

HOT Lanes: Congestion Relief and Better Transit

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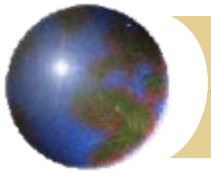




Basic Thesis:

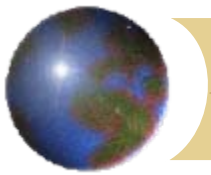
Current Transportation Plans Need Rethinking

- Major focus has been on transit and carpool lanes—but their market share keeps declining.
- Cars will still provide the vast majority of trips; trucks and buses need highways, too.
- HOT lanes can make highways work better for all forms of transportation.



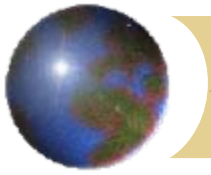
Honolulu's commuter mode share

	1990	2000
Drove alone	57.6%	61.4%
Carpooled	20.9	19.4
Rode transit	9.3	8.3
Walked/telecom.	9.3	8.5
Other means	2.8	2.4



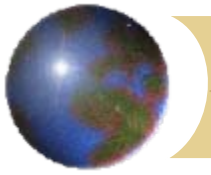
Current Long-Range Plans Don't Reduce Congestion

Metro Area	LRTP \$ %Transit 2005-2030	Transit Mode Share		TTI	
		2003	2030	2003	2030
Atlanta	38%	6.7	8.4	1.46	1.85
Denver	27%	5.0	6.4	1.40	1.80
Los Angeles	58%	4.8	7.4	1.75	1.94
San Diego	49%	5.0	10.0	1.41	1.70
Honolulu	61%	8.3	??	1.19	1.31



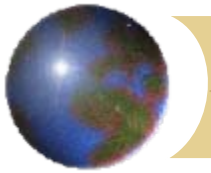
Why doesn't transit make more of a difference?

- Decentralization of housing
- Decentralization of jobs
- Hence: suburb-to-suburb commuting
- Rail gets most riders from bus—but at much higher cost.



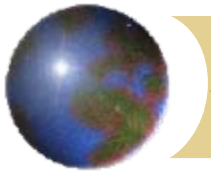
Advantages of rubber-tire transit in 21st-century metro areas:

- Can use all of existing highway infrastructure;
- Highway system is a network, with many network benefits:
 - Links every origin to every destination;
 - Much greater potential for single-vehicle trips, nearly door-to-door;
 - Less vulnerable to breakdowns, damage—like the Internet, can route around trouble;
 - Can adapt and change as land uses change.



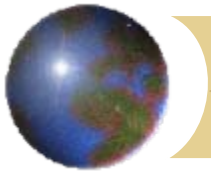
Busways Have Huge Capacity:

- Lincoln Tunnel Express Bus Lane: at peak, carries 32,600 pass/lane/hr. (with 44 passengers/bus)
- Port Authority says that with 4-sec headways, could do 39,600.
- With ITS permitting 3-sec headways, and with 58 passengers, could do 70,000.



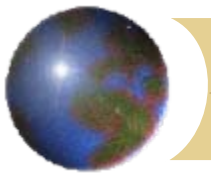
HOV Lanes Began as Busways

- FHWA/UMTA policy favored busways (1970s).
- But only a few exclusive busways today:
 - Lincoln Tunnel XBL (730 buses/hr.)
 - Pittsburgh busways
 - Miami busway
 - Seattle bus tunnel
 - Surface-street busways: Las Vegas, Orlando

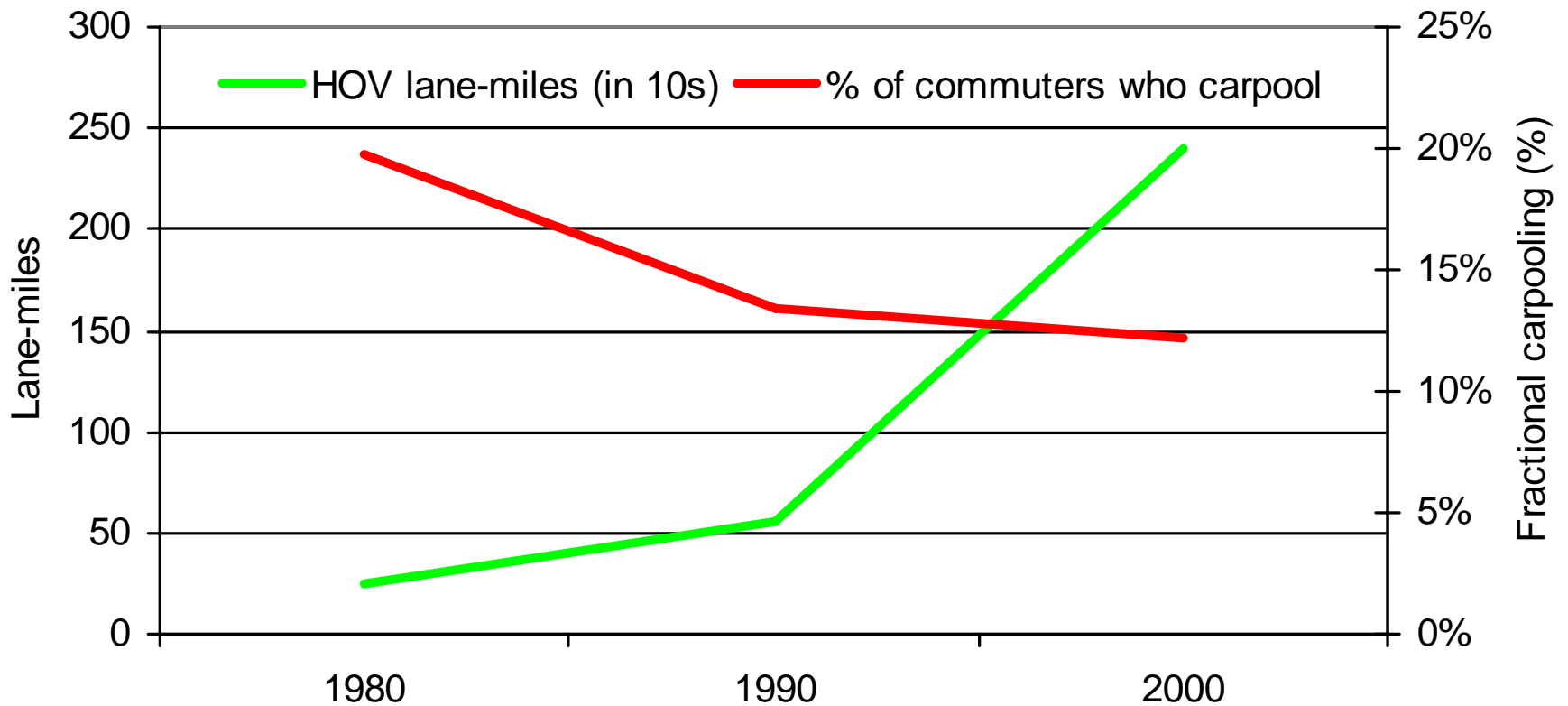


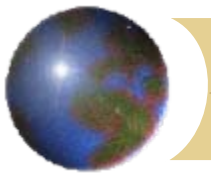
Empty Lanes Led to Opening Up Busways to HOVs

- Shirley Highway Busway:
 - Vanpools and HOV-4 (1973), HOV-3 (1989)
- Los Angeles El Monte Busway (I-10):
 - HOV-3 (1976)
- Houston Transitways:
 - HOV-4 (1985), HOV-3 then HOV-2 (1986)



But Carpooling Has Declined as HOV Lanes Have Expanded

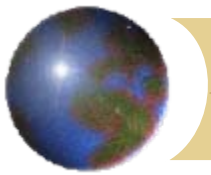




Honolulu Data Consistent with National Experience

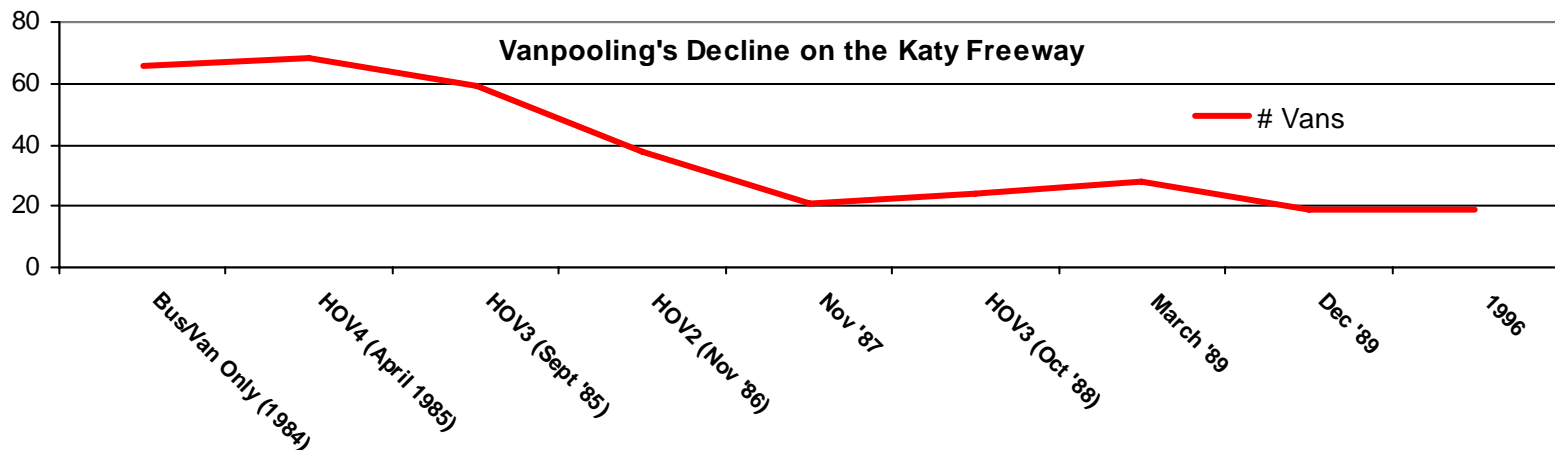
Carpool Mode Share, US Census

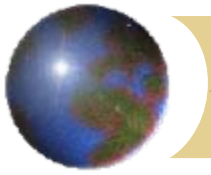
	<u>1990</u>	<u>2000</u>
SF Bay Area	13.0%	12.9%
San Diego	13.8%	13.0%
Sacramento	13.7%	13.5%
Honolulu	20.9%	19.4%
National	13.4%	11.2%



Vanpooling Has Been Hurt by Carpool Preference (Houston data)

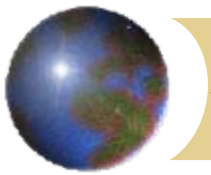
- ➊ HOV lane time-saving reduced when filled with HOV-2s.
- Need large time-saving to offset time cost of assembling van-pool





BRT in HOV Lanes: Not Sustainable

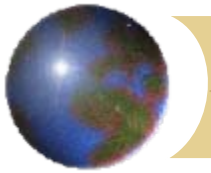
- ⊕ HOV-2 fills up and loses time-saving
- ⊕ HOV-3 in most cases empty-lane problem
- ⊕ HOV-4 even more empty space
- ⊕ No way to fine-tune occupancy (e.g., HOV-2.7)



HOT lanes: important step forward:

Managed (HOT) lanes provide greater transportation benefits than traditional HOV lanes:

- Sustainable, long-term congestion relief
- Guideway for high-speed BRT service
- Significant revenue for capital and operations

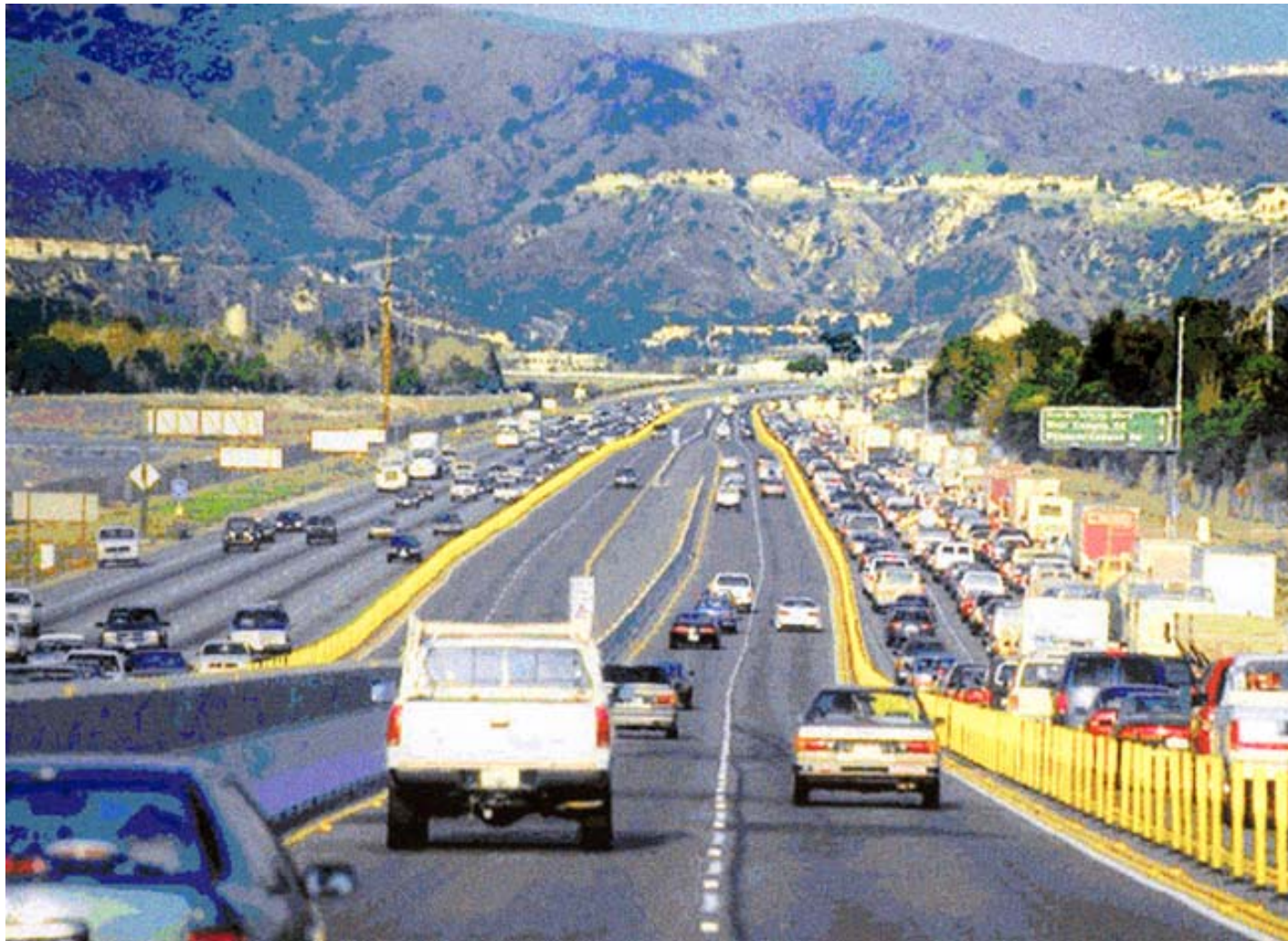


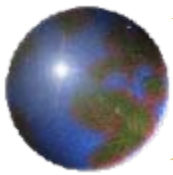
Value Pricing Offers Precise Control

- I-15 quasi-real-time variable pricing
- 91-X fine-tuned rate schedule,
periodically adjusted
 - 49% of peak traffic with 33% of lane capacity
- Both offer reliable high speeds during rush hours.

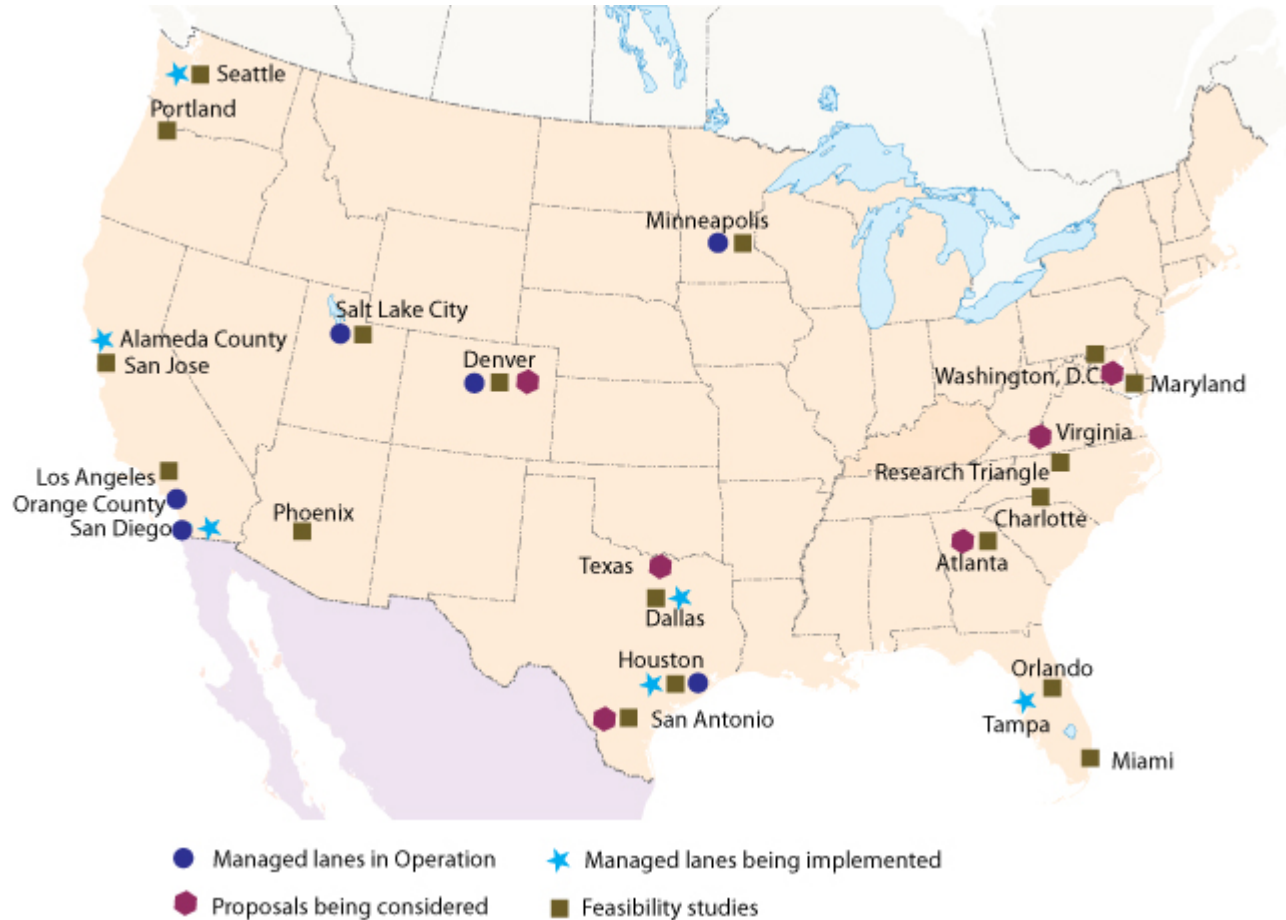


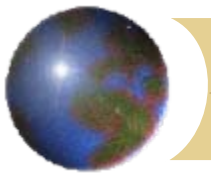
91 Express Lanes, Orange County, California





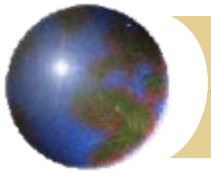
Priced Lane Projects, 2006





Two Very Different HOT Lane Models

1. HOV system that sells excess capacity:
 - ❑ I-15 express lanes, San Diego
 - ❑ Implicit Atlanta model (several recent studies)
2. Express toll lanes that give deals to certain types of HOVs:
 - ❑ 91 Express Lanes, Orange County, CA
 - ❑ Maryland/Florida proposed Express Toll Lanes



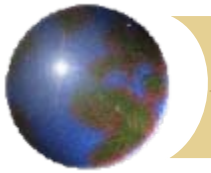
Comparison of the Two Models

Atlanta NW Corridor (I-75) study:

PM peak, 2030, MLs with 28% of total lane capacity approach 25% of traffic; hence, are closed to SOVs.

91 Express Lanes:

PM peak, 2006, MLs with 33% of total lane capacity handle 49% of total traffic, nearly all of whom pay the market price.



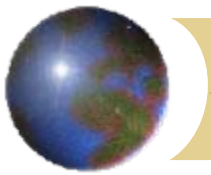
What Is the Purpose of Managed Lanes?

● VMT Reduction?

- ❑ Getting people out of their cars has not worked (declining car-pool mode share).
- ❑ Emission-reduction is becoming a non-problem (fleet turnover).

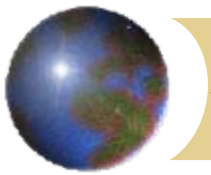
● Congestion Relief?

- ❑ Value of congestion-reduction is huge.
- ❑ That translates into major new funding source.



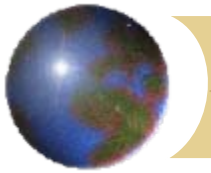
Synergy of Managed Lanes and Bus Rapid Transit

- Value-priced lane is *virtual equivalent* of an exclusive fixed guideway.
- Pricing limits vehicle flow to what's compatible with LOS C conditions.
- Reliable high speed is sustainable long-term, thanks to pricing.
- Houston implementing first such project on Katy Freeway managed lanes.



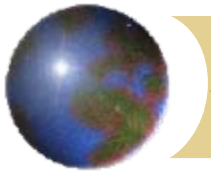
Virtual Exclusive Busway: Houston's Katy MLs

- 3-way public-public partnership
 - Transit agency (METRO)
 - Toll agency (HCTRA)
 - State DOT (TxDOT)
- 4 new MLs with value pricing
 - HCTRA funds and manages the MLs
 - METRO guaranteed 65 buses/hr and 25% of capacity for bus + HOV3+
 - LOS C to be maintained, via pricing and occupancy controls



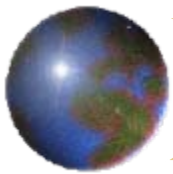
Implications of Katy ML Deal

- Transit funding: no toll revenues to METRO, but still a great deal (free guideway).
- Busway capacity: 65/hr. is 62% increase; should be ample.
- FTA approval: granted, based on LOS C.
- Occupancy changes: going to HOV-3 now and HOV-4 as needed.
- Pricing sustainability: MOU commitment.



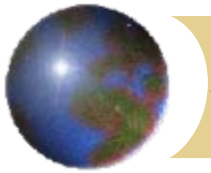
Network Benefits

- ⊕ Network of priced lanes facilitates region-wide express bus/BRT service
- But that means major construction of new lanes and flyovers
- Hence, toll revenues needed for major capital costs.



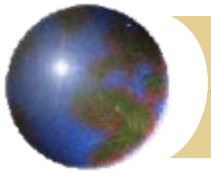
Proposed Miami Network





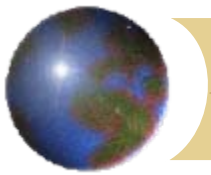
Network Comparisons

- 500-lane-mile VEB Network cost is \$4 to \$6 billion, based on Reason studies.
- 250 route-mile light rail system cost is \$31 billion, based on New Starts data.
- 250 route-mile heavy rail system would be \$38 billion, per New Starts data.
- Plus, the VEB guideway would not depend on [limited] FTA funding.



Conclusions

- Most 21st-century metro areas are not New York, Chicago Loop, or DC—decentralization of jobs requires rethinking role of transit.
- Large benefits in transit making use of expanding roadway network.
- Great synergy between priced lanes and fast, reliable, high-quality bus service.
- HOT/VEB projects with significant toll revenues will attract private-sector investment.



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