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Executive Summary

An Economic Analysis of the EPA's Proposed Emission Standards for On-Highway Motorcycles

Prepared for the Motorcycle Riders Foundation
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1. When realistic cost estimates are used, EPA's proposed emission standards for on-highway motorcycles would cost from \$3,500 to more than \$7,500 per ton (2001 dollars) – far higher than the per-ton costs of previously implemented mobile source pollution prevention programs.
2. The EPA did not meet its obligations under the Small Business Regulatory Enforcement Fairness Act of 1996 (SBREFA) because its analysis of the proposed emissions considers only motorcycle manufacturers – and especially a handful of large motorcycle manufacturers. EPA never considers the economic impacts that the proposed standards would have on the tens of thousands of small businesses that also belong to the U.S. motorcycle industry: franchised dealers, performance shops and aftermarket suppliers.
3. The EPA ignores the issue of rider safety. None of the major EPA documents that discuss the proposed standards even make a single mention of either “rider safety” or “consumer safety.”
4. The EPA's analysis ignores possible impacts of the proposed standards on future motorcycle sales by *assuming* sales will grow smoothly at 1 percent annually, despite the historical evidence showing that national sales are subject to radical year-to-year swings and despite the long-term *downward* trend between the early 1980s and the late 1990s (despite the recent upswing in annual sales).
5. The EPA wants to “harmonize” California's proposed emission standards to the other 49 states (regardless of those states' air pollution regulatory needs), but ignores that state's 7.7% *reduction* in motorcycle registrations between 1996 and 2001 when registrations increased by 32.2% in the other 49 states. Even a cursory look at the data suggests that government regulations explain much of the fall in California's motorcycle registrations.
6. The EPA did not meet its obligations under Executive Order 12866 to consider a less stringent alternative to the proposed emission standards. Yet, ample warnings abound that the catalyst-forcing Tier 2 standards will produce negligible environmental benefit at considerable cost to jobs and personal freedom, compared to only a slightly less stringent standard.

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I. Introduction

The EPA's proposed emission standards for highway motorcycles [Docket A-2000-02] would provide few (and perhaps no) environmental benefits at enormous economic cost to both riders and a wide variety of numerous small motorcycle manufacturers, independent shops,¹ franchised dealers and aftermarket suppliers. The standards would give substantial and unfair competitive advantages to the larger motorcycle companies, handing them the power to raise prices above levels that a more competitive marketplace would establish. The few jobs added by the handful of large motorcycle companies would be swamped by the numerous jobs lost in the several thousands of small companies who deal with motorcycle owners face-to-face and who best know owners' needs and preferences. Higher prices and a marketplace less attuned to meeting customers' needs mean fewer riders – and fewer jobs overall.

By setting emission standards that would be far less disruptive to the competitive balance of the multi-faceted motorcycle industry the EPA would achieve nearly as much – and perhaps greater – environmental improvement at far less economic harm to consumers and jobs. By setting emission standards that most manufacturers can only meet by installing catalytic converters, the EPA forces potential buyers of new motorcycles to make a difficult choice: either forego buying motorcycles that cannot meet their needs or stripping off the catalytic converters to get the performance they require. A motorcycle, stripped of its catalytic converter, will emit more pollution than a well-maintained motorcycle that meets a less draconian standard (a standard that does not require a catalytic converter to meet). Hence, the “tougher” standard can easily produce the worst of all worlds: higher prices for consumers, fewer jobs for *all* motorcycle companies (not just a favored few) and *more* air pollution – not to mention a greater disrespect for the law engendered by difficult-to-enforce regulations that defy consumer preferences.

II. EPA's Proposed Emission Standards for Highway Motorcycles

The EPA's proposed emission standards – in the Agency's words – “would extend the California requirements nationwide two years after they initially take effect in California.”² However, unlike in California, the proposed standards would also cover

¹ Independent shops are non-franchised motorcycle retail outlets sometimes termed custom shops or performance shops.

² United States Environmental Protection Agency (EPA), “Regulatory Announcement: Proposed Emission Standards for New Highway Motorcycles and Recreational Boats,” EPA-F-02-007, July 2002, pp. 1-2.

“previously unregulated motorcycles with engines of less than 50 cubic centimeters displacement (such as scooters and mopeds).”³ The standards would apply for highway motorcycles, currently defined as “any motor vehicle with a headlight, taillight, and stoplight and having: two wheels, or three wheels and a curb mass less than or equal to 793 kilograms (1749 pounds).”⁴

Table 1 reproduces a table in the EPA’s regulatory announcement that summarizes the key parameters of the proposed emission standards for new motorcycles.

Table 1. Proposed Highway Motorcycle Exhaust Emission Standards

Class	Engine Size (cc)	Implementation Date	HC (g/km)	HC+NO _x (g/km)	CO (g/km)
Class I	Less than 180	2006	1.0	---	12.0
Class II	180-279	2006	1.0	---	12.0
Class III	280 and above	2006	---	1.4	12.0
		2010	---	0.8	12.0

Source: United States Environmental Protection Agency, “Regulatory Announcement: Proposed Emission Standards for New Highway Motorcycles and Recreational Boats,” EPA420-F-02-007, July 2002, p. 3.

According to the EPA, more than 90 percent of projected motorcycle sales fall into the Class III (hereafter: Class 3) category. And, more than three quarters (more than 75 percent) of projected motorcycle sales exceed 700 cc in engine size.⁵ Only six manufacturers account for 95 percent of the motorcycles sold in the United States.⁶ And, the EPA treats motorcycle manufacturers – and especially large manufacturers – as the only segment of the industry worthy of its analytical attention. However, tens of thousands of small companies – franchised dealers, independent shops, aftermarket suppliers – also belong to the U.S. motorcycle industry. The EPA’s analysis does not consider how its proposed Tier 1 and Tier 2 standards would impact any of these tens of thousands of firms.

Concrete data on the precise numbers of small businesses that service the needs of motorcycle owners are difficult to obtain. However, a first-order impression of their magnitude can be obtained from Internet “search engines.” (See Table 2).

³ United States Environmental Protection Agency (EPA), “Regulatory Announcement: Proposed Emission Standards for New Highway Motorcycles and Recreational Boats,” EPA-F-02-007, July 2002, p. 2.

⁴ United States Environmental Protection Agency (EPA), “Regulatory Announcement: Proposed Emission Standards for New Highway Motorcycles and Recreational Boats,” EPA-F-02-007, July 2002, p.3.

⁵ EPA, *Draft Regulatory Support Document: Control of Emissions from Spark-Ignition Marine Vessels and Highway Motorcycles*, EPA420-D-02-003, July 2002, p. 2-2.

⁶ EPA, *Draft Regulatory Support Document: Control of Emissions from Spark-Ignition Marine Vessels and Highway Motorcycles*, EPA420-D-02-003, July 2002, p. 2-1.

Table 2. Number of “Hits” Using the “Google” Internet Search Engine

Phrase	Approximate Number of “Hits”
“Motorcycle Aftermarket”	72,100
“Motorcycle Dealer”	264,000
“Custom Motorcycle Shop”	93,400
“Motorcycle Parts”	613,000

III. The EPA Overlooked Thousands of Small Firms in its Review of the Small Business Regulatory Enforcement Fairness Act of 1996 (SBREFA)

Aside from mention of a few motorcycle importers, the EPA treats small motorcycle manufacturers as virtually the only “small entities” it need consider under the Small Business Regulatory Enforcement Fairness Act of 1996 (SBREFA).⁷ As Table 3 indicates, the EPA literally makes no mention of franchised dealers, independent shops or aftermarket suppliers – motorcycle firms that, together, number several thousand small firms. Table 3 shows the number of times various words and two-word phrases appear in the EPA’s “Notice of Rulemaking” published in the 14 August 2002 *Federal Register*, the Agency’s “Regulatory Support Document” (RSD) and the “Final Report of the Small Business Advocacy Review Panel.” While “manufacturer(s)” appears more than nine hundred times, the phrases “franchised dealer(s),” “independent shops,” “custom shop(s)” and “aftermarket supplier(s)” do not appear even once in any of those three documents.

Yet, the EPA is surely aware that emissions regulations affect small firms other than manufacturers. The EPA’s Small Business Advocacy Review Panel, in its September 2001 Final Report on the proposed emission standards, noted that California had to revisit its regulation of off-highway motorcycles because few of those motorcycles could meet the standards, causing dealers economic hardship by leaving them with few units to sell.⁸ Furthermore, on 17 September 2002 the EPA heard testimony from John Paliwoda,

⁷ EPA’s Regulatory Support Document (RSD) for the highway motorcycle emissions proposal, in its discussion of “Affected Entities” under SBREFA devotes only two paragraphs to the affected highway motorcycle firms. The first of these two paragraphs lists the *large* motorcycle manufacturers *not* affected by SBREFA. The second of the two paragraphs discusses affected highway motorcycle firms with these words: “In addition to the big six manufacturers noted above, EPA finds as many as several dozen more companies that have operated in the U.S. market in the last couple of years. Most of these are U.S. companies that are either manufacturing or importing motorcycles, although a few are U.S. affiliates of larger companies in Europe or Asia. Some of the U.S. manufacturers employ only a few people and produce only a handful of custom motorcycles per year, while others may employ several hundred and produce up to several thousand motorcycles per year.” See: EPA, *Draft Regulatory Support Document: Control of Emissions from Spark-Ignition Marine Vessels and Highway Motorcycles*, EPA420-D-02-003, July 2002, p. 8-15. In its “notice of proposed rulemaking” in the 14 August 2002 *Federal Register*, the EPA refers to “small manufacturers (and in the case of one category, small importers)” under its discussion of SBREFA and highway motorcycles. The EPA makes no mention of franchised dealers, independent shops or aftermarket suppliers – firms that, when added together, number several thousand.

⁸ EPA, *Final Report of the Small Business Advocacy Review Panel on Control of Emissions from Nonroad Large Spark Ignition Engines, Recreational Engines (Marine and Land-based), and Highway Motorcycles*, EPA420-R-01-049, September 2001, p. 14.

Director of the California Motorcycle Dealers Association (CMDA), who pointed to California’s regulation of off-highway motorcycles as an example of what happens to dealers when poorly conceived regulations cause “product shortages or customer rejection of certifying models.” Mr. Paliwoda added that “dealers have significant brick-and-mortar investments to plan, finance, build, remodel, expand, operate from and pay for.”⁹ At the same hearing, John Silk of the Motorcycle Riders Foundation (MRF) testified “that EPA’s proposed rulemaking will ban venerated classic engine families and destroy a vast cottage industry of small businesses in the United States – from some small motorcycle makers to the aftermarket.”¹⁰

Table 3. Frequency in Three Basic Regulatory Proposal Documents of Key Words and Phrases Related to Types of Motorcycle Firms Considered by EPA’s Analysis

Word or Phrase	<i>Federal Register</i>	Regulatory Support Document	Report of Small Business Review Panel	Total
“manufacturer(s)”	396	243	268	907
“importer(s)”	11	6	25	42
“dealer(s)”	2	2	1	5
“franchised dealer(s)”	0	0	0	0
“shop(s)”	0	0	0	0
“independent shop(s)”	0	0	0	0
“custom shop(s)”	0	0	0	0
“supplier”	7	5	12	24
“aftermarket supplier”	0	0	0	0

A. EPA’s Estimation of Engineering Costs Favors Large Motorcycle Manufacturers Over Small Manufacturers

Despite the enormous size and variety of motorcycle firms – from a few large manufacturers (such as Harley Davidson) that assemble entire motorcycles to many thousands of small independent shops (some of which may specialize in modifying only a portion of motorcycles manufactured by others) – the EPA’s RSD presents engineering cost estimates for a single type of motorcycle firm: a large manufacturer of Class 3 motorcycles. This *approach* to estimating those costs inherently favors a few large

⁹ Transcript of public hearing on proposed emission standards for 2006 and later model year on-highway motorcycles, held September 17, 2002 at the U.S. Environmental Protection Agency Office of Transportation and Air Quality, 2000 Traverwood Drive, Ann Arbor, Michigan, De Scribe Reporting, Inc., p. 72.

¹⁰ Transcript of public hearing on proposed emission standards for 2006 and later model year on-highway motorcycles, held September 17, 2002 at the U.S. Environmental Protection Agency Office of Transportation and Air Quality, 2000 Traverwood Drive, Ann Arbor, Michigan, De Scribe Reporting, Inc., p. 23.

manufacturers at the expense of smaller manufacturers, and totally ignores the far more numerous smaller firms that are also members of the U.S. motorcycle industry.

The RSD presents engineering cost estimates for a hypothetical motorcycle manufacturer that annually produces 25,000 units with 600cc engines and 64,000 units with 1200cc engines.¹¹ Both engine sizes belong to the Class 3 category. A firm producing 89,000 units annually would meet more than a fifth of U.S. demand, according to EPA projections. The RSD states that, in projecting future annual sales of Class 3 motorcycles, “we started with 1999 sales of 387,000 units and projected out using a [sic] annual growth rate of 1 percent.”¹² (Section VI of this analysis discusses why EPA’s projection of a smooth 1 percent growth rate in annual sales – besides ignoring the cyclical historical record of annual sales – has the effect of ignoring any impacts that its proposed emission standards may have on sales by impacting price or the ability of compliant motorcycles to meet consumer preferences.) Applying EPA’s projected sales growth for Class 3 motorcycles, shows that the Agency projects annual sales to be 414,916 in 2006 (when the Tier 1 standards would become effective) and 431,764 in 2010 (when the Tier 2 standards would become effective). Even assuming that EPA’s hypothetical firm does not increase its annual production in tandem with the industry’s 1 percent annual sales growth, the EPA’s engineering estimates implicitly assume that a mere five large manufacturers would more than meet the total demand for Class 3

Table 4. The Industrial Structure of Worldwide Motorcycle Manufacturing Implicitly Assumed by EPA’s Engineering Cost Estimates

Year	EPA Projected Sales of Class 3 Motorcycles Growing at 1% Annually	Annual Sales of Class 3 Motorcycles by EPA’s Hypothetical Firm	Number of Firms EPA Implicitly Assumes Would Meet U.S. Demand
1999	387,000 ^a	89,000	4.35
2006 ^b	414,916	89,000	4.66
2010 ^c	431,764	89,000	4.85

^aActual sales. ^bTier 1 standards become effective. ^cTier 2 standards become effective.

¹¹ EPA, *Draft Regulatory Support Document: Control of Emissions from Spark-Ignition Marine Vessels and Highway Motorcycles*, EPA420-D-02-003, July 2002, p. 5-6.

¹² EPA, *Draft Regulatory Support Document: Control of Emissions from Spark-Ignition Marine Vessels and Highway Motorcycles*, EPA420-D-02-003, July 2002, p. 5-15. Conceivably, the engineering cost estimates could apply to two, separate firms: one producing the 600cc engine model and the other producing the 1200cc engine model. However, at page 53079 of the 14 August 2002 notice of proposed rulemaking published in the *Federal Register*, the EPA proposes that, “under the emission-credit program, manufacturers would be able to balance the certified HC+NO_x emissions of their Class III motorcycles so that the sales-weighted HC+NO_x emissions level meets the applicable standard. This means that some engine families may have HC+NO_x below the standards, while others have HC+NO_x emissions higher than the standards.” From this discussion, the EPA reveals that the hypothetical annual production runs of 25,000 units with a 600cc engine and 64,000 units with a 1,200cc engine discussed in the RSD could easily apply to a single firm using the emission-credit program to balance emissions between the two engine families.

motorcycles in 2010. (See summary Table 4.) In other words, the EPA's engineering cost estimates presume a motorcycle manufacturing industry dominated indefinitely by an oligopoly.

Applying the EPA's engineering cost estimates to small manufacturers (let alone to even smaller motorcycle firms such as independent shops or aftermarket suppliers that may fabricate a portion of a motorcycle), demonstrates that they could face per-unit cost increases of thousands of dollars – hundreds of times greater than the per-unit cost increases trumpeted by the EPA for its large manufacturer. Table 5 illustrates how much heavier the proposed emissions could bear upon a small manufacturer than upon a large manufacturer.

Table 5 draws upon four tables in EPA's RSD that show long-term capital cost estimates. (Table 5 does not include EPA's engineering cost estimates for "variable costs" since, according to EPA, those per-unit costs would be the same for all motorcycle manufacturers – regardless of their size – and do not require any R&D, retooling or amortization.) EPA does not explain why it applies its engineering cost estimates to a single large firm, instead of to firms of various sizes. EPA states merely that, "The California ARB [Air Resources Board] used an average production level of 15,000 units for both [engine] categories. In this analysis we use 25,000 units per year for the 600 cc engine and 64,000 units per year for the 1200 cc engine."¹³

Apparently, EPA's selection of 25,000 units and 64,000 units of annual production was arbitrary; *i.e.*, equivalent to drawing two numbers at random out of a hat. At the least, the EPA should have estimated per-unit costs for manufacturers of more than one size to gain a perspective on how its proposed emission standards may affect smaller manufacturers' ability to compete. This analysis considers the per unit costs implied by the EPA for three other size manufacturers: a very small firm that would be exempt from the Tier 2 standards, a small manufacturer just large enough to be subject to Tier 2 and a manufacturer large enough to supply the entire U.S. market demand (*i.e.*, a monopoly) Since EPA's engineering cost estimates do not relate per unit costs to firm size (make no reference to either economies or diseconomies of scale), the application of those estimates to a monopoly cannot be excluded logically. Since EPA's hypothetical large manufacturer produces about two-and-a-half 1200cc engine models for every 600cc engine model, this analysis applies that same ratio of outputs to the other three firms.

As shown in Table 5, the average per-unit costs for the exempt small manufacturer are \$3,819.06 (600 cc engine) and \$1,496.30 (1200 cc engine) – considerably higher than EPA's per unit estimates of \$2.14 and \$0.84 respectively. These figures illustrate an important aspect of EPA's per-unit cost estimates: the relatively low per-unit cost estimates arrived at by the Agency reflect its assumption of large annual production

¹³ EPA, *Draft Regulatory Support Document: Control of Emissions from Spark-Ignition Marine Vessels and Highway Motorcycles*, EPA420-D-02-003, July 2002, p. 5-6. Words in brackets are added.

Table 5. EPA's Engineering Cost Estimates for Four Different Size Motorcycle Manufacturers

Fixed Cost Annual Production	Small Manufacturer Exempt From Tier 2		Small Manufacturer		EPA's Large, Oligopolistic Manufacturer		Monopoly Manufacturer	
	600cc 14 units	1200cc 36 units	600cc 842 units	1200cc 2,158 units	1200cc 25,000 units	1200cc 64,000 units	600cc 121,276 units	1200cc 310,488 units
Engine Modific- ation ^a								
R&D	\$62,292	\$62,292	\$62,292	\$62,292	\$62,292	\$62,292	\$62,292	
Tooling	\$30,000	\$30,000	\$30,000	\$30,000	\$30,000	\$30,000	\$30,000	
Electronic Fuel Injection ^b								
R&D	\$62,292	\$62,292	\$62,292	\$62,292	\$62,292	\$62,292	\$62,292	\$62,292
Tooling	\$10,000	\$12,000	\$10,000	\$12,000	\$10,000	\$12,000	\$10,000	\$10,000
Pulse Air Valve ^c								
R&D	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Tooling	\$8,000	\$8,000	\$8,000	\$8,000	\$8,000	\$8,000	\$8,000	\$8,000
Catalyst ^d								
R&D	\$54,750	\$54,750	\$54,750	\$54,750	\$54,750	\$54,750	\$54,750	\$54,750
Tooling	\$10,000	\$10,000	\$10,000	\$10,000	\$10,000	\$10,000	\$10,000	\$10,000
Oxygen Sensor								
R&D	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Tooling	\$5,000	\$5,000	\$5,000	\$5,000	\$5,000	\$5,000	\$5,000	\$5,000
Compliance	\$25,000	\$25,000	\$25,000	\$25,000	\$25,000	\$25,000	\$25,000	\$25,000
Sub-Total	\$267,334	\$269,334	\$267,334	\$269,334	\$267,334	\$269,334	\$267,334	\$269,334
/Annual Production	\$19,095	\$7,481	\$317.50	\$124.81	\$10.69	\$4.21	\$2.20	\$0.87
/Years to Recover	5	5	5	5	5	5	5	5
Total Per Unit Fixed Cost	\$3,819	\$1,496	\$63.50	\$24.96	\$2.14	\$0.84	\$0.44	\$0.17

Source: EPA, RSD. ^aTable 5.5.2-1 ^bTable 5.2.2-3 ^cTable 5.2.2-4 ^dTable 5.2.2-6

levels, not anything intrinsically “low” in the engineering costs themselves. Indeed, the EPA’s engineering cost estimates indicate that, without a permanent Tier 2 exemption, a very small motorcycle manufacturer would soon be driven out of the marketplace. Even the per unit costs for a small manufacturer, right at the margin of being subject to Tier 2 standards, would be several times higher (at \$63.50 for the 600cc engine and \$24.29 for the 1200cc engine) than per-unit costs estimated by the EPA for a large manufacturer.

It should also be noted that the EPA’s engineering cost estimates imply that consumers would be best served if a single manufacturer – a monopoly – dominated the industry since (as shown in Table 5) a monopoly would have even lower per-unit costs than the large, oligopolistic-size firm chosen by the Agency: \$0.44 (for the 600 cc engine) and \$0.17 (for the 1200 cc engine). This absurd result illustrates another severe limitation of EPA’s engineering cost estimates: they totally ignore how the proposed emission standards may lessen competition and contribute to monopoly power. Consumers face higher prices and reduced choice in markets needlessly infected with monopoly power.

EPA’s treatment of “Compliance Costs” in the RSD provides another example of its engineering cost estimates being used to reach an absurd conclusion. The Agency claims that the “actual” compliance costs may turn out to be “much lower than those estimated here” “because California standards are scheduled to be implemented 2 years earlier.” Yet, the RSD shows the per-unit certification costs to be a miniscule \$0.26 for the 600cc engine and an even more miniscule \$0.10 for the 1200cc engine. Such trivial sums – that even when added together amount to less than a first-class postage stamp – make it literally impossible for the actual costs to be “much lower,” with or without the benefit of California experience. After all, the per-unit cost cannot fall below \$0.00, and \$0.00 is only ten cents less than \$0.10 (and only 26 cents less than \$0.26). Apparently, the EPA wordsmiths who coined (no pun intended) the phrase “much lower” failed to notice that the Agency’s \$25,000 certification cost estimate (per engine line) – when divided by five years’ worth of annual production by an oligopolistic firm – yields only a dime or a quarter plus a penny. The EPA authors also failed to notice that the same \$25,000 certification cost per engine line can yield per-unit costs in the hundreds of dollars if applied instead to a very small manufacturer. (Since even small manufacturers will have to certify engines under Tier 1 standards, this observation is of more than academic interest.)

In brief, the EPA’s low per-unit costs result almost entirely from its arbitrary decision to apply its engineering cost estimates to a large motorcycle manufacturer – a manufacturer that can spread those costs over tens of thousands of units. Those same engineering cost estimates imply substantial per unit costs when applied to small manufacturers who can spread those costs over only a small number of units per year. Hence, the Agency’s engineering cost estimates strongly indicate that very small manufacturers will be forced from the marketplace absent a permanent exclusion from Tier 2 standards. The engineering cost estimates also suggest that manufacturers at the margin of being subject to Tier 2 standards will have difficulty surviving in the marketplace against larger competitors. Finally, and perhaps even more importantly, the EPA’s engineering cost estimates for manufacturers totally ignore how the proposed emission standards would

affect the cost structures of the franchised dealers, independent shops and aftermarket suppliers that number in the tens of thousands. The EPA failed its responsibilities under SBREFA by ignoring those small firms completely.

B. EPA's Exclusive Focus on Large Manufacturers Ignores the Important Role that Smaller Firms Play in Making Sure Motorcycles Meet Customer Preferences

Had the EPA paid adequate attention to franchised dealers, independent shops and aftermarket suppliers, the Agency would have better appreciated the important roles they play in assuring that the final products meet the specific – highly personalized – needs of motorcycle riders. The EPA did note that, “Adequate performance is clearly an important attribute for highway motorcycles,”¹⁴ and that “many motorcycle owners personalize their motorcycles in a variety of ways. This is one of the aspects of motorcycle ownership that is appealing to a large number of motorcycle owners, and they take their freedom to customize their bikes very seriously.”¹⁵ In effect, motorcycle manufacturers deliver products that many purchasers consider not-yet-finished. These consumers look to dealers, independent shops and aftermarket suppliers to provide the necessary – “personalizing” – changes to the motorcycles they buy from manufacturers.

Unfortunately, however, the EPA views “personalization” with considerable suspicion. In the same paragraph where the EPA observes that “adequate” performance is important to motorcycle owners, the Agency terms buyers of “sport or super-sport motorcycles” as seeking “outrageous performance.”¹⁶ And, the Agency – immediately after noting that many motorcycle owners “take their freedom to customize their bikes very seriously” – notes that “there are some forms of customization that are not legal under the provisions of the Clean Air Act.”¹⁷

However, the EPA fails to mention that its proposed Tier 2 standards would criminalize much of what owners now do to personalize their motorcycles. For instance, many owners want to change the pipes and mufflers on the motorcycles they purchase from manufacturers. Yet, the EPA anticipates that to meet Tier 2 standards, many manufacturers will choose to “build a full catalyst/muffler combination.”¹⁸ Any purchaser of a motorcycle with such a catalyst/muffler combination could not – legally –

¹⁴ EPA, *Draft Regulatory Support Document: Control of Emissions from Spark-Ignition Marine Vessels and Highway Motorcycles*, EPA420-D-02-003, July 2002, p. 2-5.

¹⁵ EPA, *Draft Regulatory Support Document: Control of Emissions from Spark-Ignition Marine Vessels and Highway Motorcycles*, EPA420-D-02-003, July 2002, p. 2-6.

¹⁶ EPA, *Draft Regulatory Support Document: Control of Emissions from Spark-Ignition Marine Vessels and Highway Motorcycles*, EPA420-D-02-003, July 2002, p. 2.5.

¹⁷ EPA, *Draft Regulatory Support Document: Control of Emissions from Spark-Ignition Marine Vessels and Highway Motorcycles*, EPA420-D-02-003, July 2002, p. 2-6.

¹⁸ EPA, *Draft Regulatory Support Document: Control of Emissions from Spark-Ignition Marine Vessels and Highway Motorcycles*, EPA420-D-02-003, July 2002, p. 3-7. The RSD states: “If there is no available space [on a preexisting motorcycle design] to add a separate catalyst, it is possible to build a full catalyst/muffler combination that fits in the same space as the conventional muffler. With this packaging option, even compact applications should have little or no trouble integrating a catalyst into the equipment design. The hundreds of catalysts already operating on highway motorcycles clearly demonstrate this.”

personalize that machine. That potential buyer would have to select from the following uncomfortable options: buy a less-than-fully-satisfactory motorcycle; buy the motorcycle and then violate the law; or, spend the same amount of money on other pursuits. The EPA recognizes that “as with other recreational vehicles, highway motorcycles are generally discretionary purchases. Significant cost increases could therefore result in decreased sales of these motorcycles if the increased costs cause consumers to take their discretionary income elsewhere and into other recreational opportunities.”¹⁹ By adding to the cost of a motorcycle (for the pollution-control equipment), and simultaneously reducing the appeal of the motorcycle to the potential buyer, the emissions standards can easily pose the functional equivalent of a significant price increase.

The EPA appears to assume that if a single example of a particular technology can be found on any motorcycle now plying the nation’s highways, then that technology has been shown “feasible” for *every* motorcycle of any kind in any price range. Under that mind-set, the technology underpinning every desirable feature found in the relatively few top-of-the-line Mercedes-Benz sedans now operating on U.S. highways would be “clearly shown” to be feasible also for the far more numerous small Fords, Dodges and Chevrolets.

The engineers and lawyers employed by EPA fail to grasp that the technologically feasible may not be *economically feasible*. An example of this mind-set is the following statement drawn from EPA’s RSD: “The combinations of low-emission technologies ultimately chosen by motorcycle manufacturers are dependent on the engine-out emission levels of the vehicle, the effectiveness of the prior emission control system, and individual *manufacturer preferences*.”²⁰ The possibility that motorcycle manufacturers may be guided in their “preferences” by an economic need to cater to consumer (rider)

Table 6. Frequency in Two Basic Regulatory Proposal Documents of Phrases Related to the Preferences of Motorcycle Manufacturers and Consumers

Phrase	RSD	<i>Federal Register</i>	Total
“manufacturer preference(s)”	3 ^a	1 ^b	4
“consumer preference(s)”	0	0	0
“rider preference(s)”	0	0	0

^aPhrase appears at pp. 4-6, 4-14 and 5-7. ^bPhrase appears at p. 53086.

preferences never occurs to the Agency. Indeed, as shown in Table 6, the phrase “manufacturer preferences” appears a total of four times in the RSD and the notice of proposed rulemaking (published in the 14 August 2002 *Federal Register*) but the phrases “consumer preferences” and “rider preferences” *never appear* in either document (nor in

¹⁹ EPA, *Draft Regulatory Support Document: Control of Emissions from Spark-Ignition Marine Vessels and Highway Motorcycles*, EPA420-D-02-003, July 2002, p. 2-5.

²⁰ EPA, *Draft Regulatory Support Document: Control of Emissions from Spark-Ignition Marine Vessels and Highway Motorcycles*, EPA420-D-02-003, July 2002, p. 5-7. Emphasis added.

the Small Business Advocacy Final Report). The Agency does not, apparently, consider consumer preferences²¹ important enough to merit any discussion.

The EPA's cavalier attitude toward consumer needs and preferences is also evident in the minimal consideration that the Agency gives to the potential impacts its proposed emissions standards may have upon safety. EPA's RSD notes that, "the Clean Air Act directs us to consider potential impacts on noise, energy, and safety when establishing the feasibility of emission standards for nonroad engines."²² After noting its duties under the Clean Air Act, the EPA's RSD then devotes all of two paragraphs to discussing the impact its proposed emission standards may have on rider safety, concluding with that while "protecting the rider from excessive heat [in exhaust pipes and catalytic converters] is a concern for both riders and manufacturers," the "issues are not insurmountable on a variety of motorcycle styles and engine sizes."²³

Observing that safety issues are "not insurmountable" offers little assurance either that those issues will in fact be surmounted or – if not – that the EPA will help accomplish any of the surmounting. On the contrary, the EPA's analysis shows remarkably little evidence that the Agency has made any serious effort to meet its obligation under the Clean Air Act to consider "potential impacts on safety." Table 7 shows the number of times various words or phrases related to safety appear in three basic EPA documents about the emissions proposal. While the word "safety" appears 61 times in the three

²¹ EPA's notice of proposed rulemaking in the 14 August 2002 uses the term "consumer choice" two times in referencing the "consumer choice labeling program." Under this program, "manufacturers would label their engines or vehicles based on their certified emission level." The EPA believes "consumer-choice labeling would give people the opportunity to consider varying emission levels as a factor in choosing specific models. This may also give the manufacturer an incentive to produce more of their cleaner models." However, the EPA is also concerned that "a difficulty in designing a labeling program is in creating a scheme that communicates information clearly and simply to consumers." See: U.S. Environmental Protection Agency, "Notice of Proposed Rulemaking," *Federal Register*, Vol. 67, No. 157, 14 August 2002, p. 53063. In this discussion, the EPA appears to assume that buyers of motorcycles are ignorant of the models' various emission characteristics absent government-sponsored labeling. The EPA also appears to assume that motorcycle buyers will prefer the cleaner models preferred by the Agency. Some anecdotal evidence, however, suggests that many motorcycle buyers outside of California actively avoid models labeled as being compliant with California's standards because of poorer performance and (or) the greater expense involved in personalizing such models. In any case, the EPA's use of the phrase "consumer choice" does not address the issue of emission standards' tendency to restrict consumer choice by outlawing a large segment of currently-available models. In that regard, the EPA's single use of the phrase "consumer choice" in the RSD (at the third page of the RSD's "Overview") mentions that California's "harmonization and emission credit averaging had a first order impact on cost and consumer choice." The meaning of "first order impact" is not entirely clear since that phrase does not specify whether the "impact" is positive or negative. This MRF analysis interprets EPA's use of "first order impact" to mean that the restriction on consumer choice was not as great as would otherwise be expected because of the "harmonization and emission credit averaging." Still, however, consumer choice was restricted under California's program, relative to what would have occurred absent that program.

²² EPA, *Draft Regulatory Support Document: Control of Emissions from Spark-Ignition Marine Vessels and Highway Motorcycles*, EPA420-D-02-003, July 2002, p. 4-13.

²³ EPA, *Draft Regulatory Support Document: Control of Emissions from Spark-Ignition Marine Vessels and Highway Motorcycles*, EPA420-D-02-003, July 2002, p. 4-13.

Table 7. Frequency in Three Basic Regulatory Proposal Documents of Key Words and Phrases Related to Motorcycle Safety

Word or Phrase	<i>Federal Register</i>	Regulatory Support Document	Report of Small Business Review Panel	Total
“safety”	23	26	12	61
“rider safety”	0	0	0	0
“motorcycle safety”	0	0	0	0
“accident”	0	0	0	0
“injury” (to humans from motorcycle accidents)	0	0	0	0
“injury” (to plants from ozone pollution)	0	2	0	2
“burn” (riders from hot motorcycle exhaust pipes or catalytic converters)	0	0	0	0
“burn” (fuel in engine)	1	0	0	1
“fatality” or “fatalities” (to motorcycle riders from accidents)	0	0	0	0

documents, many of those references occur in sentences such as “the Clean Air Act requires us to consider safety.” However, phrases such as “rider safety” and “motorcycle safety” *never* appear in any of the three documents. Indeed, when words such as “injury” or “burn” appear (rarely), they apply to plants and fuel, not to human beings.

Furthermore, the EPA views safety issues strictly as a matter of technology development, that there is no need to consider rider, passenger or bystander behavior. For instance, the EPA’s RSD notes that the “primary concern” expressed by motorcycle riders was “regarding the close proximity of riders to hot exhaust pipes and the catalytic converter.”²⁴ The RSD then proceeds to dismiss the riders’ concerns by stating, “the current use of catalytic converters on a number of motorcycles (accounting for tens of thousands in the current fleet) already indicates that these issues are not

²⁴ EPA, *Draft Regulatory Support Document: Control of Emissions from Spark-Ignition Marine Vessels and Highway Motorcycles*, EPA420-D-02-003, July 2002, p. 2-6.

insurmountable.”²⁵ “Tens of thousands in the current fleet” of “approximately 4.3 million units,”²⁶ represents somewhere between one-half of one percent to two percent of all motorcycles (depending on whether “tens of thousands” means 20,000 or 90,000). The EPA does not consider the possibility that the vast majority of motorcycle owners have chosen *not* to purchase catalytic converters in large part because of the small minority’s experience with those converters.

Furthermore, the EPA does not mention the potential hazards to children and other innocent bystanders attracted to parked motorcycles – neophytes who may not realize that the new machines (unlike previous models) possess catalytic converters that remain intensely hot for hours after the riders have dismounted. The EPA is very concerned with protecting children against the dangers of air pollution (the *Federal Register* notice of proposed rulemaking uses the word “children” in that context 11 times). However, EPA appears very unconcerned about possibly creating a new risk to children from burns caused by contact with a new, extremely hot motorcycle component (the *Federal Register* mentions “children” in that context zero times).

C. The EPA Gives No Consideration to Competitive Issues.

Consistent with its choice of a large, oligopolistic manufacturer to estimate per-unit engineering costs for a diverse industry teeming with thousands of small firms (most of which do not manufacture entire motorcycles), the EPA’s analysis never discusses the competitive issues raised by its proposed emission standards. As already noted in some detail, the EPA appears oblivious to the fact that its own engineering cost estimates strongly suggest that small manufacturers would be put to a severe competitive disadvantage relative to a small handful of large manufacturers. The Agency’s indifference to competitive issues manifests itself in other ways, as well.

The phrase “at least one manufacturer” has developed a pollution control technology to the EPA’s liking appears five times in the RSD and two times in the *Federal Register* notice of proposed rulemaking. The EPA intends this phrase to buttress the case for technological feasibility of its proposed standards but appears not to realize that “monopoly” belongs to the category of “at least one manufacturer.” The casual reader may tend to interpret “at least one” as suggesting that there could be many more, in the same vein that the sighting of a single rare animal may signify the presence of more specimens still hiding in the foliage. Logically, however, “at least one” can turn out to mean “no more than one.” And, indeed, “more than one manufacturer” or similar phrase *never* appears in either the EPA’s RSD or notice of proposed rulemaking published in the *Federal Register*.

Apparently, therefore, the EPA authors of the proposed emission standards lost little sleep worrying that the standards may bestow monopoly power on a small number of

²⁵ EPA, *Draft Regulatory Support Document: Control of Emissions from Spark-Ignition Marine Vessels and Highway Motorcycles*, EPA420-D-02-003, July 2002, p. 2.7.

²⁶ EPA, *Draft Regulatory Support Document: Control of Emissions from Spark-Ignition Marine Vessels and Highway Motorcycles*, EPA420-D-02-003, July 2002, p. 2-2.

firms that have developed technologies favored by the Agency (if not necessarily by motorcycle riders). Firms with monopoly power are known to restrict output and raise prices to consumers. Fewer motorcycles purchased by consumers would, of course, mean less need for the services of franchised dealers, independent shops and aftermarket suppliers.

IV. Significant Reductions in Ground Level Ozone (O₃) Not Demonstrated

Of the two pollutants targeted by EPA's proposed emission standards on motorcycles – ozone (O₃) and carbon monoxide (CO) – O₃ is the more serious, persistent problem. Motorcycles – like other gasoline-burning vehicles – do not emit O₃ directly. Instead, they emit “ozone precursors” – hydrocarbons (HC) and nitrous oxides (NO_x) – that, in the presence of sunlight and heat, lead to the formation of ground-level ozone.²⁷ Only some – but by no means all – of the ozone precursors actually lead to harmful ozone levels.

The EPA infers that highway motorcycles are a significant contributor to actual ozone formation because they “are operated on public roadways during warmer weather and often in or near urban areas where they contribute to ozone formation.”²⁸ However, the EPA also notes that “in general” motorcycles “are purchased by consumers who already own one or more cars, and the motorcycle is used for recreation on summer evenings or weekends.”²⁹ The most critical times for ozone formation during the summer in urban areas occur during the morning “rush hour” Monday through Friday – *not* during summer evenings or on weekends.³⁰ Hence, even those motorcycles owned and operated near urban areas are unlikely to be used during those times of the work week when ozone-forming emissions are most troublesome.

Furthermore, a large proportion of all motorcycles are owned and operated in areas where ozone formation is not a persistent, serious problem. As of November 4, 2002, the EPA's “Green Book” listed all of the ozone nonattainment areas. The states having not a single area or county on that nonattainment list include:

²⁷ At ground level, ozone is considered a harmful pollutant. High up in the stratosphere, however, ozone blocks harmful solar radiation. The term “ozone hole” refers to the eating away of this highly beneficial upper-level by certain man-made gasses (such as “Freon”).

²⁸ EPA, *Draft Regulatory Support Document: Control of Emissions from Spark-Ignition Marine Vessels and Highway Motorcycles*, EPA420-D-02-003, July 2002, fourth page of “Overview.”

²⁹ EPA, *Draft Regulatory Support Document: Control of Emissions from Spark-Ignition Marine Vessels and Highway Motorcycles*, EPA420-D-02-003, July 2002, p. 2-2.

³⁰ See Vernon Henderson, “Geographies of Smog,” *Regulation*, Vol. 21, No. 3, 1998, pp. 11-13. Professor Henderson states (p. 12): “There is a daily ozone cycle, in which the 1-2 P.M. daily peak ozone reading on a typical day is four to five times the minimum reading at 5 A.M. Ozone persists and builds up over the course of the day, as emissions accumulate from economic activity. Inferred economic activity (commuting, trucking, machines turning on in factories) peaks very sharply at 8 A.M. and then declines slowly over the day until it drops sharply around dinnertime. This 8 A.M. peak followed by fairly strong but diminishing emitting activity through the day, results in an ozone peak at 1-2 P.M., given the nature of ozone persistence and build-up.” Professor Henderson is Eastman Professor Political Economy and Professor of Economics and Urban Studies at Brown University.

Alaska	Michigan	South Carolina
Arkansas	Minnesota	South Dakota
Colorado	Mississippi	Tennessee
Florida	Montana	Utah
Hawaii	Nebraska	Vermont
Idaho	North Carolina	Washington
Iowa	North Dakota	West Virginia
Kansas	Oklahoma	Wyoming
Kentucky		

Furthermore, the following states have only one nonattainment area listed as “marginal”: Alabama, Nevada and New Mexico. With a few exceptions (such as Phoenix and St. Louis), the interior states and cities that do not border on the Gulf Coast, the Pacific Coast (*i.e.*, California) or the Atlantic Coast (Atlanta, Georgia and from Richmond, Virginia north to Maine) are in ozone attainment.

Since so many areas and states of the United States face far less severe air pollution problems than California, there is no obvious reason why California-style standards should be imposed on all 50 states. Few motorcycles are ridden great distances from the states in which they are registered. Hence, few motorcycles registered in say, Kansas or Iowa, are likely to ever be used for any significant length of time (if at all) in California. The EPA does state, with respect to motorcycle evaporative emissions: “California has unique air quality concerns that may prompt the State to pursue and select emissions controls that we may find unnecessary for a national program.”³¹ And, the EPA – in its discussion of the efforts of “the United Nations/Economic Commission for Europe (UN/ECE) to develop a global harmonized world motorcycle test cycle (WMTC)” – also states that “the process [of developing the WMTC] recognizes that nations will have differing emissions standards due to the varying air-pollution concerns.”³² If the U.S. EPA recognizes that the residents of (say) France have legitimate reasons to establish different emission standards than the residents of Hong Kong or New Delhi, why does the EPA not recognize the same principle for the residents of Iowa, Montana and Utah *vis-à-vis* California?

Apparently, the EPA believes that making the motorcycle marketplace more congenial to a relatively few large, oligopolistic motorcycle manufacturers (that offer pollution-control technologies to the Agency’s liking) outweighs any needs and preferences of U.S. citizens who live in states other than California. The EPA states: “Today, highway motorcycles are predominately an international commodity and importing and exporting of product is the norm. Thus, harmonization of emission standards and control

³¹ U.S. Environmental Protection Agency, “Notice of Proposed Rulemaking,” *Federal Register*, Vol. 67, No. 157, 14 August 2002, p. 53081.

³² U.S. Environmental Protection Agency, “Notice of Proposed Rulemaking,” *Federal Register*, Vol. 67, No. 157, 14 August 2002, p. 53076.

requirements is a key need for industry with the added benefit of lower consumer cost.”³³ This language reveals, once again, that the EPA sees only large manufacturers – who import and export on the world stage – as legitimate members of the motorcycle industry. If the EPA also recognized the tens of thousands of U.S. franchised dealers, independent shops and aftermarket suppliers as legitimate members of the industry, it could not write “importing and exporting of product is the norm.” The services provided by these firms are produced and consumed primarily within the United States – with no exporting and importing as “the norm.” Finally, the reader can well imagine the public reaction to a written statement by the Securities and Exchange Commission or the Federal Trade Commission that it was issuing a regulation to meet a “key need of industry” followed by a glib (but not demonstrated) assurance of an “added benefit of lower consumer cost.”

V. Cost-Effectiveness

The RSD concludes that: “the weight of the evidence from the alternative means of providing substantial NO_x + NMHC emission reductions indicates that our proposed program is cost-effective. This is true from the perspective of other mobile source control programs or from the perspective of other stationary source technologies that might be considered.”³⁴ However, this conclusion depends heavily on the Agency’s unrealistically low engineering cost estimates and also upon the Agency’s assumption that the proposed standards will not have even the slightest impact on consumer demand for new motorcycles. Furthermore, the EPA’s analysis presupposes that motorcycle firms will enjoy an ideal marketing environment extending from 1999 through 2030 where sales grow smoothly at 1 percent each year – with or without the proposed emission standard.³⁵ When costs and the marketing environment are treated more realistically, the proposed emission standards stand revealed as both enormously expensive per ton of emissions and potentially environmentally counter-productive.

A. Historical Motorcycle Sales Show Large Cyclical Swings – Not Smooth Upward Growth

The RSD notes that from 1982 through 1999, annual on-highway motorcycle sales have ranged from a high of 605,000 units (in 1982, 1983 and 1984) to a low of 203,000 units in 1995. Unit sales have plunged by as much as 28 percent from one year to the next (from 465,000 units sold in 1987 to 335,000 units sold in 1988). Motorcycle sales did rebound during the 1990s, rising from a low of 203,000 units in 1992 to 387,000 units in 1999. However, the long-term sales trend from 1982 through 1999 (shown in the RSD) was decidedly negative, with the end-year (1999) sales of 387,000 units some 35 percent

³³ EPA, *Draft Regulatory Support Document: Control of Emissions from Spark-Ignition Marine Vessels and Highway Motorcycles*, EPA420-D-02-003, July 2002, second page of “Overview.”

³⁴ EPA, *Draft Regulatory Support Document: Control of Emissions from Spark-Ignition Marine Vessels and Highway Motorcycles*, EPA420-D-02-003, July 2002, p. 7-5.

³⁵ The RSD (at p. 5-15) states: “To estimate future sales for Class 3 motorcycles, we started with 1999 sales of 387,000 units and projected out using a annual growth rate of 1 percent.”

below the first-year (1982) sales of 605,000 units.³⁶ This substantial drop in annual sales occurred against the backdrop of an economy that grew by 80 percent in real (inflation-adjusted) terms. Yet, despite this historical record, the EPA's analysis assumes that from 1999 through 2030 sales of Class 3 on-highway motorcycles will grow smoothly at one percent each and every year.

The EPA also assumes its proposed emission standards will not alter that smooth upward sales growth whatsoever, even though the Agency recognizes that prospective motorcycle owners consider performance "an important attribute" and that "significant cost increases" could "result in decreased sales of these motorcycles" because "as with other recreational vehicles, highway motorcycles are generally discretionary purchases."³⁷ Yet, EPA's proposed emission standards *would* affect both performance and price. Nonetheless, the EPA's sales projections – by presuming unit sales will increase smoothly at 1 percent annually – assumes at the outset that the proposed emission standards will not have even a tiny impact on future unit sales.

B. EPA's Per-Ton Cost Estimates are Based on a Questionable Accounting Methodology

The RSD presents its cost estimates in terms of "discounted per vehicle cost per ton (\$/ton)."³⁸ This approach starts counting costs and emission reductions only *after* a motorcycle enters the fleet. However, considerable time will be needed before the existing motorcycle fleet of about 4.3 million units "turns over," and the older, higher-emission motorcycles are replaced by the newer, lower-emission units. And, by increasing the prices of new motorcycles and possibly harming performance (in the eyes of prospective buyers, even if not in the eyes of EPA's engineering experts), motorcycle enthusiasts may respond by retaining older motorcycles longer (through more intensive repairs and maintenance) and slowing down their purchases of new motorcycles. According to the EPA, some motorcycles remain in the fleet as long as 24 years after the year of purchase.³⁹ Should motorcycle enthusiasts respond to the emission standards by slowing down their replacement of older motorcycles with new units, the delivery of emission benefits will be slower than the EPA expects. Yet, motorcycle manufacturers will still bear all of the costs needed to meet the emission standards: research and development, retooling and so forth.

The EPA also presumes that competition will force manufacturers, distributors and marketers to pass through to final consumers in the form of higher prices no more than the Agency's engineering cost estimates. However, as already noted in subsection III.B., the Agency's cost estimates presume an oligopolistic manufacturing sector. And, as also

³⁶ EPA, *Draft Regulatory Support Document: Control of Emissions from Spark-Ignition Marine Vessels and Highway Motorcycles*, EPA420-D-02-003, July 2002, p. 2-3.

³⁷ EPA, *Draft Regulatory Support Document: Control of Emissions from Spark-Ignition Marine Vessels and Highway Motorcycles*, EPA420-D-02-003, July 2002, p. 2-5.

³⁸ EPA, *Draft Regulatory Support Document: Control of Emissions from Spark-Ignition Marine Vessels and Highway Motorcycles*, EPA420-D-02-003, July 2002, Tables 7.1.3.-1, 7.1.3.-2, and 7.1.3.-3, p. 7-3.

³⁹ EPA, *Draft Regulatory Support Document: Control of Emissions from Spark-Ignition Marine Vessels and Highway Motorcycles*, EPA420-D-02-003, July 2002, Table 6.2.1-5, p. 6-11.

noted earlier, the emission standards could bestow monopoly power to a handful of companies that possess exclusive knowledge of the pollution-control technologies favored by the standards. Hence, the intense competition presumed by the Agency, in estimating price impacts upon consumers, may not materialize – leaving consumers facing higher prices than suggested by the Agency’s engineering cost estimates.

Perhaps equally important, the EPA treats cost from the manufacturer’s point of view, not from the point of view of either the consumer or of society as a whole. For instance, the Agency speaks of “amortizing” capital costs and “retiring” these fixed costs after they have been “recovered.” This is the point of view of a corporation’s tax accountant calculating how much his (or her) employer must pay to the Internal Revenue Service in 2003 (or some other specific year) with the expectation that the employer will still be in business – and paying corporate income taxes – in 2004, 2005 and so on. Hence, for this purpose, accountants *should* amortize capital assets over several years, instead of expensing them in the year that those assets are purchased. Since those assets will help the corporation produce taxable income in later years, the corporation should allocate some of the capital costs to taxable income in those future years.

However, from society’s point of view, capital resources spent in a single year to meet a regulatory requirement are forever foreclosed from meeting other needs. Hence, from society’s perspective, the entire amount of capital expenditure should be expensed in the year that the resources are dedicated to meeting a regulatory requirement; *i.e.*, the expenditure should not be amortized over several years. Furthermore, from consumers’ point of view, costs are never “retired.” Perhaps, a corporation can “recover” costs and then “retire” them, out of revenues received from consumers. But, consumers – with the money they pay manufacturers – do not “recover” or “retire” those sums. When a consumer spends \$20,000 on a new on-highway “cruiser,” that consumer can no longer spend those dollars on a new car, new furniture or a new house. Hence, accounting for cost from the consumer’s point of view excludes any “recovering” and “retiring” of fixed costs.

Finally, looking at cost from either society’s or consumers’ point of view avoids such difficulties as amortizing and “recovering” capital costs over 5 years for Tier 1 standards that will apply for only 4 years (before being replaced by Tier 2 standards) – an exercise seemingly forbidden by conventional arithmetic (since the number 4 is one less than the number 5).⁴⁰ EPA’s cost accounting for Tier 1 also shows a “near term” and “long term” composite incremental costs of \$26 and \$17 respectively.⁴¹ EPA does not explain how a mere four years can accommodate both a “near term” and a “long term.” Nonetheless, in EPA’s world of cost accounting, “long term” costs fall below “near term” costs for two

⁴⁰ Note, for instance, the RSD’s treatment of “fixed costs” in its Table 5.2.2.-1 (p. 5-7) of “Engine Modification Costs” that apply to meeting Tier 1 standards. The “years to recover” row shows 5 years being used. A small manufacturer, exempt from the Tier 2 standards, would have (if it remains in business) more than four years to recover its long term costs. However, the engineering cost estimates shown by the EPA apply to a large firm that *would* be subject to the Tier 2 controls. That large firm would only have four years to sell Tier 1 motorcycles.

⁴¹ EPA, *Draft Regulatory Support Document: Control of Emissions from Spark-Ignition Marine Vessels and Highway Motorcycles*, EPA420-D-02-003, July 2002, Table 5.2.2-9, p. 5-12.

reasons: The “retirement” of capital costs after 5 years and a two-stage “learning curve,” with the first-stage beginning at the fourth year of production and the second stage beginning at the sixth year of production. Since the \$17 “long term” Tier 1 cost shown by EPA is about 35 percent less than the Tier 1 “near term” cost – close to the 37 percent difference between the “near term” and “long term” incremental Tier 2 costs – the Agency apparently applied both stages of its two-stage learning curve to estimate Tier 1 costs. Yet, if it did so, what are EPA’s methods for applying at least six years of a two-stage learning curve to a four-year regulation?⁴²

C. Alternative Cost Estimates

The EPA’s RSD shows estimates for the “discounted per vehicle cost per ton” – the net present value (NPV) of the vehicle (essentially the per unit cost estimate) divided by the discounted sum of the reduced emissions expected over the vehicle’s lifetime. However, the cost per vehicle estimates do not take into account the rate at which the proposed cleaner motorcycles would replace existing, older motorcycles. In effect, the EPA’s approach assumes that the “per vehicle” is put into service immediately. However, the EPA’s scrappage/survival rates indicates that a quarter century will need to elapse before all of the existing motorcycles are replaced by Tier 1 and Tier 2 motorcycles.⁴³ The public will not receive any clean air benefits from a Tier 2 motorcycle until that machine is actually bought and replaces an older, pre-control motorcycle.

Had it chosen to do so, the EPA’s RSD could have used the information at its disposal to instead estimate the cost-per-ton of the proposed emission standards, taking into account the rate at which Tier 1 and Tier 2 motorcycles enter the fleet, replacing the existing pre-control motorcycles. This study performs that analysis, using three alternative cost assumptions. The first set of assumptions uses the EPA’s \$35 “near term” per vehicle Tier 2 engineering cost estimate.⁴⁴ In contrast to the \$35 estimate, the second set of cost

⁴² The EPA has used the same time-warping accounting procedures to estimate Tier 1 costs for its proposed emission standards for other recreational vehicles. See, for instance: EPA, *Draft Regulatory Support Document: Control of Emissions From Nonroad Large Spark Ignition Engines and Recreational Engines (Marine and Land-Based)*, Table 7.1.4.-1, p. 7-8. Here, the EPA shows cost estimates for “Phase 1 near term” and “Phase I long-term” for snowmobiles. The proposed Phase 1 standards for snowmobiles were to begin in 2006 and be replaced in 2010 with Phase 2 standards: a total of four years. Yet, the EPA also used 5-year fixed cost amortization and a (minimum) 6-year learning curve to estimate “Phase 1 long-term” incremental unit costs.

⁴³ Some Tier 1 motorcycles will be sold after 2010, when Tier 2 standards take effect, by manufacturers producing fewer than 3,000 units annually (and, therefore, exempt from Tier 2). However, the firms now accounting for 95 percent of Class 3 motorcycle sales will be subject to Tier 2 standards.

⁴⁴ The EPA produces *four* different “per vehicle” cost estimates, ranging from a low of \$17 (for “Tier 1 – Long-term”) to a high of \$35 (for “Tier 2 – Near-term”).⁴⁴ As discussed earlier, the short four-year duration of the Tier 1 standards makes it difficult to take the EPA’s Tier 1 estimates seriously (even if the underlying engineering costs were not absurdly low). And, EPA’s “long-term” Tier 2 cost estimate is flawed because it excludes “retired” fixed costs.⁴⁴ However, as noted earlier, the supposedly “retired” fixed costs were received by EPA’s hypothetical large, oligopolistic manufacturer from the dollars paid to it by consumers. From consumers’ point of view, those dollars never “retired” and fell to zero (as they do under EPA’s manufacturer-oriented cost accounting) but remain spent for all eternity. Hence, of EPA’s four per-vehicle NPV cost estimates, the Tier 2 “near-term” estimate appears least dubious, since it alone does not depend on cost “retirement” or five-year amortization under a four-year regulatory program.

modifies the EPA's engineering cost estimates to apply to a motorcycle manufacturing industry consisting of more than four or five large firms. In general, the larger the number of firms, the greater the industry costs for research and development, tooling, certification, and so forth. Even if a relatively few manufacturers would be subject to the Tier 2 standards, all motorcycle manufacturers would be subject to the Tier 1 standards. In the 14 August 2002 *Federal Register* (at p. 53097), the EPA states that "the estimated number of respondents is 73." Hence, Table 8 assumes that 73 firms will be subject to Tier 1 standards and face the Tier 1 costs identified by the EPA's RSD.

Furthermore, the industry's costs under the proposed standards will also be affected by the number of engine families offered to consumers. The EPA's engineering cost estimates (for a single large firm) covers but two engine families for Class 3 motorcycles: a 600cc engine and a 1200cc engine. However, according to the EPA, the marketplace in 2002 offered 151 engine families for Class 3 motorcycles⁴⁵ – some 75 times the number of engine families the EPA used to derive its per vehicle NPV cost estimates. Even if the larger manufacturers account for a majority of the 151 engine families, they would surely face greater costs modifying 151 engine families to meet the standards than only two engine families.

In the second set of cost assumptions, summarized in Table 8, the entire industry is assumed to face certifying 151 engine families under Tier 1. The fixed costs for meeting Tier 1 standards are allocated equally to 2004 and 2005 (with half of EPA's engineering cost estimates for electronic fuel injection and pulse air allocated to Tier 1 standards and the other half – for those relatively few firms producing more than 3,000 units a year – allocated to meeting Tier 2 standards). Tier 1 certification costs are allocated to 2005, assuming that the engines will need to be certified prior to sale in 2006, when the standards take effect. Similarly, Tier 2 certification costs are assumed to occur in 2009, the year before the Tier 2 standards apply to motorcycle sales.

While all motorcycle manufacturers will be subject to Tier 1 standards, an estimate of the number of firms subject to Tier 2 standards must take into account the fact that in the United States only "six companies account for about 95 percent of all motorcycles sold."⁴⁶ The EPA projects that by 2006 (when Tier 1 standards will first become effective), approximately 415,000 Class 3 motorcycles will be sold. If the top six companies maintain their 95 percent market share, then approximately seven other firms could supply the remaining five percent and be subject to the EPA's Tier 2 standards – for a total of 13 manufacturers. However, recent entry by new firms suggests that – absent the proposed standards – the top six companies may not be able to maintain their

Hence, this analysis estimates, as one of its "scenarios," the cost per ton that follows from a per-unit cost estimate of \$35, the EPA's Tier 2 "near term composite incremental cost."

⁴⁵ EPA, *Draft Regulatory Support Document: Control of Emissions from Spark-Ignition Marine Vessels and Highway Motorcycles*, EPA420-D-02-003, July 2002, p. 2-4.

⁴⁶ EPA, "Notice of Proposed Rulemaking: Control of Emissions From Spark-Ignition Marine Vessels and Highway Motorcycles," *Federal Register*, Vol. 67, No. 157, August 14, 2002, p. 53074.

combined 95 percent share of market sales. The EPA’s RSD notes the entry of “at least ten new companies into the heavyweight motorcycle market in the last several years.”⁴⁷ In summary, while the selection of the number of firms cannot avoid being arbitrary to

Table 8. EPA Engineering Cost Estimates Modified for a Motorcycle Manufacturing Industry Consisting of More Than a Few Large Firms

Engine Family	Tier 1 Costs		Tier 2 Costs	
	600cc	1200cc	600cc	1200cc
Variable Cost				
Improved Pistons	\$5.25*annual sales	\$8.40*annual sales		
Electronic fuel injection	\$182/2*annual sales	\$198/2*annual sales	\$182/2*annual sales	\$198/2*annual sales
Pulse air	\$12*annual sales	\$12*annual sales	\$18*annual sales	\$18*annual sales
Catalyst			\$57*annual sales	\$61*annual sales
Oxygen sensor			\$27*annual sales	27*annual sales
Fixed Cost				
Engine modification R&D and Tooling	\$82,292*73/2 for each 2004 and 2005	\$87,292*73/2 for each 2004 and 2005		
Electronic fuel injection R&D	\$66,292/2*73/2 for each 2004 and 2005	\$70,292/2*73/2 each for 2004 and 2005	\$66,292/2*13/4 for each 2006, 2007, 2008 and 2009	\$70,292/2*13/4 for each 2006, 2007, 2008, and 2009
Pulse air	\$4,000/2*73/2 for each 2004 and 2005	\$4,000/2*73/2 for each 2004 and 2005	\$5,000/2*13/4 for each 2006, 2007, 2008 and 2009	\$5,000/2*13/4 for each 2006, 2007, 2008, 2009
Catalyst			\$62,750*13/4 for each 2006, 2007, 2008 and 2009	\$62,750*13/4 for each 2006, 2007, 2008 and 2009
Oxygen sensor			\$3,000*13/4 for each 2006, 2007, 2008 and 2009	\$3,000*13/4 for each 2006, 2007, 2008, and 2009
Certification	\$25,000*151 for 2005	\$25,000*151 for 2005	\$25,000*13 for 2009	\$25,000*13 for 2009
\$3,430,908 annual paperwork costs beginning in 2005 (divided between Tiers 1 and 2 according to sales volume, assuming that 5% of post-2009 units subject to Tier 2 exemption)				

⁴⁷ EPA, *Draft Regulatory Support Document: Control of Emissions from Spark-Ignition Marine Vessels and Highway Motorcycles*, EPA420-D-02-003, July 2002, p. 2-5.

some extent, this analysis uses 13 manufacturers as the number at least potentially subject to Tier 2 controls during the 2006 to 2030 period used by the EPA's RSD.⁴⁸

The third set of cost assumptions is based on testimony by the Motorcycle Industry Council (MIC) before the EPA in Ann Arbor, Michigan on September 17, 2002. Mr. Tom Austin of Sierra Research, speaking on behalf of the MIC, stated that "we think a much more realistic estimate [than EPA's] of the cost of compliance with this Tier 2 regulation is going to be in the range of \$226, and we'd really like your final documentation to reflect something in that range."⁴⁹ Hence, this analysis substitutes Mr. Austin's figure of \$226 (and \$113 – half of \$226 – for the four years that Tier 1 models are sold) in place of the EPA's \$35.

Table 9 summarizes the cost estimates that follow from the three alternative sets of cost assumptions and contrasts them (where possible) with the EPA's "per vehicle" cost-per-ton estimates. The EPA provides estimates for two different discount rates: three percent and seven percent. In addition to those two discount rates, this analysis also provides estimates for three assumed annual average mileage rates for Class 3 motorcycles: 2903 (EPA's single mileage assumption), 2,503 and 3,303.

Table 9. Cost Per Ton Estimates (2001 dollars).

Annual Mileage	EPA Discounted Per Vehicle Cost Per Ton	Net Present Value of Cost Per Ton at EPA's \$35 Per Vehicle	Net Present Value of Cost Per Ton Under Table 8 Costs	Net Present Value of Cost Per Ton at MIC's \$226 Per Tier 2 Vehicle
3% Discount Rate				
3,303	Not Estimated	\$729	\$3,546	\$4,247
2,903	\$980	\$878	\$4,275	\$5,119
2,503	Not Estimated	\$1,032	\$5,289	\$6,329
7% Discount Rate				
3,303	Not Estimated	\$865	\$3,813	\$5,126
2,903	\$1,230	\$1,037	\$4,575	\$6,099
2,503	Not Estimated	\$1,187	\$5,626	\$7,413

Not surprisingly, the estimates shown in Table 9 vary dramatically according to the per-motorcycle production cost estimates. Under EPA's view that Tier 2 standards can be met for \$35 per motorcycle, the cost per ton of prevented emissions ranges between \$729 and \$1,187, depending on the average annual mileage and the discount rate. However, under the Motorcycle Industry Council's view that meeting Tier 2 standards will cost

⁴⁸ The number of firms actually subject to Tier 2 standards could be less than 13 in some years, more than 13 in other years and precisely 13 in still other years.

⁴⁹ Public Hearing on Proposed Emission Standards For 2006 and Later Model Year On-Highway Motorcycles, Held on Tuesday, September 17, 2002 at the U.S. Environmental Protection Agency Office of Transportation and Air Quality, 2000 Traverwood Drive, Ann Arbor, Michigan, De Scribe Reporting, Inc., p. 41. Words in brackets are added.

around \$226 per motorcycle, then the cost per ton ranges from \$4,247 to \$7,413. Under the production costs shown in Table 8, cost per ton estimates that range from \$3,546 to \$5,626 – less than the estimates derived from MIC’s \$226 per Tier 2 motorcycle but still about four times greater than EPA’s results.

The EPA claims that the cost-per-ton of the proposed emission standards for on-highway motorcycles is within the range established by previously implemented mobile source programs. However, that claim rests upon a \$35 estimate that – when measured against the \$10,300 average amount spent by consumers on new motorcycles – implies that Tier 2 standards can be met for an average cost increase of but three-tenths of one percent – or about 3.4 pennies per \$10. Such a trivial sum strains credulity. Even the MIC’s \$226 cost estimate for Tier 2 implies a modest increase in percentage terms – although a still substantial sum for the typical young adult considering the purchase of an entry-level motorcycle. However, the per ton estimates shown here – ranging from \$3,500 to \$7,400 a ton – are well above the \$26 - \$2,993 range for previously implemented mobile source programs cited by the EPA.⁵⁰

The estimates shown in Table 9 illustrate, too, that cost-per-ton estimates vary considerably, depending upon the assumptions made about the average annual mileage and the time value of resources (as measured by the discount rate). As the average annual mileage increases, the cost-per-ton estimates fall. This occurs because, each additional mile adds to the grams of emissions presumed to be prevented by the standards – and, hence, places a larger number in the fraction: \$/tons; reducing the size of that fraction. The EPA considered a single annual average mileage: 2,903. Decreasing and increasing that amount by 400 miles (to 2,503 miles and 3,303 miles respectively) changes the cost-per-ton estimate by approximately \$1,000 (*vis-à-vis* the estimate for 2,903 miles) under the second and third sets of cost assumptions.

Increasing the discount rate increases the cost-per-ton estimates because the environmental benefits – prevented emissions – lag behind costs; *i.e.*, costs begin as early as 2004 but the delivery of benefits does not begin until 2006, and then only as the fleet “turns over.” A higher discount rate diminishes the net present value (NPV) of benefits expected to occur several years in the future.

VI. The EPA Failed to Seriously Consider the Proposed Standards’ Likely Impacts on Motorcycle Sales and on the Livelihoods of Small Entrepreneurs

Although the EPA is well aware that motorcycle owners consider “adequate performance an important attribute for highway motorcycles,”⁵¹ the Agency failed to consider seriously how its proposed emission standards may affect motorcycle sales and, hence, may affect the thousands of small business people who earn their livelihoods by meeting the needs of motorcycle owners.

⁵⁰ EPA, *Draft Regulatory Support Document: Control of Emissions from Spark-Ignition Marine Vessels and Highway Motorcycles*, EPA420-D-02-003, July 2002, Table 7.2-1, p. 7-4.

⁵¹ EPA, *Draft Regulatory Support Document: Control of Emissions from Spark-Ignition Marine Vessels and Highway Motorcycles*, EPA420-D-02-003, July 2002, p. 2-5.

A. The EPA Merely Assumes No Impacts on Motorcycle Sales and Service

The EPA’s RSD essentially ignores possible impacts on motorcycle sales by *assuming* annual U.S. motorcycle sales will increase one percent a year from 1999 through 2030, with or without the proposed standards in place. As already mentioned, however, historical data indicate national motorcycle sales are subject to wide cyclical swings. Indeed, the underlying major trend in U.S. motorcycle sales has been down, not up, since the early 1980s. However, the EPA has not made any attempt to uncover the reasons for the ups-and-downs of U.S. motorcycle sales nor how its proposed standards may interact with those reasons.

Even though the EPA states several times its objective of extending – and “harmonizing” – California’s proposed emission standards to all 49 states (regardless of other states’ air regulatory needs), the Agency fails to mention that motorcycle registrations in California have fallen during the latter half of the 1990s, in stark contrast to the robust upward

Table 10. Motorcycle Registrations in the U.S. and Selected States: 1996 and 2001

Year	California	Other 49 States	Five Largest Helmet-Law States (excluding CA) ^a	Six Largest Helmet-Law States (including CA)	Six Largest No Helmet-Law States ^b
1996	512,835	3,318,735	600,858	1,113,693	1,084,478
2001	473,258	4,388,900	730,148	1,203,406	1,395,156
% Change	-7.7%	+32.2%	+21.5%	+8.1%	+37.2%

Source: U.S. Federal Highway Administration, *Highway Statistics 1996* (September 1997) and *Highway Statistics 2001* (November 2002), Tables MV-1. ^aFive other helmet-law states are: New York, Pennsylvania, Michigan, Georgia and North Carolina. ^bSix no helmet-law states are: Texas, Minnesota, Wisconsin, Illinois, Ohio and Florida

growth in the United States as a whole (which the EPA *does* mention). The EPA has not considered how California’s regulatory climate may have affected motorcycle ownership in that state or how extending that climate to all 50 states may impact motorcycle ownership for the country as a whole.

As already mentioned, John Paliwoda – director of the California Motorcycle Dealers Association – testified before the EPA on 17 September 2002 upon the impact on sales of off-road motorcycles after California’s regulation on those vehicles took effect in 1997. Table 10 shows how state motorcycle registrations have changed since 1996 – the year before California’s regulation took effect – and 2001 (latest data available from the Federal Highway Administration). During the five years between 1996 and 2001, motorcycle registrations *fell* 7.7% in California while they increased by 32.2% – nearly a third – in the rest of the United States.

California’s motorcycle helmet law (enacted prior to 1996) may have continued to help depress registrations in that state. However, comparing California with the five largest

helmet-law states (in terms of number of retail outlets) indicates that such laws – by themselves – may depress a state’s growth in motorcycle registrations relative to the United States as a whole but not drive the change all the way into negative territory. (Note that the six largest no helmet-law states had a greater percentage increase in motorcycle registrations than all 49 states other than California. In contrast, the five helmet-law states excluding California had a smaller percentage increase in motorcycle registrations than all 49 states other than California.)

The data in Table 10 indicate that government regulations *can and do* impact motorcycle sales. A tighter regulatory environment reduces motorcycle sales and registrations. Yet, EPA structured its RSD so that no serious attempt to measure such impacts could even be attempted. And, since the RSD ignores any possible impacts on motorcycle sales, that analysis also implies little or no harm to the thousands of small businesses that depend upon the patronage of motorcycle owners for their economic viability.

C. EPA Failed to Fulfill Its Responsibilities Under Executive Order 12866

Under Executive Order 12866, issued by President Clinton, federal agencies that propose health, safety and environmental regulations should “consider alternative levels of stringency to better understand the relationship between stringency and the size and distribution of benefits and costs among different groups.”⁵² Since the proposed Tier 2 standards force most manufacturers to install a catalytic converter while Tier 1 standards do not, the EPA should have at least considered permanent imposition of Tier 1 as a less stringent alternative of the sort required under E.O. 12866. As pointed out by Tom Austin of Sierra Research, appearing before the EPA on 17 September 2002 on behalf of the Motorcycle Industry Council: “Because the Tier 2 standards will require the widespread use of catalysts, much of the theoretical benefit is going to be lost in customer service due to the popularity of aftermarket exhaust systems,” and “motorcycles with catalyst systems are likely to have higher emissions with the catalyst removed than motorcycles designed to meet a slightly less stringent standard without catalyst.”⁵³

The EPA’s analysis, however, never gives any serious consideration to the sort of potential consequences, mentioned by Mr. Austin, of selecting the Tier 2 standard over a “slightly less stringent” standard. By assuming – but not demonstrating – that the proposed standards will have no impact on motorcycle sales, the EPA implies that there is no need for it to consider how a somewhat less stringent standard may better serve the public interest. After all, with no reduction in sales and no problems to safety (and other rider concerns) that it judges “not insurmountable,” the proposed standards appear to impose no serious hardships whatsoever. Under such benign conditions, there would be little point to considering a less stringent standard.

⁵² U.S. Office of Management and Budget, “Economic Analysis of Federal Regulations Under Executive Order 12866,” January 11, 1996, p. 8 (of 34).

⁵³ Public Hearing on Proposed Emission Standards For 2006 and Later Model Year On-Highway Motorcycles, Held on Tuesday, September 17, 2002 at the U.S. Environmental Protection Agency Office of Transportation and Air Quality, 2000 Traverwood Drive, Ann Arbor, Michigan, De Scribe Reporting, Inc., pp. 35, 38-39.

Besides the possible negation of any environmental benefit from Tier 2 mentioned by Mr. Austin, Tier 2 standards pose other potential problems that the EPA failed to consider. Since small manufacturers will be exempt from Tier 2 (at least until political pressures build up from environmental groups, and competing large manufacturers, to close this “loophole”), some Tier 1 motorcycles will continue to be sold after 2010. These relatively few units may command a premium in the marketplace, relative to Tier 2-compliant motorcycles, because Tier 1 models may offer superior performance and be more readily “personalized” (without running the risk of being subject to draconian penalties of \$10,000 per day for “tampering” with pollution-control devices). Relatively affluent consumers, of course, will have the best financial access to the relatively few legal post-2010 Tier 1 motorcycles. Less affluent consumers will have to choose among these unpleasant options: (1) accept performance and safety they (if not the EPA) consider less than satisfactory; (2) “tamper” with the motorcycles to obtain acceptable performance and safety (while running the risk of heavy fines and other legal penalties); or (3) spend those same discretionary dollars on something other than motorcycles.

After all, a prospective motorcycle buyer who decides to spend his or her discretionary dollars on something else, because of government regulations, is at least partially compensated by the enjoyment provided by that “something else.” However, those same regulations threaten the very livelihoods of the tens of thousands of small business people now serving the needs of motorcycle owners. If – when Tier 2 standards take effect in 2010 – motorcycle sales in all 50 states begin to fall at a rate of 7 percent a year (as they have in California since 1996), only 94,056 Class 3 motorcycles would be sold in 2030 compared to the EPA’s rosy projection of 526,834. The last two decades have demonstrated that annual sales can fall precipitously, from 605,000 units in 1984 down to 203,000 units in 1992 – a decline of more than 66 percent in only eight years. Motorcycle buyers have – and will – take their business elsewhere when price or performance (or both) turns against them. Obviously, therefore, emission standards that prevent a large number of prospective motorcycle buyers from receiving the performance they require would have an enormous impact on the “brick and mortar” investments made by the tens of thousands of small motorcycle companies not considered by the EPA.

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