DAIMLER

Sustainable Pathways for Trucking
DTNA Recommendations for Rulemaking

STEPS Workshop

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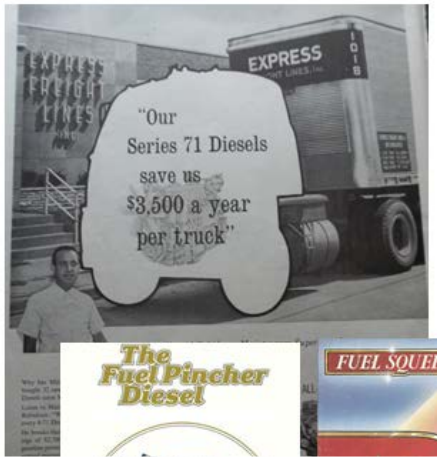
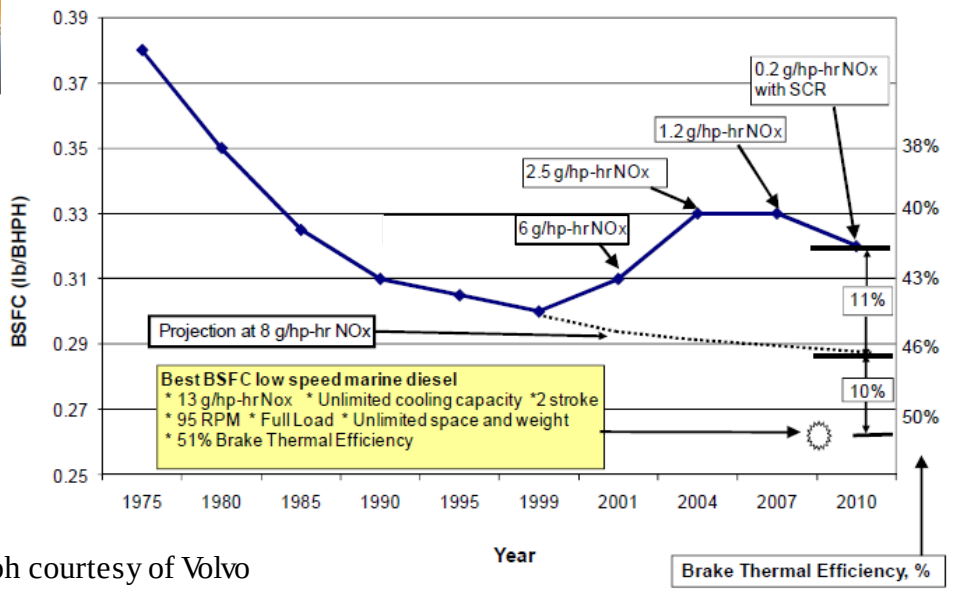
Mercedes-Benz FREIGHTLINER FUSO WESTERN STAR Thomas Built Buses DETROIT

Our longtime mission…



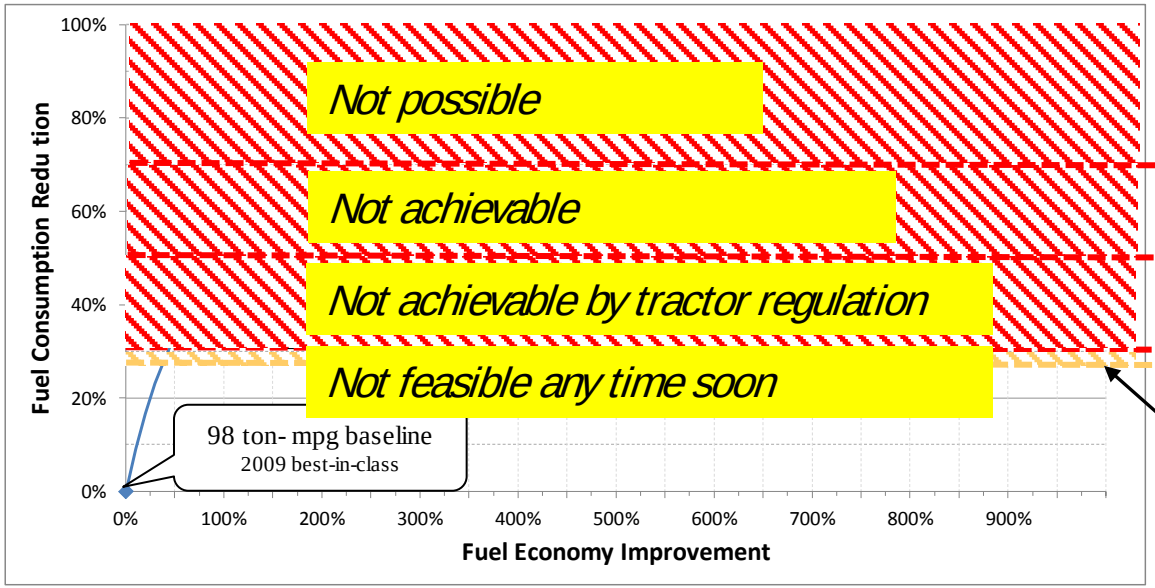
..but fuel economy is constrained by NOx



Graph courtesy of Volvo

Are the 80 to 90%reduction targets achievable?

Relationship between Fuel Economy Improvement and Fuel Consumption Reduction

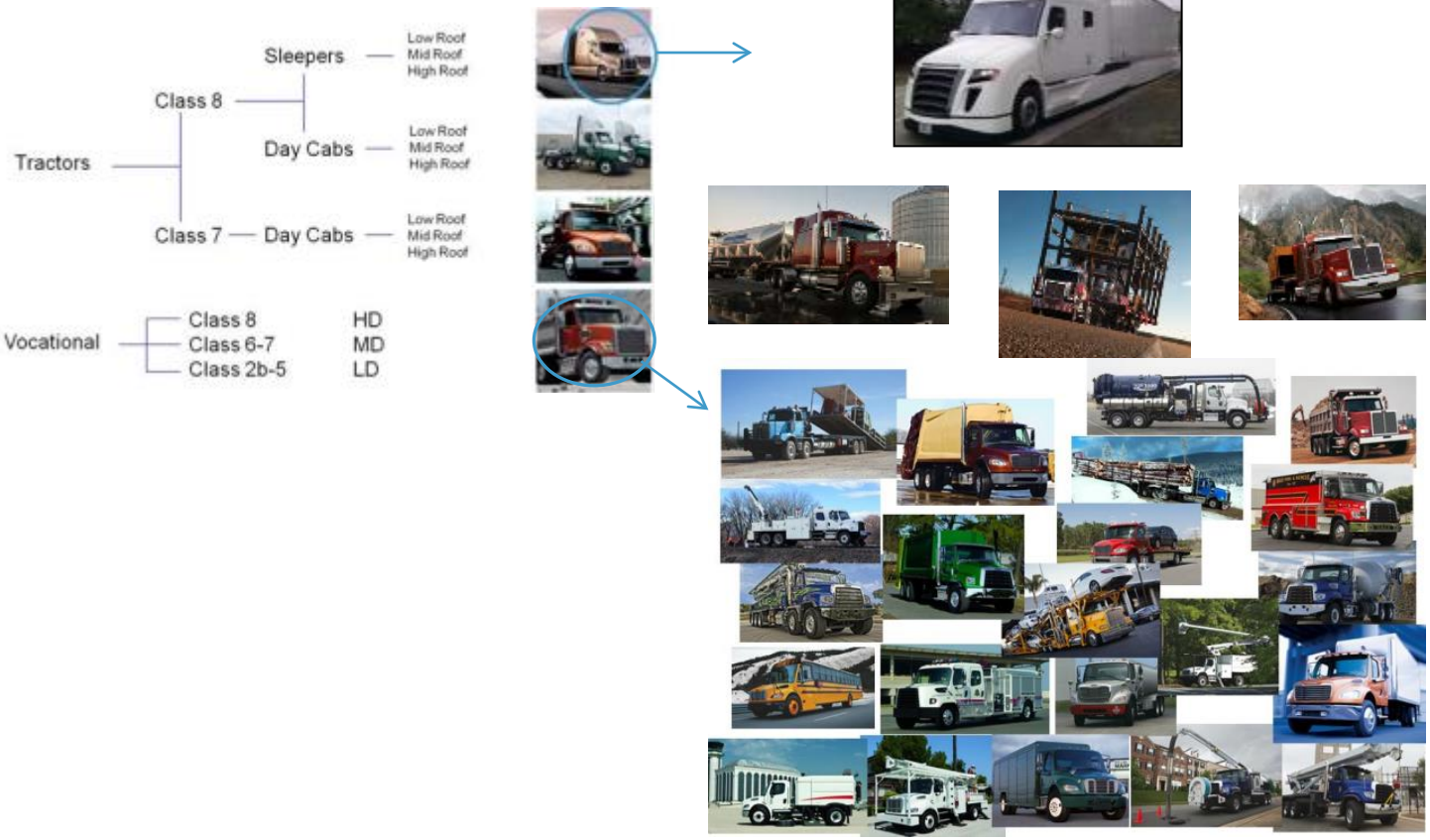


	Second Law Limit Vehicle
Engine	Second law, maximum theoretically possible
Aero CdW	Less than ½ of best vehicle on the market
Transmission & Axle	No friction, best axle and gearing available
Auxiliaries	No power consumption
Overall Rolling Resistance	Steel wheels

Electric heavy-duty vehicle
200 gallon diesel equivalent range = approx. 75,000 lb. tare weight
At best, 5,000 lb. left for freight

Bottom line: No, the tractor targets exceed what a tractor may feasibly achieve.

And regulations must reflect the fact that—even if technology costs and feasibilities were not issues–not all vehicles can be Super Truck.



Bottom line: for any regulatory subcategory, standards must be based on technologies' FCRs times their achievable market penetration rates.

Multiple approaches to reduce braking losses

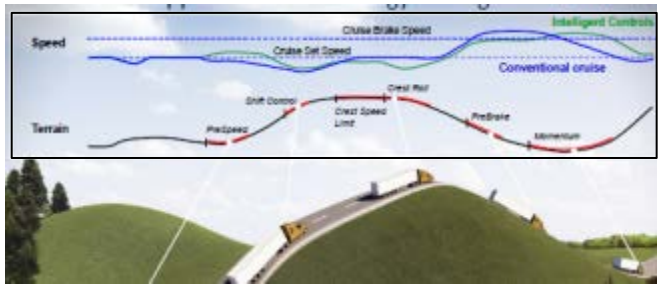
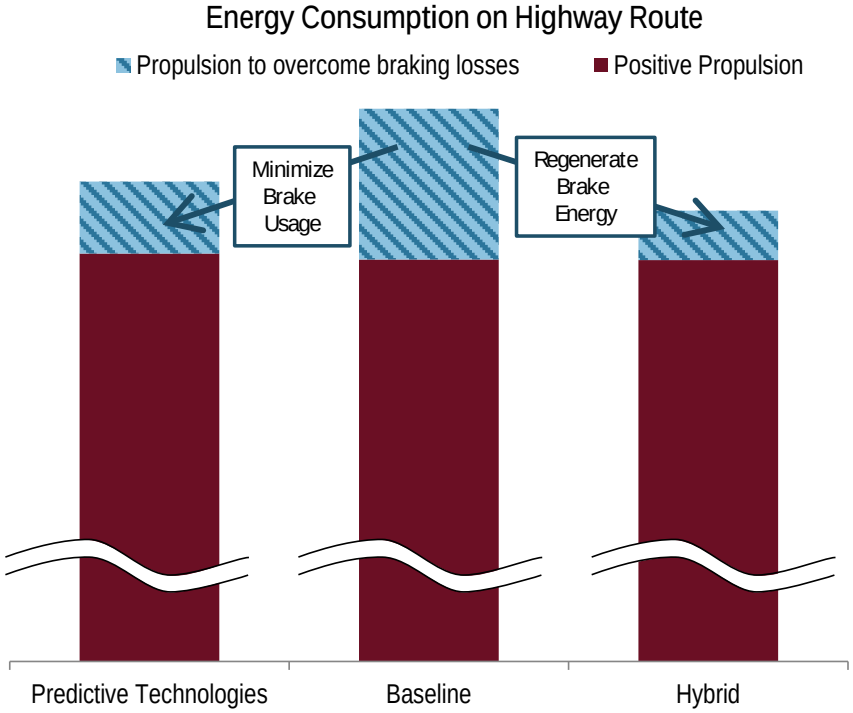


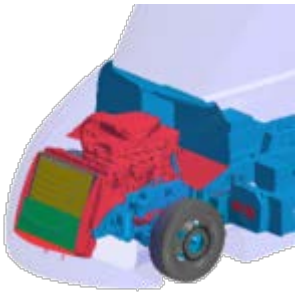
Illustration courtesy of Volvo Trucks

..and energy kinetic energy optimization erodes energy recoverable from waste heat.

Waste-Heat Recovery system on A-sample SuperTruck prototype.



Cooling System



➔ *Most of benefit is derived at minimal hardware, weight, and cost*

The optimal approach is a balance of vehicle GHG reductions and more.