



Raytheon Highway Transportation Management Systems

HOT Lanes

**Presentation To:
Team Florida**

April 2010



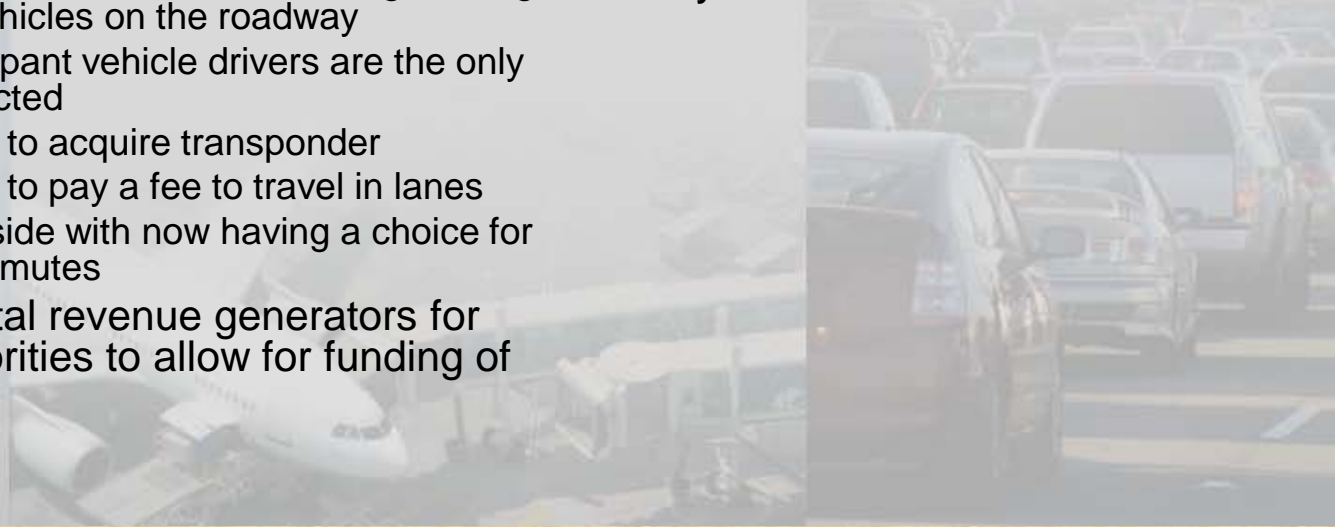
HOT Lanes Benefits

HOT Lanes Benefits:

- Give transportation agencies the ability to better utilize an often under-utilized asset
- Gives single or low occupant vehicle drivers a choice of travel that was not available previously
- Allows current users to continue to use the facility with little to no change to them
 - Many facilities do not require a transponder for HOV traffic
 - Facilities allow HOV users to either travel for free or at a steep discount
 - Low/zero emission vehicles many times are classified as HOV
 - HOT Lanes continue to foster the social engineering benefits of fewer vehicles on the roadway
 - Single or Low Occupant vehicle drivers are the only one's that are impacted
 - Required to acquire transponder
 - Required to pay a fee to travel in lanes
 - Huge upside with now having a choice for their commutes
- Potential supplemental revenue generators for Transportation Authorities to allow for funding of other transit projects



Many HOV facilities are under-utilized...



HOT Lanes - History

- 91 Express Lanes
 - 1995
- I-15 HOT Lanes
 - Original – 1996
 - Extension – 2009
- Texas – I-10
 - 1998
- MnPASS HOT Lanes
 - I-394 – 2005
 - 35W – 2009
- Denver – I-25
 - 2006
- WA SR 167
 - 2008
- Miami – I-95
 - 2008
- Utah – I-15
 - 2010
- VA - Capital Beltway I-495
 - 2012



Congestion Relief Initiative and HOT Lanes

- The Urban Partnership Program was part of the Bush Administration's comprehensive initiative launched in May 2006 to confront and address congestion throughout the nation's transportation system.
- Six Urban Partners chosen:
 - **Miami, \$63M ; Minneapolis, \$133M; San Francisco, \$158M; and Seattle; \$138M, Los Angeles, \$213M; Atlanta, \$110M**
 - Every Urban Partner proposed some form of congestion pricing and several had HOT Lanes as part of their proposed solution.

***“Many politicians treat tolls and congestion pricing as taboo, but leaders in these communities understand that commuters want solutions that work,”
 fmr Transportation Secretary Mary Peters***

- GAO Report in July 2006:
 - “Gas taxes are fundamentally incapable of balancing supply and demand”

Typical HOT Lanes Implementations

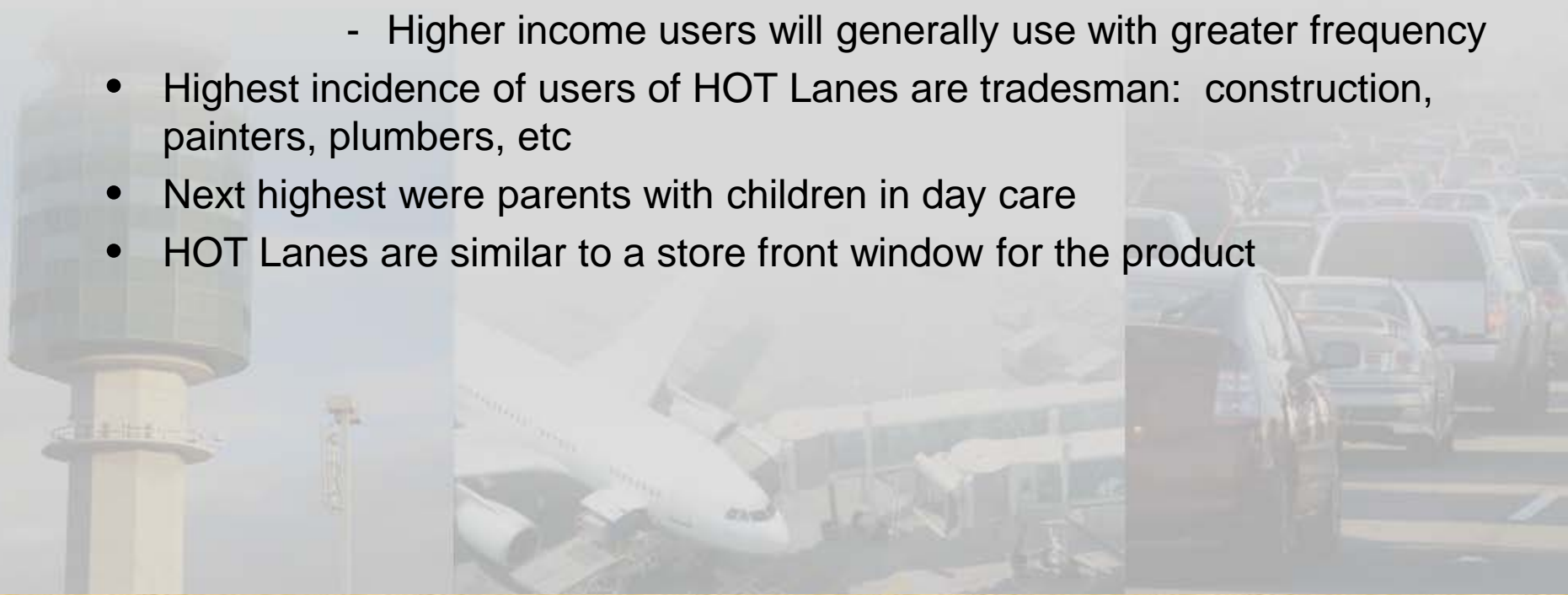
- HOV to HOT conversion
 - Typically short stretches of roadway (10 – 20 miles)
 - Relatively quick implementation (12 – 18 months)
 - Lanes are already in place
 - USDOT has been quick to approve modifications to HOV Lanes
 - Relatively inexpensive to implement (\$10M - \$20M)
 - State Legislatures and State DOT have shown a willingness to push through Legislation
 - HIGH public acceptance
- HOT Lanes – New construction
 - Same as above, with considerably longer lead times and cost due to the construction element



HOT Lanes Issues

HOT Lanes issues:

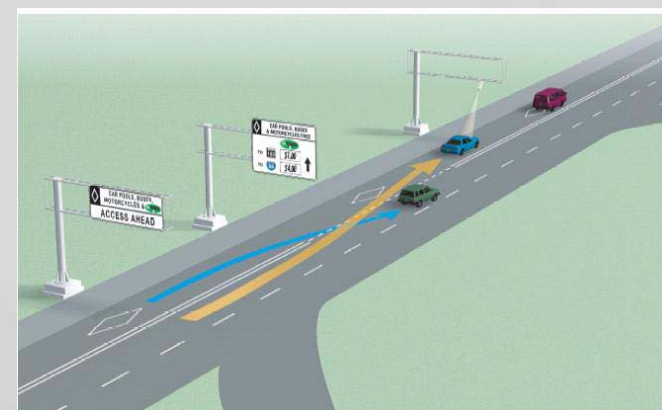
- Lexus Lanes (or other derogatory terms for the lanes)
 - Significant academic study regarding the demographics of users
 - Cal Poly San Luis Obispo study
 - HOT Lane user demographics mirror GP lane users
 - Lower income users understand the time benefits of the HOT Lanes and judiciously use the lanes
 - Higher income users will generally use with greater frequency
 - Highest incidence of users of HOT Lanes are tradesman: construction, painters, plumbers, etc
 - Next highest were parents with children in day care
 - HOT Lanes are similar to a store front window for the product



HOT Lanes Issues

HOT Lanes issues:

- X-lane reads
 - Some facilities have channelizers to increase distance between HOT and GP lanes
 - Other facilities use striping to discourage drivers from slaloming the HOT Lanes
 - Transportation agencies need to have these occurrence to be at near zero
 - Public perception of accuracy is of critical importance
 - False transactions undermine the credibility of the agency
 - Raytheon has refined the technology and has 5 years of operational experience that minimizes the occurrence of x-lane reads



HOT Lanes Issues

HOT Lanes issues:

- Trip Building for Dynamic Pricing
 - Trips are compiled through transactions compiled via road segments
 - A facility can have multiple segments or just one that is priced
 - Each segment (facility) is dynamically priced and then the trip is built using the various dynamically priced elements
 - These elements are posted on the Dynamic Message signs to allow the customer to determine whether to drive the segment or facility
 - Trip building requires extremely accurate correlation between AVI, Imaging and the Vehicle traversing the facility
 - Several business rules may come into play
 - Does the agency require images of all transactions?
 - Is this license plate registered with the account?
 - If there are multiple segments, how do we handle a missing segment in the stream?



HOT Lanes success

- High customer acceptance >90%
- Year over year growth in volume and revenue
- Extra funds go straight into transit improvement
- Most UPA funding to expand HOV to HOT Lanes
- 35W first UPA funded HOT Lane to become operational
- Conversion of existing underutilized HOV to HOT
- Mobile enforcement
- Dynamic pricing
- Increases safety on facilities
- Entire facility throughput increases





Raytheon

- A Market Leader for All-Access Open Road Tolling Systems, with 14 years of operational experience with over 300 ORT points
- Proven Video Tolling Technology that supports <math><0.1\%</math> unbillable images with >math>90\%</math> OCR accuracy for all images taken. Pioneered the use of fingerprinting to further increase OCR accuracy
- Patented mobile enforcement effectively utilized by police on MnPASS, CIH and 407ETR
- Trip building implementation in three projects: 407ETR, CIH and MnPASS
- Mature ISO-9001, Capability Maturity Model Integration (CMMI) Level 5 Engineering Process (only company in the industry with any classification)





Raytheon Experience

- FTE TSR
- 407ETR
- MnPASS HOT Lanes
- TxDOT
- Cross Israel Highway
- Chile
- Capital Beltway – I-495 HOT Lanes Project





Questions?

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