

Credit-Based Congestion Pricing: Policy & Response

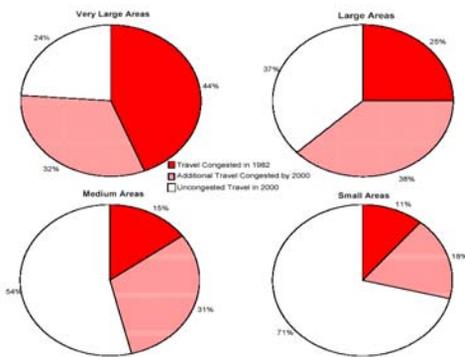
Investigators: Dr. Kara Kockelman &
MS/MPP Student Sukumar Kalmanje

Congestion Costs

- Congestion estimated to waste **\$68 billion** per year (fuel + time, 2000) in 75 **U.S. major urban areas**.
- **\$1,160 average cost** per peak-period traveler in 75 urban areas (2000)
- **In Austin:** Congestion "cost" per peak-period driver = **\$1,190/yr** (2000)
- **Traffic Delay** ~ **61 hours/peak user/yr** in Austin (2000)
- **Wasted Fuel** ~ **104 gals/peak user/yr** in Austin (2000)

Source: 2002 Urban Mobility Report, TTI

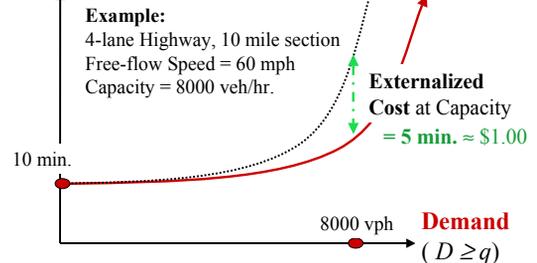
Percent of peak-period travel that is congested



Source: 2002 Urban Mobility Report, TTI

Congestion: Its Marginal Social Cost

Travel Time (t)



Is there a viable solution?



Proposed Strategy: CBCP

- Road users are held **responsible for the marginal social cost** of their trip, as it impacts others.
- **Bankable credits** permit a **basic** amount of travel – & an opportunity to make money (by avoiding congested roadways during peak periods).
- **Equitable & effective!**
- **Revenue neutral!**

CBCP: A Scenario...

- **Every month** licensed drivers receive **allowance** of "driving credits" to drive on congested roads using an EZ-Pass/ FastTrak credit-card account (or debit card) linked to his/her name.
- **Some drivers would spend much more** than others & travel under uncongested conditions, deriving benefits from **reduced delays & less variable travel times**.
- **Some drivers would spend much less** & receive cash (or tax credits) – &/or may donate credits to special groups.
- Total credit updates would be based on total revenues collected in prior month, so policy is **revenue-neutral**.
- **Bus use & local shopping** increase, **emissions** fall, roads busier at off-peak periods...

CBCP: Toll Collection...

- **Each network link**, at each time of day, **priced distinctly**, based on current demand.
- Electronic technology uses **card-like transponders** mounted on cars windshields.
- Tolls automatically deducted from user's account (or debit card) when vehicle passes toll collecting point, with **no delay**.
- Electronic **displays upstream** of collection points (**& on-line**) indicate exact tolls.
- **Maximum tolls & variability** may be set (e.g., 50¢/mile, 1¢/mile/minute), to minimize uncertainty.
- Possible exceptions for HOVs, taxis, &/or others.

Transponder Technology:



IMPORTANT: Place the transponder at least 5cm and not more than 10 cm from the top of the windshield of the vehicle. Do not mount it on the dashboard and maintain a clear view of the road.



Toll Collection Technology:



Project Objectives:

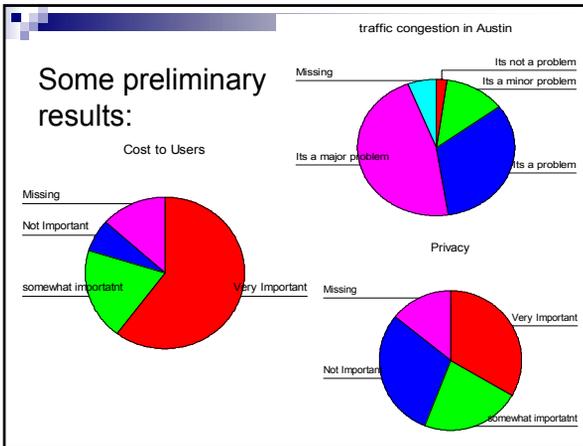
- Identify practical & optimal approaches for:
 - Application
 - Administration
- Forecast:
 - Resulting road **operations**
 - Final **benefits distribution**
- Identify hurdles to implementation
- Examine a variety of urban CBCP cases
- Propose policy recommendations

Where are we now?

- Current **survey** of Austinites...

Survey of Austin Residents

- **Objective:** Gauge Austinites' perceptions of & travel responses to CBCP
- Spatial-sampling, RDD, & Internet surveys
- Almost 400 responses to date; survey still in progress
- ****** Weblink: <http://cbcp.hypermart.net> ******



- More preliminary results...
- **85.5% feel congestion is a problem** in Austin. (48% "major problem")
 - **Travel during congestion ~1.9 times longer** (on average)
 - **54.8%** in favor of **light rail**
 - **27.3%** supportive of a **CBCP** scheme
 - **24.8%** support **flat tolls** for reducing congestion

- Factors affecting responses...
- Income
 - Age
 - Gender
 - HHsize
 - #Children
 - #Vehicles
 - #Peak-hour trips made by the traveler
 - Distance usually traveled during peak hours
- ... & more!

- Additional Observations...
- People who travel further &/or own more vehicles consider **congestion a more serious** problem.
 - People making more work trips are more likely to seek ways to **avoid congestion**.
 - More peak-hour trips &/or Older persons → **Less willing to switch** modes & will endure higher tolls to keep driving.
 - Persons living in bigger households &/or having more kids will **endure higher tolls**

- Average responses to CBCP...
- Assuming **25¢/mile** for 20 miles of peak-hour trip (\$5 round-trip cost), avg. drivers willing to **modify** mode or re-schedule peak-period trip **3.71 weekdays per month** (so as to save credits)
 - If allowance covers just 15 of 20 workdays, avg. **willing to pay = \$4.81/day** (\$24.06/mo.) (in peak tolls, after credits expire)
 - **Avg. VOT = \$12.42**: People willing to pay \$2.07 (average) to save 10 minutes on a work commute trip by car that presently requires 30 minutes.

- Coming Research:
- **Enforcement & Privacy Provision** on CBCP Accounts, **Visitor Policies**
 - Travel Behavior Modeling for **Welfare Estimates** across Sub-Populations
 - Integrated Modeling for **Land Use Impacts**
 - **Other Areas** to Consider?
- Thank you for your time!*
- Please link to our survey (cbcp.hypermart.net)!*