“The TAR”

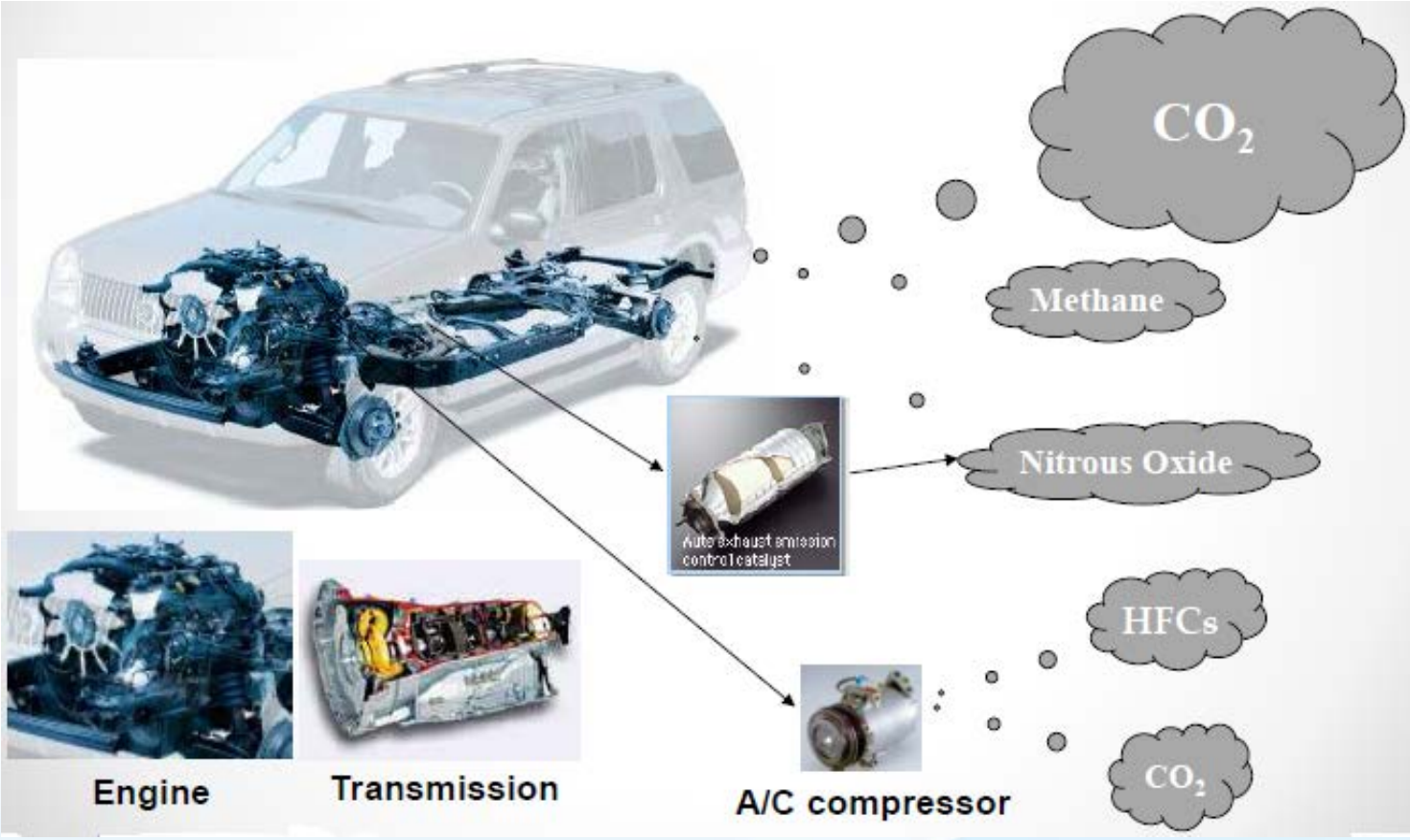
Draft Joint Technical Assessment Report for Adopted Light-Duty Vehicle Greenhouse Gas Emission Standards

Sacramento, California
July 21st, 2016

One National Program

- National Program requires all new vehicles improve efficiency and reduce GHG emissions over time
  - Started in 2012, when ARB adopted LEV III GHG emission standards for model year (MY) 2017-2025 light-duty vehicles
  - Later that year, U.S.EPA adopted nearly same GHG standards and NHTSA corresponding CAFE standards
- Agencies made commitment for Mid-Term Evaluation (MTE) of long-term standards (MY 2022-2025)
- TAR is key assessment and most important technical and economic underpinning of MTE
  - TAR led by U.S. EPA and NHTSA in collaboration with ARB

What are the regulated GHG emissions?



What are the GHG limits and how do they apply?

- Limits on CO_2 and other GHG emissions from light-duty vehicles
  - Passenger cars, SUVs, light trucks



- Applicable to model years 2017-2025
- Standards are based on vehicle footprint – CO_2 limits are higher for trucks than for cars
- MY 2025 vehicle fleet was projected to be at 54.5 mpg or 163 gCO_2e/mile on average
  - Achieving this will require ~40% improvement in fuel consumption and GHG emissions from today's levels

What NAS study concluded

The National Academies of
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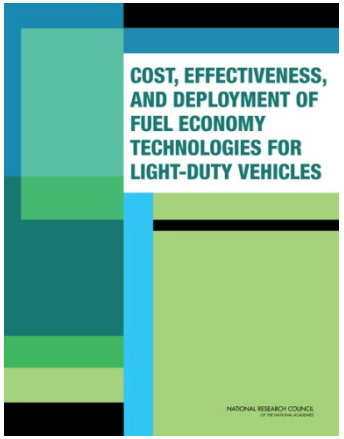
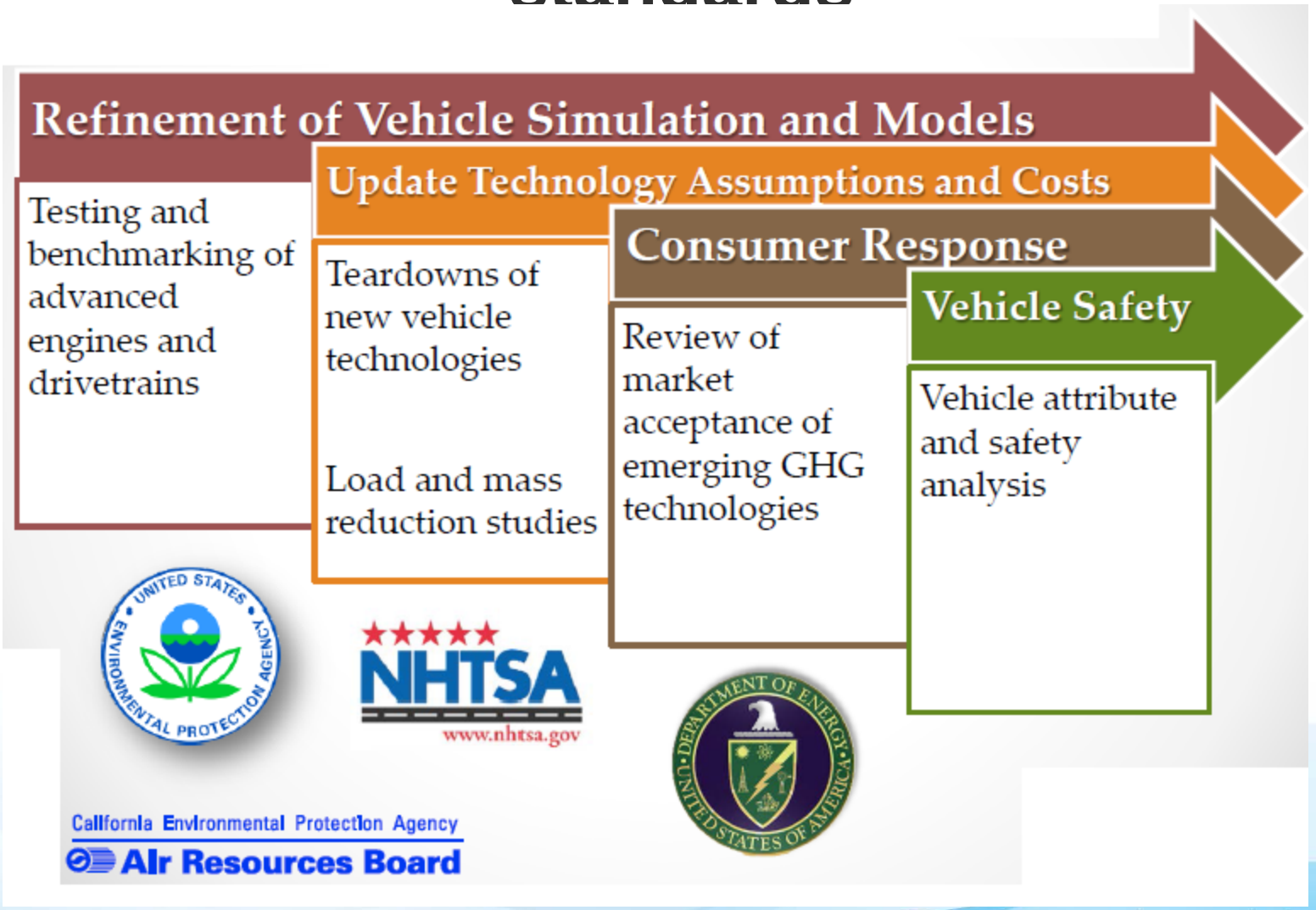


- NAS Report on fuel economy technologies
- Confirmed overall methodology of agencies' original analysis was sound
- Affirmed 2025 standards can be met mostly with advanced gasoline technologies
  - Many technologies already widely in use

Updated technical and economic assessment used for MY 2022-2025 GHG standards



TAR Key Findings (1)

- 2025 GHG standards can be met cost effectively predominantly with advanced gasoline engines and transmissions
- In addition, light-weighting, improved aerodynamics and better tires also key technologies
- Nationwide, minimal reliance on ZEVs needed to meet GHG standards

2025 Model Year Vehicle Technologies	
Conventional Technologies	54%
Stop-Start	20%
Mild Hybrid (48 Volt)	18%
Strong Hybrid	3%
Plug-in Hybrid Electric Vehicle	2%
Battery Electric Vehicle	3%

TAR Key Findings (2)

- Current mix of new vehicle sales has shifted to more trucks:

MY 2025 Fleet Mix	Original Projection	New Projection
% Car	67%	52%
% Truck	33%	48%

- Updated projection for MY 2025 fleet average is 175 gCO_2e/mile vs. original 163 gCO_2e/mile projection
  - Corresponding projected fuel economy is 50.8* mpg nationally
- Today, costs to meet standards are similar or lower than in 2012:

	Incremental Cost per Vehicle in MY 2025	Payback Period
2012	$ 1,070	3.2 years
2016 Draft TAR:		
EPA Analysis	$ 894	5 years
NHTSA Analysis	$ 1,128	6 years

*Unadjusted test cycle fuel economy, assuming all reductions achieved solely through fuel economy improvements

Automaker Concerns*

- Actual benefits from advanced technologies lower than projected, and costs are higher
  - ARB: Not supported in findings of NAS study and draft TAR
- Fuel efficiency not a consumer priority** (lower fuel prices, slower pace of hybrid sales)
  - ARB: Consumer Reports survey shows strong public support
- Project standards will require substantially higher hybrid vehicle sales by 2025
  - ARB: Draft TAR scenario shows compliance with minor sales of "strong" hybrids
- CA ZEV Reg makes national compliance more costly
  - ARB: ZEV sales necessary for longer term emission goals, and battery costs are declining (as reflected in the draft TAR)

* "Light-Duty Vehicle CAFÉ and GHG Standards" http://www.autoalliance.org/midtermevaluation

** http://consumersunion.org/2016/06/2016-fe-consumer-survey/

Next Steps

- 60 day public comment period for TAR
- California ACC Technology Symposium Sept 2016
- California Mid-term Review (MTR) – Dec 2016 Board Hearing
  - TAR and other input go into ARB technical report for Board Hearing
- 2017: Federal Proposed Determination/Notice of Proposed Rulemaking on National Standards
- By April 2018: Federal Final Determination/Final Rulemaking on National Standards for MY 2022-2025