

Discussion Questions/Exercises

1. One classic study of congestion taxes (Keeler and Small, 1977, listed on p. 288) assumed that the imposition of a congestion tax would not affect traffic volume.
 - a) Depict graphically what this case would look like.
 - b) Will this overestimate or underestimate the congestion tax relative to a more reasonable assumption of variable traffic volume?
2. Consider the following quote from a transportation consulting firm: “An increase in highway capacity increases traffic volume by an amount sufficient to leave the private trip cost unchanged.” Depict graphically what this case would look like and discuss how likely this case is.
3. Sinead commutes from her suburban residence to the city center. When asked her opinion of a proposed congestion tax of \$8 per trip, she says, “Of course I oppose the congestion tax. It would make me worse off by \$8 per trip.” Critically appraise her statement.
4. Consider a city that has both a congestion problem (but no congestion tax) and an auto pollution problem (drivers do not pay for the pollution they generate).
 - a) Draw the private-trip-cost curve and the social-trip-cost curve. How does your diagram vary from Figure 10-3?
 - b) Suppose the city builds a light-rail transit system and subsidizes light-rail fares. Depict graphically a situation in which the subsidized light-rail system generates the optimum auto volume.
 - c) Does the fact that the light-rail system generates the optimum auto volume mean that it is an efficient policy?
5. Chopperville is evaluating the merits of using helicopters to clear up highway accidents. Suppose that an accident simply stops traffic from the time the accident occurs to the time the disabled vehicles are removed from the highway. During rush hours, the typical accident stops traffic for 7,000 cars. Under the current tow-truck system, the typical rush-hour accident stops traffic for 20 minutes. Under a helicopter system, the typical rush-hour accident would stop traffic for eight minutes. Suppose that the cost of operating the tow-truck system is \$200 per accident and the cost of operating the helicopter system is \$3000 per accident.
 - a) Is there enough information to determine which system is superior? If not, what additional information do you need, and how would you use it?
 - b) If possible, specify a “reasonable” value for the missing piece of information and compute the benefits and costs of switching to the helicopter system.
 - c) Suppose that it is possible for each accident to instantaneously determine which driver is at fault and to have the responsible driver pay for either a helicopter or a tow truck to clear up the accident. Describe a simple public policy that would provide the incentive for drivers to freely choose the socially efficient method of clearing up the accident.

6. The cost curves in Figure 11-4 were derived under a number of assumptions about the disutilities of walking, waiting, and in-vehicle time. Draw a new set of curves for the following changes:
 - a) a decrease in the disutility of walking and waiting time.
 - b) an increase in the disutility of line-haul time.
7. Zirconium City just converted one of the four lanes on its freeways to a diamond lane. The conversion shortened the line-haul time of buses by 10 minutes and increased the line-haul time of autos by 3 minutes. Consider the responses of two commuters: Ellen switched from driving to taking the bus, but Nathan continues to drive. Explain these different responses to the changes in travel times caused by the diamond lane: How does Ellen differ from Nathan?
8. The city of Congestville is examining alternative policies to deal with its congestion problem. One of its options is free rush-hour bus service. Depict graphically the effects of free bus service on auto congestion and auto trip costs.
9. Consider the effects of dropping a planner's bomb on the San Francisco Bay area. A planner's bomb doesn't hurt any people, but destroys everything except the BART infrastructure (tracks, vehicles, and stations). Most important, it destroys all buildings, so the metropolitan area must be completely rebuilt. Design a set of public policies that will ensure that in the rebuilt Bay area, BART ridership will be high enough that BART is as efficient as an integrated bus system.
10. In Phoenix, private companies provide bus services on low-volume routes at a fraction of the cost of the public bus agency. In Chicago, private companies provide bus service on high-volume (peak-period) routes at a fraction of the cost of the public bus agency. If private firms can underprice the public sector on high-volume and low-volume routes, what, if anything, should be the role of the public sector in the provision of transit services?
11. Suppose that the purpose of cross-subsidization is to increase the welfare of people along low-volume routes. Discuss some alternative means of improving their welfare.