Road Congestion Tax Example

Trip Time (minutes) = 12.0+0.001 (Volume-400) + 0.000015 (Volume-400)^2

(A) Traffic Volume	(B) Trip Time	(C) Increse in Travel Time Per Driver	(A)*(C) (D) Increase in Total Travel Time	$0.10*(D) (E) External Trip Cost	$2+$0.10(B) (F) Private Trip Cost	(E)+(F) (G) Social Trip Cost	(H) Marginal Benefit-Demand
200	12.0	0	0	0	3.20	3.20	31.10
400	12.0	0	0	0	3.20	3.20	27.44
600	12.8	0.007	4.2	0.42	3.28	3.70	23.78
800	14.8	0.013	10.4	1.04	3.48	4.52	20.12
1000	18.0	0.019	19.0	1.90	3.80	5.70	16.46
1200	22.4	0.025	30.0	3.00	4.24	7.24	12.80
1400	28.0	0.031	43.4	4.34	4.80	9.14	9.14
1600	34.8	0.037	59.2	5.92	5.48	11.40	5.48
1800	42.8	0.043	77.4	7.74	6.28	14.02	1.82
2000	52.0	0.049	98.0	9.80	7.20	17.00	-1.84

↑ Congestion Externality

↑ Value of Congestion Externality

Col. A - Vehicle Per Lane Per Hour
Col. B - Minutes
Col. C - Minutes
Col. D - Minutes
Col. E - Dollars
Col. F - Dollars
Col. G - Dollars
Col. H - Dollars

Assumption:
10 mile commute
Time cost= 10 cents/minute
Money Cost= 20 Cents /mile

Private Market Eq. Private Trip Cost = Marginal Benefit 1600

Social Opt. Social Trip Cost = Marginal Benefit 1400

Congestion Tax Social Trip Cost − Private Trip Cost at # 1400 = 9.14 − 4.80 = 4.34

External Trip Cost at # 1400 $4.34