

Road Pricing in Texas

Adjusting to a New Paradigm in
Transportation



C&M Associates, Inc

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C&M Associates, Inc

**Transportation Planning
Traffic and Revenue Studies**

Currently

**T&R Consultant for the
Texas Turnpike Authority**

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Cal y Mayor y Asociados, S.C. (Mexico)

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- ▶ Traffic and Revenue studies
- ▶ United States: Texas Turnpike Authority
- ▶ Recognized by financial community

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Road Pricing

- ▶ Fund programs
- ▶ Improve transportation efficiency
- ▶ Generate revenue , and/or
- ▶ Manage congestion—not the same

Revenue Generation

- ▶ Generates funds
- ▶ Rates set to maximize revenues or recover specific costs
- ▶ Revenue often dedicated to roadway projects
- ▶ Shifts to other routes and modes not desired (because this reduces revenues)

Congestion Management

- ▶ Reduces peak-period vehicle traffic.
- ▶ Revenue not dedicated to roadway projects
- ▶ Requires variable rates (higher during congested periods)
- ▶ Travel shifts to other modes and times considered desirable

Road Tolls

- ▶ Common way to fund highway and bridge improvements
- ▶ Fee-for-service, with revenues dedicated to roadway project costs
- ▶ Considered more equitable and economically efficient
- ▶ Often proposed in conjunction with road privatization

Road Tolls

- ▶ Often structured to maximize revenues
- ▶ Success is measured in terms of project cost recovery
- ▶ Tolling authorities may discourage development of alternative routes or modes

Congestion Pricing (or Value Pricing)

- ▶ Variable road pricing
- ▶ Intended to reduce peak-period vehicle trips
- ▶ Fixed or dynamic variability
- ▶ Implemented when road tolls are implemented to raise revenue, or
- ▶ On existing roadways as a demand management strategy to avoid the need to add capacity
- ▶ May combine un-priced and priced lanes (Responsive Pricing, may change consumption patterns)

Cordon (Area) Tolls

- ▶ Paid by motorists to drive in a particular area, usually a city center
- ▶ May apply during peak periods, such as weekdays
- ▶ Implemented in different ways (passes, electronically)

Other Schemes

- ▶ HOT: type of managed lane, LOV pays toll, incentive to shift lanes, raises revenue
- ▶ HOT: often proposed as compromised between HOV and full Road Pricing
- ▶ Vehicle user fees (mileage, pay-as-you-drive insurance)
- ▶ Road Spacing Rationing (Revenue-neutral credits used to ration peak-period roadway capacity)

Pay-As-You-Drive Insurance

- ▶ Prorates premium by mileage
- ▶ Legislation introduced in Texas (HB 45, 2001, adopted Jan. 23, 2002) and Pennsylvania
- ▶ Proposed at U.S. federal level
- ▶ Favors car-pool, pedestrians, bicycle, women, elderly, teleworkers
- ▶ Female drivers: drive about 40% less, 40% less crashes and claims

Road Pricing Implemented at Various Scales

- ▶ *Point*: Pricing a particular point in the road network, such as a bridge or a tunnel
- ▶ *Facility*: Pricing a roadway section
- ▶ *Corridor*: Pricing all roadways in a corridor
- ▶ *Cordon*: Pricing all roads in an area, such as a central business district
- ▶ *Regional*: Pricing roadways at regional centers or throughout a region

Toll Elasticity

- ▶ Range: -0.1 to -0.4 for urban highways (varies by type of toll / traveler / other)
- ▶ Traffic volumes and trip lengths decline significantly if tolls $> 10\text{¢}$ per vehicle kilometer (Canadian dollars) (Mekky 1999)
- ▶ Financial incentives most effective in reducing auto trips
- ▶ A US\$3 (round-trip) toll predicted to reduce auto-commuting by 25%
- ▶ Cong. Pricing can reduce 5.7% of VMT and up to 4.2% of vehicle trips in a region
- ▶ Effects on VMT, trips, delays, fuel, pollution, revenue

Road Pricing

Barriers to Implementation

- ▶ Opposition from user groups
- ▶ Consumers generally oppose new or increased prices
- ▶ The trucking industry and automobile associations have generally opposed it
- ▶ Their position may change as congestion increases
- ▶ Citizens may distrust government agencies motives (“raise revenue?”)

Road Pricing Principles

- ▶ User Perspective
- ▶ Easy for users to understand
- ▶ Convenient: does not require vehicles to stop at toll booths
- ▶ Transport options: consumers have viable travel options available
- ▶ Payment options: multiple payment options (cash, prepaid card, credit card, etc.)
- ▶ Transparent: charges evident before trip is undertaken
- ▶ Anonymous – privacy of users is assured

Traffic Authority's Perspective

- ▶ Traffic impacts: does not require each vehicle stops or delays
- ▶ Efficient and equitable: charges reflect true user costs
- ▶ Effective: reduces traffic congestion and other transportation problems by changing travel behavior
- ▶ Flexible: easily accommodates occasional users and different vehicle types
- ▶ Reliable: minimal incorrect charges
- ▶ Secure and enforceable: minimal fraud or non-compliance
- ▶ Cost effective: positive return on investments
- ▶ Implementation: minimum disruption during implementation; expandable

Society's Perspective

- ▶ Benefit/cost: positive net benefits (when all impacts are considered)
- ▶ Political acceptability: public perception of fairness and value
- ▶ Environment: positive environmental impacts
- ▶ Integrated: same charging system for other public service fees (parking, public transit, etc.)

Hesitancy

- ▶ Voter's reaction
- ▶ How to manage traffic? (BRT? Managed Lanes [pricing]? Traffic signals?)
- ▶ Confusing: Price what? User, road space, pollution, fixed (gasoline)
- ▶ Infrastructure as a public good financed with taxation
- ▶ Supply is theoretically open-ended
- ▶ Added Supply: leads to new road users / more demand

Road Pricing

Pilot Schemes (OECD area)

- ▶ London, Edinburgh, Bristol and Cambridge (UK)
- ▶ Orange County, California
- ▶ Copenhagen (Denmark)
- ▶ Rome, Genoa (Italy)
- ▶ Gothenburg (Sweden)
- ▶ Helsinki (Finland)
- ▶ Trondheim (Norway)
- ▶ Texas

User-Specific

- ▶ Capital road improvements: on society? On User?
- ▶ Road pricing tries to reflect the latter
- ▶ Or marginal cost of using road space
- ▶ Users may: travel, abstain, take another route / time / mode

Costs

- ▶ Obvious: wear and tear, gasoline, vehicle operating
- ▶ Indirect costs: accidents, pollution, noise
- ▶ Transportation-related pollution ~28% of total OECD emissions of CO₂
- ▶ 80% from road-based sources
- ▶ US cost of congestion (lost time, wasted fuel, increased vehicle operating costs) US\$72 billion in 1997, or 3.7% of GDP (Source TTI 1999)

Congestion Costs

(Annual Mobility Report, TTI)

- ▶ Annual delay per peak period-traveler: 46 hours (16 in 1982)
- ▶ Annual financial cost of traffic congestion, which has ballooned from \$14 billion to more than \$63 billion since 1982 (as expressed in 2002 dollars)
- ▶ Wasted fuel, totaling 5.6 billion gallons lost to engines idling in traffic jams

Revenue Sources

- ▶ Fuel taxes: fixed, non related to supply and demand
- ▶ Fuel taxes: may actually discount heavy users
- ▶ Toll roads: pay building, maintenance. May not “manage” traffic
- ▶ Tolls may vary according to supply and demand inputs
- ▶ Varying tolls best as controlling (managing) congestion

Varying Tolls

- ▶ Lower tolls during low demand
- ▶ Approach roads to Paris
- ▶ Bergen ting Road, Norway and ETC (Electronic Toll Collection)
- ▶ Singapore and ERP since 1998 (Electronic Road Pricing varying with time-of-day)
- ▶ Singapore: adjusts to optimal flow

Key to Success

- ▶ Variability of price, as per demand
- ▶ Balance between cost and congestion objectives
- ▶ May require help from institutions (varying work schedules, telecommuting)
- ▶ Surpluses should be spent on public transportation, parking, bicycle, pedestrian
- ▶ Price must aim to reduce congestion

Key to Success

- ▶ Regulation may be needed (some operators may benefit from peak time congestion)
- ▶ Pricing could be the trick to remove that 5-10% peak congestion. Some changes to entrenched customs...work hours, for instance
- ▶ Substantial reduction in congestion by removing 5% peak-time traffic

Texas Department of Transportation

TxDOT

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TxDOT

- ▶ Created in 1917 as Texas Highway Department
- ▶ 1950s Federal Interstate System connecting major cities
- ▶ New strategy for the 21st Century

TxDOT

New Strategy

- ▶ Devolve prioritizing to local governments
- ▶ Funding through toll revenues (better matched with local usage)
- ▶ Under previous scheme: funds dried by maintenance
- ▶ Include other modes: commuter/freight rail, others
- ▶ “9050 Plan”: accelerate 90% of projects, 50%

TxDOT

General Supply/Demand Outlook

- ▶ Traffic volumes increased by 200% in last 30 years
- ▶ State population increased by 90% in same period
- ▶ System gained 20% capacity only
- ▶ State fuel tax same since 1991

TxDOT

New Planning and Financing Instruments

- ▶ Texas Metropolitan Mobility Plan
- ▶ Texas Mobility Fund (backs bond issues)
- ▶ Pass-Through Toll Agreements (indirect toll paid by state to entity)
- ▶ Texas Highway Safety Bonds
- ▶ Regional Mobility Authorities
- ▶ Stress on partnering and regional leadership

TxDOT

In Current Agenda

- ▶ State, nation, and beyond (NAFTA)
- ▶ Extension of I-69
- ▶ Trans Texas Corridor (TTC)
- ▶ TTC as complement of interstate highway system
- ▶ TTC built in stages through public-private partnerships

Landmark Legislation and Developments

- ▶ HB 3588, 2003: trans Texas Corridor, CDA, others
- ▶ SB (Senate Bill) 370, 1997: creates TTA
- ▶ SB 342, 2001: creates RMA figure
- ▶ TTC announced in Jan 2002
- ▶ COTP transferred to Austin District Sep. 2003
- ▶ I-69 Corridor transferred TTA Sep. 2003

House Bill 3588

- ▶ “Portfolio approach” to funding
- ▶ New CDA Authority (legal frame)
- ▶ Passed in May 2003
- ▶ Changed coined name from “Exclusive Development Agreement”
- ▶ Unlimited use of CDA through 2011
- ▶ Can be used in Trans Texas Corridor and turnpike projects

Private Sector Involvement

- ▶ “Creative business plans and private partners needed” (TTA, Russell, 2004)
- ▶ Currently: 3B annual letting, covers only one third of needs
- ▶ HB 3588 and Proposition 14 provide for funding options
- ▶ Need for new business models in Texas (public-private partnerships)
- ▶ Gasoline tax is unpopular, targets population at large, threaten by new technologies
- ▶ Recent increase in gasoline taxes in Ohio, Washington and Indiana

Road Pricing: Expectations

- ▶ Accelerate projects
- ▶ Leverage the limited funding sources
- ▶ Be an alternative contributing to the decline of gas taxes (unpopular, new technologies)
- ▶ Provide economic engine for system expansion, proactive approach
- ▶ Free up maintenance funds to construct other projects
- ▶ Benefit of reliable travel time, increased options (reduces travel volume risk),
- ▶ Supported by TxDOT and Governor Rick Perry.

Geographic Outlook on Mobility

- ▶ Local, regional (RMAs, Districts)
- ▶ Statewide (State of Texas, TxDOT, TTA)
- ▶ Larger (US, Mexico, NAFTA)

Six Types of Authorities

- ▶ International bridges (cities and counties on Mexican border; numerous)
- ▶ Private toll corporations (legislation repealed, generally)
- ▶ County Toll Authorities; Chapter 284 (part of county government)
- ▶ Regional Tollway authorities: Chapter 366
- ▶ Regional Mobility Authorities (RMA): Chapter 370
- ▶ TxDOT/TTA: Chapter 361; statewide jurisdiction

Regional Mobility Authority (RMA)

- ▶ Local transportation Authority that can build, operate, and maintain toll roads
- ▶ Overwhelmingly approved by voters under Proposition 15
- ▶ New, more flexible way to construct critical mobility improvements
- ▶ Allow use of local dollars to leverage revenue bonds
- ▶ Individual or multiple counties can form an RMA
- ▶ Excess revenues can be used for other transportation projects in the area

The Central Texas RMA

- ▶ Central Texas Regional Mobility Authority (CTRMA)
- ▶ First RMA to be created under this new authority
- ▶ Formed by Travis and Williamson Counties
- ▶ Approved by the Texas Transportation Commission on October 31, 2002
- ▶ Currently working to develop U.S. 183A in Williamson County

RMAAs and Bonds

- ▶ May issue tax-exempt revenue bonds
- ▶ Term not to exceed 40 years
- ▶ May be repaid from any financial source available to the Authority
- ▶ Not repayable with revenue from other projects (not in system)
- ▶ The Texas Attorney General must approve the bonds
- ▶ They do not constitute a debt of the State of a government agency

TxDOT Districts

- ▶ 25 geographic districts
- ▶ Responsible for highway development
- ▶ Design, O&M, ROW acquisition, construction, planning primarily accomplished locally
- ▶ Familiar with their unique area demands and needs of the local people
- ▶ District offices offer access to citizens' involvement

Financial Feasibility Studies

- ▶ Performed at the request of: The TxDOT Commission; a TxDOT Distric; a Developing RMA (with District Coordination)
- ▶ Study levels: sketch, intermediate (modeling), investment-grade (certified T&R, Financiers)
- ▶ Traffic analysis: volumes, growth, toll plan
- ▶ Revenue analysis: economic projections, market acceptance, elasticity

Specific Costs I

- ▶ Construction
- ▶ ROW / utility relocation
- ▶ Engineering (preliminary and final)
- ▶ Environmental mitigation
- ▶ Maintenance expenses

Specific Costs II

- ▶ Construction inspection
- ▶ Operational expenses
- ▶ Inflation
- ▶ Capitalized interest (if bonded)
- ▶ In matters of cash flow, treated “like a business”

CDAs

- ▶ Comprehensive Development Agreement
- ▶ HB 3588
- ▶ Agreement with one entity (the developer)
- ▶ To design, develop, construct, finance, acquire, operate and/or maintain
- ▶ Object: highways, turnpikes, freight or passenger rail, public utilities
- ▶ Criteria: best value selection; will not replace conventional project delivery
- ▶ Considered as “another tool in the box”

Types of CDA



Design-Build or Design-Build-Maintain

- ▶ One point of responsibility
- ▶ Earlier cost certainty
- ▶ Accelerated delivery
- ▶ Shifting risk away from owner
- ▶ Best for well defined project, yet not fully designed (SH130, SH45)

Strategic Business Partnership

- ▶ Early private sector involvement in development
- ▶ Short, mid and long term corridor strategy
- ▶ Assists TxDOT in packaging specific facilities for procurement
- ▶ Best for corridor program
- ▶ Concession/Franchise: Revenue sharing, facilities leasing, shared operations and revenue risks and responsibilities

Procurement CDAs (HB 3588)

- ▶ Solicited
- ▶ Unsolicited

Trans Texas Corridor TTC



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Trans Texas Corridor Overview

- ▶ Estimated cost: \$184 billion
- ▶ Term: 50-year
- ▶ Estimated economic development generated US\$135 billion (Ray Perryman, economist)
- ▶ Law allows state to acquire land under power of eminent domain
- ▶ State may sale or lease land for revenue-generating facilities (hotels, gas stations, stores)
- ▶ Calls for building 4,000 miles (6,400 km) of roadways
- ▶ Up to ¼ mile (400 mt) ROW (Right of Way)

Trans Texas Corridor

ROW--Section

- ▶ Six high-speed toll lanes for cars and trucks
- ▶ Six rail lines
- ▶ Easements for petroleum, natural gas and water pipelines
- ▶ Easements for electric, broadband and other telecommunications lines

Trans Texas Corridor

Demand Outlook

- ▶ Texas's population expected to double to 50 million in the next few decades
- ▶ NAFTA-induced cross-border trade increase
- ▶ From Mexico to Oklahoma, from East Texas to the El Paso desert
- ▶ Higher speeds: autos and trucks at 85 mph
- ▶ Oil pipe line
- ▶ Water from the Louisiana border to West Texas
- ▶ Hazardous materials moved out of Houston and Dallas

Trans Texas Corridor

- ▶ PPP (Public-Private Partnership)
- ▶ One signed CDA (Cintra-Zachry, March 2005)
- ▶ Alternative ROW compensation
- ▶ Toll equity
- ▶ Local participation (RMAs, Districts)
- ▶ Options: Revenue Bonds / shadow (pass-through) tolls

Trans Texas Corridor

Proposed Priorities

- ▶ I-35, I-37 and I-69 (proposed) from Denison to the Rio Grande Valley
- ▶ I-69 (proposed) from Texarkana to Houston to Laredo
- ▶ I-45 from Dallas-Fort Worth to Houston
- ▶ I-10 from El Paso to Orange

Trans Texas Corridor

Opposition: Grounds

- ▶ Environmental impacts
- ▶ Property rights
- ▶ Expense of tolls
- ▶ Loss of business along already established interstate routes (towns)

Trans Texas Corridor: Opposition

Some specific opponents (Dem. and Rep.)

- ▶ Texas Farm Bureau
- ▶ Sierra Club and other environmental watchdogs
- ▶ River of Trade Coalition
- ▶ Big- and small-town officials
- ▶ CorridorWatch

Trans Texas Corridor (TTC)

CASE STUDY: TTC-35

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TTC-35

CDA

- ▶ TxDOT and Cintra-Zachry: partnership to develop TTC-35
- ▶ First element in TTC (generally) along I-35
- ▶ State seeks “innovation and resources” from private sector
- ▶ Cintra-Zachry proposes 7.2B in investments

TTC-35

Initial Scope

- ▶ First phase of proposal calls for building a \$6 billion toll road
- ▶ From Dallas to San Antonio (estimated completion by 2010)
- ▶ East of I-35, parallel to it
- ▶ Consortium will build and operate it as a toll facility
- ▶ Will pay the state an additional \$1.2 billion for I-35 improvements
- ▶ State may use to fund road improvements or high-speed and commuter rail projects

TTC-35

Contractual Plans

- ▶ CDA authorizes Cintra-Zachry to begin the master development and financial plan
- ▶ Plan will guide the development of a new system of roads, rail and utilities
- ▶ Plan will include a project list, implementation schedule and funding options

TTC-35

Committed Deliveries for Identified Projects

- ▶ Conceptual design plan
- ▶ Preliminary cost estimates
- ▶ Toll feasibility studies
- ▶ Plan for complying with environmental requirements
- ▶ Master plan to be updated regularly (to environmental, financial and other factors)

CASE STUDY: TTC-35

CDA's Goals

- ▶ Authorizes a \$3.5 million planning effort
- ▶ Does not set the alignment for TTC-35
- ▶ Does not authorize construction
- ▶ Does not set toll rates
- ▶ Does not determine who gets the tolls
- ▶ Does not eliminate competition for future services

CASE STUDY: TTC-35 Envisioned Section (ROW)



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CASE STUDY

NTTA

- ▶ North Texas Tollway Authority (NTTA)
- ▶ Empowered to acquire, construct, maintain, repair and operate turnpike projects
- ▶ Can issue Turnpike Revenue Bonds for construction projects
- ▶ Can collect tolls to operate, maintain and pay debt service on those projects

CASE STUDY: NTTA

Constituent Counties

- ▶ Dallas County (Dallas)
- ▶ Collin (Dallas)
- ▶ Tarrant (Fort Worth)
- ▶ Denton County (Denton)

CASE STUDY: NTTA

Roads

- ▶ The Dallas North (DNT)
- ▶ DNT extension / SH 121 Interchange
- ▶ Phase 3 Extension of the Dallas North Tollway
- ▶ The President George Bush Turnpike (PGBT)
- ▶ The Addison Airport Toll Tunnel (AATT)
- ▶ The Mountain Creek Lake Bridge (MCLB)

CASE STUDY: HCTRA

- ▶ Harris County Toll Road Authority (HCTRA)
- ▶ Covers approximately 83 miles (133 km) of roadway
- ▶ Located in the Houston / Harris County area
- ▶ Nine mainline plazas (7 on Sam Houston Tollway and 2 on Hardy Toll Road)
- ▶ Paying options: EZ Tag, Exact Change, Exact Change + EZ Tag, and Full Service

CASE STUDY: HCTRA

Roads

- ▶ Sam Houston North, Central, South, Southwest, South East, East
- ▶ Sam Houston Ship Channel Bridge
- ▶ Hardy North, South
- ▶ Westpark

CASE STUDY: CTTS

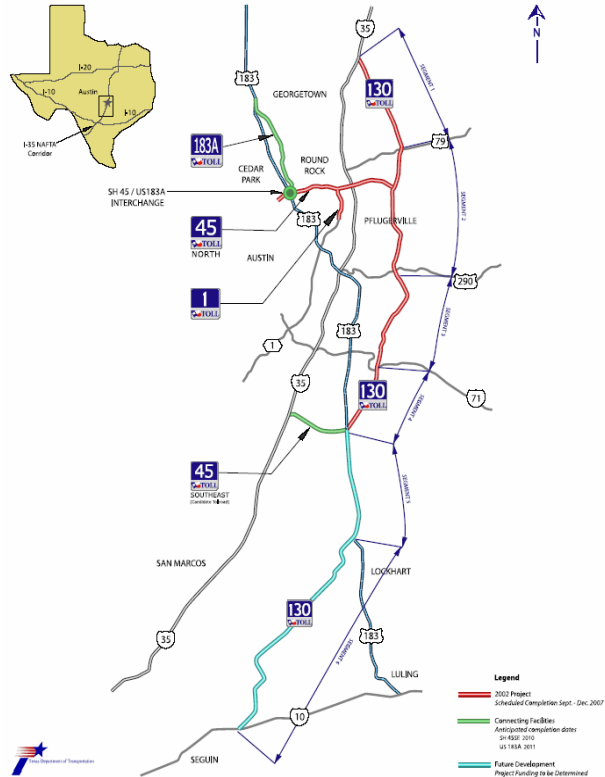
Central Texas Turnpike System (CTTS)



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CTTS

Central Texas Turnpike System



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