Technology and the Changing Face of Tollways



Harris County Toll Road Authority Lisa Castañeda, PE, Assistant Director ITS Texas 2009 November 12, 2009





Growth and Evolution of Tollways in Houston

- Katy Managed Lanes
 - How they work
 - Experience to date
 - Future plans



HCTRA Background

- 120+ miles of toll road with 13 new miles under construction
- 14 mainline plazas
- 60+ ramp plazas
- Over 1M transactions per day
- Two All Electronic Toll facilities
 - Westpark
 - Katy Tollway
- One Managed Lanes facility





Hardy Toll Road



- Opened: 1988–89
- 23 Miles
- Lane Types: Cash, Coin, EZ TAG
- Originally Constructed With Tokens and Without EZ TAG





Sam Houston Tollway





- Opened: 1989–98
- 63 Miles
- Lane Types: Cash, Coin, EZ TAG

 Originally Constructed With Tokens and Without EZ TAG



Fort Bend Parkway

- Opened: 2004
- 9 Miles
- Lane Types: Coin, EZ TAG



Westpark Tollway

NESTPAR

OLL ROA

NESTPAR

TOLLWAY

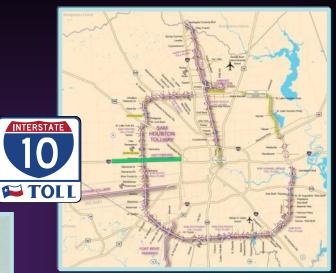
- Opened: 2004–05
- 20 Miles
- Lane Types: EZ TAG



Katy Tollway

- Opened: 2009
- 12 Miles
- Lane Types: EZ TAG
- Variable Pricing, LOS C



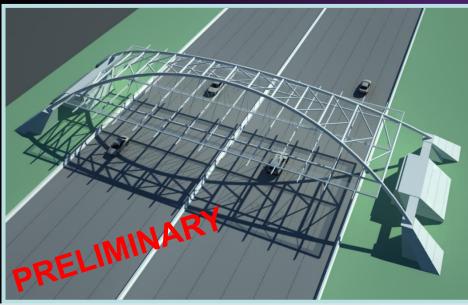




Sam Houston Tollway Northeast

- Scheduled Opening: 2011
- 13 Miles
- Lane Types: EZ TAG Only
- Construction Began in July 2009









Managed Lanes

- Also known as
 - High Occupancy Toll Lanes
 - Express Lanes
- Road facility separate from the general purpose lanes that incorporates various vehicle occupancy and pricing strategies in order to manage congestion

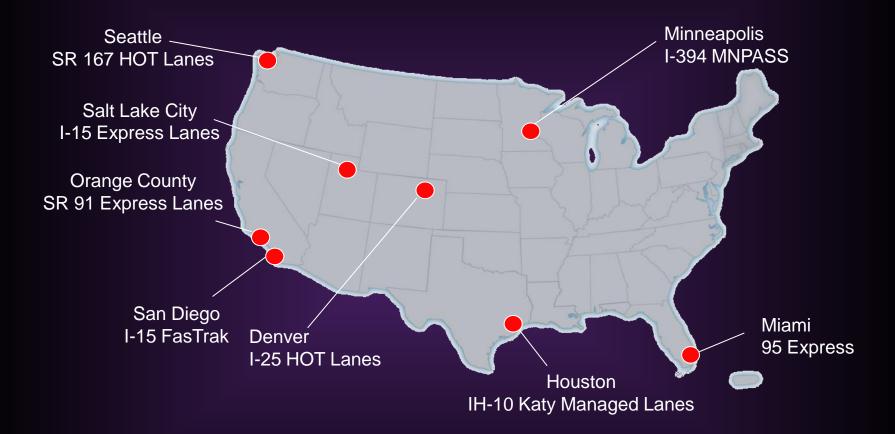


Goals of Managed Lanes

- Manage congestion
 - Provide reliable speeds or travel times
 - Maintain vehicle throughput
- Person throughput
 - Support transit vehicles and HOV users
- Generate revenue
 - Provide a funding stream for operations, maintenance, new services, or system expansion / enhancement



Where are Managed Lanes Operating?



As of 09/2009

Many more being studied or under development



Many Design and Operational Choices

- Dynamic or TOD pricing
- HOV declaration/registration
- Enforcement options
- Use of barriers
- Concurrent flow or reversible
- Lane conversion or new construction
- Public or PPP
- HOV occupancy requirements
- Allowable users
- Information provided



Katy Managed Lanes

- General
 - Partnership between HCTRA, TxDOT, METRO
 - 12 Miles, Built as part of the reconstruction of IH 10
 - Two lanes in each direction, uses plastic delineators
 - Phased implementation approach
 - Opened April 18, 2009





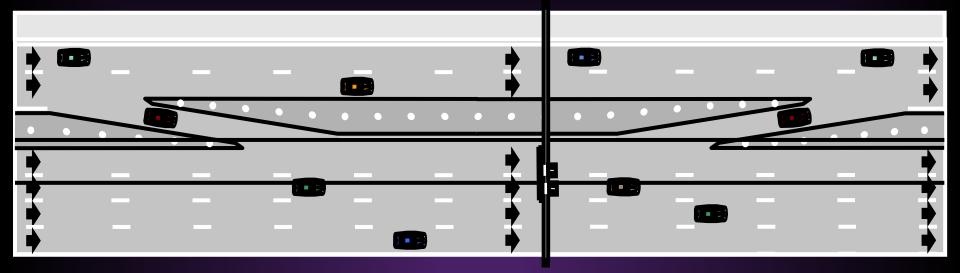
Katy Managed Lanes

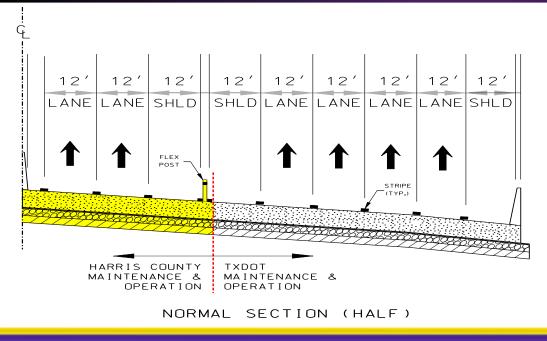
- Cost
 - HCTRA portion \$250M
- Configuration
 - Before single reversible HOV lane
 - After two lanes in each direction, uses plastic delineators





Katy Managed Lanes





- Three tolling points
 in each direction
- Limited access to and from lanes



Operating Plan

- Keep it simple
 - Minimal user options, clear user direction
 - HOV Similar operation as to operation prior to managed lanes
 - Toll Similar to Westpark
 - Choice HOV or toll transponder
 - Cash or coin not an option
 - Video tolling
 - Didn't want to add complexity to options
 - Avoided extra burden on back office
 - Against policy and business rules



Operating Plan

- Phased implementation
 - Soft launch Opened initially as HOV only
 - After 6 months opened to toll customers
- Use declaration lanes
 - HOV don't need to register
 - Allowed faster implementation
- Toll collection
 - ETC only, leverages EZ TAG





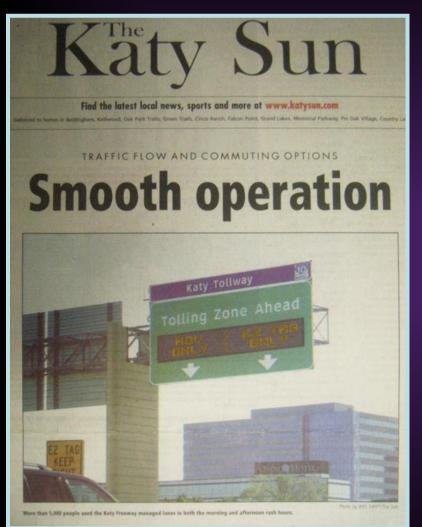
Operating Plan

- Rate table with time of day pricing
 - Varies by time, location, and direction
- HOV2+ at certain times of day, tolled all other times
- Enforcement
 - Tolling VES System
 - Vehicle occupancy -Observation booth with roadside police support

VEHICLE TYPE	MONDAY - FRIDAY HOV HOURS 5 am - 11 am	MONDAY - FRIDAY HOV HOURS 2 pm - 8 pm	ALL OTHER TIMES INCLUDING WEEKENDS
EXEMPT VEHICLES METRO buses and vehicles, school buses	Free	Free	
MOTORCYCLES	Free	Free	\$0.30 to \$0.40 per tolling plaza
HOV 2+ car, truck, van or SUV	Free	Free	\$0.30 to \$0.40 per tolling plaza
SOV car, truck, van or SUV	\$0.30 to \$1.60 per tolling plaza	\$0.30 to \$1.60 per tolling plaza	\$0.30 to \$0.40 per tolling plaza
3+ AXLES commercial vehicles or vehicles towing trailers	\$7.00 per tolling plaza	\$7.00 per tolling plaza	\$7.00 per tolling plaza



Implementation and Outreach



- "One Message"

 HCTRA managed information and message
 - Proactive in pushing information to media
 - Multiple interactions
 - Media package
 - Media tours
 - HCTRA web page
 - Coordination with TxDOT PIO

 Coordinated "all hands on deck" first day to make sure any issues were quickly addressed

Violation and Enforcement

- Manual enforcement
 - Strong relationship with law enforcement
- Enforcement Issues
 - Can't see everything in a vehicle
 - Window tint, small children, early morning/evening darkness
 - Balance of presence and enforcement, enough presence to deter but not too much where traffic slows
 - Signage needs to be clear to support enforcement
 - Creative violators
 - Utilizing top violator alerts
 - Enforcing failure to pay toll rather than HOV occupancy
 - 3+ axle vehicles do not get HOV status







Plastic Delineators



- Initially not desired by law enforcement
- Proven effective
- Some accidents have been avoided
 - Hit delineators instead of wall
- Supported access for emergency vehicles
- Minimal drivers crossing over



Future Plans

- Plan for continued enhancements to Katy Managed lanes
 - Switch to a more advanced system once technology matures and users are more familiar with operations
 - Implement full dynamic pricing
- Maintain relations with public, media and other agency PIO
- Coordinate with regional partners on other managed lanes operations



What Electronic Tolling Means to ITS

EZ TAGS reduce operating costs and make toll road management more efficient, but ITS benefits also:

- Over 1.7 million probe vehicles and thousands more monthly
- Improved local area real-time travel maps
- Regional communities can monitor local traffic flow patterns
- Improved statewide disaster and evacuation traffic flow monitoring



Good Community Partner

- System backbone fiber includes reserved dark fiber for county traffic, TxDOT, and others
- Shared fiber ductwork with TxDOT
- Toll road camera video shared with TranStar
- TranStar Traffic Map uses EZ TAG for speed data
- Disabled Veterans, Purple Heart recipients, and other Congressional Medal of Honor discounts in December



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Thank You

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