

1.221J/11.527J/ESD.201J *Transportation Systems*

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## LECTURE 4

DISPLAYS

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# SOURCES

- ◆ A lot of thoughtful researchers in HOV/HOT/BRT/ congestion pricing and our discussion draws on their work
  - ◆ Poole
  - ◆ Wachs
  - ◆ Downs
  - ◆ Orski
- ◆ *Innovation Briefs*
- ◆ July 2004 TRB Summer Meeting at Park City, UT

# MULTIPLE ISSUES IN TRANSPORTATION

- ◆ Congestion
- ◆ Environmental Impact
- ◆ Revenue generation for
  - ◆ Construction
  - ◆ Maintenance
  - ◆ New technology
- ◆ Sources of revenue
  - ◆ Gas tax
  - ◆ Tolls
  - ◆ General public funds

# TRADITIONAL HIGHWAY PHILOSOPHY:

“One size fits all”

- ◆ Everyone gets the same service
- ◆ We allocate capacity by queuing
  - ◆ Exception—HOV lanes—we reward “good behavior” by enticing people to carpool
  - ◆ Interesting historical note: first HOV lanes were under-utilized express lanes

# HOT LANES

- ◆ HOVs ride for free (currently)
- ◆ Some argue hybrid cars should too
- ◆ Non-carpoolers ride for a fee (toll)
- ◆ Opportunity to pay a price for a premium service
- ◆ Who uses HOT lanes? People that value a faster, more reliable trip (“Lexus Lanes”)
- ◆ Also, we create a revenue stream... but for what?

# BUSES FOR PUBLIC TRANSPORTATION

- ◆ Conventional buses put public transportation in the same traffic as everyone else
- ◆ Special lanes for buses allow them to avoid general traffic congestion
  - ◆ Reverse flow lanes on arterials
  - ◆ Dedicated ROW, but not expensive rail
    - ◆ Curitiba, Brazil
    - ◆ Bogotá, Colombia (Transmilenio)
- ◆ But how do we pay for special infrastructure?

# POOLE'S BIG IDEA

- ◆ Networks for bus rapid transit (BRT) paid for by HOT riders
- ◆ \$10 billion estimated cost in Los Angeles for such a network

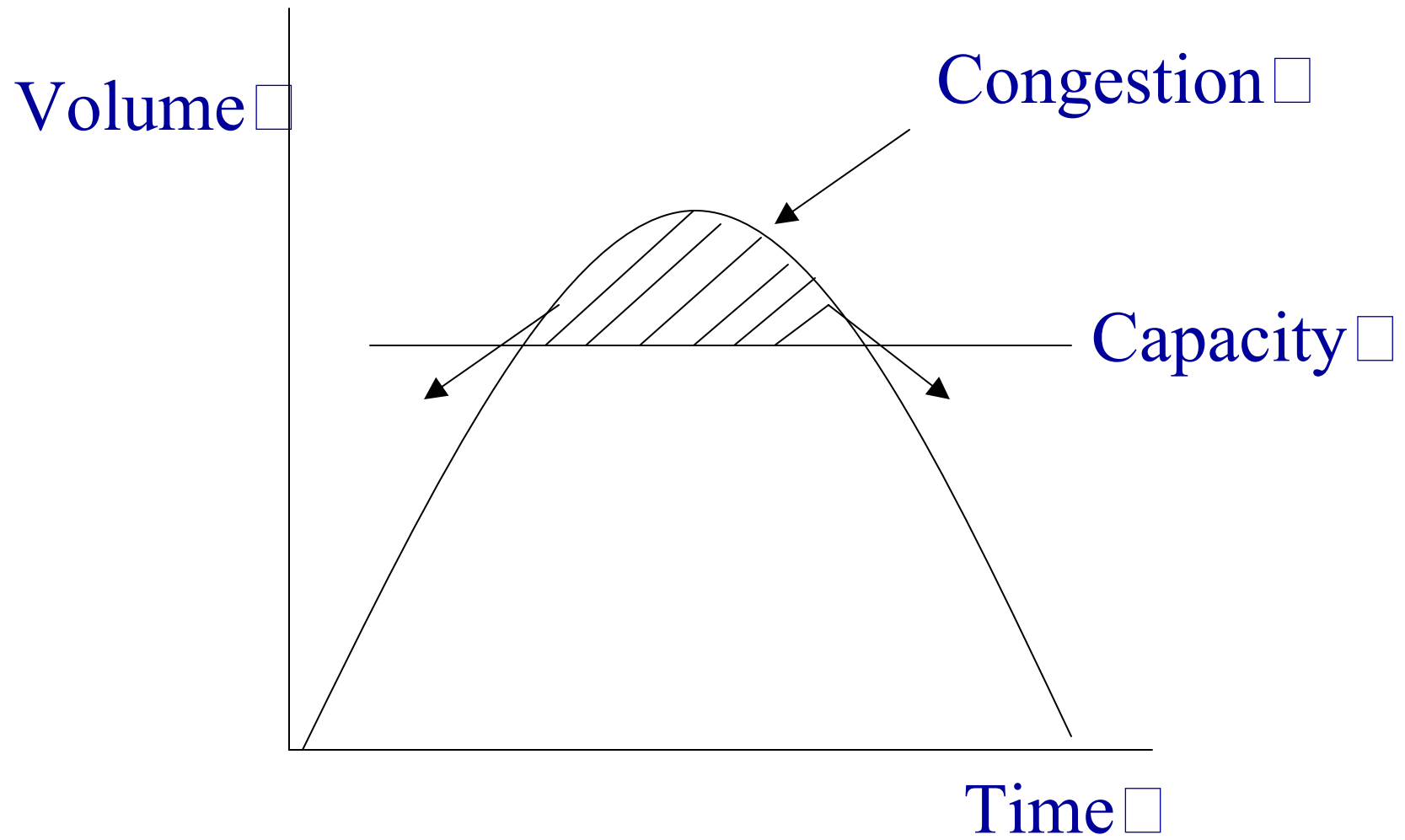
So, share new ROW between buses (BRT), autos (HOT), and registered vanpools, but *not* HOVs

# CONGESTION PRICING (I)

- ◆ HOT is a special case of having people pay for the value they get
- ◆ Charge people for using the road at congested periods
  - ◆ Internalize externalities caused by driving at the peak (congestion and emissions)
  - ◆ Entice people out of the peak; in principle, this is good for all drivers



# CONGESTION PRICING (II)



# CONGESTION PRICING (III)

- ◆ Issues
  - ◆ Implementation
  - ◆ Equity
- ◆ Big breakthrough—London—a cordon scheme—implemented 1.5 years ago and working well