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California Air Resources Board
P.O. Box 2815
Sacramento, CA 95812-2815

Dear Chairperson Nichols and Members of the Board:

Mike Campbell & Associates is actively exercising "green" technologies and practices, and is pleased with many of California's measures to reduce harmful emissions and air pollution from all facets of life. We are already employing alternative fuels (Biodiesel), new transport technologies (electric standby on Transportation Refrigerated Units), and innovative logistics programs (Turnpike GPS systems) to realize better fuel economy and more environmentally-sound practices. Overall, we support the ARB's regulations that should help clean the air quality throughout California.

However, our company has found flaws in some regulations that may have been overlooked by the ARB. In preparation for the upcoming AB32 Heavy Duty Greenhouse Gas regulation, Mike Campbell & Associates decided to test some of the SmartWay-inspired aerodynamics technologies that the ARB is requiring for 53-foot trailers. We have attached our results of the testing which was performed with a 53-foot fully-loaded long haul trailer across approximately 500 miles of (mostly) highway travel: ideal conditions for testing aerodynamics.

The ARB initiated this regulation considering the success of the US EPA's SmartWay program. However, the ARB has not utilized the federal voluntary program as decisively as possible. We have made the argument that the federal SmartWay program was meant as a complete package, not individual components thereof. In the attached pages, you can find statistics that show that solely relying on aerodynamic technologies does not account for the majority of the federal SmartWay program's reduction of emissions. There are many other components to the US EPA's SmartWay program that should be examined if the ARB intends to base a California law upon it.

Further, the ARB has never conducted any studies on the proposed regulation regarding actual application. The numbers for a federal program are going to display different outcomes than a state whose truck speed limit is 55 MPH. All of the federal testing was performed at speeds of 62 MPH. This 7 MPH reduction could account for more fuel efficiency (and less greenhouse gas emission) than adding any aerodynamics to a trailer.

Again, Mike Campbell & Associates is encouraged by the efforts of the ARB and will continue to work with the organization to promote clean air for California. However, we want to be certain that each aspect of this regulation is validated as true and keeps us moving in the right direction: toward a brighter, cleaner future.

Sincerely,

Andy Cox
Environmental Manager

Problems with ARB's AB32 Heavy Duty Greenhouse Gas Rule

⇒ **Our Turnpike System Aerodynamics Road Testing**

- Summary
  - Our company tested low rolling resistance tires and side skirts on a trailer to realize true fuel efficiencies of technologies[1]
- Experiment (measured by Turnpike System)[2]
  - Constants
    - same driver
    - same truck
    - same trailer
    - same route (Chino, CA to Las Vegas, NV)
    - same average load weight
    - all of the factors measured by Turnpike's GPS system
  - Variables
    - tires (regular v. low rolling resistance)
    - side skirts (with v. without)
- Results
  - Phase 1 (no changes)
    - 12 route trips
    - 6.13 MPG
  - Phase 2 (add side skirts only)
    - 16 route trips
    - 6.12 MPG
      - .06% **decrease** in fuel mileage
  - Phase 3 (add side skirts and low rolling resistance tires)
    - 21 route trips
    - 6.32 MPG
      - 3.24% **increase** in fuel mileage
- Conclusion
  - Side Skirts
    - The assertions made by the US EPA, ARB, and side skirt companies regarding the benefits of adding this aerodynamic technology to a trailer appear to be contraindicative of our findings. The side skirts we tested, overall, have no positive effects on a long haul tractor trailer. These findings suggest that the side skirts may actually hinder fuel efficiency for tractor trailers.
  - Low Rolling Resistance Tires
    - The tires that are certified by the US EPA's SmartWay program have a definite positive effect on the overall fuel efficiency of the tractor trailer that we utilized in this study. These findings suggest that the low rolling resistance tires can help fuel efficiency.

[1] See Appendix A
[2] Company statistics available upon request

⇒ **ARB's Refusal to Test Aerodynamics according to California Laws**

- Summary
  - The ARB has never tested any of the "SmartWay" technologies suggested by the US EPA. The ARB is, essentially, using a voluntary federal program that they have never tested to dictate California law.
- Issues
  - All of the tests that the ARB has used to prove the fuel efficiency of SmartWay technologies were done at 62 MPH
    - These tests should be thrown out, as the CA truck speed limit is 55 MPH over the majority of roads
      - – or – change the CA truck speed limit to 65 MPH
    - The average truck highway speed for all of California is 48.43 MPH[3].
    - The US EPA's study of rolling friction v. aerodynamic drag[4] shows that friction is only overcome by aerodynamics at constant speeds above 50 MPH.
      - Considering the average CA highway speed mentioned above, the aerodynamics do not come into play for trucks driving on California highways.
      - In fact, requiring solely these aerodynamic technologies on all of a fleet's trailers that extend past a 50-mile radius will make the same trailers that are used for short haul applications lose fuel efficiency, use more fuel, and cause more air pollution. In the end, the ARB's efforts do not seem well-planned and could easily end up hurting the air quality that the ARB is fighting for.

⇒ **ARB's Refusal to Consider SmartWay's Other Methods for Compliance**

- Summary
  - The US EPA's SmartWay program does not rely solely on new technologies to reduce Greenhouse Gases and improve fuel efficiency in trucks. They rely on thirteen (13) different strategies.
- Carrier Strategies[5]
  - Idle Reduction
    - Not applicable: already CA law
  - Improved Aerodynamics
    - Improvements to both trailers and tractors
  - Improved Freight Logistics
    - Improving routes, loads, shipping, and receiving
  - Automatic Tire Inflation Systems
  - Single Wide-base Tires

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[3] Please see statistics on CA I-5 average speed: http://ops.fhwa.dot.gov/freight/time.htm

[4] Please see the US EPA's study (p.12): http://www.northeastdiesel.org/pdf/FSES-SmartWayTechnologies.pdf

[5] Please see the US EPA's SmartWay "Overview of Carrier Strategies": http://epa.gov/smartway/transport/what-smartway/carrier-strategies.htm

- Driver Training
  - Teaches fuel efficient and safe techniques
- Low-Viscosity Lubricants
- Intermodal Shipping
- Longer Combination Vehicles
- Reducing Highway Speed
  - Huge disparities in every 5 MPH drop in speed
  - US EPA states that a "truck driving 55 miles per hour uses up to 20% less fuel than a similar truck driving 65 miles per hour"[6]
    - Why drive faster to make aerodynamics work when driving slower (without aerodynamics) can provide better fuel efficiency overall?
- Weight Reduction
- Hybrid Powertrain Technology
- Renewable Fuels

- Conclusion
  - The California ARB is ignoring many of the strategies that can be utilized to increase fuel efficiency and reduce pollution that contributes to climate change. The US EPA estimates that improved aerodynamic for trucks and trailers could reduce 20 metric tons (M/T) of CO_2 annually. While that number is large, it accounts for less than 20% of the total decrease in greenhouse gases through the ARB's SmartWay recommended strategies that can be used to promote fuel economy. Not included in the ARB's plans are the following CO_2-reducing methods: improving freight logistics (24M/T), automatic tire inflation (1M/T), single wide-base tires (4M/T), training (8M/T), low-viscosity lubricants (5M/T), intermodal shipping (~ 65% reduction), combination vehicles (34M/T), reduced speed (10M/T), weight reduction (3M/T), hybrid powertrains (12M/T), and renewable fuels (varies). As you can see, a company that only trains its drivers and improves freight logistics will reduce 50% more GHG than a company employing aerodynamics. Choosing only one aspect of the US EPA's SmartWay program and ignoring the others is entirely ignorant in its reasoning.

[6] See EPA report: http://www.epa.gov/smartway/transport/documents/tech/reducedspeed.pdf

Appendix A

Results of Trailer Aerodynamics Testing (Chino, CA to Las Vegas, NV)

Phase 1 (No Accessories)

Tractor:1137 Trailer: 829144 Total Trips: 12 Dates: 9/9/08-9/29/08

	Date	Miles Driven	Gallons Pumped	MPG	Out-bound Weight	Comments
	9/8/08		85		56,620	No skirt
	9/9/08	546	105	5.20	54,060	No skirt
	9/10/08	499	83	6.01	57,340	No skirt
	9/11/08	498	81	6.15	49,380	No skirt
	9/15/08	499	78	6.40	52,580	No skirt
	9/16/08	498	76	6.55	58,740	No skirt
	9/17/08	499	87	5.74	55,660	No skirt
	9/18/08	498	77	6.47	57,020	No skirt
	9/19/08	499	75	6.65	60,460	No skirt
	9/24/08	503	86	5.85	57,760	No skirt
	9/26/08	500	80	6.25	53,500	No skirt
	9/29/08	499	76	6.57	55,280	No skirt
Totals		**5538**	**989.00**			
Averages				**6.13**	**55,700**	

Phase 2 (Trailer with Side Skirts)

Tractor:1137 Trailer: 829144 Total Trips: 16 Dates: 10/1/08-10/25/08

	Date	Miles Driven	Gallons Pumped	MPG	Out-bound Weight	Comments
	10/1/08	993	161.00	6.17	56,140	Skirt without low rolling resistance tires
	10/2/08	502	77.00	6.52	55,420	Skirt without low rolling resistance tires
	10/3/08	499	77.00	6.48	54,200	Skirt without low rolling resistance tires
	10/4/08	498	76.68	6.49	64,260	Skirt without low rolling resistance tires
	10/8/08	499	85.00	5.87	56,000	Skirt without low rolling resistance tires
	10/9/08	499	72.00	6.93	50,980	Skirt without low rolling resistance tires
	10/10/08	500	82.00	6.10	59,080	Skirt without low rolling resistance tires
	10/13/08	499	85.00	5.87	53,980	Skirt without low rolling resistance tires
	10/14/08	571	102.00	5.60	53,980	Skirt without low rolling resistance tires
	10/15/08	500	80.00	6.25	53,980	Skirt without low rolling resistance tires
	10/20/08	567	96.00	5.91	53,980	Skirt without low rolling resistance tires
	10/21/08	500	78.00	6.41	53,980	Skirt without low rolling resistance tires
	10/22/08	551	98.00	5.62	53,980	Skirt without low rolling resistance tires
	10/23/08	543	97.00	5.60	53,980	Skirt without low rolling resistance tires
	10/24/08	499	78.00	6.40	53,980	Skirt without low rolling resistance tires
	10/25/08	510	80.00	6.38		Skirt without low rolling resistance tires
Totals		**8,730**	**1,424.68**			
Averages				**6.12**	**55,195**	
				-0.06%	Phase 2 Percentage increase/decrease in MPG	
				-0.004 MPG	Phase 2 Actual increase/decrease in MPG	

Phase 3 (Trailer with Side Skirts and Low Rolling Resistance Tires)

Tractor:1137 Trailer: 829144 Total Trips: 20 Dates: 10/30/08-11/28/08

	Date	Miles Driven	Gallons Pumped	MPG	Out-bound Weight	Comments
	10/30/08	499	81.00	6.16		Skirt with low rolling resistance tires
	10/31/08	499	81.00	6.16		Skirt with low rolling resistance tires
	11/3/08	498	77.00	6.47	56,240	Skirt with low rolling resistance tires
	11/4/08	500	80.00	6.25		Skirt with low rolling resistance tires
	11/5/08	500	82.00	6.10	55,900	Skirt with low rolling resistance tires
	11/6/08	500	78.00	6.41		Skirt with low rolling resistance tires
	11/7/08	542	86.00	6.30		Skirt with low rolling resistance tires
	11/10/08	499	80.00	6.24	60,500	Skirt with low rolling resistance tires
	11/11/08	501	82.00	6.11	58,500	Skirt with low rolling resistance tires
	11/12/08	496	75.00	6.61	59,160	Skirt with low rolling resistance tires
	11/13/08	500	80.00	6.25	60,000	Skirt with low rolling resistance tires
	11/14/08	499	79.00	6.32	52,940	Skirt with low rolling resistance tires
	11/17/08	500	83.00	6.02	55,480	Skirt with low rolling resistance tires
	11/18/08	497	77.00	6.45	53,540	Skirt with low rolling resistance tires
	11/19/08	499	81.00	6.16	58,320	Skirt with low rolling resistance tires
	11/20/08	498	78.00	6.38	53,040	Skirt with low rolling resistance tires
	11/21/08	499	74.00	6.74	52,520	Skirt with low rolling resistance tires
	11/24/08	500	75.30	6.64	59,020	Skirt with low rolling resistance tires
	11/25/08	500	80.00	6.25	58,640	Skirt with low rolling resistance tires
	11/26/08	500	80.00	6.25	51,860	Skirt with low rolling resistance tires
	11/28/08	500	75.00	6.67	59,320	Skirt with low rolling resistance tires
Totals		**10526**	**1,664.30**			
Averages				**6.32**	**56,444**	
				3.24%	Phase 3 Percentage increase/decrease in MPG	
				.198 MPG	Phase 3 Actual increase/decrease in MPG	