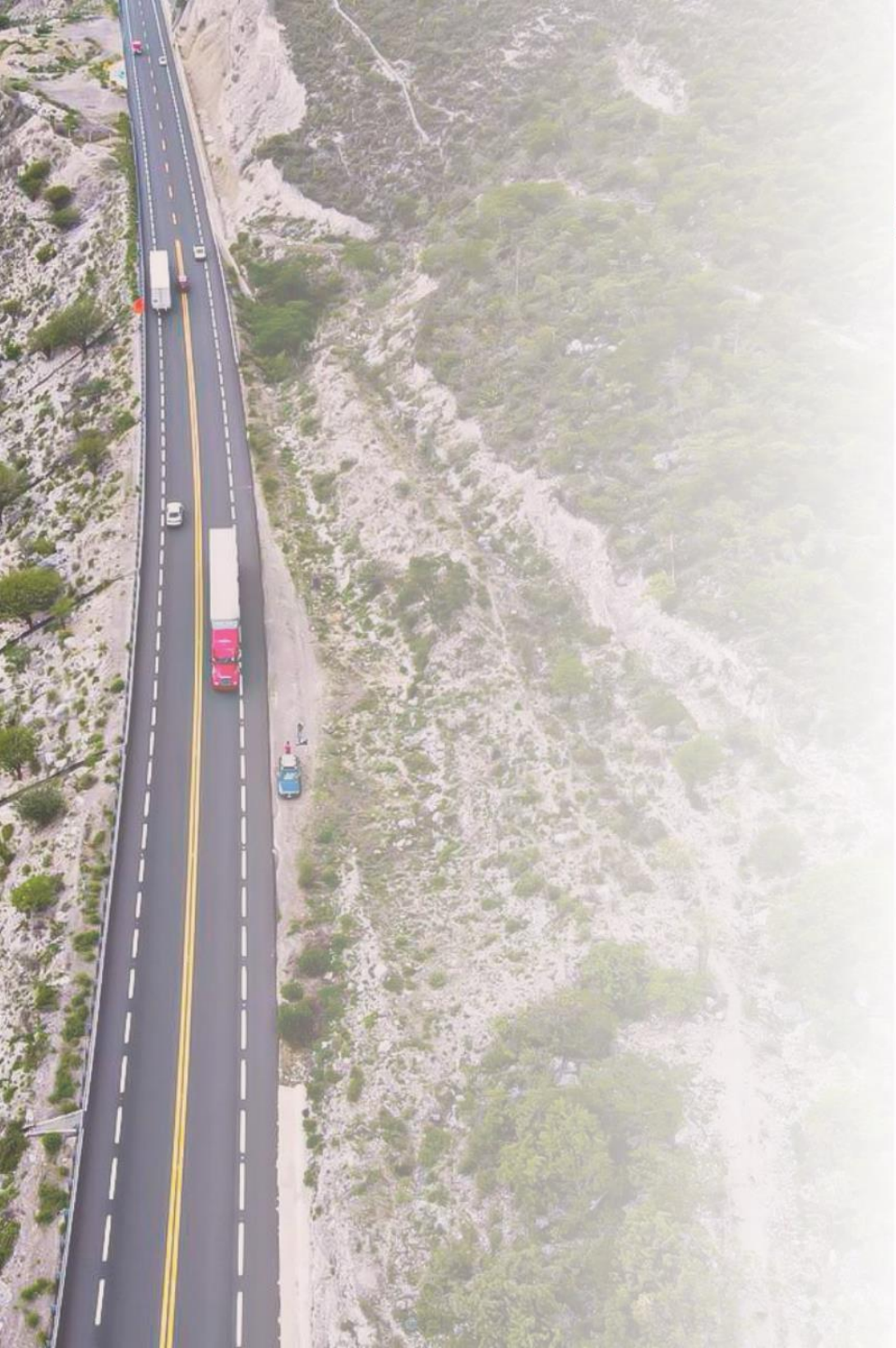


Serie de seminarios virtuales

Intercambio de estrategias y experiencias para mejorar la eficiencia del transporte de carga

Segunda sesión: Verificación de tecnologías para el transporte de carga

Instrucciones para el ingreso a los seminarios virtuales

Participantes que deseen escuchar el audio original en inglés	Unirse a la sesión en inglés
Participantes que deseen escuchar las presentaciones en español	Unirse a la presentación en español

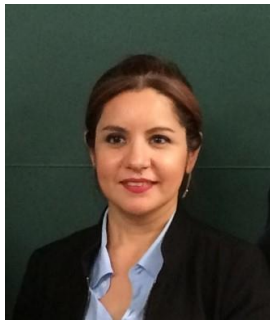
Consideraciones para la sesión

- Las diapositivas serán compartidas con todos los participantes en los días posteriores a la sesión.
- Durante las presentaciones, todos los participantes estarán silenciados.
- Si tiene alguna pregunta, por favor escríbala en español o en inglés en el chat de la sesión en inglés. Habrá una sesión de preguntas y respuestas al finalizar las presentaciones.
- En caso de que tenga alguna dificultad técnica, por favor descríbala en el chat y trataremos de asistirlo.

Agenda de la sesión

Verificación de tecnologías para el transporte de carga: Experiencia del programa SmartWay. Buddy Polovick y Josh Silverblatt
Preguntas y respuestas
Cierre y reflexiones finales

Ponentes



Judith Trujillo Machado
SEMARNAT - México

Buddy Polovick
EPA – Estados Unidos

Technology Verification

SEMARNAT & GIZ VIRTUAL SEMINAR SERIES

Buddy Polovick
U.S. Environmental Protection Agency
5 November 2020

Why Freight Matters

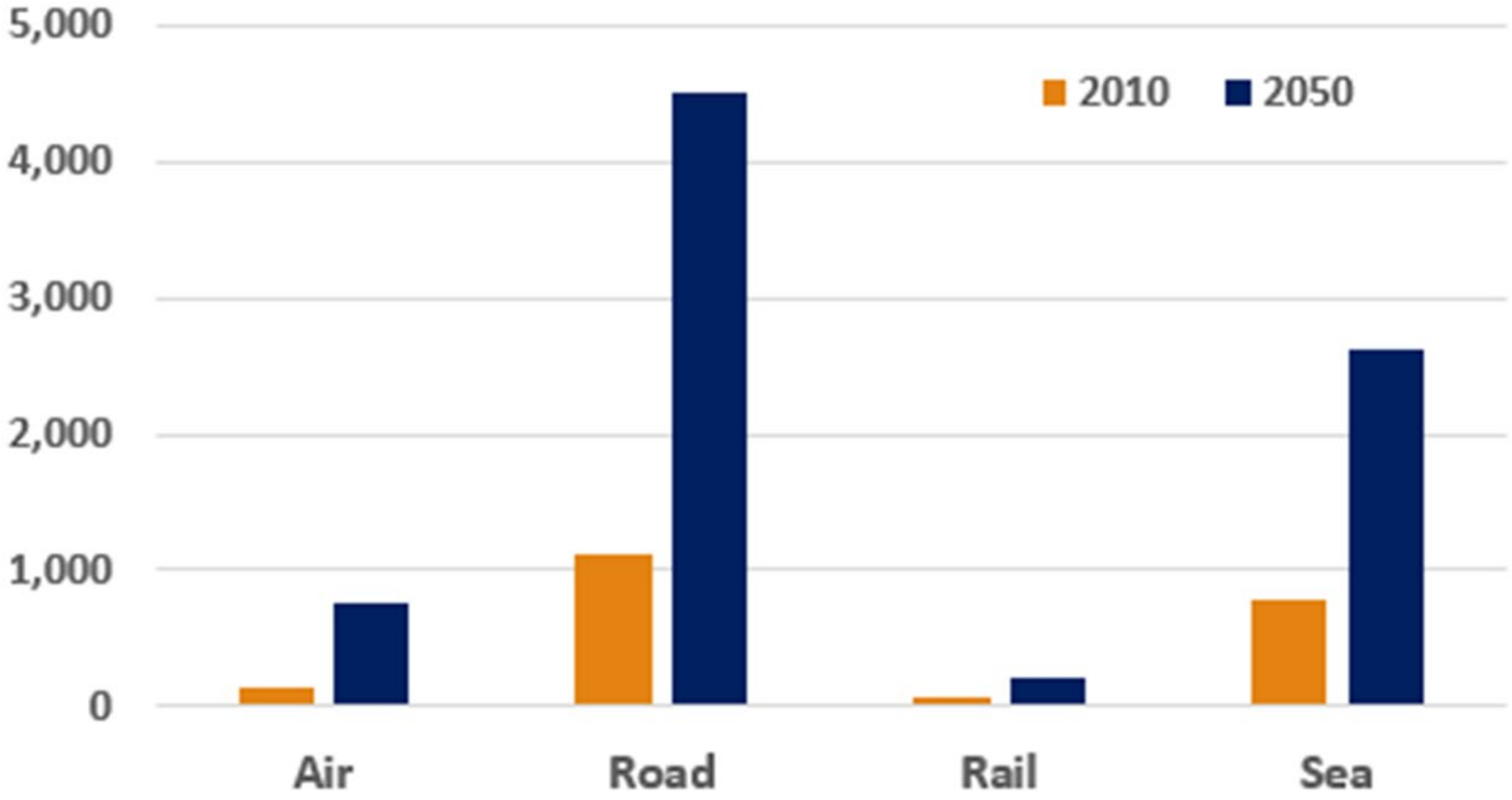
- Goods and materials moved via truck, rail, water, & air are core to businesses & communities across America
  - $19 trillion in value of goods shipped
  - 17.9 billion tons annually; 55 tons per person
  - 72% of tonnage goes by truck
  - 80% of value goes by truck

- Logistics contributes to U.S. jobs and livelihoods
  - About 8M U.S. jobs in trucking
  - About half are truck drivers

How & Why Freight is Growing

- Freight accounts for about 39% of world transportation energy use
- Global freight volumes projected to triple by 2050
  - Megatrends driving freight growth
- Freight emissions impact public health and environment
  - Transportation already contributes 30% of global emissions of PM, methane, carbon and other harmful air pollutants

Global Growth in Freight GHG Emissions



Global Growth
by Transport Mode

International Transport Forum 2015

Sustainability Drivers: Environmental Impacts of Freight

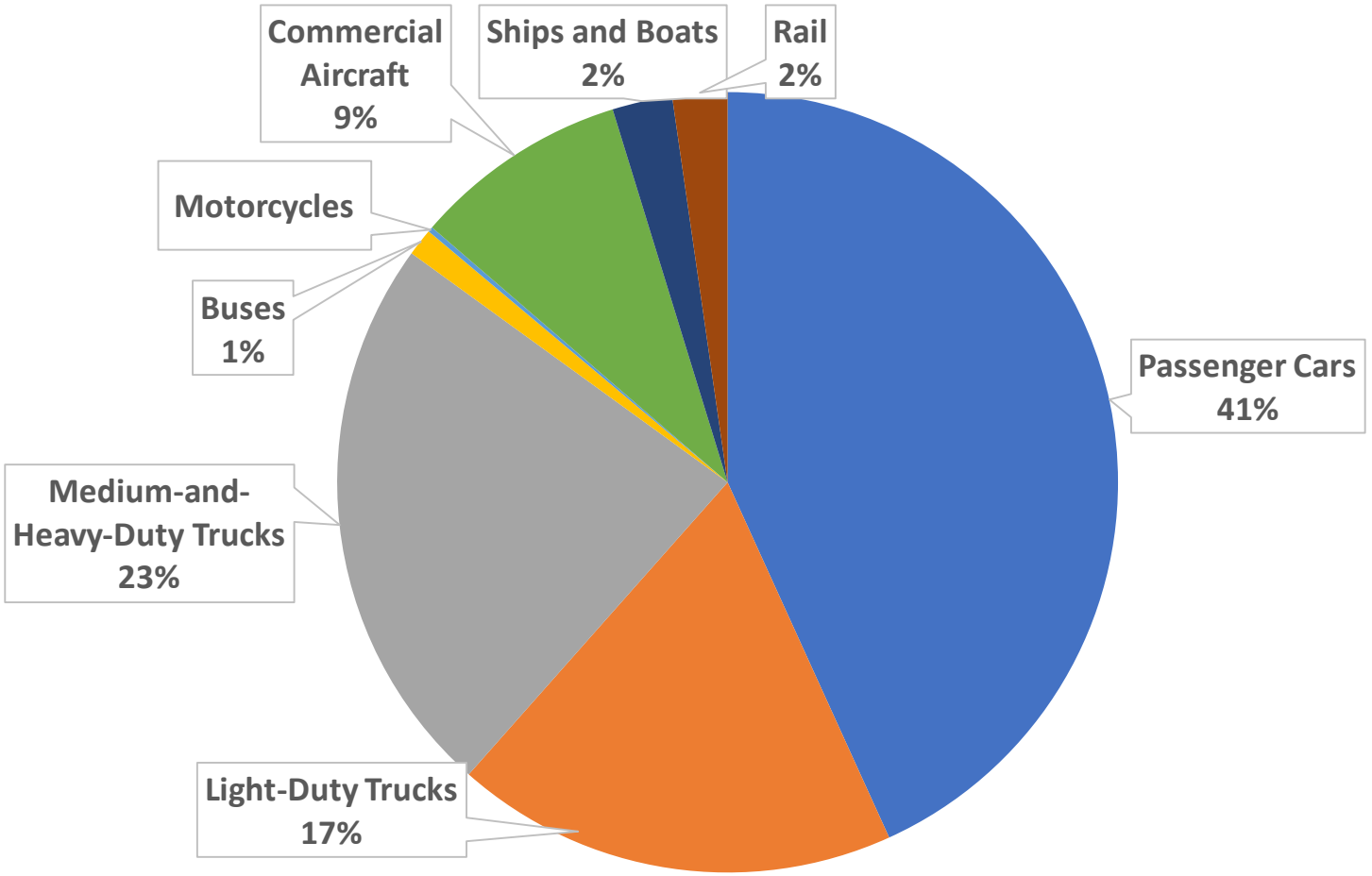
SmartWay
U.S. Environmental Protection Agency

Transportation in U.S.:

- Over 1/3 total GHG emissions
- About 2/3 petroleum-based fuel use

In Transport Sector:

- Freight accounts for over 25% of all fuel consumed and GHGs emitted
- Freight is fastest growing source of transport GHGs



2018 Data - Inventory of U.S. Greenhouse Gas Emissions and Sinks (EPA 2020)

Sustainability Drivers: Public Health Impacts of Freight

SmartWay®
U.S. Environmental Protection Agency

Diesel Particulates

- PM_{10} and $PM_{2.5}$
- Permeate lungs, bloodstream
- Aggravates asthma, lung function, heart conditions
- Likely carcinogen

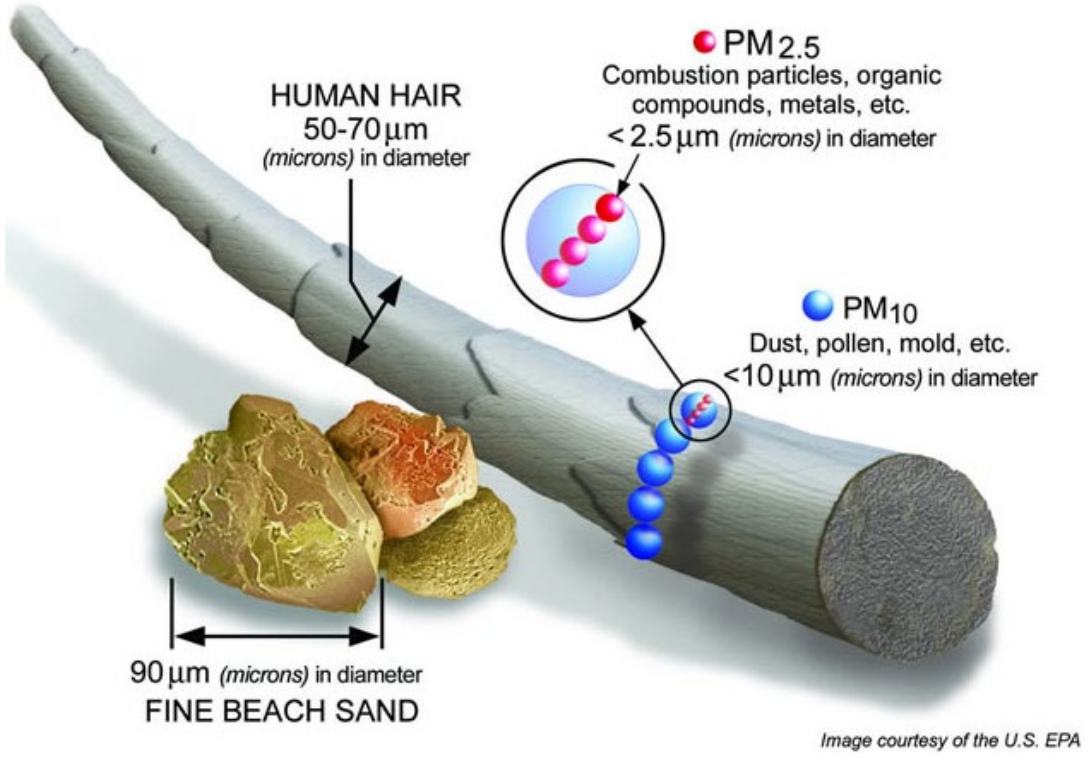
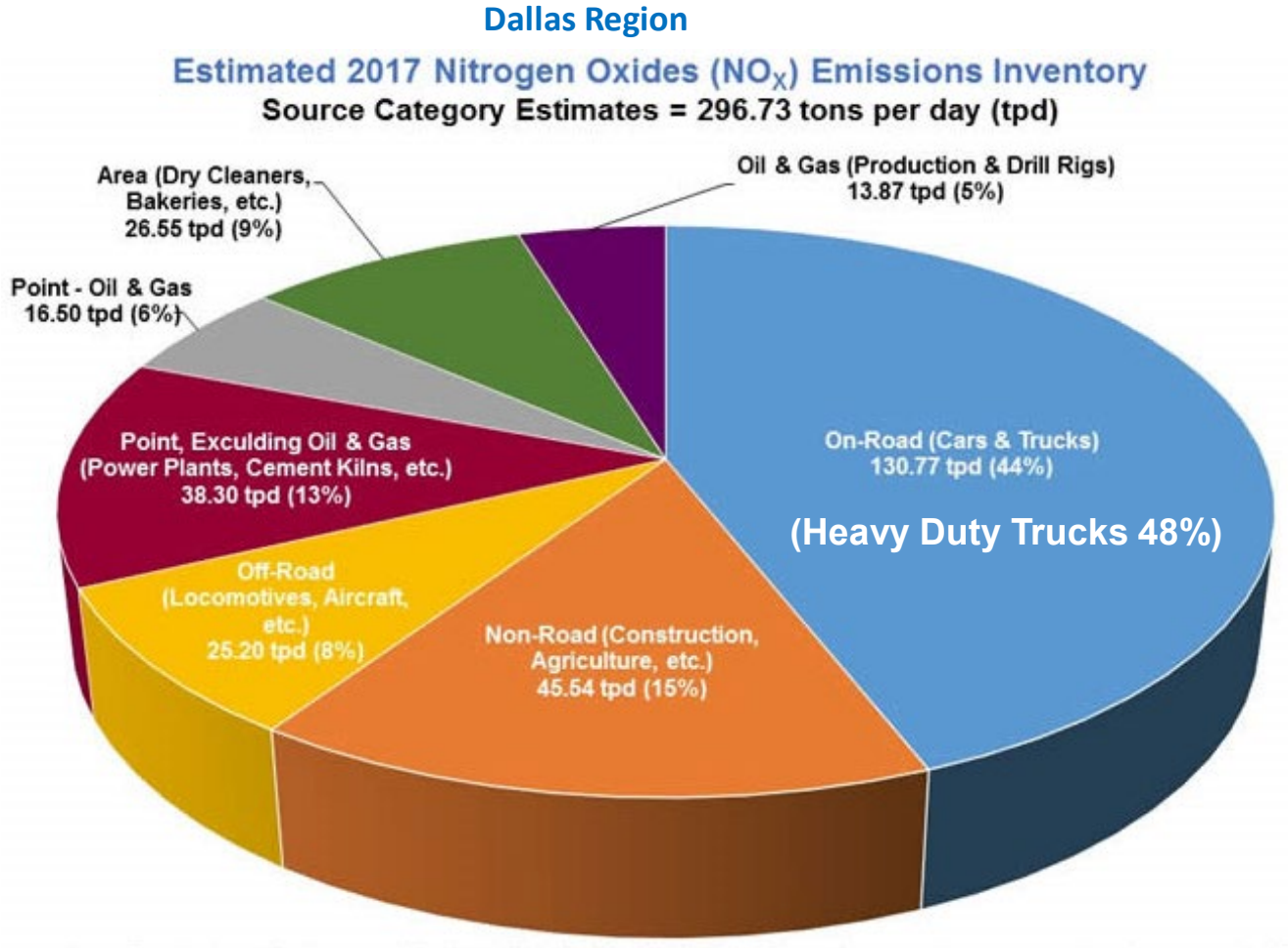


Image courtesy of the U.S. EPA

Diesel NOx emissions

- Forms ground level ozone
- Ozone – significant effects on asthmatics, elderly, children

Sustainability Drivers: Public Health Impacts of Freight

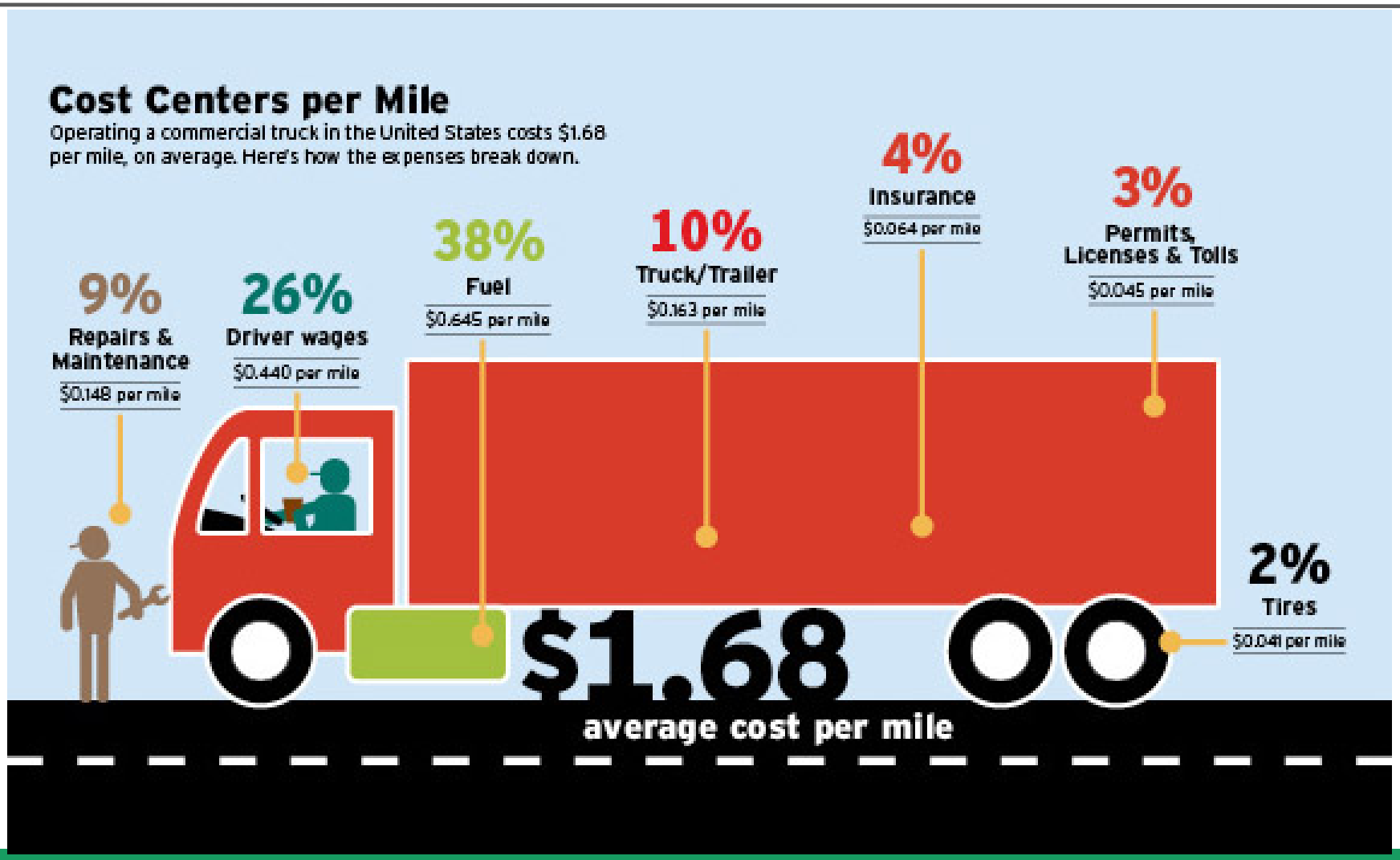


http://www.nctcog.org/trans/air/ozone/sources.asp

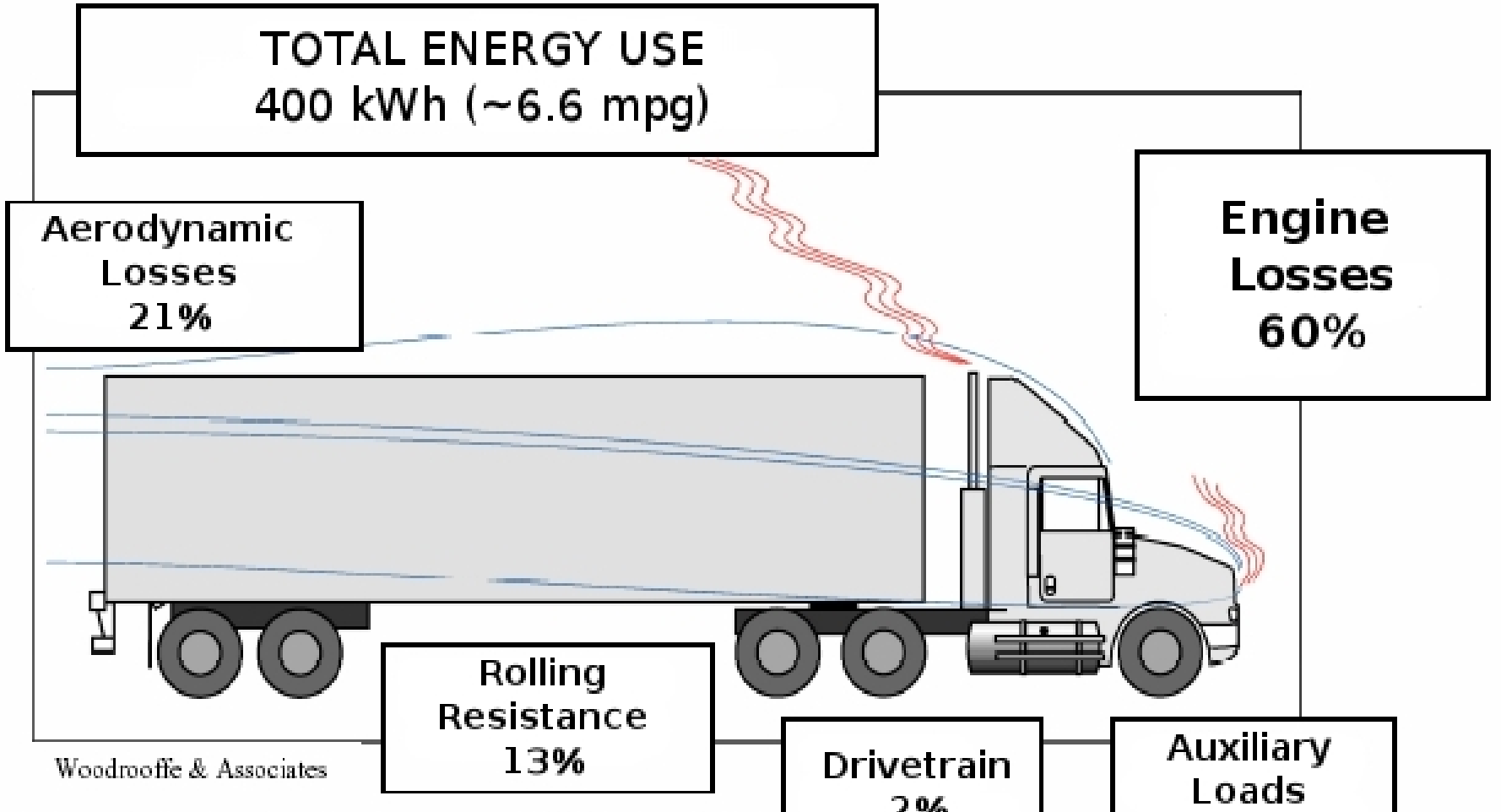
Diesel NOx emissions

- Forms ground level ozone
- Ozone – significant effects on asthmatics, elderly, children

Key Operational Costs



Opportunities for Energy Savings



U.S. DOE, Technology Roadmap for 21st Century Truck Program

How Can We Reduce Freight Emissions?

- Provide emission control retrofit options that work
- Help fleets make sense of fuel savings claims for most important product categories
- “Mythbust” research to address fleets concerns about performance and unintended consequences
- Develop standard protocols that allow the industry to move forward with common “performance language”
- Build technical knowledge base, industry understanding, and relationships to support Agency or Ministry programs

EPA Office Of Transportation & Air Quality
Technology Assessment Center

Verify performance, fuel savings and emission reductions from products within certain categories of technologies

National Clean Diesel Campaign

- Evaluate emission impacts of control devices like SCR, DPF, and DOCs
- In-use performance testing evaluates durability

SmartWay

- Evaluate fuel savings (and GHG emission) impacts of tires, aerodynamics, and idle reduction devices
- Long-haul trucking focus with some marine and locomotive applications
- “Verified” components are used together for “SmartWay Designated” trucks and trailers

Technology Verification

- ***Objective:*** Evaluate the emission reduction effectiveness of emissions retrofit and fuel saving technologies
  - Provide stakeholders with confidence that technologies will achieve real results
- ***Verification Includes:***
  - Application & technology review
  - Testing by the manufacturer in accordance with protocols
  - Durability requirements and manufacturer in-use testing for emission controls
- ***Verification Coordinates with:***
  - Manufacturers
  - Testing Organizations
  - Regional or provincial authorities

Technology Verification Programs: Key Benefits

- Help fleet owners and owner-operators select the most appropriate technology with confidence
- Consistent test protocols create “level playing field”
- Help accelerate adoption and acceptance of key technologies
- Drive emissions reductions (CO_2, NOx, PM)
  - Climate and public health benefits
- Encourage technical innovation and technology transfer
- Creates market demand for new technologies
- Enhance energy security by reducing fuel demand
- Help businesses enhance reputations and grow sustainably

Listening to Stakeholders

Fleets want…

1. To know how a technology will **perform in their fleet**
2. To know the **trade-offs** (e.g., weight, maintenance time, driver acceptance) for fuel savings?
3. Understanding top **performance limits**
4. **Simple sources of information** and a **say in the program**

Manufacturers want…

1. **Apples-to-apples** comparisons of technology performance
2. Innovative **standardized test methods** that provide **flexibility** and **reduce burden**
3. Potential for **other types of technologies**

Save Fuel, Money and the Environment with a SmartWay Truck

A SmartWay tractor and trailer annually save 2,000 to 4,000 gallons of fuel and reduce CO2 emissions by up to 20% as compared to similar trucks on the road. Learn more at www.epa.gov/smartway

SmartWay®
U.S. Environmental Protection Agency

SmartWay Technology Verification Program

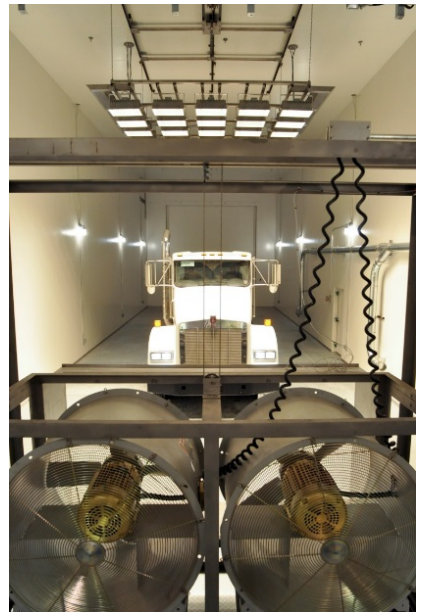
US EPA Designated SmartWay Tractor

US EPA Designated SmartWay Trailer

US EPA Designated SmartWay Elite

Fuel Saving Technologies Verification

- SmartWay-*Designated* Tractors & Trailers use *verified* components
- SmartWay-verified Technologies
  - Aerodynamic devices
  - Idle reduction systems
  - Low rolling resistance tires



SmartWay Designated Tractors

SmartWay®
U.S. Environmental Protection Agency

Day and Sleeper Cabs can qualify now!

Class-8 tractor with aerodynamically integrated high-roof

Aerodynamic body including:
- bumper,
- mirrors,
- tank fairings,
- side-extending fairings.

EPA-certified engine

US EPA Designated SmartWay Tractor

SmartWay-verified low-rolling resistance tires

SmartWay-verified idle reduction system (optional)

SmartWay Designated Tractors

Component	Specifications
Engine	•Current model year engine designated to meet U.S. EPA NOx/PM/GHG emission requirements (meaning the engine's model year should match the vehicle's model year. So a 2019 tractor should have a 2019 engine.)
Aerodynamics	•Aerodynamically integrated high-roof fairing or cab compartment •Aerodynamic mirrors •Aerodynamic bumper •Tractor side extending fairings (also called tractor gap reducers) •Fuel tank fairings (also called chassis fairings)
Tires	•SmartWay verified low-rolling resistance steer and drive tires (duals or singles) (aluminum wheels optional)
Idle Reduction	Sleeper and Day cabs must have automatic engine shut-off capability. For sleeper cabs, manufacturer availability of at least one option providing eight hours or more of engine idle-free auxiliary power, heat, and/or air conditioning using: •Auxiliary power unit or generator set •Fuel operated heater •Battery air conditioning system •Thermal Storage System *For day cabs, manufacturers are encouraged to provide additional idle reduction options that meet regional-haul needs.

US EPA Designated SmartWay Tractor

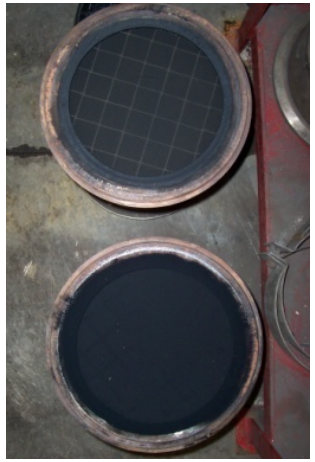
SmartWay Lab Testing

Chassis Dynamometer Test

SmartWay Track Testing

Emissions Reducing Technologies Verification

Diesel Particulate Filter (DPF)



Diesel Oxidation Catalyst (DOC)

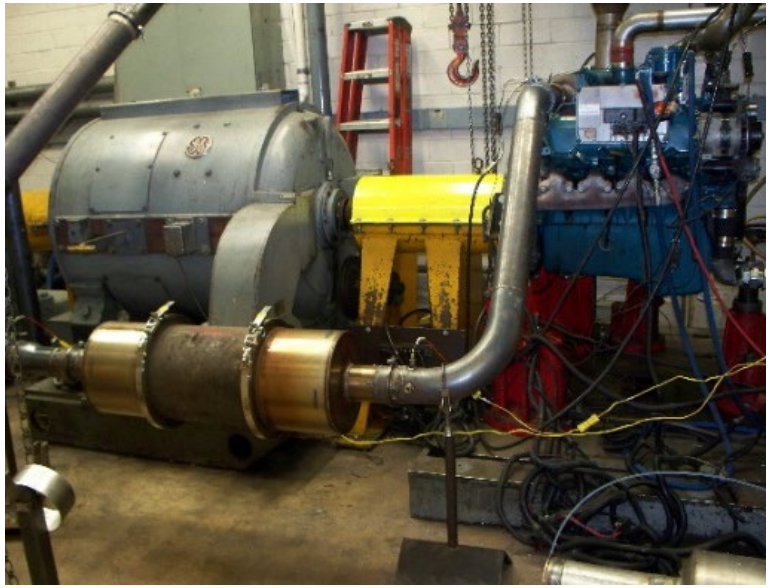
Verifying and supporting demonstration of technologies to reduce emissions and save fuel

SCR and DPF

Emissions Reducing Technologies In-Use Testing

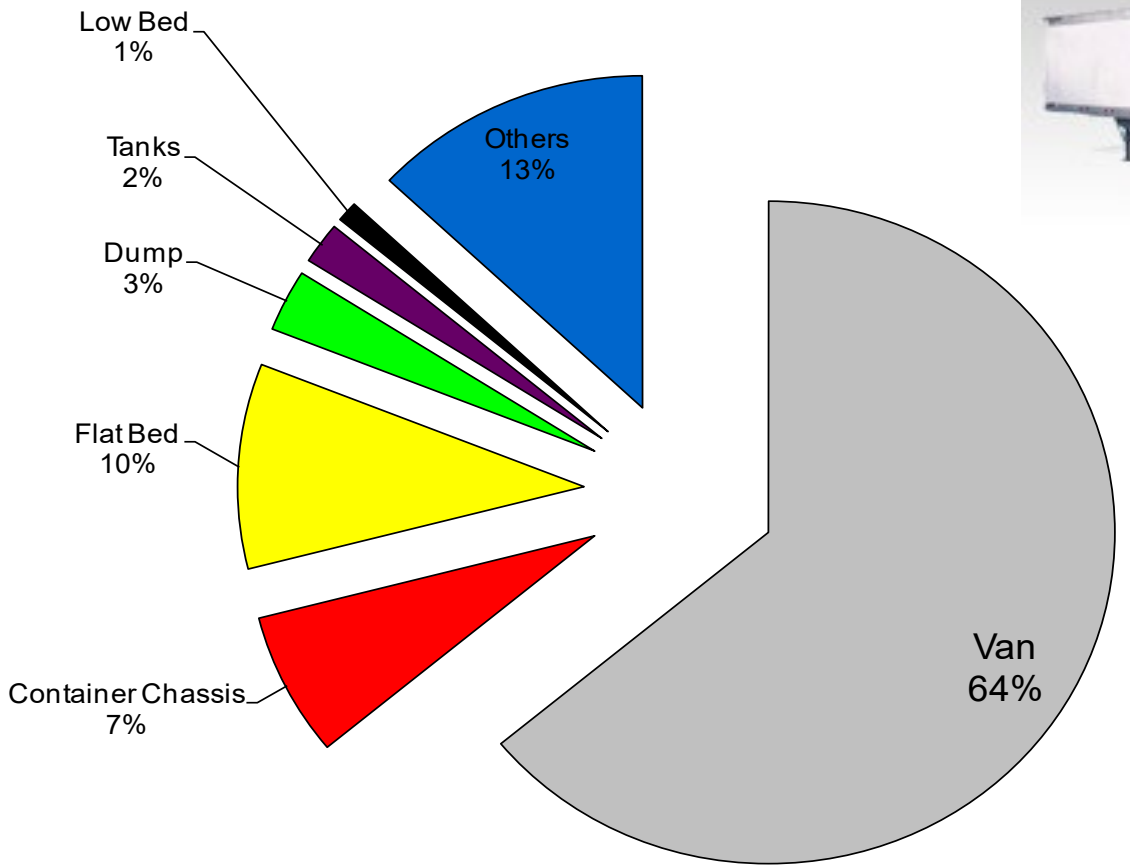
Emissions Reduction			
Devices	**PM**	**HC**	**CO**
DOC #1	20%	76%	63%
DOC #2	16%	81%	66%
DOC #3	20%	70%	37%

Emissions Reduction			
Devices	**PM**	**HC**	**CO**
DPF #1	94%	37%	N/A
DPF #2	64%	57%	55%
DPF #3	65%	72%	61%
DPF #4	51%	51%	53%
DPF #5	82%	74%	65%
DPF #6	99%	86%	73%
DPF #7	97%	92%	77%
DPF #8	98%	86%	77%
DPF #9	97%	87%	73%



On Road Focus: Long-Haul Trailers

U.S. Trailer Population by Type



Includes: dry van, refrigerated van, and smaller van trailers (28 foot “twin pups”)

SmartWay Designated Trailer & Aerodynamics Verification

SmartWay
U.S. Environmental Protection Agency

Scope

53’ Van trailers

53’ Refrigeration trailers

Trailer Designation Levels

SmartWay Trailer
(5% fuel savings from aero)
(1% fuel savings from tires)

*SmartWay “**Elite**” Trailer*
(9% fuel savings from aero)
(1% fuel savings from tires)

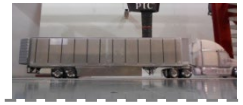
Aero Device Performance Bins

9% ***or more*** fuel savings
5% *(5.0 - 8.9)* fuel savings
4% *(4.0 - 4.9)* fuel savings
1% *(1.0 - 3.9)* fuel savings

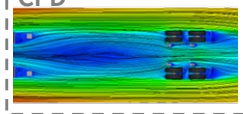
Test Methods

New Track Test

Tunnel



CFD



Coastdow

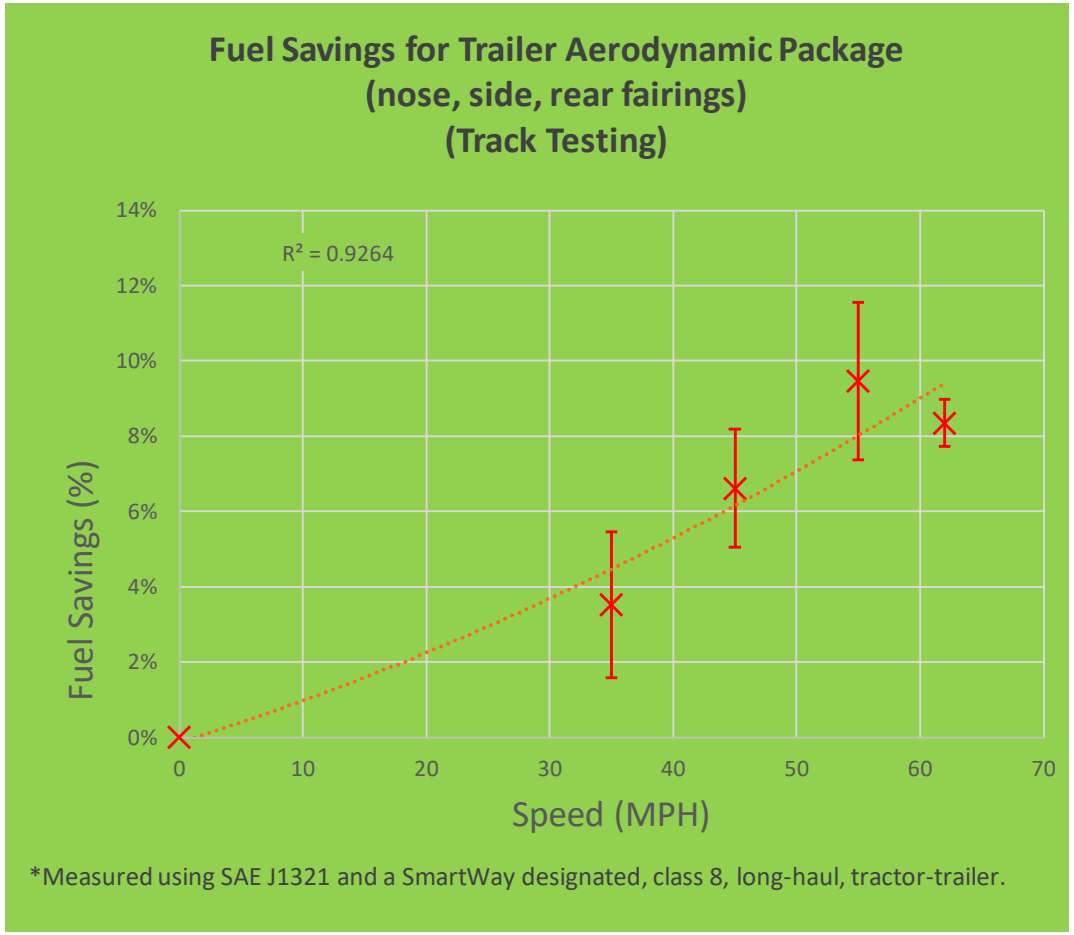
Choice of ***test method*** for verification and option to supplement with additional test methods

Web table indicating all methods used to verify a device

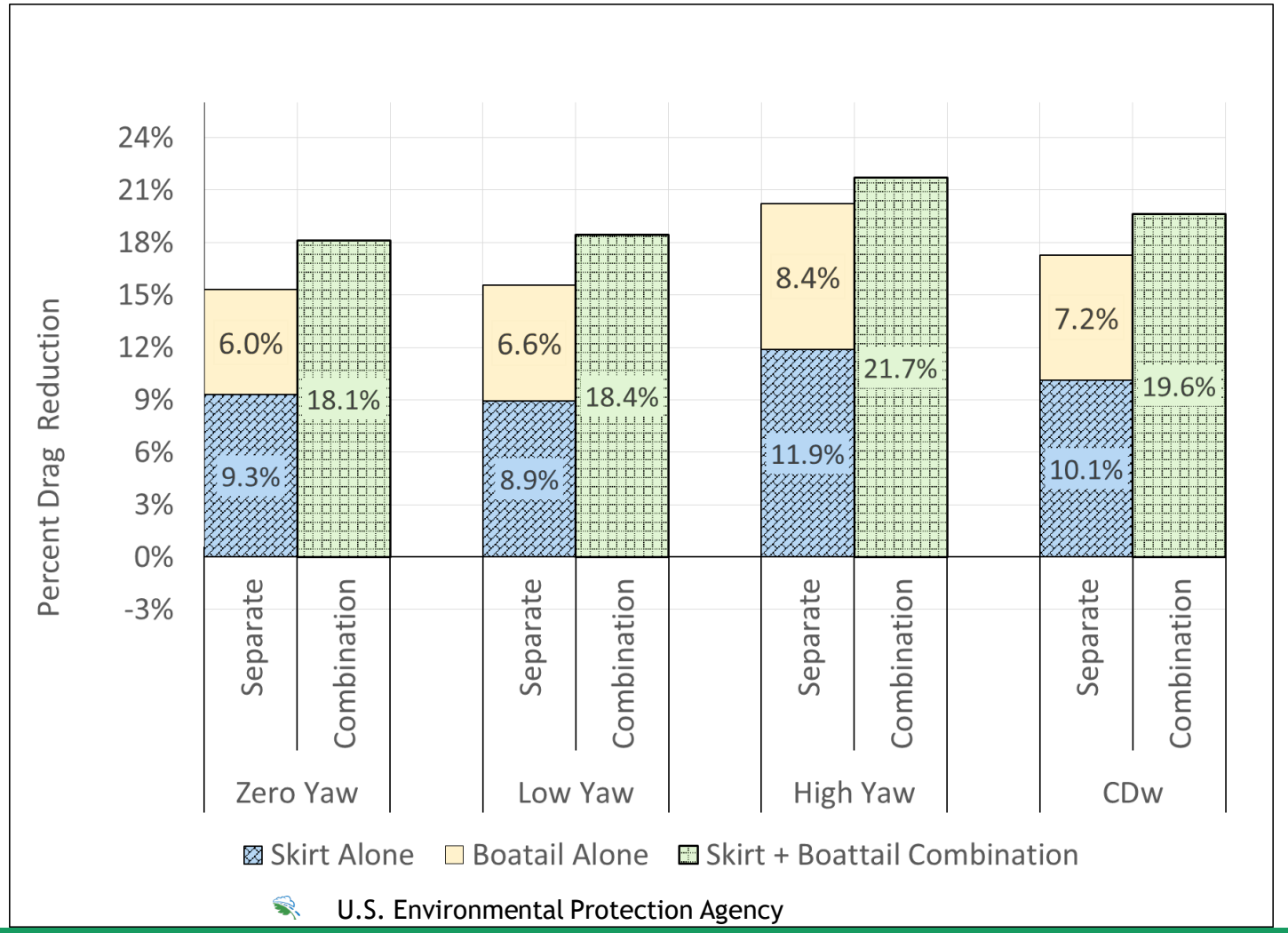
US EPA Designated SmartWay Trailer

Benefits of Trailer Aerodynamic Technologies

- Demonstrated 9%+ fuel savings at high speeds relative to standard tractor-trailer. (Track, wind tunnel, coastdown)
- Combinations work – bigger packages produce bigger fuel savings.
- Synergy – Sometimes aero devices work together to save more fuel than the sum of their individual results.
- Wind angles – Some devices work better at higher wind angles.
- Speed – while best at higher speeds, aerodynamics provide benefit at speeds as slow as 35 mph.

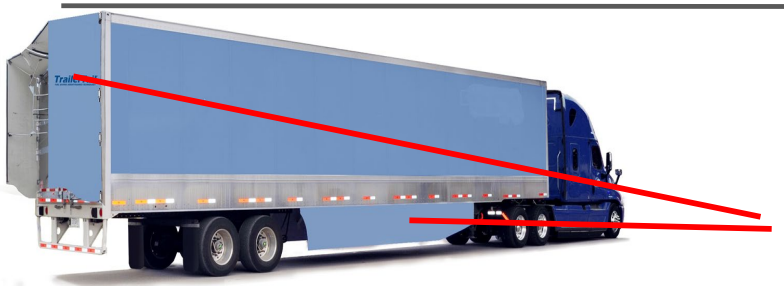


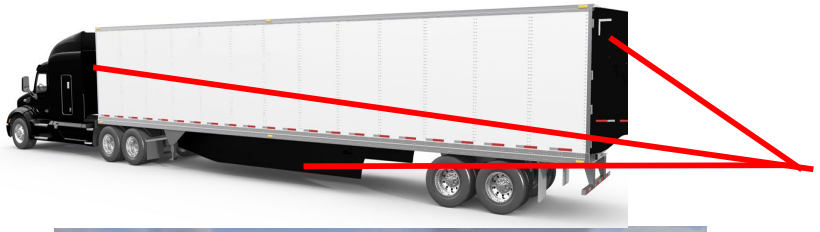
Synergistic Effects

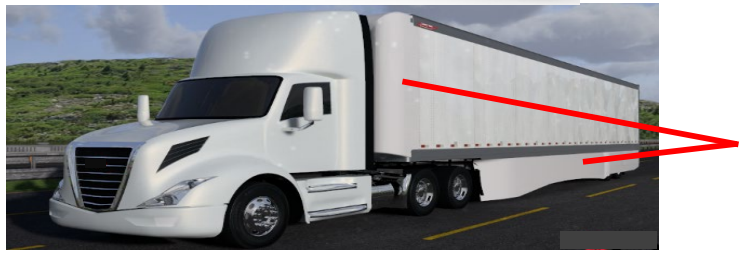


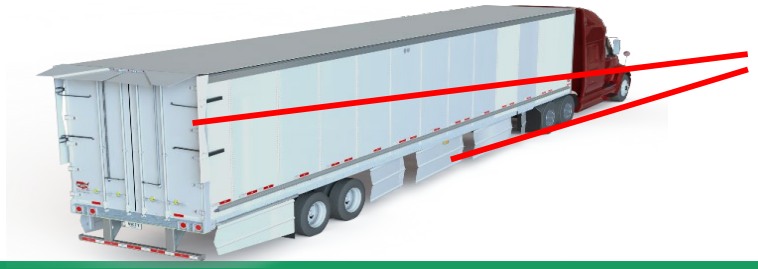
SmartWay *Elite* Performance:

Manufacturers meet Elite challenge with both traditional and less-traditional approaches



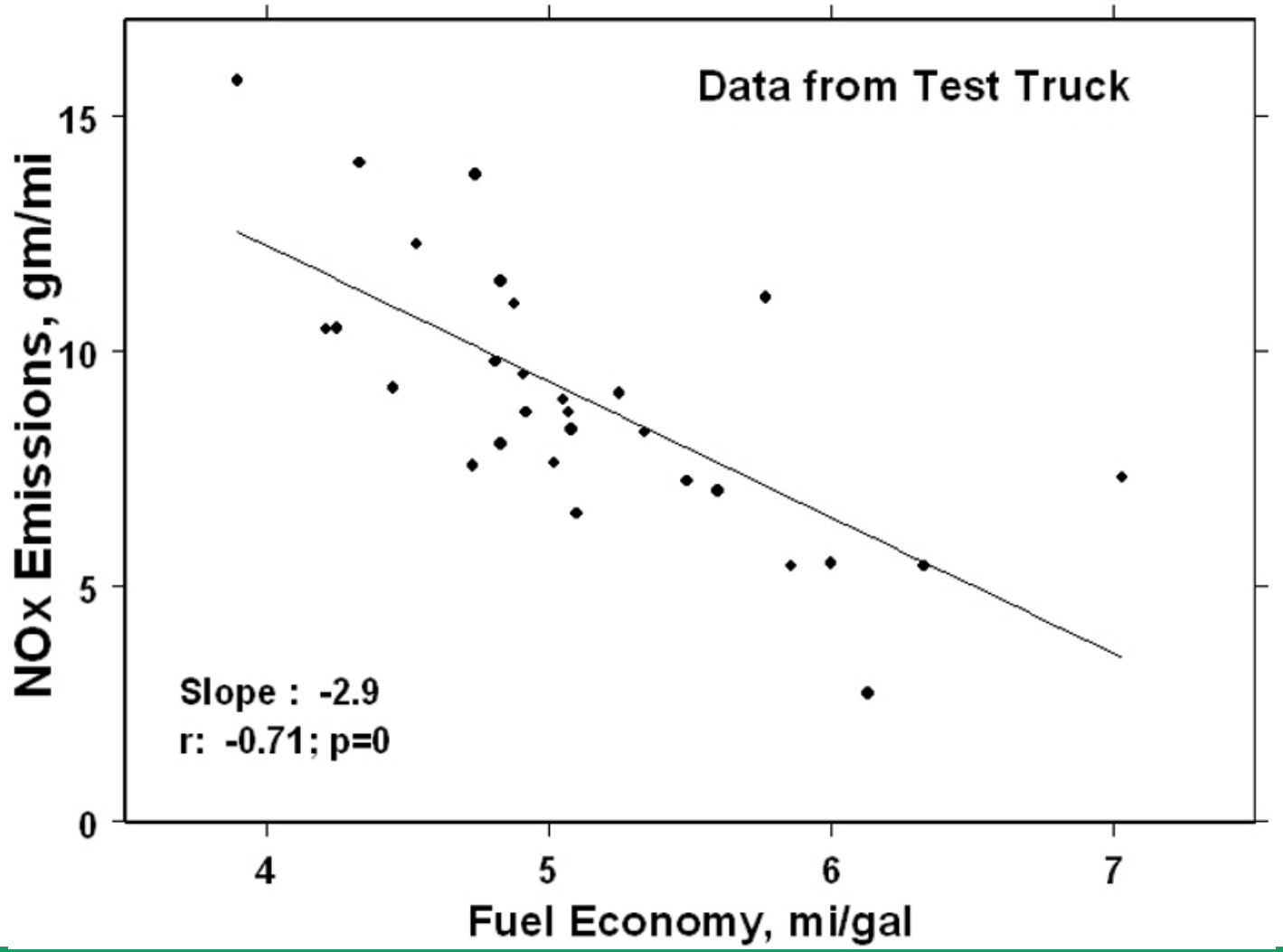






SmartWay Elite Device	Description	Verification Method
Traditional **2 component** package	Traditional large skirt & large tail	Wind tunnel
Traditional **3 component** package	Traditional large skirt, small tail, and gap reducer	Wind tunnel
Less traditional: "No Tail"	Full-length skirt with gap reducer	Wind tunnel
Less traditional: "segmented skirt"	Segmented-skirt design with tail	Wind tunnel

Fuel Savings and Emissions Reduction



SmartWay in the Marketplace

KENWORTH

New, Aerodynamic Kenworth T680 Earns Prestigious EPA SmartWay Designation

KIRKLAND, Wash. – Kenworth Truck Company today announced that the new, aerodynamic Kenworth T680 model has received U.S. Environmental Protection Agency (EPA) SmartWay[SM] Designation.

"Kenworth is proud that the Kenworth T680 has earned the prestigious EPA SmartWay Designation," said Gary Moore, Kenworth general manager and PACCAR vice president. "As our

Cab width for the T660, T680 and T700, respectively, is 1.9, 2.1 and 2.3 meters.

EPA SmartWay Designated tractors are intended for use with 53-foot, box van trailers that are also EPA SmartWay Designated. According to the EPA, SmartWay tractor-trailer combination may reduce fuel consumption by as much as 18 percent at highway speeds. Fleets in-use savings will vary based on their specific operations and environment.

Kenworth's fuel-savings technology solutions include liquefied and compressed natural gas vehicles, and medium duty diesel-electric hybrids. Kenworth is the only truck manufacturer to receive the EPA's Clean Air Excellence award in recognition of its environmentally friendly products.

The EPA SmartWay Transport Partnership (www.epa.gov/smartway) is an innovative, collaboration between the EPA and freight industry

Press Release!

To assist other countries working to develop robust Technology Verification programs as part of their Green Freight efforts…

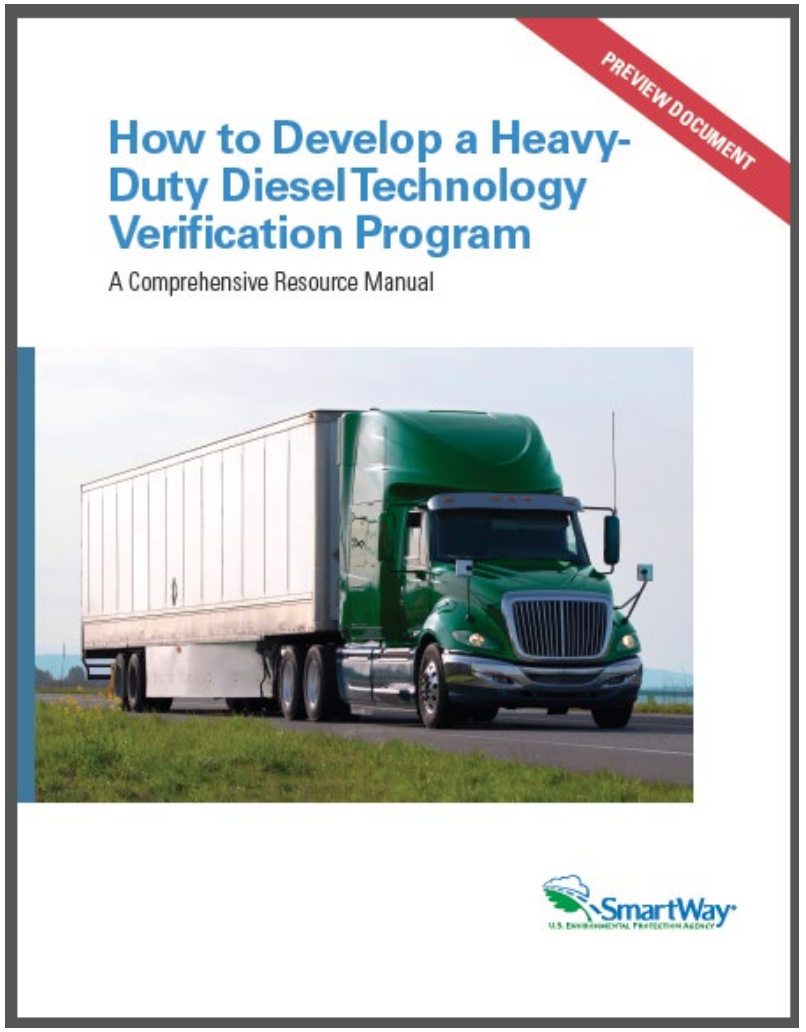
To build capacity for policy makers, agencies and ministries to reduce freight emissions…

To drive the adoption of advanced fuel-saving and emission reducing technologies in the global freight supply chain…

Technology Verification Training Curriculum

Workbook & Resource Manual

- Five Modules of technical and programmatic guidance for policy makers
- Design and implement a robust Technology Verification program
- For full-day or 1.5 day workshop or for extended individual study
- 75 pages: includes U.S. EPA recommended practices, lessons learned, group exercises and worksheets



Technology Verification Training Curriculum

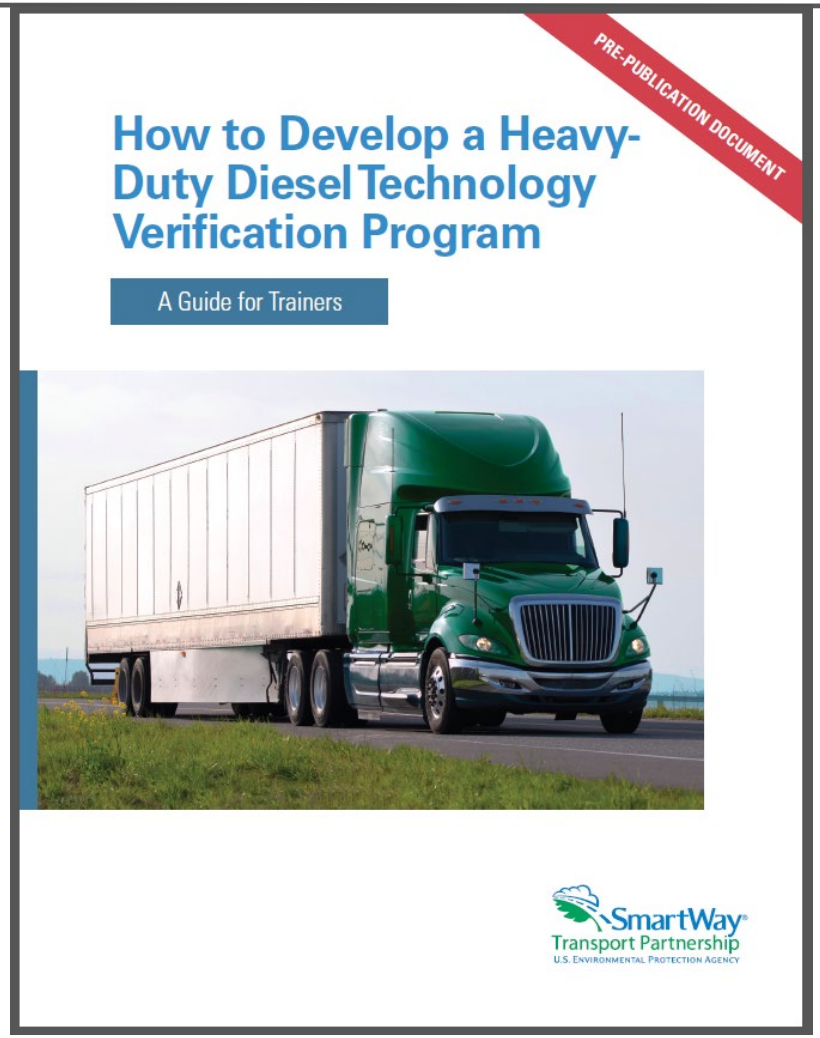
Training Powerpoint Slides

- 37 complementary slides as companion to Training Manual
- Customizable for workshop use or individual study

Technology Verification Training Curriculum

Teacher-Trainer Guide

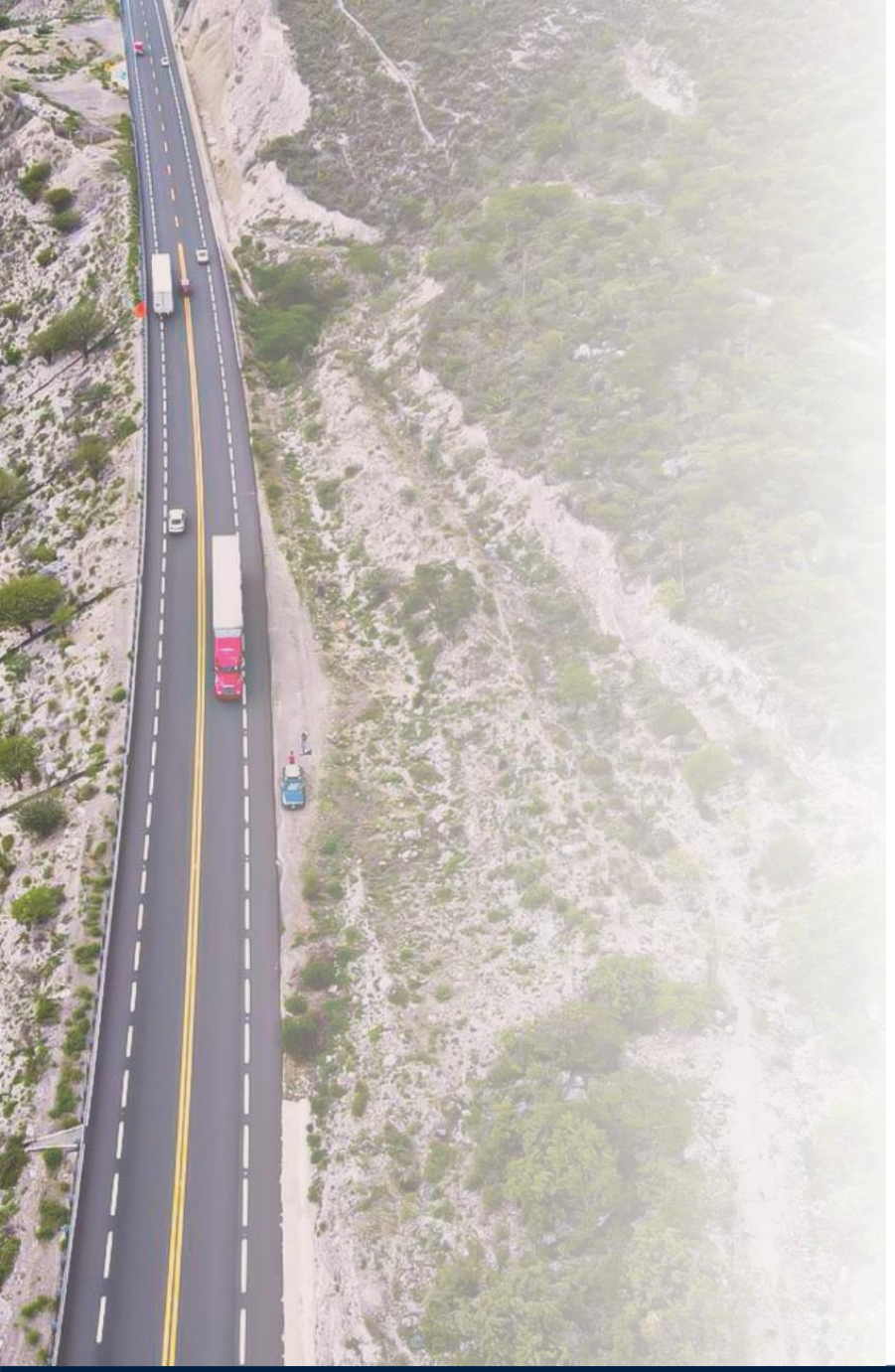
- Workshop resource, orientation and guidance for trainers
- Companion material for Training Manual and Slides
- 64 pages: includes learning objectives, key lessons, teaching techniques, exercise guidance and best practices



www.epa.gov/smartway

smartway_transport@epa.gov

SmartWay Helpline
734-214-4767



Preguntas y respuestas


PROGRAMA
TRANSPORTE
SUSTENTABLE
PRESENTA
Hack
Última Milla
30 de Noviembre al 04 de Diciembre
TRACK:
"Transporte de carga sustentable"
Participa y gana hasta
$60,000 MXN.
Registro: 03 al 29 de noviembre
Más información en: hackultimamilla.org
Contacto: hack.ultimamilla@talent-network.org
#HackathonÚltimaMilla
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MEDIO AMBIENTE
Medio Ambiente y Desarrollo Territorial
Jalisco
cooperación alemana
giz