The Impact of Emerging Technologies

NARC's 51st Annual Conference & Exhibition

Steve Heminger, Executive Director

Metropolitan Transportation Commission
San Francisco Bay Area

http://transpressnz.blogspot.com/2010/11/days-of-future-passed.html

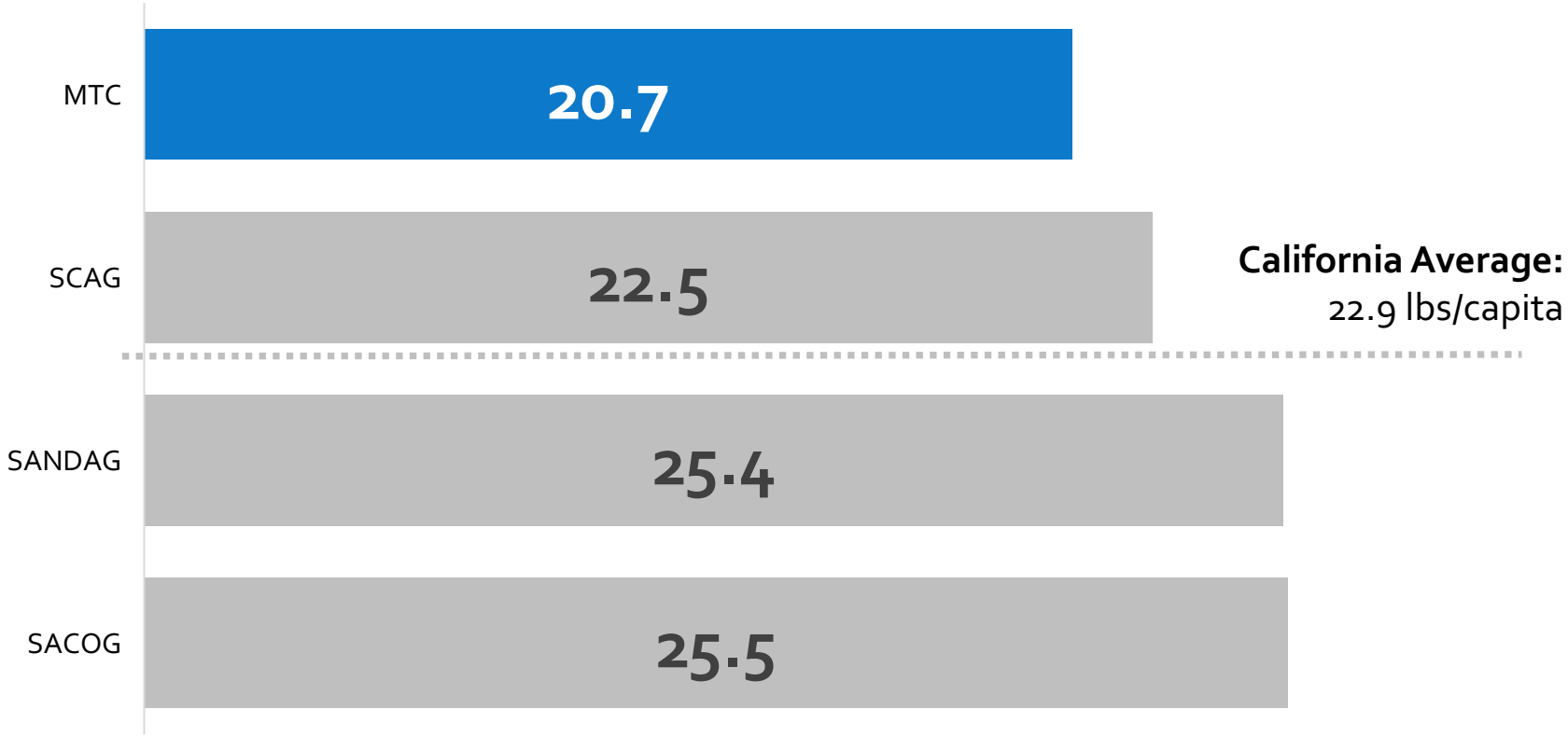
Senate Bill 375

- A blue print to coordinate land use and transportation policies, projects, and public investment
- Part of California's approach to reducing greenhouse gas emissions from passenger vehicles
- Requires the development of a Sustainable Communities Strategy (SCS) as part of MPO's long-range transportation planning efforts to:
  - Reduce GHG emissions 15% by 2035
  - House the region's population

Plan BayArea 2040

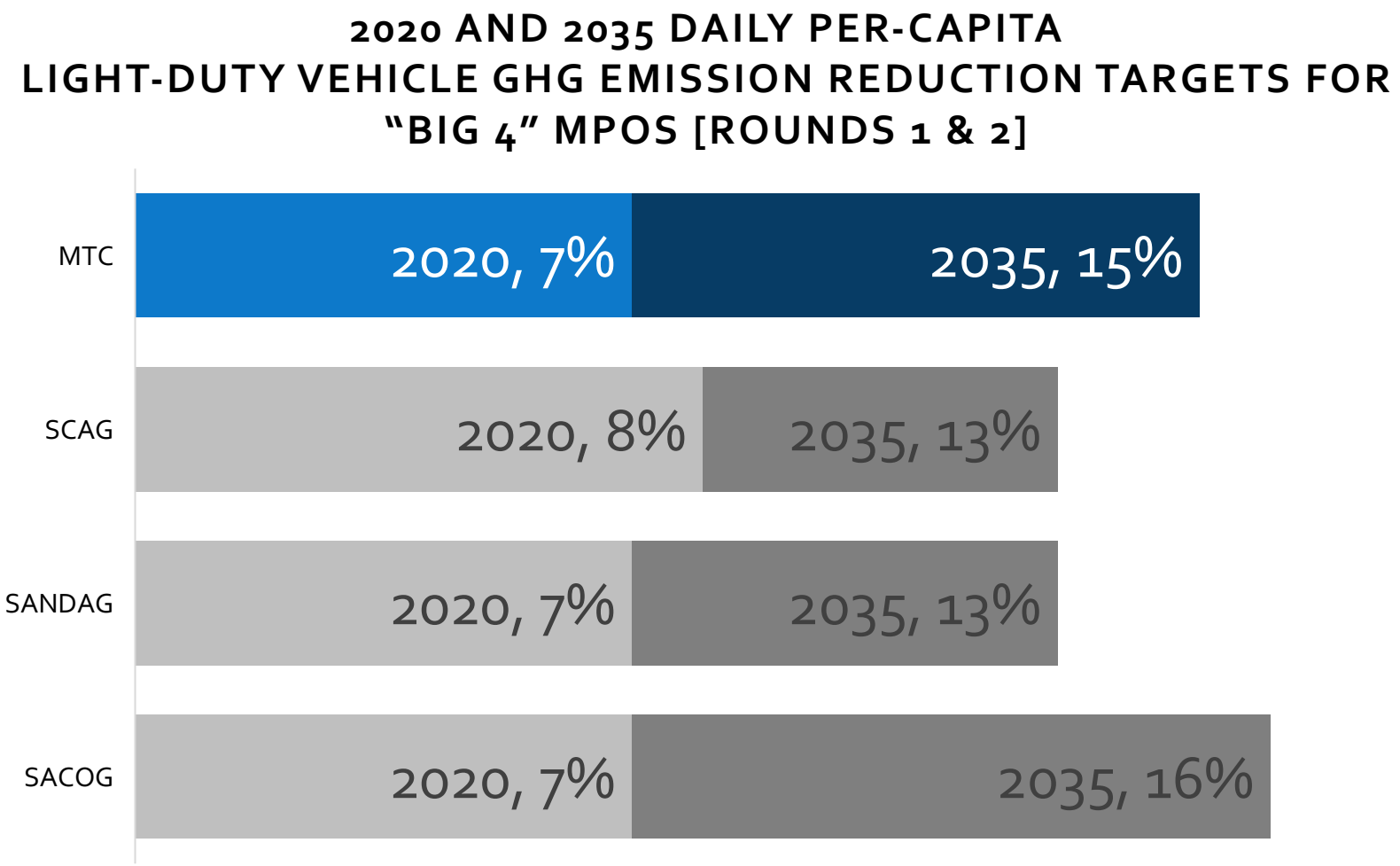
Regional GHG Emissions

2015 DAILY PER-CAPITA LIGHT-DUTY VEHICLE GHG EMISSIONS FOR "BIG 4" MPOS [ESTIMATE]



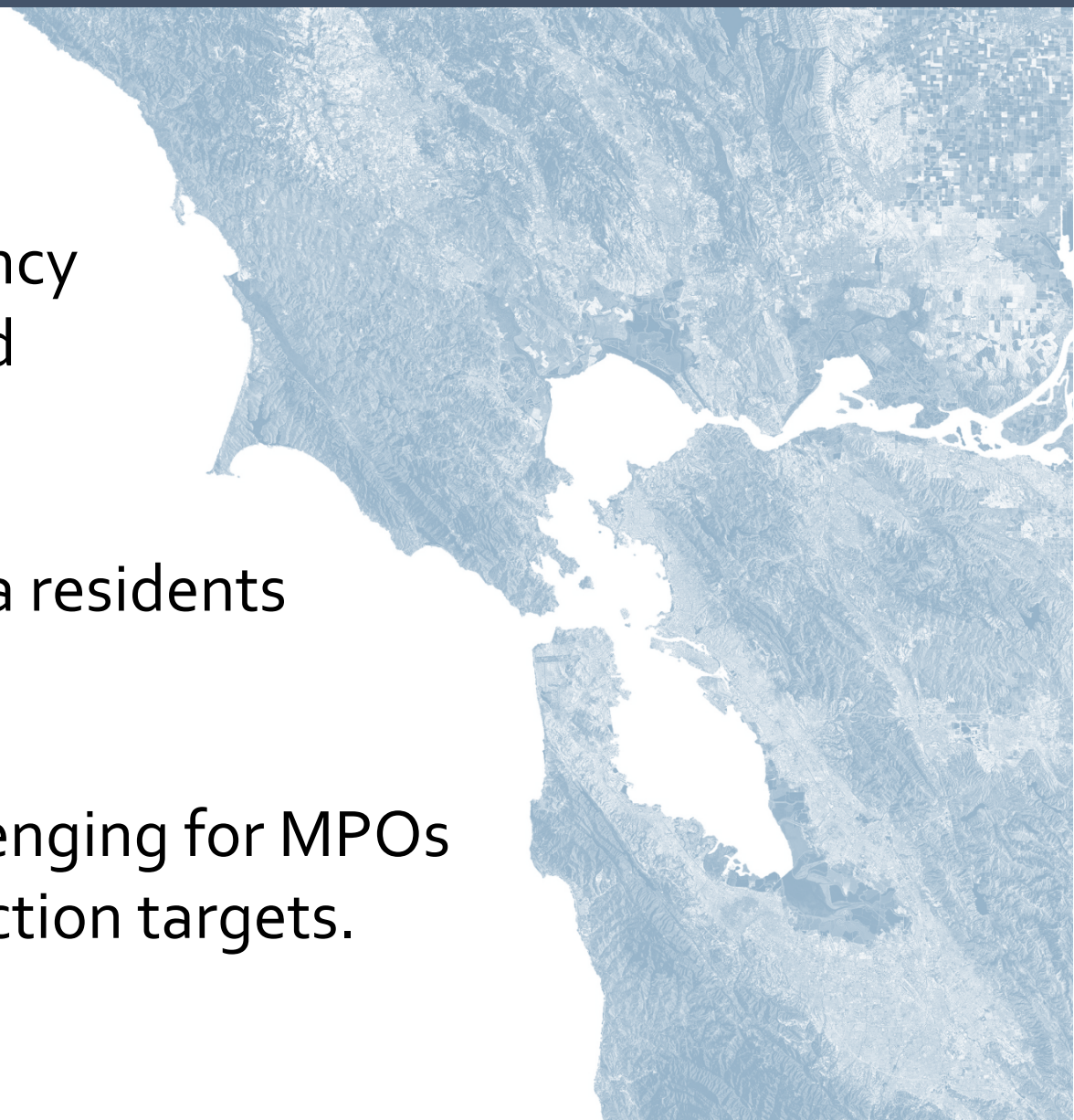
Source: California Energy Commission, 2015; California Department of Finance, 2015; *based on monitoring data for retail fuel sales for gasoline by county of purchase; 300-day annualization factor*

Regional GHG Reduction Targets



Source: California Air Resources Board (CARB)

The Rebound Effect



Low fuel prices and increased fuel efficiency is resulting in reduced auto operating costs,

Resulting in California residents driving more,

Making it more challenging for MPOs to achieve GHG reduction targets.

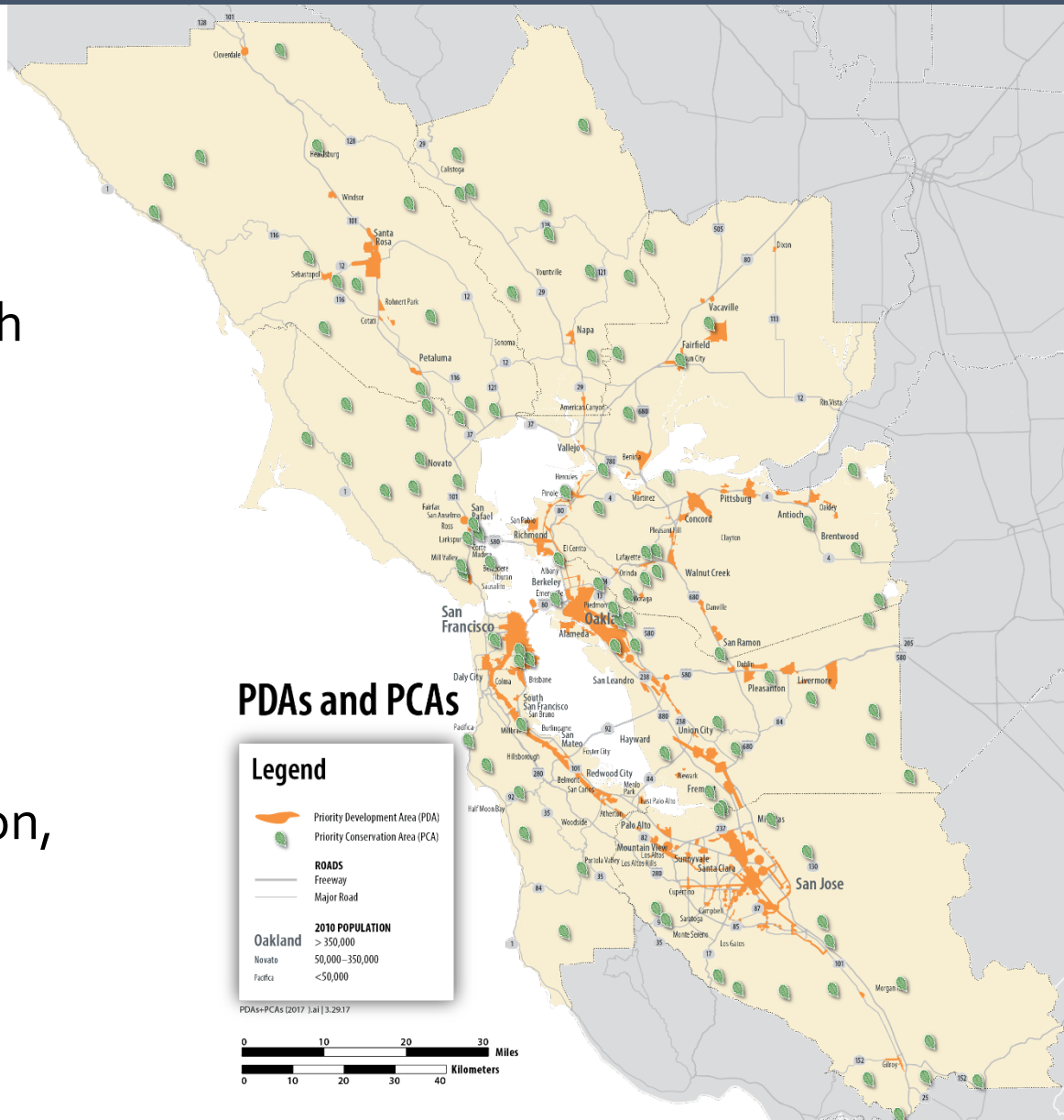
Bay Area PDAs & PCAs

Priority Development Areas (PDAs)

- Focus for future growth
- Locally-identified and approved

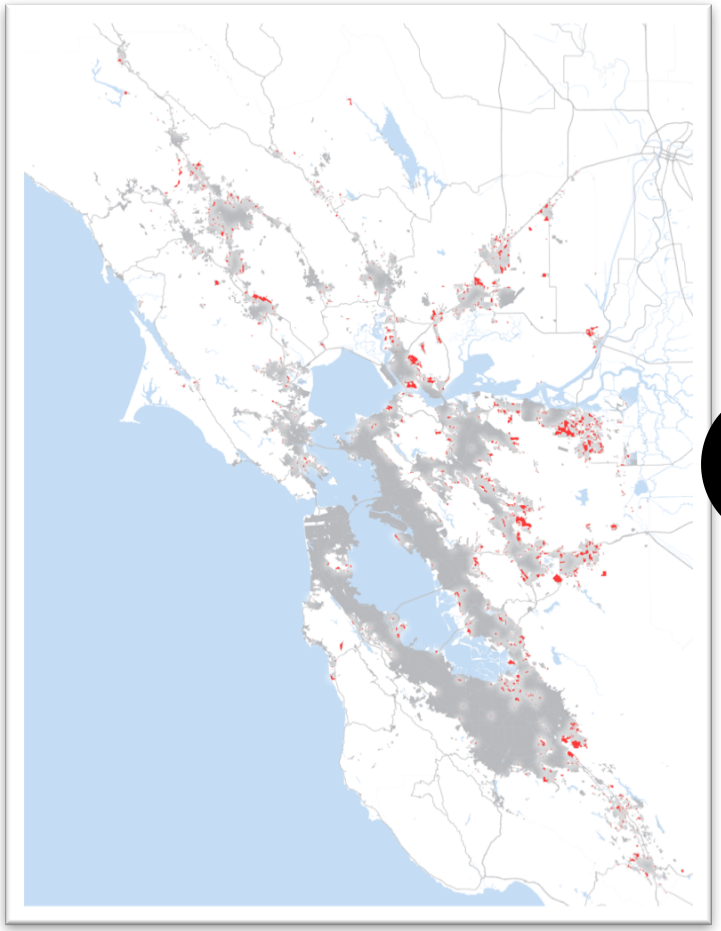
Priority Conservation Areas (PCAs)

- Areas identified for protection, preservation, and access

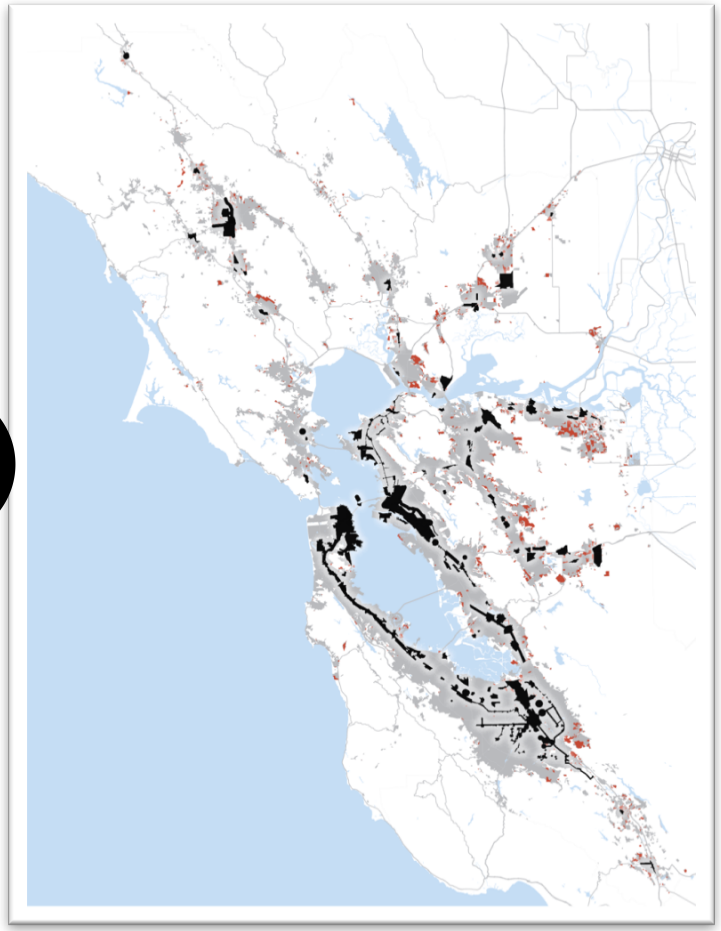


Focused Land Use Development

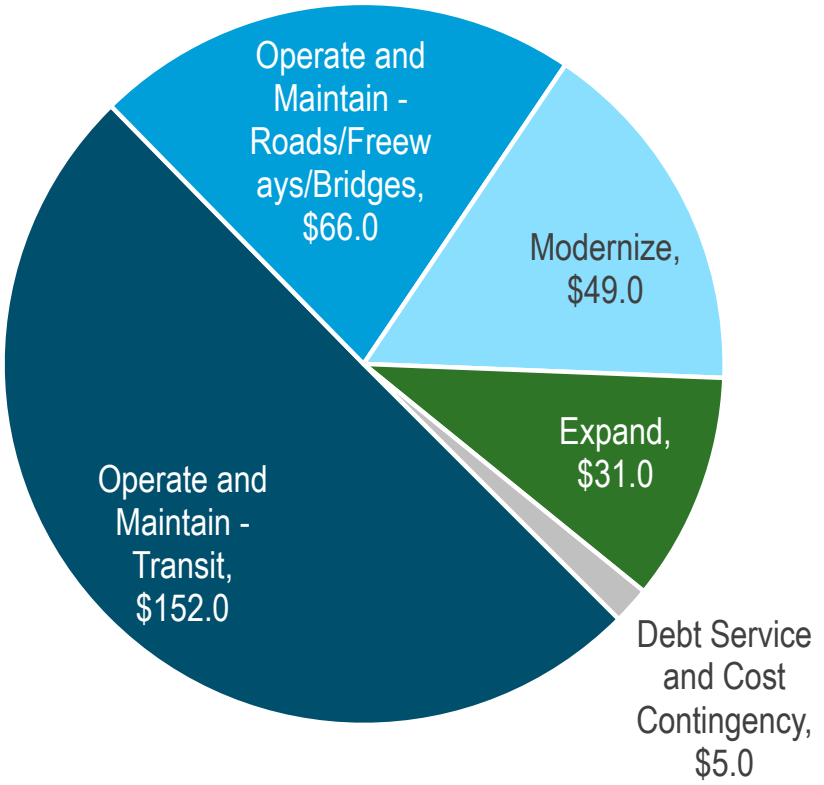
Red = Greenfield Development from 1990-2014



Black = PDAs where ~75-80% of new households are planned through 2040



Transportation Investments



90%

Operate, Maintain, and Modernize

10%

Expand

Operate and Maintain – replace, repave, or operate

Modernize – improve

Expand – extend or add

Targeted Emission Reductions

Traditional transportation and land use strategies may not be enough to meet be enough to meet GHG emission reduction goals, requiring other programs and investments.

Transportation Demand Management

- Commuter Benefits Ordinance
- Targeted Transportation Alternatives
- Trip Caps

Alternative Fuel / Vehicle Strategies

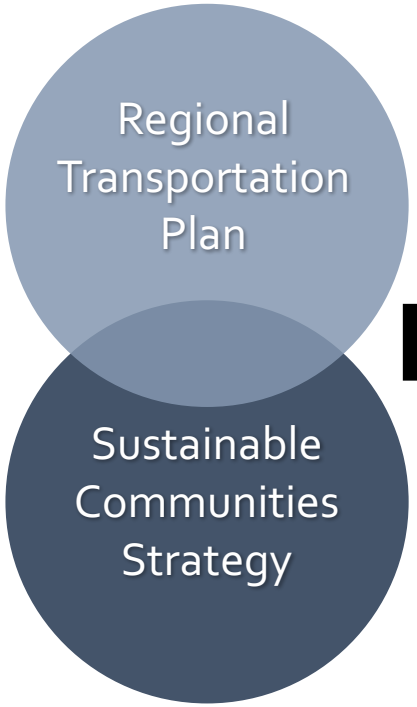
- Regional EV Charger Deployment
- Clean Vehicles Feebate
- Smart Driving

Car Sharing and Vanpool Incentives

- Car Sharing
- Vanpool

One Bay Area Grant Funding

Plan Bay Area
MTC/ABAG (2013)



Bay Area Federal Funding
FHWA – STP/CMAQ

$862M

5 year period
FY2018 – FY2022

One Bay Area Grant
OBAG 2

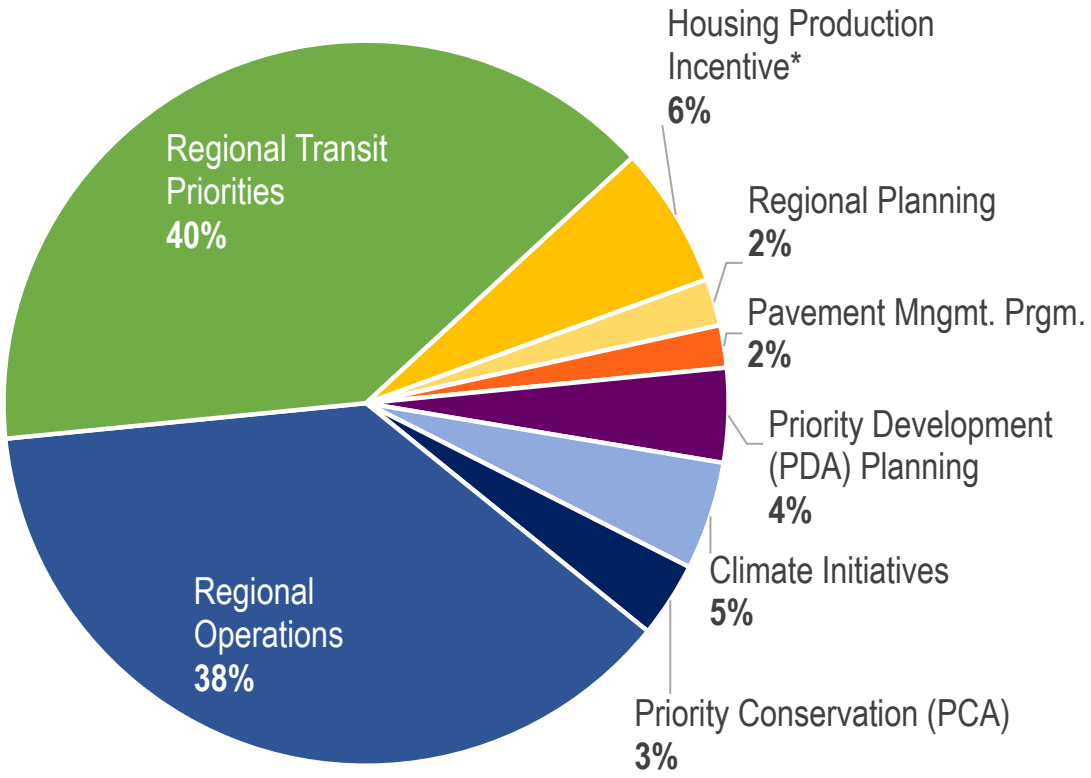
Regional Programs
$476M

County Programs
$386M

A Comprehensive Funding Approach

- Distribute transportation funding through a framework that implements the Sustainable Communities Strategy (SCS)
- Provide flexibility on how money can be spent, while meeting regional objectives (ex: Complete Streets)
- Reward jurisdictions that accept and produce housing in Priority Development Areas (PDAs)
- Support open space preservation in Priority Conservation Areas (PCAs)

Regional Programs



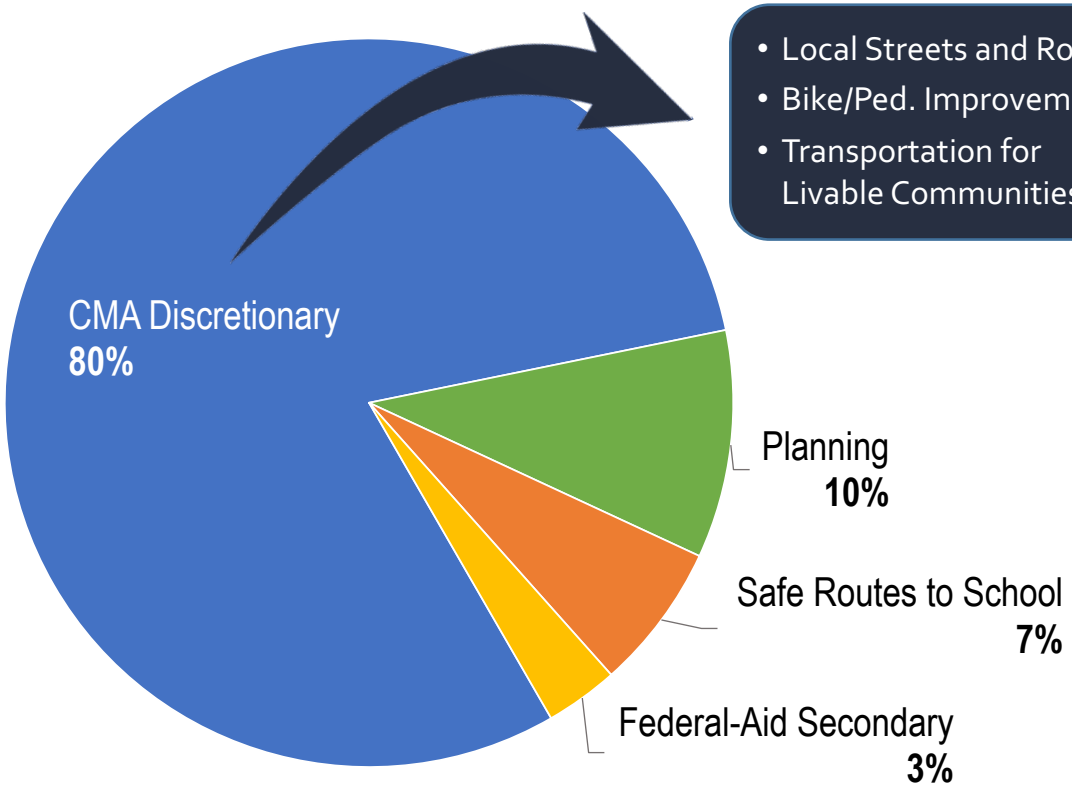
$451M OBAG 1 FY2013-2017 ❯ **$476M** OBAG 2 FY2018-2022

BART Car Replacement
Paul Chinn,, San Francisco Chronicle

Bay Trail, Tiburon
Association of Bay Area Governments

San Francisco-Oakland Bay Bridge
Noah Berger

County Program

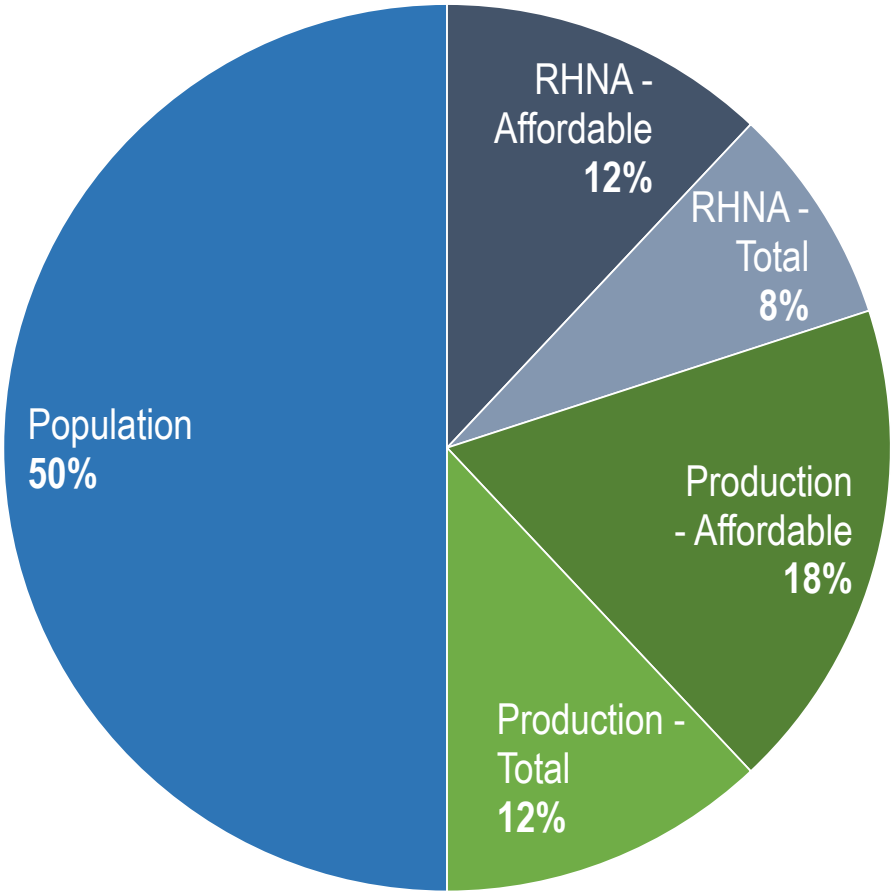


- Local Streets and Roads
- Bike/Ped. Improvements
- Transportation for Livable Communities

$327M OBAG 1 FY2013-2017 **›** **$386M** OBAG 2 FY2018-2022

County Program Distribution

Distribution Formula



Program Amounts

Alameda	$77
Contra Costa	$56
Marin	$11
Napa	$8
San Francisco	$48
San Mateo	$33
Santa Clara	$104
Solano	$21
Sonoma	$28
Total	**$386**

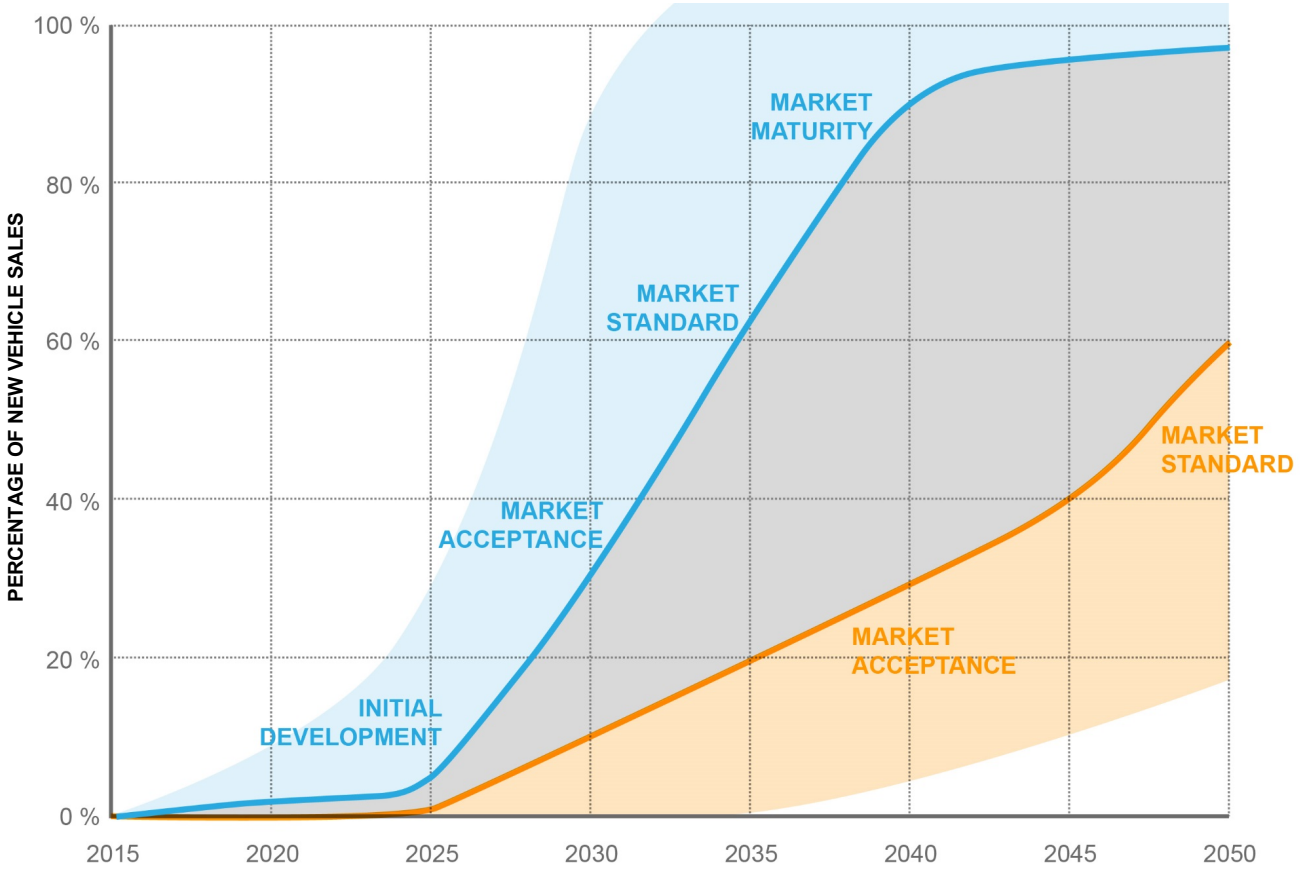
Millions $, rounded

Program Requirements

- **Priority Development Areas (PDAs)**: 50-70% of discretionary funds to PDAs
- **Complete Streets** resolutions
- **PDA Investment and Growth Strategy**: guide project prioritization within each county
- **Local Streets & Roads**: certified pavement management program (PMP), participation in statewide data collection
- **Housing/Displacement**: reward jurisdictions with most effective housing anti-displacement policies

Program requirements introduced with OBAG 1 in 2013

When will Automated Vehicles become commonplace?



Revolutionary

- Technology breakthroughs
- Regulatory resolutions
- Shared model, at much lower cost than ownership
- Rapid adoption

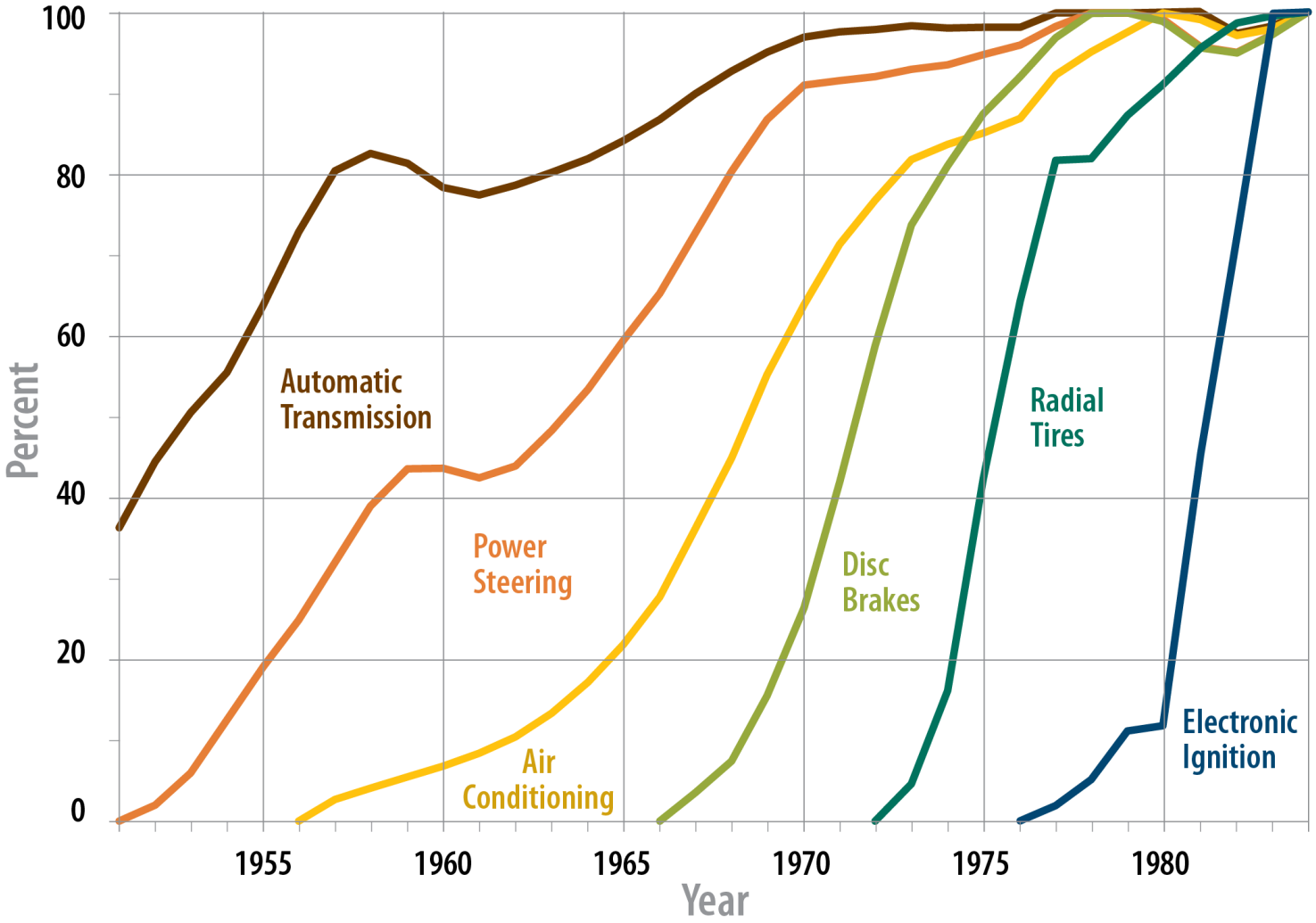
Evolutionary

- Slower technology development and rollout
- Owned AV model with cost premium
- Slower adoption

Fully Automated Vehicle (L4/5) uptake predictions based on high disruption scenarios, indicates possible percentage of new car sales 2016 to 2050.

ARUP

What can we learn from the past?

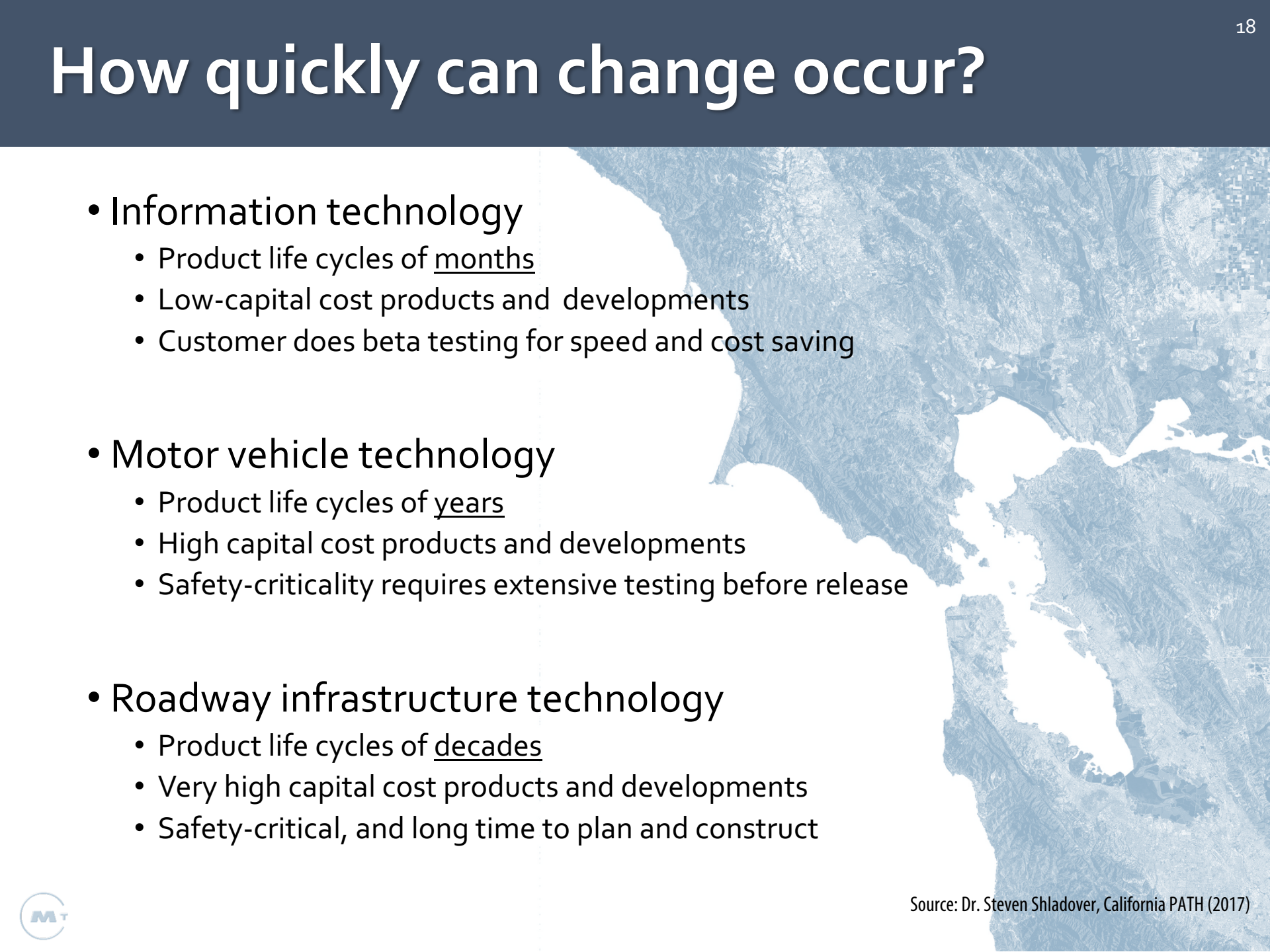


Diffusion of new technologies in the US car industry (in percent of car output). (Source: Jutila and Jutila, 1986.)

Source: Dr. Steven Shladover, California PATH (2017)

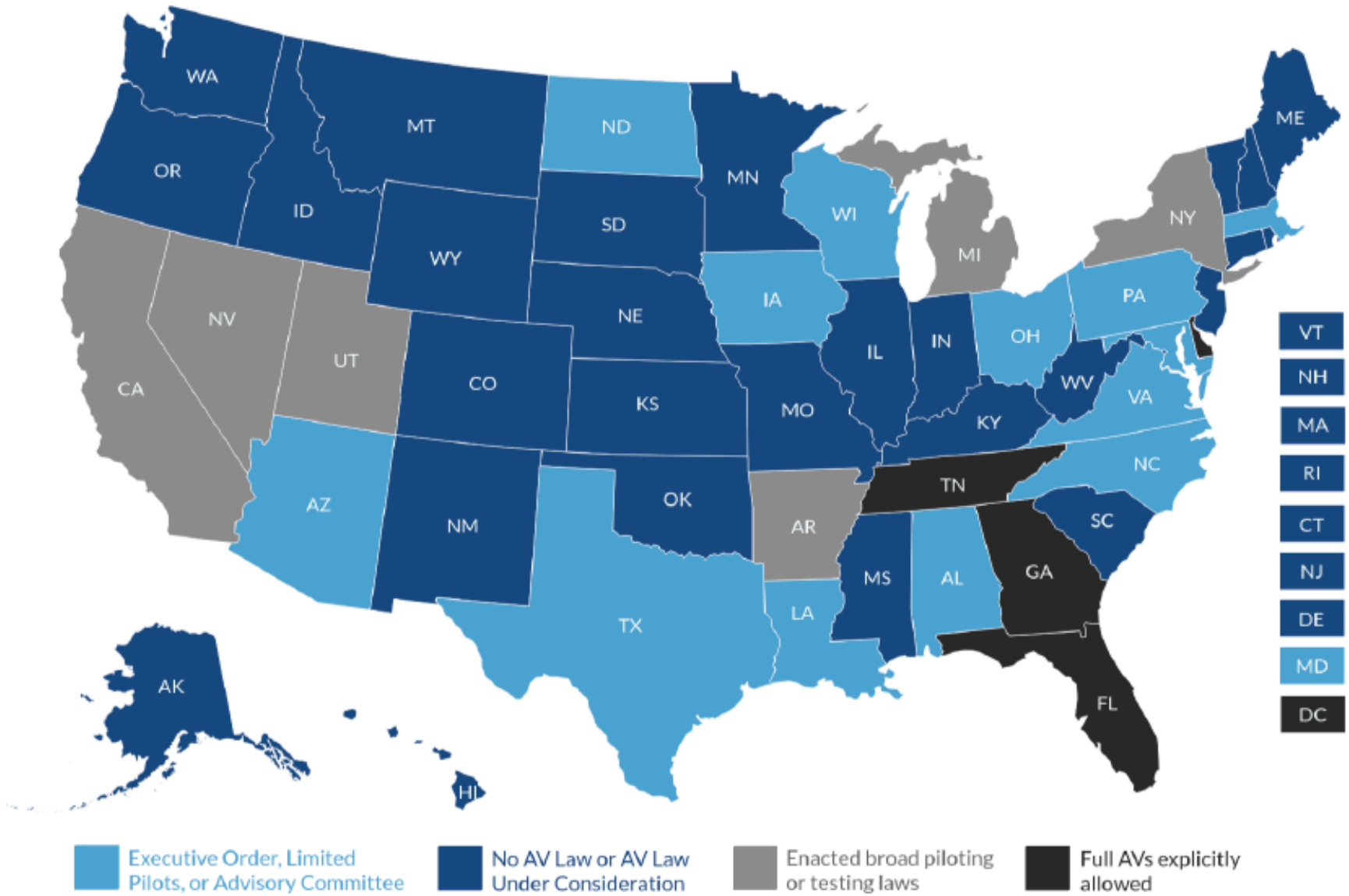
How quickly can change occur?

- Information technology
  - Product life cycles of months
  - Low-capital cost products and developments
  - Customer does beta testing for speed and cost saving
- Motor vehicle technology
  - Product life cycles of years
  - High capital cost products and developments
  - Safety-criticality requires extensive testing before release
- Roadway infrastructure technology
  - Product life cycles of decades
  - Very high capital cost products and developments
  - Safety-critical, and long time to plan and construct



Source: Dr. Steven Shladover, California PATH (2017)

The Emerging Patchwork: The 4 Categories of State Action on AVs



Source: National Conference of State Legislatures and individual state legislation [17]

Created by:
Ann Henebery / Eno Center for Transportation

What does the larger vision look like?

Source: Qualcomm 2017

A unique opportunity, but not without risks

New travel choices
Reduced car ownership

Repurposed parking
Space for Housing

Safer streets
Improved user experience

Higher efficiency transit
Lower operating costs

Increased VMT
Empty vehicle circulation

Urban sprawl
Higher congestion

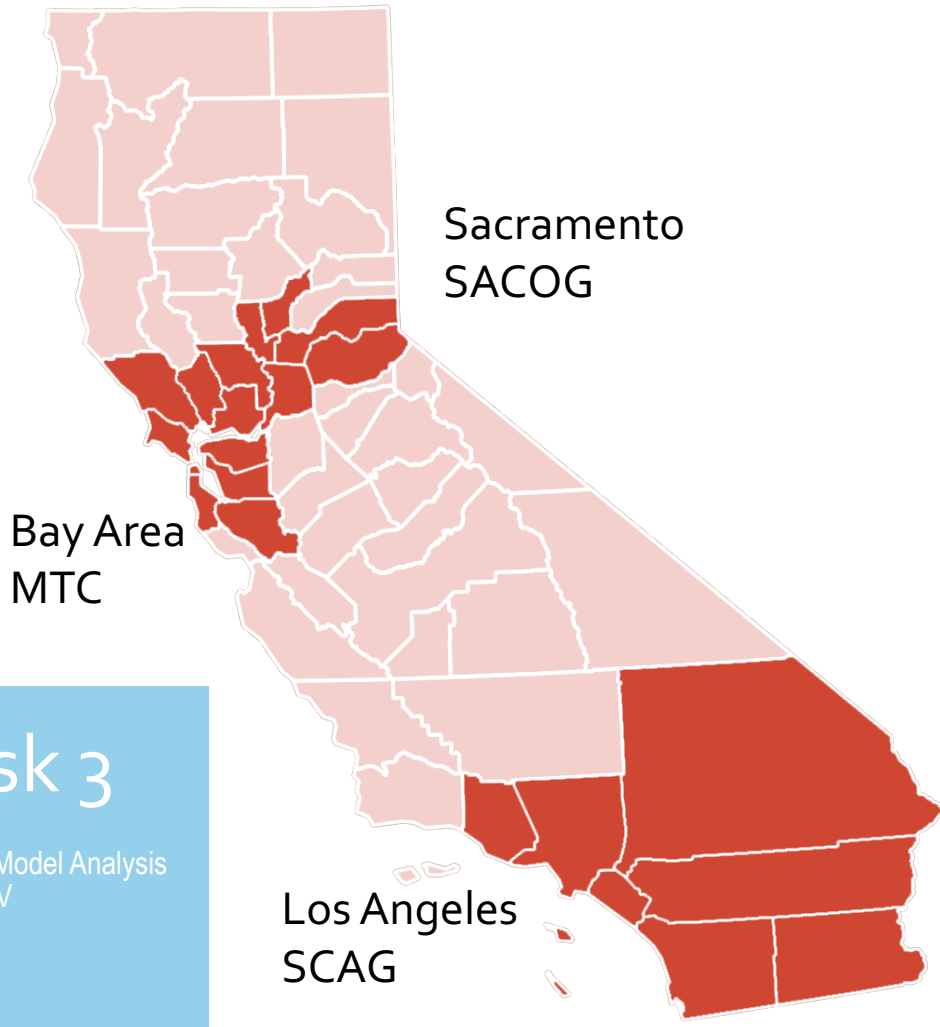
Cyber attack
Privacy concerns

Decline in transit use
Inequity

ARUP

A research partnership

- Future of Mobility Research Program
- To identify and address common interests of the MPOs related to changing travel, policy, and planning shaped by Emerging Technology



Task 1

MPO's and Future Mobility: Roles and Opportunities

Task 2

Modeling Assumptions for Emerging Technologies in Long-Range Planning

Task 3

On/Off-Model Analysis of CV/AV

Tools to shape the future

511

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