Congestion Pricing in the U.S. and Around the World

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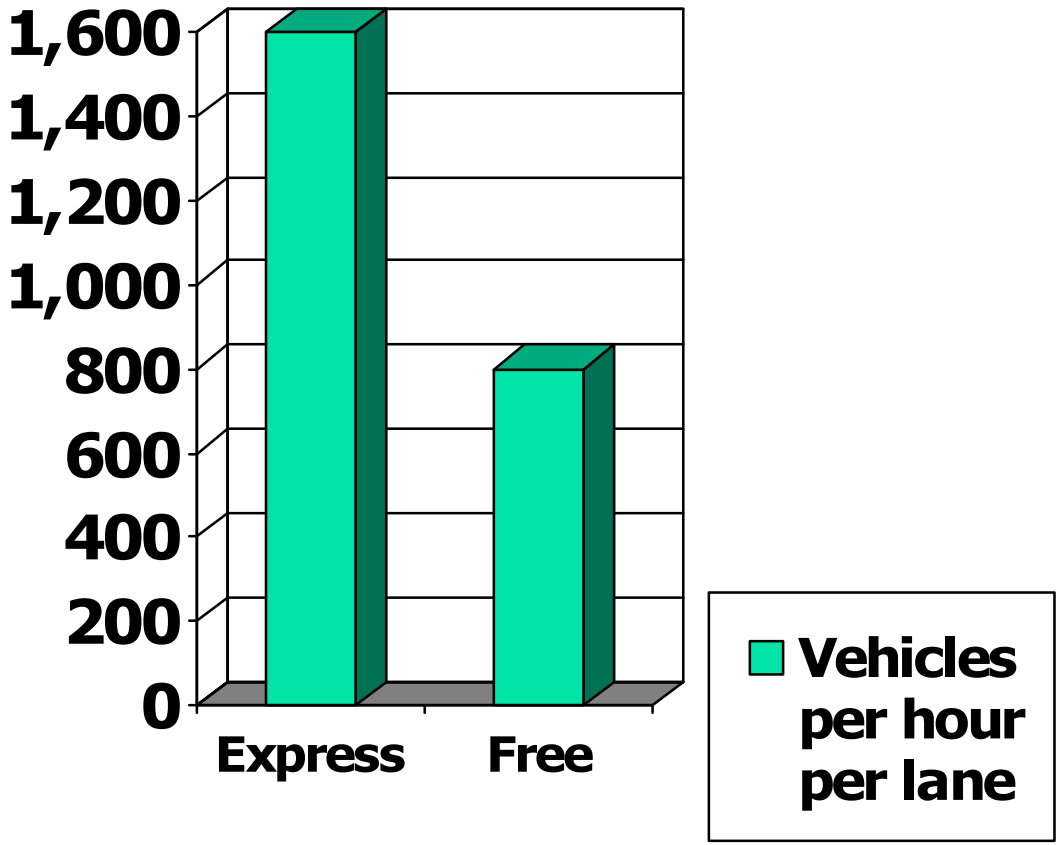
Congestion Pricing in the U.S.

1. **HOV to HOT Conversion**
   - Lower-occupancy vehicles allowed on HOV lanes for a fee
2. **Express Toll Lanes**
   - All vehicles (including HOVs) tolled
3. **Variable tolls on toll facilities**
   - Higher tolls during rush hours
4. **Area-wide pricing**
   - Per mile fees

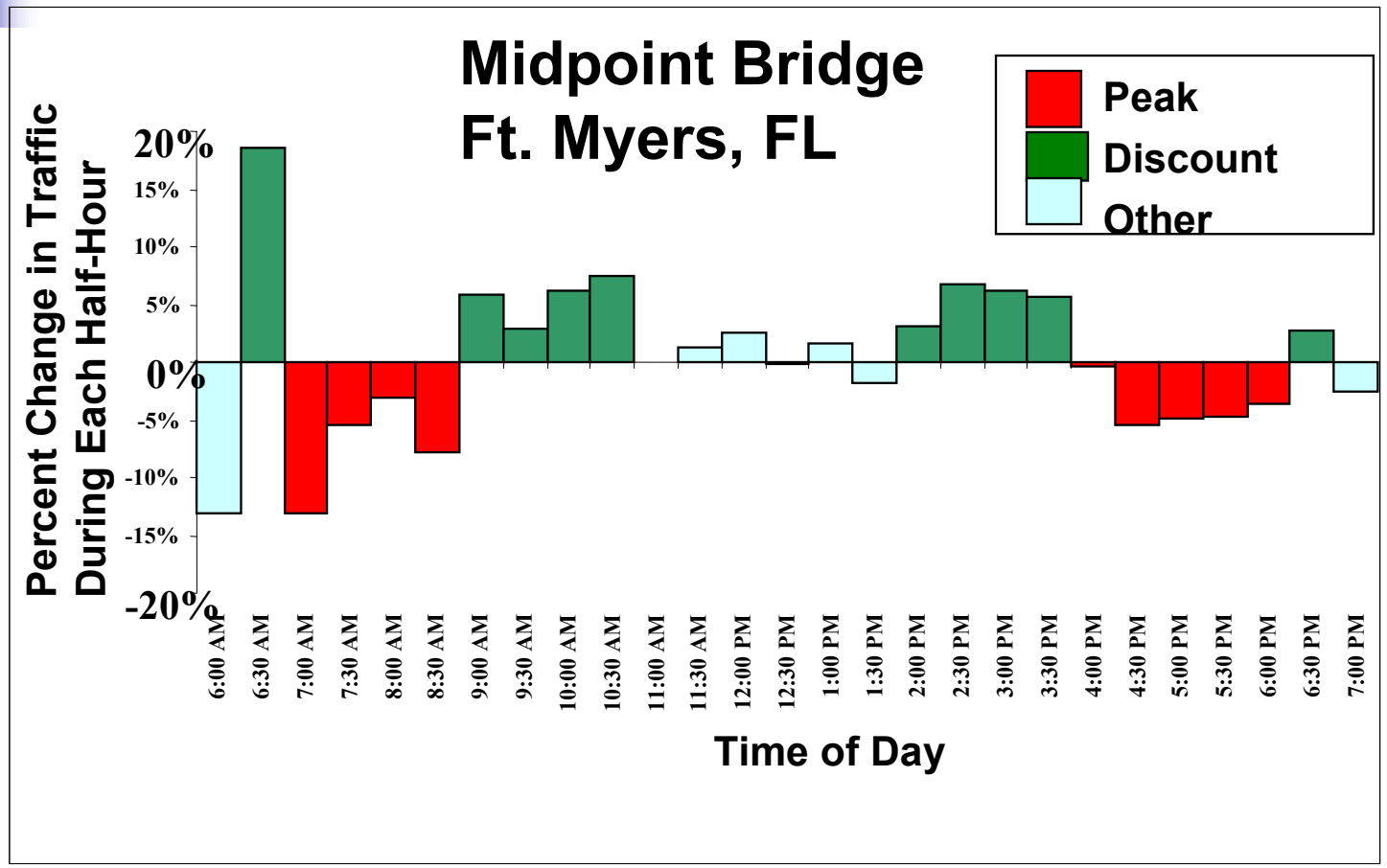
Lessons: Freeway Efficiency

SR 91 Express Toll Lanes:

- Higher peak hour throughput per lane
- Speed 3 to 4 times higher



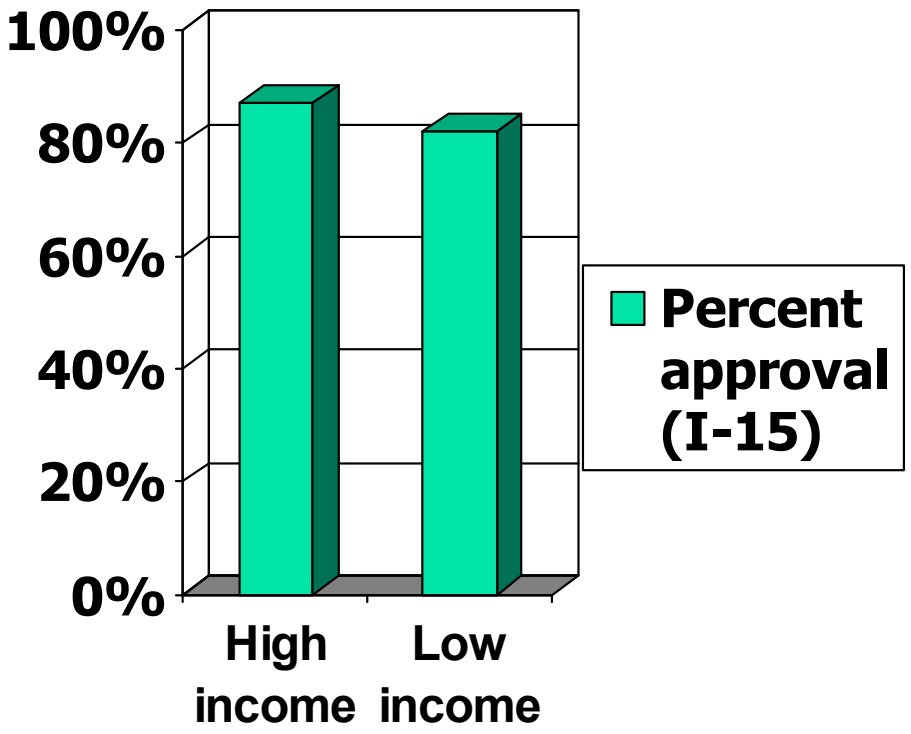
Lessons: Travelers Have Flexibility



Lessons: Public Opinion

I-15, San Diego:

- 70% approval for existing HOT Lanes
- 84% favor HOT Lanes extension
- Considered "fair"



Technology Summary

- **Tolling:**
  - Sticker tags
  - Battery-operated tags
  - Video tolls (camera-based)
  - GPS-based
- **Enforcement:**
  - Cameras and automatic license plate recognition

International Experience

Key projects:

1. Cordon Pricing

- London, Stockholm, Singapore

2. Urban Highway Network Pricing

- Singapore

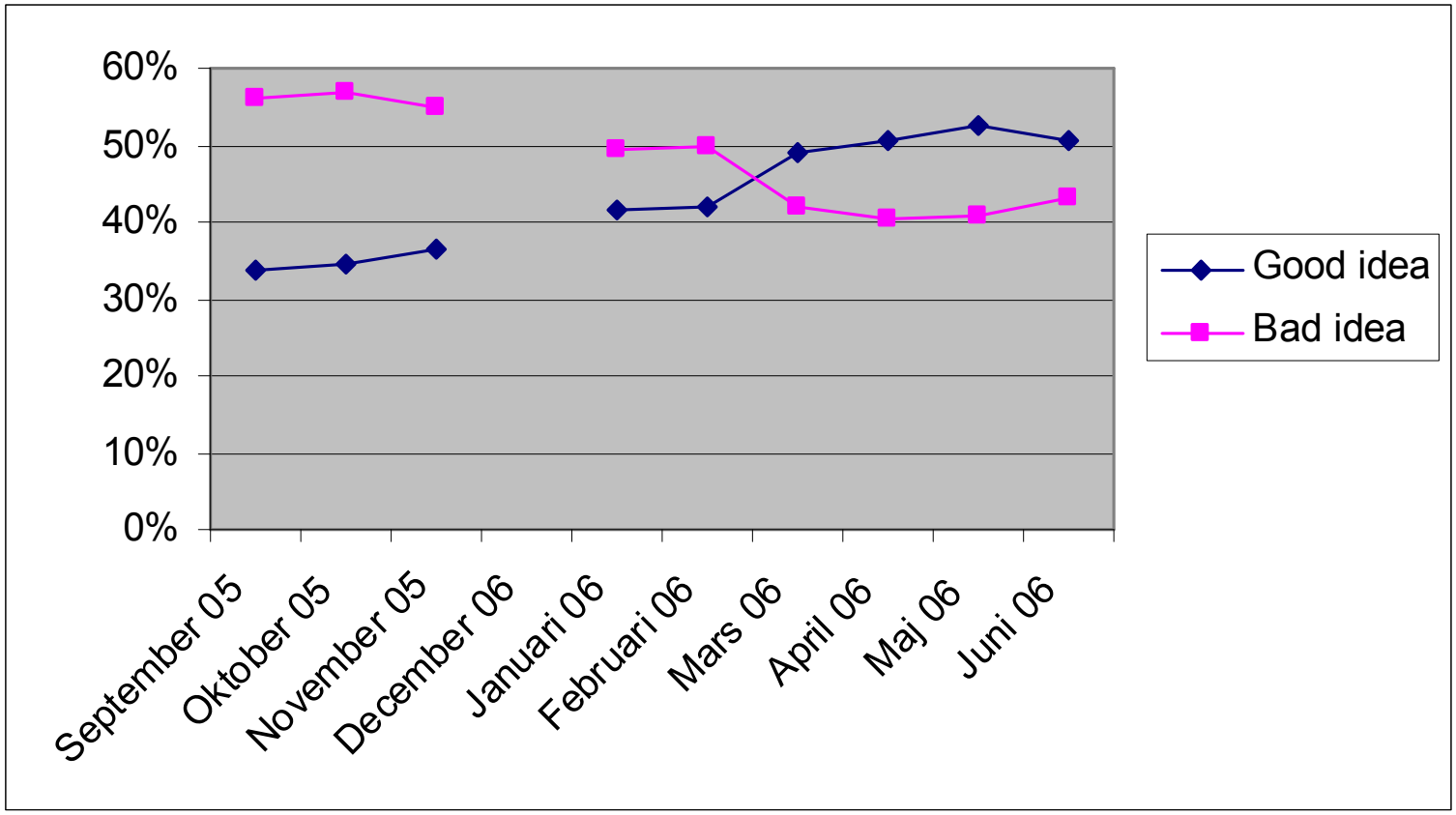
3. National Truck Pricing

- Germany, Switzerland, Austria

Cordon Pricing Impacts: London

- Vehicle trips reduced by 15%
- Delays fell by 30%
- Bus delays reduced by 50%
- Bus ridership increased by 37%
- Taxi fares reduced by 20%-40%
- Vehicle emissions reduced by:
  - 12% for NOx
  - 20% for CO_2

Public Opinion: Stockholm



Electronic Road Pricing on the Highway Network: Singapore

- *Expressway System (since 1998):*
  - Speeds maintained at 28-40 mph (to maximize vehicle throughput)
  - Charges consider traffic diversion

Note: Singapore has also had cordon pricing since 1975

Urban Charging Schemes: Costs vs. Revenues

	Capital costs	Operating costs (annual)	Revenues (annual)
London	$180 M.	$180 M.	$360 M.
Stockholm	$260 M.	$26 M.	$105 M.
Singapore	$130 M.	$9 M.	$52 M.

Stockholm Cordon Pricing: Costs vs. Benefits

- Investment cost (including cost to close down system & evaluate it) = **$262 M.**
- Net present value of benefits (after subtracting operating costs) = **$1,104 M.**
- Benefit/Cost ratio **= 4.3**

Construction Costs for Adding Urban Freeway Lanes vs. Gas Tax

	Per Mile	**For10 mile trip**
Construction cost per lane	$10-15 M.	$100-150 M.
Daily traffic volume in peak periods (5-6 hours/day)	10,000 vehicles	10,000 vehicles
Construction cost per vehicle carried in peak periods	$1,000-1,500	**$10,000-15,000***
Gas tax per vehicle	$0.02	$0.20
Present value of gas taxes paid over 30-year period	$62	**$620***

***Note: Multiply by 2 to get estimate for round-trip of 20 miles**

Addressing Equity Concerns

- **"Not fair to provide better mobility to the wealthy"**
  - Package pricing with benefits for low-income travelers:
    - New transit, HOV and park-and-ride service
    - Toll discounts for low-income motorists
    - Credits to motorists in regular lanes (also known as FAIR lanes)

Addressing Traffic Diversion

- **Unlike toll facilities:**
  - "Stepped" tolls provide option to reduce cost by shifting TIME of travel
  - Enhancements to alternative modes provide other options
  - Effective highway capacity may increase:
    - Freeway throughput INCREASES with pricing
    - Improved arterial operations can be funded

Concluding Thoughts

- Pricing has worked:
  - Facility-based in the U.S.
  - Area-wide abroad
- "Seeing is believing" --Public opinion can change after pricing is experienced
- Public acceptance issues can be addressed