

THE FUTURE OF MANAGED LANES FROM (A)UTONOMOUS VEHICLES TO (Z)ERO EMISSIONS



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INFLECTION POINTS

- **1970s: Busways to HOV lanes**



- **1990s: HOV lanes to HOT lanes**

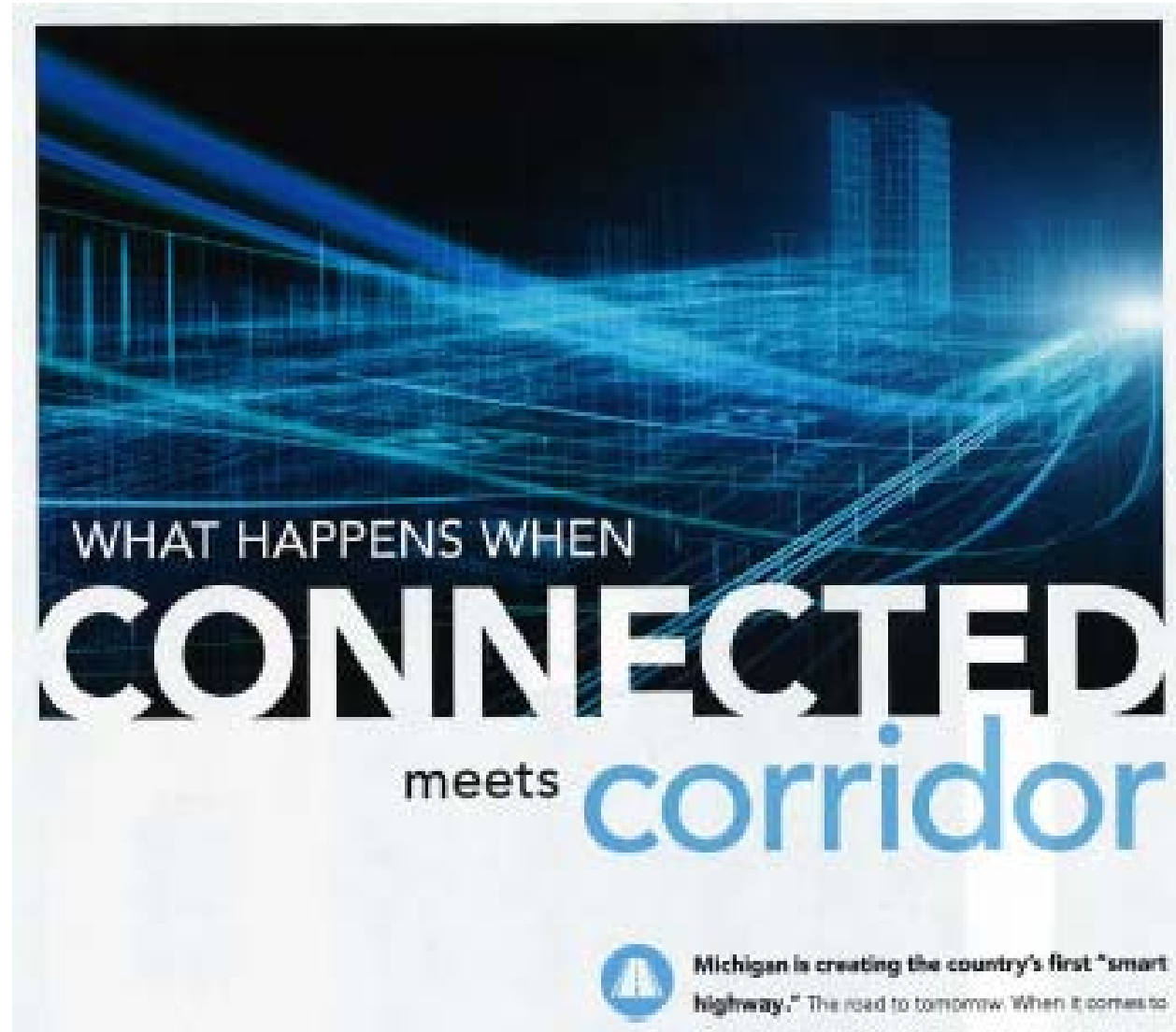


- **Now: HOT lanes to express lane systems**



- **What's next?**

ABRUPT DISRUPTION IS COMING



RAPID PACE OF TECHNOLOGY ADOPTION



ARE WE READY FOR AUTONOMOUS VEHICLES?

Approaching the car with your phone or watch pre-positions the seat and mirrors. The climate control prepares your cabin temperature. Your music swells. The door rises. You climb in. The dash—smooth, featureless leather that notably lacks today’s electronic screens—suddenly brightens with projected displays. A Siri avatar greets you. “Hello. Any errands on our way to work, Bob?”

Fortune Magazine, February 2016



© Provided by Motor Trend

AN AUTONOMOUS AND CONNECTED FUTURE: CAN WE ACHIEVE THE VALUE PROPOSITIONS?



NEW
DEDICATED
LANES
(WITHOUT
COMPROMISING
OTHERS)

**SELF
DRIVING** **CURRENT USERS**

AN AUTONOMOUS AND CONNECTED FUTURE: CAN WE ACHIEVE THE VALUE PROPOSITIONS?

GREATER
AND SAFER
HEADWAY
CAPACITY
(WITH SAME
TRAVEL
BENEFITS)



HOW WELL ARE WE AT PREDICTING CHANGE?



1973



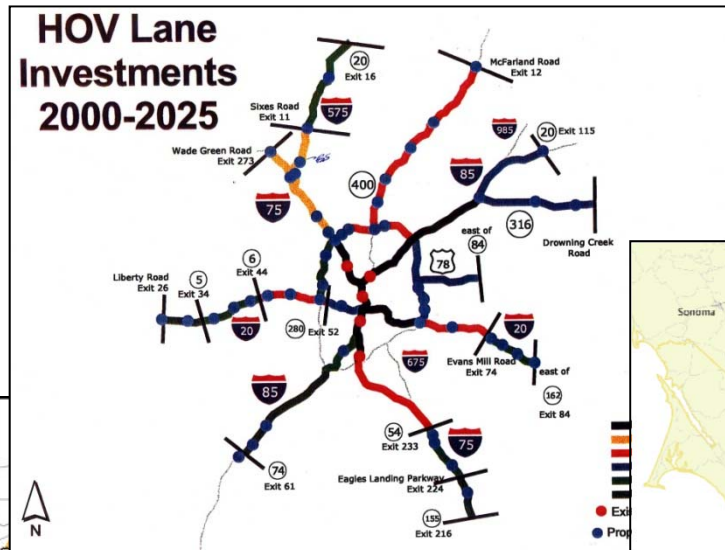
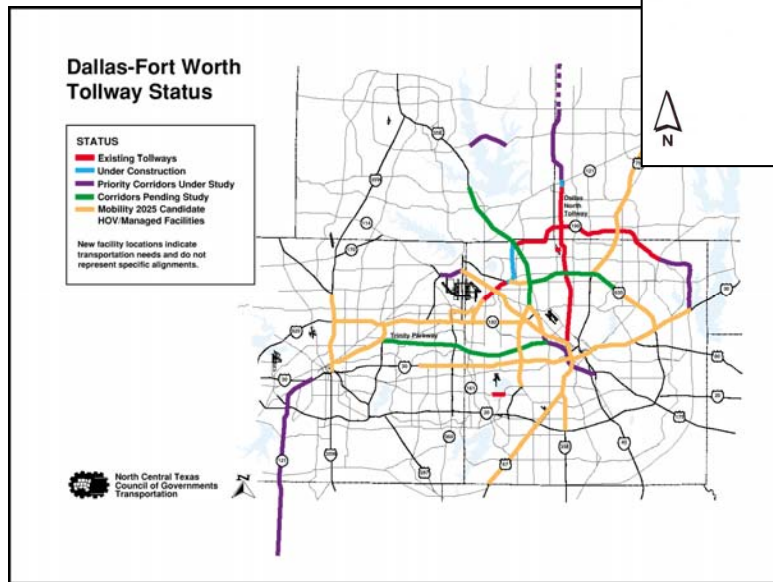
1988



2013

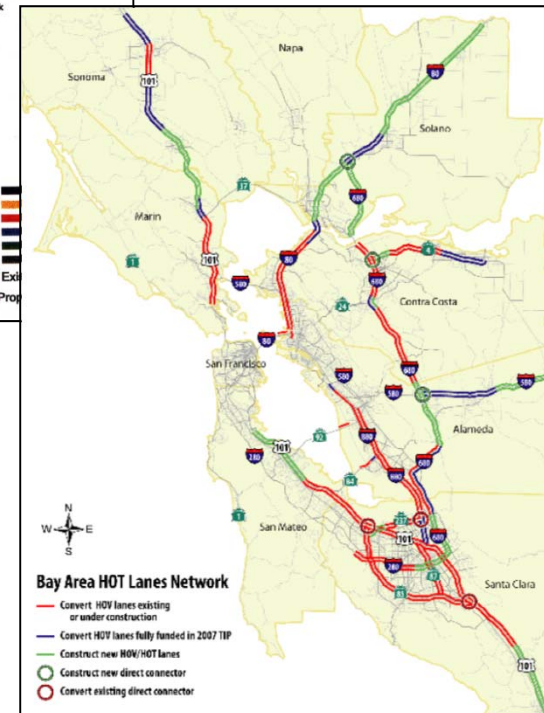
IT TAKES LONGER TO ACHIEVE OUR VISION THAN WE ANTICIPATE

Dallas-Ft Worth



Atlanta

Bay Area



WHAT IF POLITICAL DECISIONS OVERRIDE HOW WE BUILD OR OPERATE OUR MANAGED LANE INVESTMENTS?



WHAT TOOLS ARE NEEDED TO MAKE INFORMED POLICY DECISIONS?



ZERO AND LOW EMISSION VEHICLES



Virginia's Story

- I-95 HOV Lane Counts
 - March 2004 – 8%
 - October 2004 – 18%
- Increased HOV lane volume to 1,900

“Allowing single-occupant hybrid cars to use carpool lanes....creates crushing congestion and about \$4,500 per car in adverse social costs annually.” ¶

American Economic Journal, August 2014 ¶

The Mercury News

BAY AREA NEWS ¶

**December 22, 2015 ¶

California's 85,000 green carpool stickers are all gone



WHAT ARE IMPLICATIONS TO TRANSIT?

Drive with Uber
Earn money on your schedule



Uber home page

HOW DO WE ADDRESS TOLLING BACKLASH IN SOME LOCALES?

Transportation chair signals end may be near for toll-managed lanes



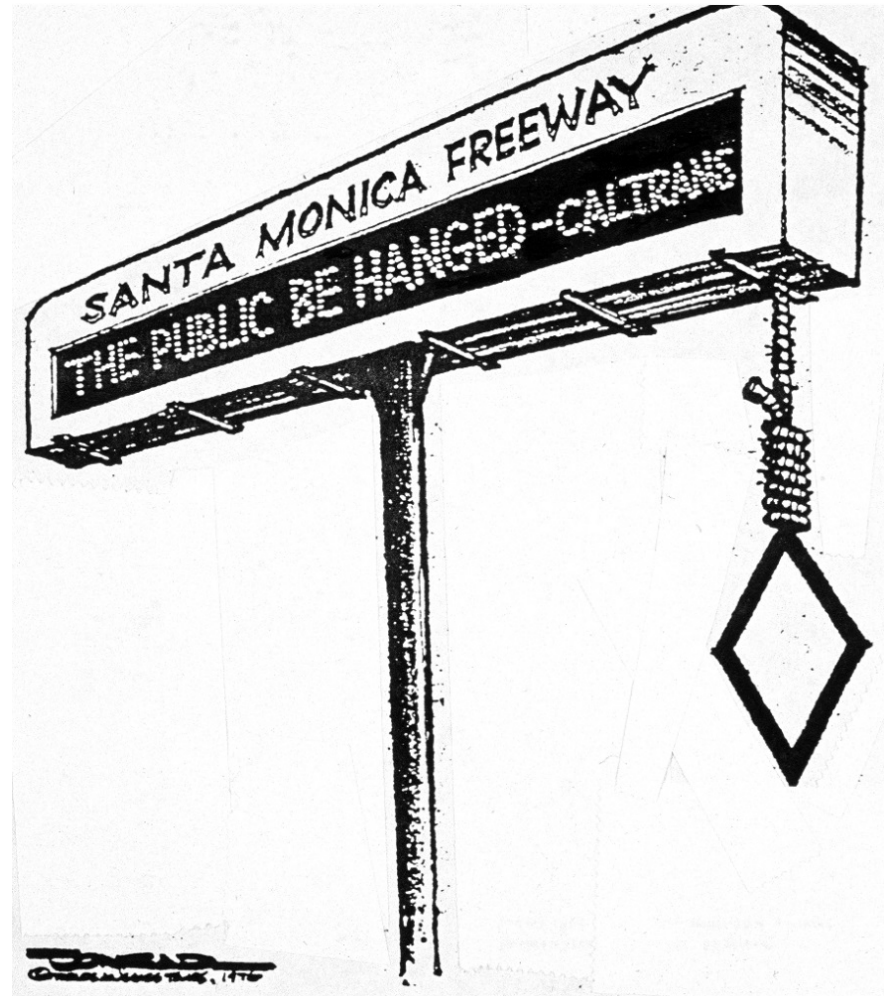
I-405 tolls aren't providing relief

Texas Backlash Against Tolling



NEWS
I-405 tolling plan heads to legislature
Feb 2, 2014 at 4:00PM

BEWARE THAT PROGRESS IS NOT LINEAR



LESSONS

- **Success has always been driven by effective managed lane operation and use**
- **Technical, institutional, public acceptance issues play a big role in what gets implemented**
 - Don't oversell the benefits
 - Create "win-win" scenarios
 - Listen to constituents
- **Don't ignore legacy issues**
 - Who originally paid for the road?
 - What rules can be maintained?
 - How will customers respond?

KEEPING IT SIMPLE IN A CHANGING DRIVER ENVIRONMENT

OR AT LEAST MINIMIZING DRIVER DECISION MAKING CHOICES



MANAGED LANES SHOULD CONTINUE TO SUPPORT ADOPTED LOCAL POLICIES

Providing more transportation choices

Ensuring safe and efficient performance

Making transit attractive

Addressing congestion

Local funding for projects

Embracing emerging technology

BEING BOLD

New technologies and transportation approaches will continue to alter how managed lanes are implemented and operated:

- Electronic tolling
- Automated occupancy enforcement
- Mobile apps
- Active traffic/demand management
- Autonomous and connected vehicles

What emerging technologies should be embraced and when?

- What is the value proposition in the next evolution managed lane systems?



THANK YOU

