yet, during rush hours, 8-10 am and 4-6 pm, it takes an extra hour to traverse this distance. For example, if travelling by car, a travel time of 25 minutes becomes 1 hour and 25 minutes. How do we know this? Students from East-West University travelled the entire distance using different modes of travel and found out the average travel time lost as one hour. Having found the time lost, we next calculated the numbers of people affected for each mode of travel -- bus, car, rickshaw etc. The road carries 520 private cars, 306 CNGs, and 141 buses on an average basis. How did we do this? Students from East-West University stood on the foot over bridge and counted all forms of traffic passing during these hours, on different days, over a period of two weeks. The capacity of each mode of transport is a generally known number, e.g. 38 for the buses on this road. Thus $141 \times 38 = 5358$ individuals travel by bus on the Malibag-Kuril road every hour during rush hour.

The last step is to calculate the cost of the hour lost to congestion. All citizens are equally valuable, but their times may not be equally so. Hence, we need to separate the traffic flow by type of traveler, a separation which can be approximated by the mode of travel chosen by each person. Thus, a businessman travels by private car, while a delivery can be by bus or van. How do we get some numbers for the travel time cost for each type of travel? Fortunately, there is some relevant data on this point from the Roads and Highway Department road cost annual report for 2004-2005 which shows that travel cost (passenger/hour) for an ordinary large Bus was 24.21 BDT, for a Car was 39.94 BDT and for a CNG was 25.72 BDT. How do we update this data to 2019? Consider 2006. These numbers do not consider environmental costs, such as air pollution. Why do we not use RHD figures for 2019? Unfortunately, RHD have not repeated this necessary exercise after 2005. So, we used a common-sense adjustment to update the 2005 values. From the real GDP growth rate, we adjusted the real TC for each successive year. For example, if the real growth rate was 6.7%, we took the value of 39.94 BDT for a car passenger and multiplied it by 1.067. If the inflation rate for 2006 was, say, 7%, we multiplied the earlier number by 1.07%. The full adjustment for 2006 was $39.94 \times 1.067 \times 1.07$. the same procedure was then used to update the TC for each year till we got to 2018. After we adjusted for both inflation and GDP growth rate, we

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find travel cost in 2018 to be 154 BDT for a bus, for a car it has increased to 223 BDT and for a CNG it has increased to 143 BDT.

We are now ready to calculate the total travel cost for each type of vehicle for example – in case of bus, 141 buses travel during rush hour with an average occupancy per bus being 38 persons and the travel cost per person being 154 BDT. So total travel cost is: $141 \times 38 \times 154 = 8,25,132$ BDT.

Similarly, the cost for private cars, CNG and rickshaws is 347,880 BDT, 87,516 BDT and 71,850 BDT respectively. So, the total cost for 1 hour is 13,32,378 BDT.

The aggregate travel cost for this one road is four times the above, giving rise to 53,29,512 BDT. In a month of 22 working days, the total travel cost will then be 11,72,49,264 BDT!!!

This huge amount of money is our total travel cost (TTC) only because of traffic congestion during rush hour, on ONE ROAD. It does not take into account the hazardous air pollution costs that such congestion gives rise to or the incalculable loss of lives tragically seen repeatedly.

If these numbers are approximately correct, then we can save 11 crores every month by ensuring the smooth flow of traffic on the Malibag-Kuril road. Can we not rearrange the traffic pattern so that there is no congestion by spending less than this amount?

The Centre for Urban Studies and Sustainable Development (CUSSD) at East West University has worked out such an alternative traffic smoothing pattern using only a third of the total travel cost. The difficulty with implementing the ‘cure’ is that the two ends of the road, Kuril and Malibag, may not be able to handle the increased volume of traffic if traffic flows smoothly during rush hour. City traffic, after all, is an interconnected system and it can even be counterproductive to try and illustrate a solution by experimenting on a tiny part.

There is a sense in which such calculations appear unreal to those outside Bangladesh. According to a standard used by urban planners, work efficiency declines sharply after commuting time exceeds one hour. Yet, on this one road alone, the delay is one hour so the total travel time is probably well in excess. If Bangladesh has achieved 7% growth despite such obstacles, imagine what could be done if we could ease congestion and make travel more productive.

In conclusion, it may help focus our attention if we think of the experience of two of the most enthusiastic students who engaged in this study---Sharmin Akter and Jarin Sultana. While standing on the foot over bridge to count the traffic flow they were approached by a young lady who asked what they were doing. After explaining, they asked the lady in turn, why was she on the bridge? ‘There is nothing to do and nowhere to go, so I come to this footbridge and walk around to relax’ What a poignant commentary on the quality of urban life in Dhaka. Both policymakers and the public should take note.

APPENDIX

List of Tables

Table 1²: Travel cost and average occupancy according to different kinds of vehicles on Main and Feeder roads

Category of Vehicles	Main Road		Feeder Road	
	Average Occupancy	TC (passenger/hour)	Average Occupancy	TTC (passenger/hour)
Ac Large Bus	35	49.34	-	-
Chair class Large Bus	38	27.64	-	-
Ordinary Large Bus	44	24.21	40	19
Mini bus	32	19.94	30	17.5
Micro bus	6	34.29	10	18.7
Car	3	39.94	4	33.5
Tempo	10	15.44	10	12.8
Auto Rickshaw	3	25.72	4	15.4
Motor Cycle	1	30.77	1.1	27.2

Source: RHD road cost annual report for 2004-2005, Page: 33

Table 2: Real GDP and inflation growth rate (2005-2018)

Year	GDP at Constant Producer Price (2005-06)	Growth rate (%)	Growth	Inflation (Point to Point) (%)	Growth
2004-05	428877				
2005-06	457612	0.067	1.067	0.0754	1.0754
2006-07	490424	0.072	1.072	0.092	1.092
2007-08	519118	0.059	1.059	0.1004	1.1004
2008-09	546410	0.053	1.053	0.0225	1.0225
2009-10	579425	0.060	1.060	0.087	1.087
2010-11	617921	0.066	1.066	0.1114	1.1114
2011-12	659431	0.067	1.067	0.0554	1.0554
2012-13	699936	0.061	1.061	0.0805	1.0805
2013-14	742980	0.061	1.061	0.0697	1.0697
2014-15	791538	0.065	1.065	0.0625	1.0625

² In the text the numbers have been rounded down where necessary

2015-16	848273	0.072	1.072	0.0553	1.0553
2016-17	909647	0.072	1.072	0.0594	1.0594
2017-18	981529	0.079	1.079	0.0554	1.0554
	Cumulative Growth	2.28860256		Cumulative Growth	2.441137811
			Inf and GDP adjusted C.Growth	5.586794243	

Source: Monthly Economic Trend, Bangladesh Bank

Table 3: Average occupancy and travel cost incurred according to different vehicles on the Main Road (2017-2018)

Category of Vehicles 2017-18	Main Road	
	Average Occupancy	TC (passenger/hour)
Ac Large Bus	35	275.65
Chair class Large Bus	38	154.42
Ordinary Large Bus	44	135.26
Mini bus	32	111.40
Micro bus	6	191.57
Car	3	223.14
Tempo	10	86.26
Auto Rickshaw	3	143.69
Motor Cycle	1	171.91

Source: Author's Calculation

Table 4: The total travel cost incurred per hour (tk.) according to different vehicles

Category of Vehicles (2017-18)	Category	Total in 2 days	Total no. of Hours in 2 days	Vehicles per hour	Average Occupancy Per Vehicle	TC (passengers/hour)	TTC per hour (Tk)
Ac Large Bus						275.65	
Chair class Large Bus	Bus	566	4	141.5	38*	154.42	830310.92
Ordinary Large Bus						135.26	
Mini bus						111.40	
Micro bus						191.57	
Car	Private Car	3644	7	520.6	3	223.14	348475.56
Tempo						86.26	
Auto Rickshaw	CNG	2146	7	306.6	2	143.69	88103.94
	Rickshaw	1916	4	479.0	1.5	100	71850.00
	Van	225	2	112.5	1	100	11250.00
					Total		1,349,990.42
					Per day (assuming 4 hours are rush hour)		5,399,961.67

Source: Author's Calculation

Note: We assumed, passengers of rickshaw have the same cost that a rickshaw puller earns per hour. Same goes for van also.

Note: The delayed time of motor cycle is minimal. In fact, they maybe are increasing the travel time of others. That's why motor cycle has been neglected in this cost.

*This is the minimal number of passengers during rush hours

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