

2008 ASPO-USA Peak Oil Conference

Proceedings



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Institute of Transportation Studies University of California, Davis



Future of Mobility

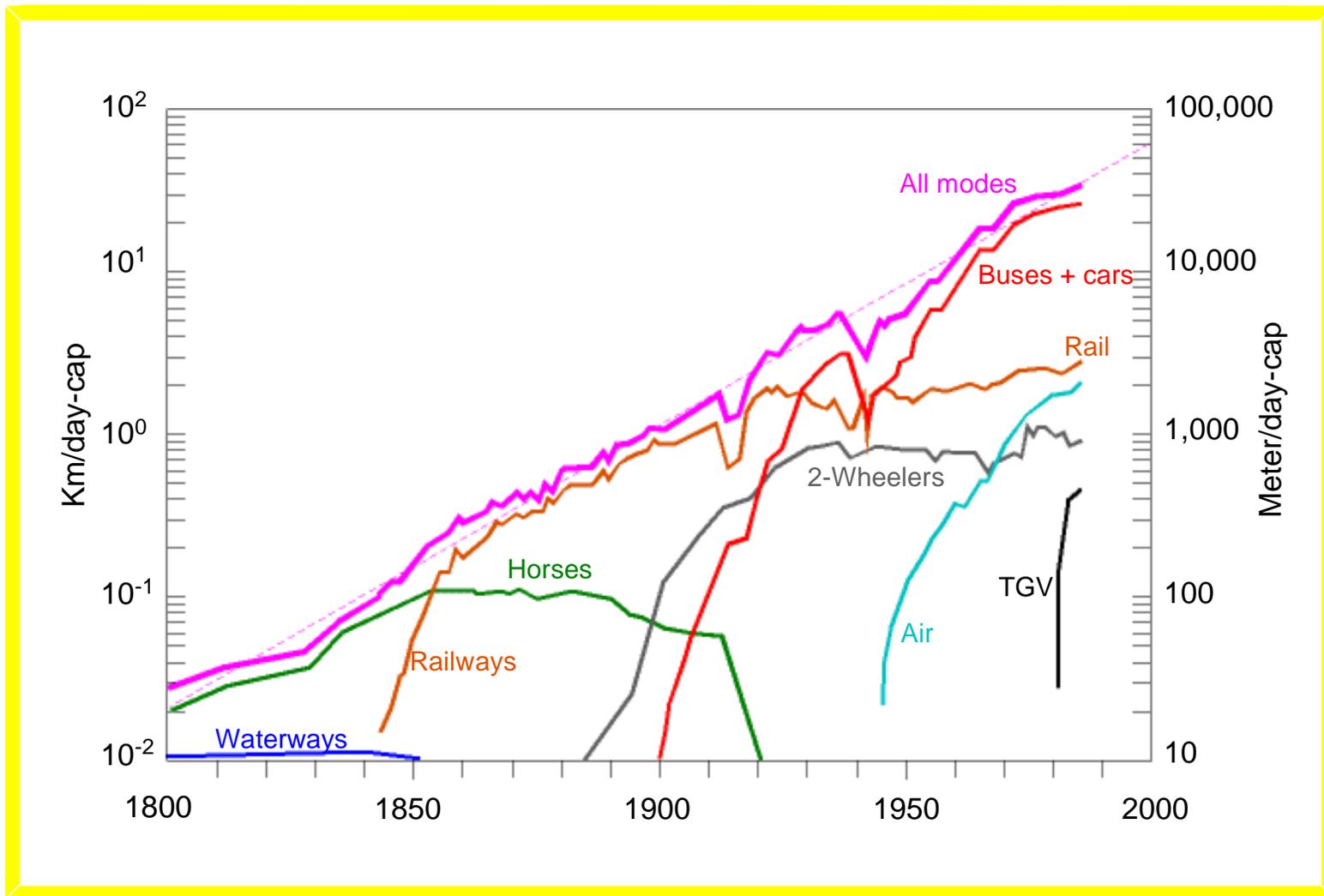
Daniel Sperling
UC Davis and CARB

2008 Peak Oil Conference
Sacramento, CA

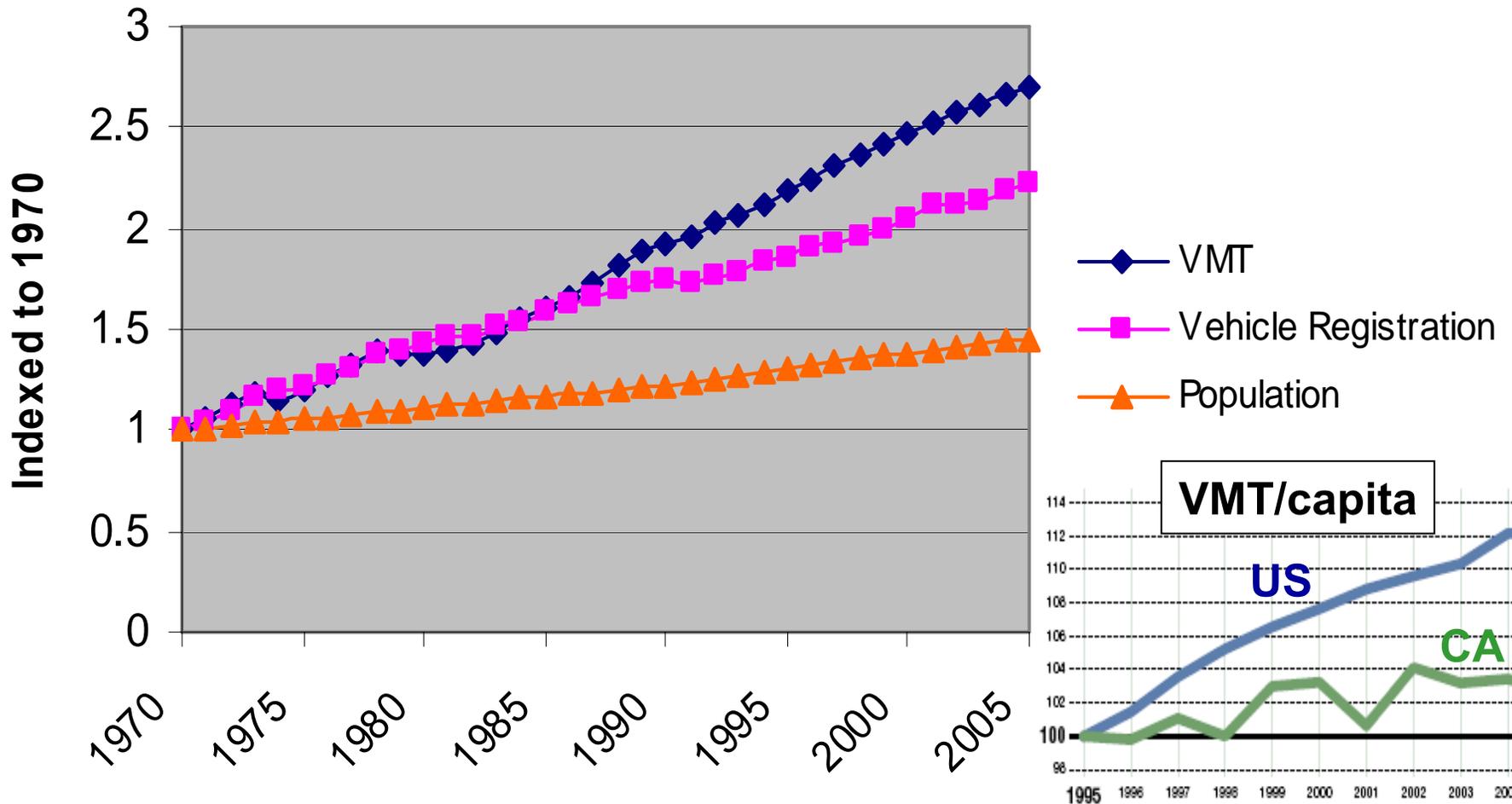
September 22, 2008

Exponential Growth in Mobility

(passenger-km per day per capita in France)



Vehicle Travel Growing Faster than Population (but not in California?!)



Source: ORNL, in Sperling and Gordon (2009)

Not all vehicle trips are “high value”!

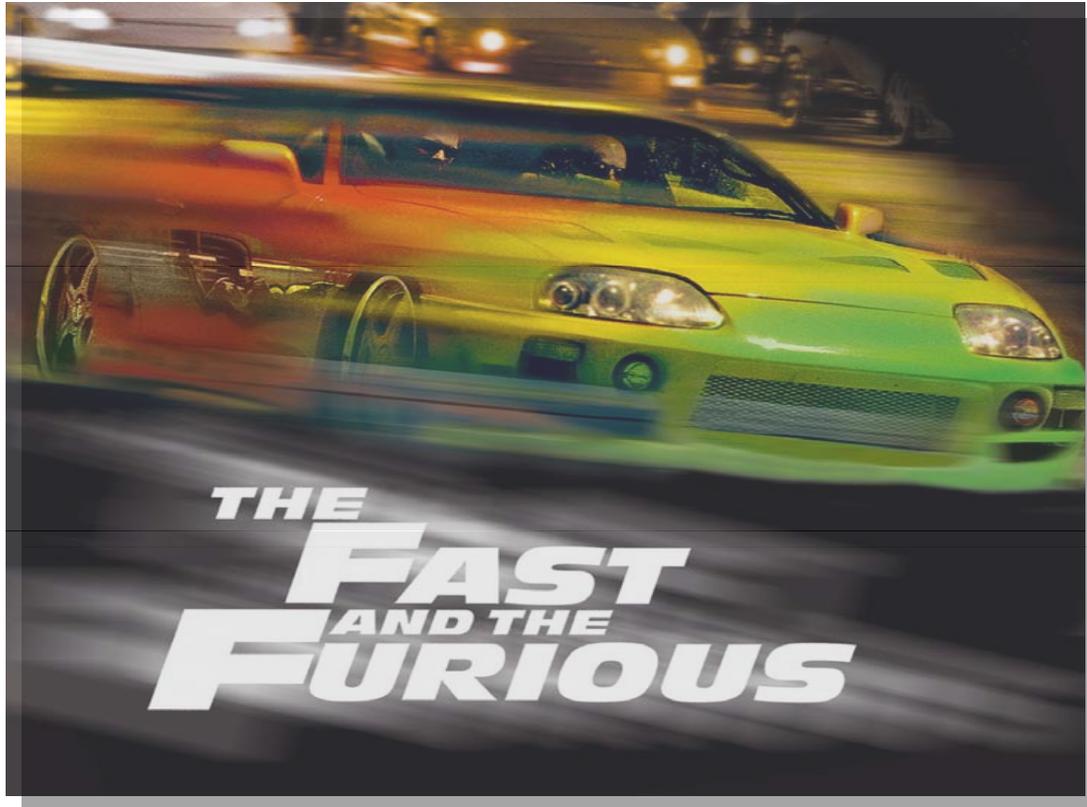


In some ways, the transport system is vastly superior to 100 years ago

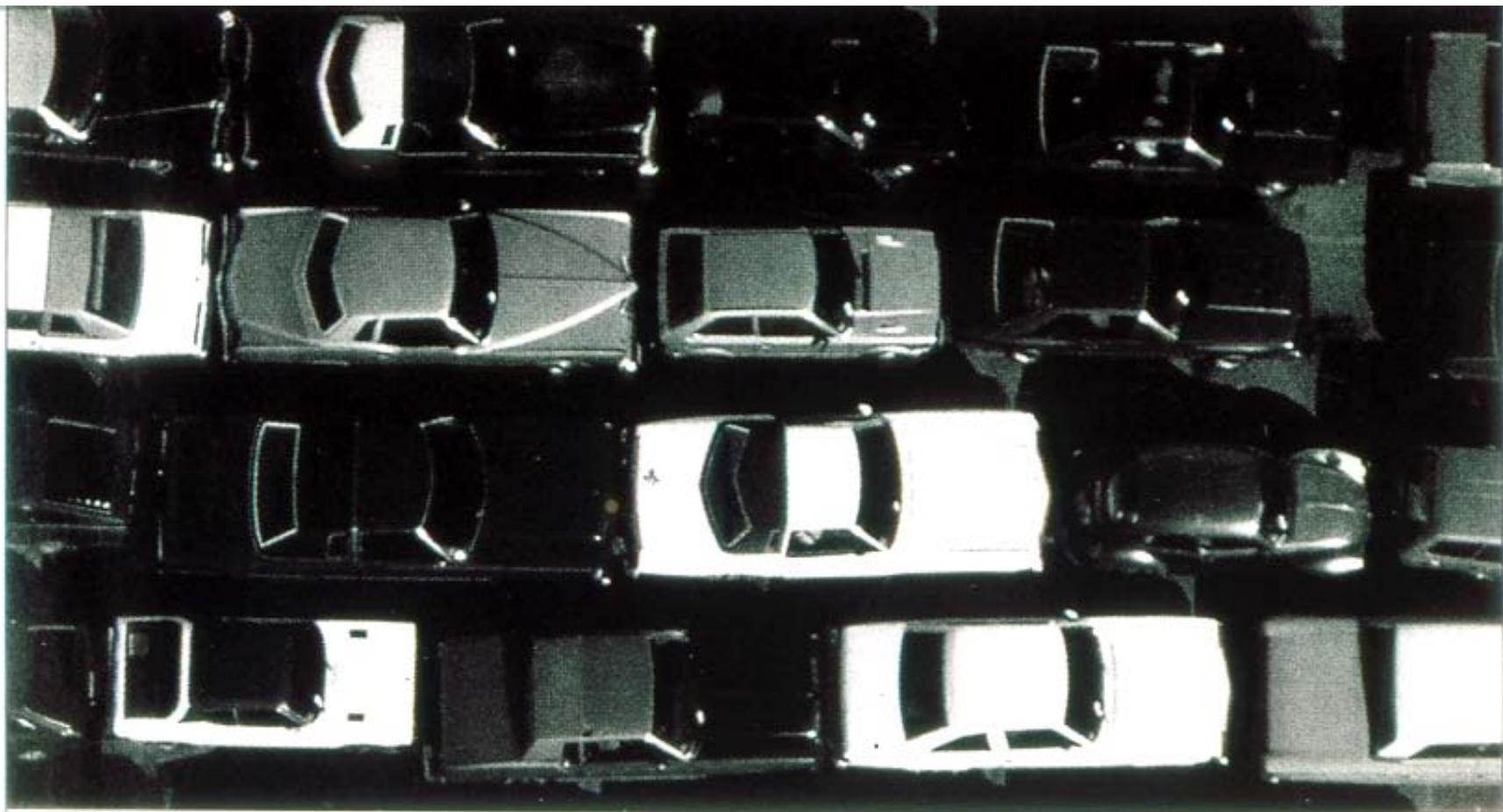


Cars and Roads Have Vastly Improved Quality of Life and Economic Productivity

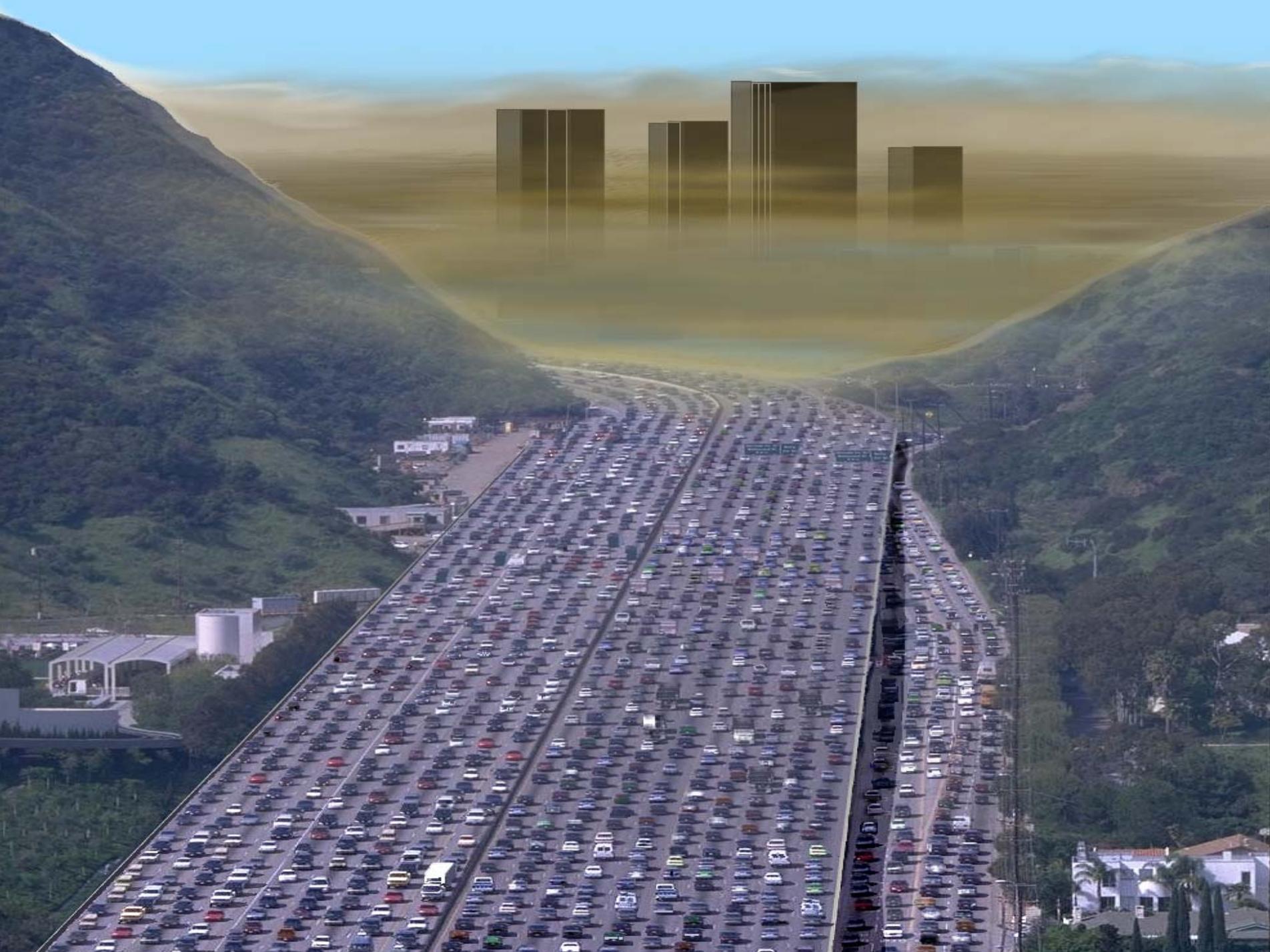








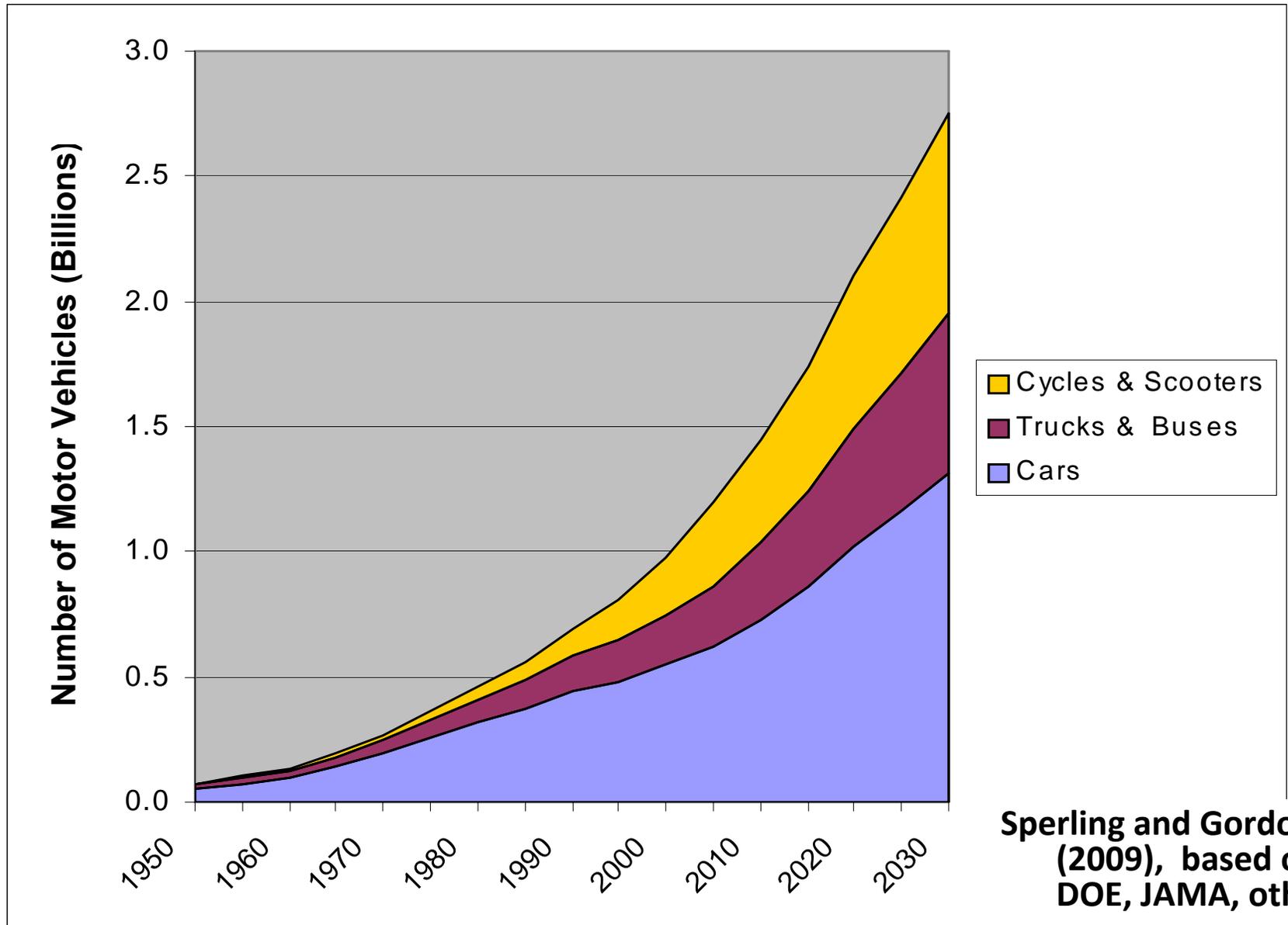
LA: Once you're here, you'll never move.



Lagos, Nigeria



2 Billion Vehicles in 2020 (globally)!



Vehicle Ownership will Continue to Surge Partly Due to New Low-Cats Cars

Nano from Tata, \$2500



15 Million Electric Bikes and Scooters Sold in China Last Year

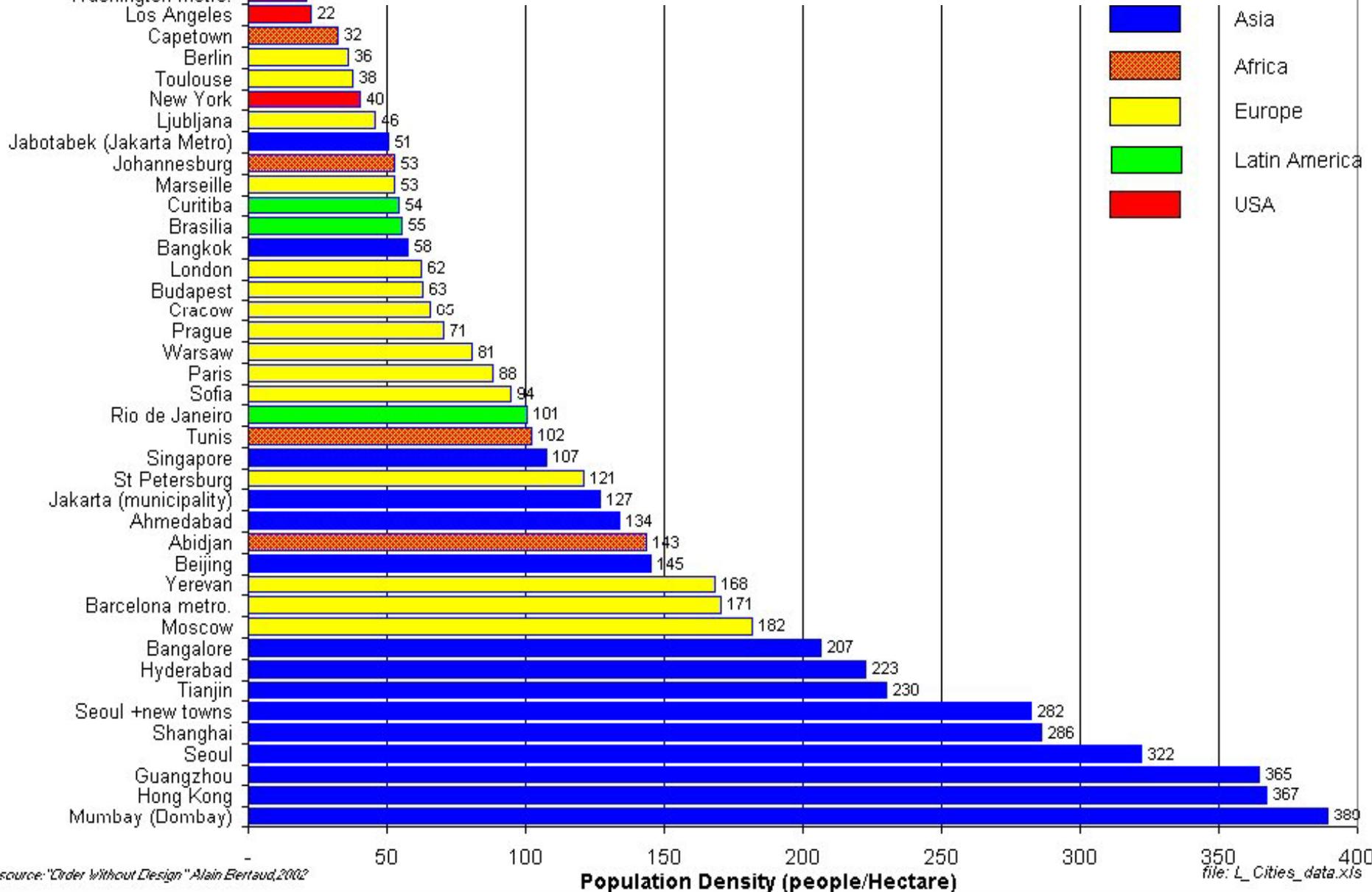




Moped parking in Bangalore (courtesy of Lee Schipper)

USA Car Monoculture Resistant to Change Partly Due to Low Population Densities

USA Metro Areas Have Lowest Densities



source: "Order Without Design" Alain Bertaud, 2002

file: L_Cities_data.xls

New Paradigm of Mobility Services Needed

....To Provide Choice and Facilitate Aggressive Policies to Reduce VMT

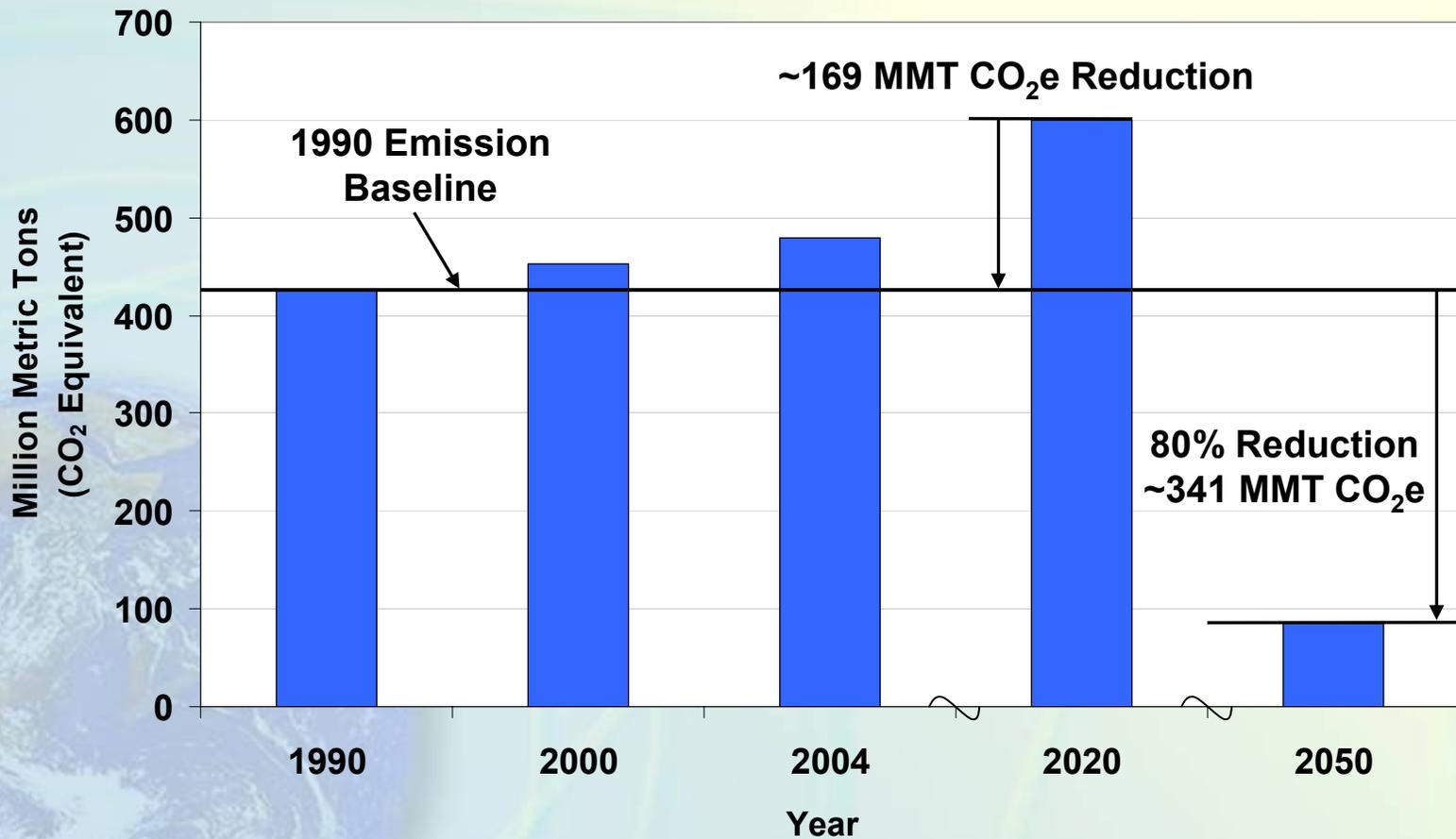


Paris rent-a-bike

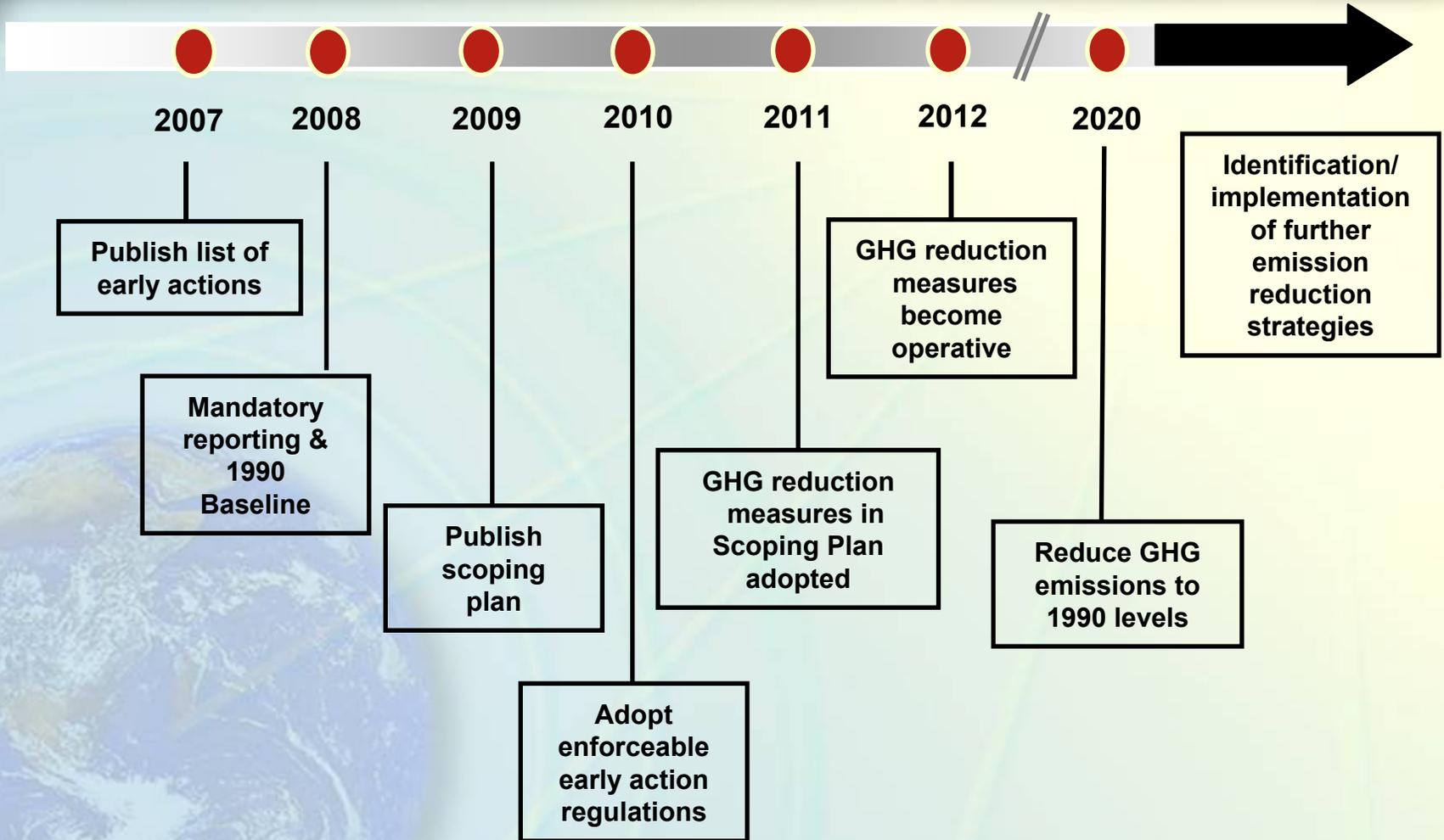


Magnitude of the GHG Challenge

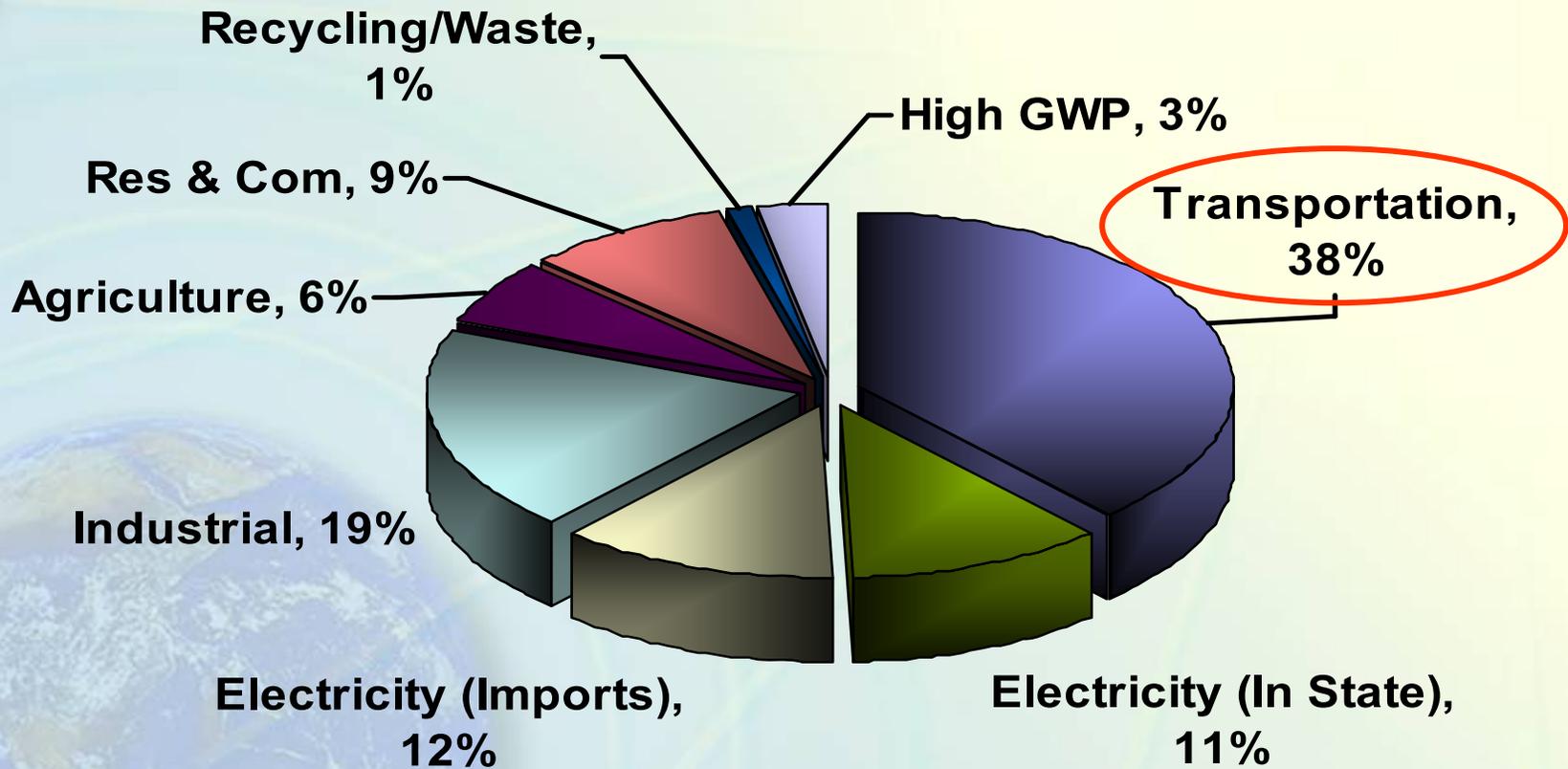
ARB Emissions Inventory



AB 32 Timeline

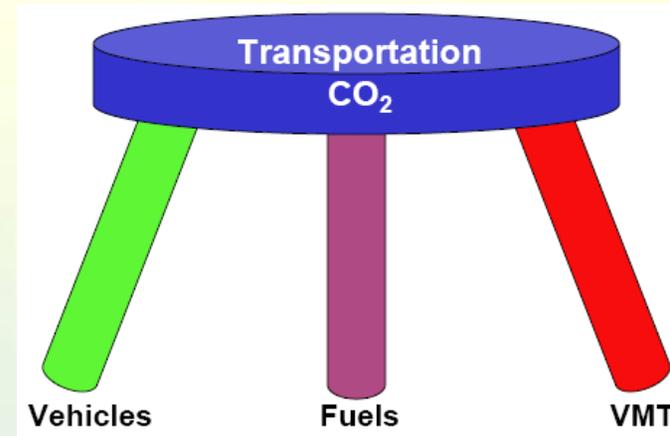


2002-2004 GHG Emissions (469 MMTCO₂E)



Transportation in AB32

- Vehicles (cars and trucks) **39 MM tons**
 - Light-duty vehicle GHG reductions (Pavley I and II)
 - Other light duty vehicle efficiency measures
 - Feebates?
 - Truck Technology
 - Aerodynamic design
 - Improved efficiency for heavy duty trucks
 - Hybridization of urban and short-haul trucks
- Fuels **17 MM tons**
 - Low Carbon Fuel Standard
- VMT and goods movement **8 MM tons (↑)**
 - VMT reduction (SB375?) (including transit and land use changes)
 - High speed rail
 - Goods movement
 - Eco-driving: tire inflation, etc



I. Transforming Vehicles

Cars of future will be far more efficient with far smaller carbon footprint, and will be powered mostly by electric-drive



AB32 Measures for Light Duty Vehicles

- Pavley I: 30% reduction by 2016 (~37 mpg, plus reduced A/C refrigerants)
- Pavley II: ~44 mpg in 2020 (equivalent to ~40 mpg in other 49 states)

(note that EU is adopting standard of ~51 mpg in 2012 (120 g/km))

- Feebates: if adopted would reduce the cost of achieving the reductions and if aggressive could achieve additional reductions

II. Transforming Fuels

Low carbon fuel standard (LCFS) will accelerate the transition to alt fuels and transform the oil industry

- Future fuels will eventually be mix of biofuels, electricity and hydrogen
- Low carbon fuel standard requires 10% reduction in GHGs/unit of energy by 2020 (which implies a large proportion of low-carbon alt fuels)

Biofuels



Hydrogen



Electricity



III. Transforming Travel and Use of Vehicles

Transforming mobility and the transportation system is a greater challenge than transforming vehicles and fuels

- AB32 target of 2 MM tons for VMT (<2% of planned GHG reductions for 2020) will be increased
- Possible measures include SB375 (Steinberg) targets, changes in transport funding formulas, pay-as-you-go insurance, many local gov't actions, and many actions to improve goods movement
- Includes eco-driving (GIS/GPS aids for parking and route selection, fuel use info feedback, etc)
- Includes actions by local governments to reform land use
- Includes expanding traveler choice with smart paratransit, smart carpooling, tele-communications, NEVs)
- Goods movement improvements might include ship electrification at ports (early action), ship speeds, port trucks, harbor craft, and logistics

TWO BILLION CARS

DRIVING TOWARD SUSTAINABILITY

DANIEL SPERLING & DEBORAH GORDON
FOREWORD BY ARNOLD SCHWARZENEGGER

Forthcoming from Oxford!

A new book by Daniel Sperling and Deborah Gordon
with a foreword by Arnold Schwarzenegger

At present, there are roughly a billion vehicles in the world. Yet within twenty years, the number will double to 2 billion, largely a consequence of China's and India's explosive growth. Given that greenhouse gases are already creating havoc with our climate and that violent conflict in unstable oil-rich nations is on the rise, does this mean that matters will only get worse, or are there hopeful signs that effective, realistic solutions can be found?

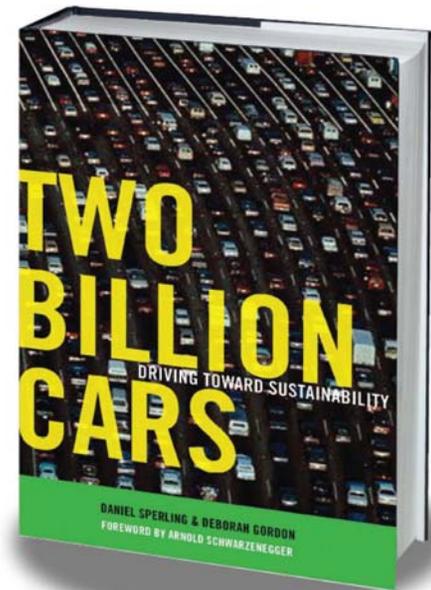
In *Two Billion Cars*, through a concise history of America's love affair with cars and an overview of the global auto industry, leading transportation experts Daniel Sperling and Deborah Gordon explain how we arrived at this state, and what we can do about it. Sperling and Gordon outline the problem in full and identify its primary sources—the auto industry, short-sighted government policies, and consumers. They consider the issue from all angles and take up such topics as getting beyond the gas-guzzler monoculture, breaking Detroit's hold on energy and climate policy, the search for low-carbon fuels, California's pioneering role, and more. But they are not Cassandras. Promising advances in both transportation technology and fuel efficiency together with shifts in traveler behavior, they suggest, offer us a way out of our predicament.

Ultimately, the authors contend that the two places that have the most troublesome emissions problems—California and China—are especially active in developing novel solutions that offer a path forward. Arnold Schwarzenegger's enlightened embrace of eco-friendly fuel policies, which he discusses in the foreword to *Two Billion Cars*, and China's forthright recognition that it needs far-reaching environmental and energy policies, suggest that if they can tackle the issue effectively and honestly, then there really is reason for hope.

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Daniel Sperling is Professor of Engineering and Environmental Science & Policy at the University of California, Davis, and Founding Director of University of California, Davis's Institute of Transportation Studies. He also serves on the California Air Resources Board, chairs the Future of Mobility Council of the Davos World Economic Forum, and has authored 10 books and over 200 technical papers and reports on transportation and energy.

Deborah Gordon is a senior transportation policy analyst who has provided consulting services to the National Commission on Energy Policy, the California Energy Commission, Hewlett Foundation, and the Chinese government to develop fiscal policies for their burgeoning auto fleet. She earlier served as director of transportation and energy programs at the Union of Concord Scientists, senior research scholar at the Yale School of Forestry and Environmental Studies, and a chemical engineer at Chevron.

Thank You