SCHEDULED FOR ORAL ARGUMENT ON FEBRUARY 16, 2007

No. 05-1188
Consolidated with Case Nos. 05-1265, 05-1294, 05-1309, 05-1391

IN THE UNITED STATES COURT OF APPEALS
FOR THE DISTRICT OF COLUMBIA CIRCUIT

PUBLIC CITIZEN, INC.,
THE GOODYEAR TIRE & RUBBER COMPANY,
BRIDGESTONE/FIRESTONE NORTH AMERICAN TIRE, LLC,
COOPER TIRE & RUBBER COMPANY,
PIRELLI TIRE LLC, AND TIRE INDUSTRY ASSOCIATION,

Petitioners,

v.

MARY E. PETERS, SECRETARY OF TRANSPORTATION, *et al*.

Respondents.

On Petitions For Review Of Orders Of The
National Highway Traffic Safety Administration

FINAL BRIEF OF PETITIONERS

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CERTIFICATE OF COUNSEL
AS TO PARTIES, RULINGS, AND RELATED CASES

Pursuant to Local Rule 28(a)(1), the Petitioners submit this Certificate Of Counsel As To Parties, Rulings, And Related Cases.

I. PARTIES AND AMICI IN THIS APPEAL

At the present time there are no amici, and the only parties to this appeal are as follows:

Public Citizen, Inc., Petitioner

The Goodyear Tire & Rubber Company, Petitioner

Bridgestone/Firestone North American Tire, LLC, Petitioner

Cooper Tire & Rubber Company, Petitioner

Pirelli Tire LLC, Petitioner

Tire Industry Association, Petitioner

Mary E. Peters, Secretary of Transportation, Respondent

Nicole Nason, Administrator, National Highway Traffic Safety Administration ("NHTSA"), Respondent

U.S. Department of Transportation, Respondent

National Highway Traffic Safety Administration, Respondent

Alliance of Automobile Manufacturers, Inc., Intervenor-Respondent

II. RULINGS UNDER REVIEW

There were three related NHTSA decisions in the proceedings below: Federal Motor Vehicle Safety Standards; Tire Pressure Monitoring Systems; Controls and Displays, 70 Fed. Reg. 18136 (April 8, 2005); Federal Motor Vehicle Safety Standards, 70 Fed. Reg. 28888 (May 19, 2005); and Federal Motor Vehicle Safety Standards; Tire Pressure Monitoring Systems, 70 Fed. Reg. 53079 (September 7, 2005).

III. RELATED CASES

There are no related cases pending. Previously, NHTSA adopted a rule governing tire pressure monitoring systems; that rule was reviewed and invalidated by the U.S. Court of Appeals for the Second Circuit in *Public Citizen, Inc. v. Mineta*, 340 F.3d 39 (2d Cir. 2003). The Second Circuit remanded the matter to the agency for further proceedings. The NHTSA rulemaking then went into a second phase and generated the decisions now before this Court.

CORPORATE DISCLOSURE STATEMENTS

Pursuant to Rule 26.1 of the Federal Rules of Appellate Procedure and Local Rule 26.1, the counsel to Petitioner Public Citizen, Inc. ("Public Citizen") represents that this organization is a non-profit corporation that has no parents, subsidiaries, or affiliates that have issued shares or debt securities to the public.

Pursuant to Rule 26.1 of the Federal Rules of Appellate Procedure and Local Rule 26.1, the undersigned counsel represents that The Goodyear Tire & Rubber Company ("Goodyear") is a publicly held corporation traded on the New York Stock Exchange. Goodyear has no parent corporation. No publicly held corporation owns 10 percent or more of Goodyear's common stock; however, Brandes Investment Partners, Inc. owns 10 percent or more of Goodyear's stock.

Pursuant to Rule 26.1 of the Federal Rules of Appellate Procedure and Local Rule 26.1, the undersigned counsel represents that Bridgestone/Firestone North American Tire, LLC ("Bridgestone/Firestone") is a Delaware limited liability company. It is a wholly owned subsidiary of Bridgestone Americas Holding, Inc., a Nevada corporation, which is not traded in the U.S.; Bridgestone Americas Holding, Inc. is a subsidiary of Bridgestone Corporation, which is publicly traded in Japan.

Pursuant to Rule 26.1 of the Federal Rules of Appellate Procedure and Local Rule 26.1, the undersigned counsel represents that Cooper Tire & Rubber

Company (“Cooper”) is a publicly held corporation. Cooper may have one shareholder that is publicly traded and that owns 10 percent or more of Cooper’s stock. This shareholder is AXA, and/or its affiliates, such as the AXA Group, AXA Financial, Inc. and/or AXA Equitable Life Insurance Company.

Pursuant to Rule 26.1 of the Federal Rules of Appellate Procedure and Local Rule 26.1, the undersigned counsel represents that Pirelli Tire LLC (“Pirelli”) is a Delaware limited liability company. It is not publicly traded. Its direct parent is Pirelli North America, Inc. (“PNA”). PNA’s series A shares are owned by Pirelli Tyre Holding N.V., based in Holland, which is itself 100 percent owned by Pirelli & C. S.p.A., an entity that is publicly traded on the Milan Stock Exchange.

Pursuant to Rule 26.1 of the Federal Rules of Appellate Procedure and Local Rule 26.1, counsel to the Tire Industry Association (“TIA”) represents that TIA is a non-profit organization with approximately 5,000 members. The TIA is not publicly traded, and it has no corporate parent or shareholders.

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TABLE OF CONTENTS

Page

TABLE OF AUTHORITIES

Page

FEDERAL CASES

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* Authorities upon which we chiefly rely are marked with asterisks.

CONSTITUTIONAL PROVISIONS

FEDERAL STATUTES

FEDERAL REGULATIONS

LEGISLATIVE MATERIALS

MISCELLANEOUS

GLOSSARY

Dynamometer	A laboratory device used to test tire endurance.
ETRTO	European Tyre and Rim Technical Organization
FARS	Fatality Analysis Reporting System, a NHTSA database for tracking motor vehicle related fatalities, described more fully at http://www-nrd.nhtsa.dot.gov/departments/nrd-01/summaries/FARS_98.html.
FMVSS	Federal Motor Vehicle Safety Standard, adopted by NHTSA pursuant to the Safety Act. The standards are set forth in title 49 of the Code of Federal Regulations. For example, FMVSS 138 is codified as 49 C.F.R. § 571.138.
FRIA	A Final Regulatory Impact Analysis, such as Tire Pressure Monitoring System, FMVSS No. 138 (March 2005), available at: http://www.nhtsa.dot.gov/cars/rules/rulings/TPMS-FMVSS-No138-2005/index.html.
GAWR	Gross Axle Weight Rating, a measure of load bearing capacity of the tires on a particular axle.
LT Tires	Tires designed for use on light trucks.
MAP	Minimum Activation Pressure, a fixed pressure level; one of two triggering pressures for a dashboard warning under NHTSA's TPMS standards.
NHTSA	National Highway Traffic Safety Administration, an agency within the U.S. Department of Transportation.
Placard Pressure	Manufacturer's suggested tire inflation pressure; typically specified in the owner's manual and posted in the door or glove compartment; this level is established by the vehicle manufacturer based on safety, driver comfort and other factors.
P-metric Tire	Tires designed for passenger vehicles.

PSI	Pounds Per Square Inch, a measure of pressure. The metric equivalent is kilopascal ("kPa"). To convert from metric to SAE, multiply kPa by 6.895.
R^2 (R-Squared)	A statistical measure of how close the data point on a figure or plot fits the type of trend line that is drawn through those points, *i.e.*, how good the line fits the data or the "goodness-of-fit." Microsoft Excel has an automatic function that plots various trend lines – straight-line, an exponential line, a polynomial, etc. Trend lines are used to graphically display trends in data. When fitting a trend line to data, the Excel program can calculate the R^2. The R^2 measures how much variation there is between data and the line that represents the equation to which the data is being applied.
Random censoring	When the observations used for statistical purposes are terminated for reasons beyond the control of the investigator.
Recall	A recall occurs when a manufacturer attempts to retrieve and remove from service a vehicle or vehicle equipment. This may occur because either: (1) the manufacturer has determined that a safety defect or noncompliance exists; or (2) a condition exists that may increase warranty claims, impair customer relations or otherwise warrant removing a vehicle or component from service.
Replacement Tires	Tires other than the original equipment included with the vehicle when first sold.
Reserve Pressure	The difference in the pressure in a tire at a given time above the minimum pressure required to carry the maximum load of the vehicle and its contents safely (*i.e.*, the reserve above the minimum pressure from the Tire & Rim Association Yearbook and similar tire standards organizations (T&RA Standard or T&RA tire pressure design standard)).
RMA	Rubber Manufacturers Association.

Safety Act	National Traffic and Motor Vehicle Safety Act of 1966, Pub. L. No. 89-563, 80 Stat. 718 (codified as 15 U.S.C. § 1381 *et seq.* (1966), repealed and reenacted, without relevant changes, as the National Highway Traffic and Safety Administration Authorization Act of 1991, and recodified as amended at 49 U.S.C. § 30101 *et seq.* (1994)).
T&RA	Tire and Rim Association, private standards setting organization that, among other things, provides tables listing the minimum tire pressure required to carry various maximum vehicle loads for different types and sizes of tires.
Tire Failure	This includes: belt-to-belt separation, belt edge separation, sudden loss of inflation pressure, separation of tread, sidewall, ply cord, inner liner, or bead, chunking, broken cords, cracking, and open splices.
TIA	Tire Industry Association, a Petitioner here.
Tire Pressure Reserve	The amount by which the placard pressure exceeds the T&RA safety standard for a particular tire.
TPMS	Tire Pressure Monitoring System, a system designed to warn the driver when one or more tires are under-inflated.
TREAD Act	Transportation Recall Enhancement, Accountability, and Documentation Act, Pub. L. No. 106-414, 114 Stat. 1800 (2000) (codified at 49 U.S.C. § 30101 *et seq*. (2003)).

JURISDICTIONAL STATEMENT

A. Subject Matter Jurisdiction Over The Three Challenged NHTSA Decisions

This action arises from regulations implementing recent amendments to the National Highway Traffic and Safety Administration Authorization Act of 1991, and recodified as amended at 49 U.S.C. § 30101 *et seq*. (1994) ("Safety Act"). In November 2000, Congress enacted the Transportation Recall Enhancement, Accountability, and Documentation Act. *See* Pub. L. No. 106-414, 114 Stat. 1800 (2000) ("TREAD Act"). Section 13 of the TREAD Act directed NHTSA to promulgate regulations within one year of enactment to require a warning system in new motor vehicles to indicate to the operator when a tire is significantly under-inflated.

NHTSA commenced the required rulemaking in 2001, but its initial rule was reversed. *Public Citizen v. Mineta*, 340 F.3d 39 (2d Cir. 2003). On remand, it conducted the rulemaking from which these petitions derive. In both the initial rulemaking, and in the proceedings on review here, RMA proposed that NHTSA set an activation pressure for the monitoring devices that would always ensure that drivers learned when the tire pressure dropped below standards adopted by the tire industry. RMA proposed, alternatively, that NHTSA require a reserve pressure requirement in a separate rulemaking. NHTSA issued the final rule adopting TPMS standards on April 8, 2005. 70 Fed. Reg. 18136 (NHTSA Final Rule – TPMS) [JA1105]. In this decision, the agency rejected RMA's request for the imposition of a tire reserve pressure requirement, but indicated that the

explanation for this action would be provided separately. Then, on May 19, 2005, NHTSA issued a final decision declining RMA's request to engage in a new rulemaking to adopt a tire reserve pressure requirement. 70 Fed. Reg. 28888 (NHTSA Denial of Petition for Rulemaking) [JA1510]. In May 2005, a number of parties moved for reconsideration of the April 8, 2005 order; these motions were granted in part and denied in part on September 7, 2005. 70 Fed. Reg. 53079 [JA1535]. In its reconsideration decision in the TPMS rulemaking, the agency again addressed the tire reserve pressure issue, providing additional explanation. *Id*. at 53088-53089 [JA1544-45]. This Court has jurisdiction pursuant to the Safety Act, which provides for direct review of NHTSA orders prescribing safety standards. *See* 49 U.S.C. § 30161(a).

In addition, the Court has jurisdiction over NHTSA's May 19, 2005 decision under the *TRAC* doctrine and the All Writs Act.[1] Moreover, to the extent that the Court lacks direct jurisdiction to review the agency's May 19, 2005 decision, it can and should exercise pendent appellate jurisdiction. The Court exercises pendent jurisdiction "sparingly," but will do so "when substantial considerations of fairness or efficiency demand it." *Kilburn v. Islamic Republic of Iran*, 376 F.3d 1123, 1133-34 (D.C. Cir. 2004). These criteria are clearly met in this case.

[1] *See Int'l Union, United Mine Workers of Am. v. United States Dep't of Labor*, 358 F.3d 40, 43 (D.C. Cir. 2004) ("UMW"); *Telecommunications Research and Action Cente v. FCC*, 750 F.2d 70 (D.C. Cir. 1984) ("TRAC").

B. The Timeliness Of The Petitions For Review

Under 49 U.S.C. § 30161(a), a party may file a petition for review within 59 days after the order is issued. This period is tolled when a party petitions on a timely basis for reconsideration of the NHTSA order. In this case, all of the Petitioners have filed timely petitions for review. Public Citizen, Goodyear, Bridgestone/Firestone, Cooper, Pirelli and TIA jointly filed the petition for review in Case No. 05-1188 on June 6, 2005. This petition was filed within 59 days of the agency's April 8, 2005 decision. Goodyear, Bridgestone/Firestone, Cooper, Pirelli, and TIA jointly filed the petition for review in Case No. 05-1265 on July 13, 2005. This appeal was filed within 59 days of NHTSA's May 19, 2005 Order. Public Citizen separately filed its petition for review in Case No. 05-1294 on July 27, 2005, within 59 days of its June 16, 2005 withdrawal of its petition for reconsideration of NHTSA's April 8, 2005 Order. Similarly, TIA filed its petition for review in Case No. 05-1309 on August 3, 2005, within 59 days of its July 28, 2005 withdrawal of its petition for reconsideration of NHTSA's April 8, 2005 order. Finally, Public Citizen, Goodyear, Bridgestone/Firestone, Cooper, Pirelli, and TIA jointly filed the petition for review in Case No. 05-1391 on October 4, 2005, within 59 days of NHTSA's order of September 7, 2005.

ISSUES PRESENTED

1. Tire Reserve Pressure. Since the TREAD Act specifically directs NHTSA to adopt a regulation requiring a warning system in new vehicles

that will "indicate to the operator when a tire is significantly under inflated," and since the Safety Act requires NHTSA to adopt motor vehicle safety standards that "meet the need for motor vehicle safety," 49 U.S.C. § 30111(a), was it unlawful or arbitrary and capricious for NHTSA to adopt a safety standard requiring use of a dashboard warning system that fails to warn a driver when one or more tires have insufficient air pressure to support a vehicle when fully loaded with passengers or cargo? This issue has the following sub-parts:

a. Since NHTSA's enabling act and its existing regulations require automobile manufacturers to select tires with load-bearing capabilities and with recommended air pressure levels that allow the four tires together to support the vehicle in a fully loaded condition, 49 U.S.C. § 30123(c); 49 C.F.R. § 571.110, and since NHTSA's regulations give automobile manufacturers broad discretion to select tires with load-bearing capabilities and recommended inflation pressure that exceed the regulatory standard or that meet the bare minimum tire pressure required to carry the maximum load safely, was it unlawful or arbitrary and capricious for NHTSA to allow use of dashboard warning systems that illuminate only when a tire either (i) is under-inflated by a uniform 25 percent, as measured against the recommended inflation pressure established by the automobile manufacturer or (ii) is under-inflated so severely that the inflation pressure falls below a specified minimum level, such as 20 psi, where for many

vehicles, these trigger levels are far below the level required to support the vehicle in a fully loaded condition?

b. Was it unlawful or arbitrary and capricious for NHTSA to establish a dashboard warning system for tire under-inflation that for many fully loaded vehicles, especially light trucks, SUVs, and large vans, will not illuminate and provide warnings to drivers when the tires are under-inflated to the point where they can no longer support the weight of the fully loaded vehicle, as measured by long-established industry standards that were adopted by the T&RA decades ago and that have been incorporated into NHTSA's own regulations?

2. Replacement Tires. Since the TREAD Act expressly requires installation of tire pressure monitoring systems that will alert the operator whenever "a tire is significantly under inflated," and where the evidence of record established that consumers typically purchase replacement tires two to three times over the life of a vehicle, was it unlawful or arbitrary and capricious for NHTSA to adopt a safety standard requiring monitoring systems that excludes replacement tires and applies only to the four tires installed as original equipment?

3. 20 Minute Standard And Test Conditions. Since Congress in the TREAD Act directed NHTSA to adopt a safety standard that would warn consumers whenever a tire is "significantly under inflated," was it unlawful or arbitrary and capricious for NHTSA to adopt a standard that provides for testing of

tire pressure monitoring systems only in a narrow and artificial range of conditions, such as when the vehicle has been driven for a minimum of 20 minutes, when there is no rainfall, when the temperature is above 32º Fahrenheit and below 104º Fahrenheit, when the roads are smooth and well constructed, and when test vehicles are moving at speeds below 63 miles per hour?

STATUTES AND REGULATIONS

The pertinent statutory provisions and regulations are set forth in the statutory appendix.

I. STATEMENT OF THE CASE

A. The Statutory Framework Prior To The TREAD Act

As explained in the *Motor Vehicle Mfrs. Ass'n v. State Farm Ins. Co.*, 463 U.S. 29 (1983), "[t]he development of the automobile gave Americans unprecedented freedom to travel, but exacted a high price for enhanced mobility. Since 1929, motor vehicles have been the leading cause of accidental deaths and injuries in the United States. . . . In 1966, Congress decided that at least part of the answer lies in improving the design and safety features of the vehicle itself." *Id*. at 32-33. Therefore, Congress passed the National Traffic and Motor Vehicle Safety Act of 1966 (the "Safety Act"), to address "the soaring rate of death and debilitation on the Nation's highways." S. Rep. 1301, 89th Cong., 2d Sess., 2 U.S. Code, Cong. and Admin. News, 2709 (1966). The legislative goal was to provide a coordinated national safety program and federal motor vehicle safety standards.

Congress declared that the promotion of vehicle safety through voluntary standards largely failed, and that "the unconditional imposition of mandatory standards" was the only course, but that manufacturers of motor vehicle equipment and "individuals engaged to a significant extent in the promotion or study of motor vehicle safety" should be included in the standard setting process. *Id*. at 2714-15.

Congress understood that advances in vehicle safety would impose some costs on automobile manufacturers. As the Sixth Circuit explained in *Chrysler Corp. v. Department of Transportation*, 472 F.2d 659 (6th Cir. 1972): "[T]he Agency is empowered to issue safety standards which require improvements in existing technology or which require the development of new technology, and it is not limited to issuing standards based solely on devices already fully developed. This is in accord with the Congressional mandate that '*safety shall be the overriding consideration in the issuance of standards*.'" *Id.* at 673 (emphasis added).

Section 202 of the Safety Act, now section 30123 as amended, specifically directs NHTSA to "require a motor vehicle to be equipped with tires that meet maximum load standards when the vehicle is loaded with a reasonable amount of luggage and the total number of passengers the vehicle is designed to carry." 49 U.S.C. § 30123(c). To implement this mandate, NHTSA adopted federal motor vehicle safety standard ("FMVSS") 110 in 1968. This standard sets out specific requirements for tire selection to prevent tire overloading. FMVSS

110 also requires the posting of placards in each vehicle that specify the appropriate tire size and "vehicle manufacturer's recommended cold tire inflation pressure for front, rear and spare tires." 49 C.F.R. § 571.110. As NHTSA acknowledges, these standards are met by utilizing the "standardized tables for tire size, loading, and inflation pressure published by the Tire and Rim Association. . ." 70 Fed. Reg. at 28890 (NHTSA Denial of Petition for Rulemaking) [JA1512].[2] The tire pressure and loading relationships published by T&RA is a list of "the maximum loads that the various tire sizes [can] carry at designated inflation pressures." *Federal Motor Vehicle Safety Standards, New Pneumatic Tires – Passenger Cars*, 45 Fed. Reg. 57466, 57467 (August 28, 1980) (Notice of Proposed Rulemaking). [JA0001-2.]

[2] The tire pressure design standards specified by the T&RA yearbook, or by similar tire standard setting organizations such as the European Tyre and Rim Technical Organization ("ERTO") and the Japan Automobile Tire Manufacturers are developed as load-specific standards. For simplicity, these standards are referred to as "T&RA standards." These standards use empirical formulae so that "all manufacturers can make a product to be interchangeable with the other manufacturers' products." RMA Comments, Attachment pp. 7, 12 (9/06/01) [JA0249, 0254].

Since long before the enactment of the Safety Act in 1966, all tires (world wide) have been designed and manufactured based on these standards. "The industry's inflation standards have been recognized and for many decades have been used as a consensus, scientific guide to avoid [tire] failures." RMA Comments, p. 2 (10/25/01) [JA0372]. These tire industry design standards have been used by NHTSA since 1967 to ensure that a vehicle load can be safely carried by its tires, and explicitly have been incorporated by reference into the federal motor vehicle safety standards regulating tire selection since 1981. *See*, *e.g.*, 70 Fed. Reg. at 18161-62 (FMVSS 109 & 110 referenced in NHTSA's Final TPMS Rule) [JA1131-32]. These tire industry design standards also have been adopted by the Federal Motor Carrier Safety Administration, which regulates commercial vehicles, including 15 passenger vans. 49 C.F.R. § 393.75.

B. The TREAD Act And The TPMS Rulemakings

NHTSA received a number of complaints in the 1990s regarding tread separation in two models of tires installed on Ford Explorers. *NHTSA, Advance Notice of Proposed Rulemaking on Standards Enforcement and Defect Investigation; Defect and Noncompliance Reports; Record Retention*, 66 Fed. Reg. 6532 (January 22, 2001). [JA0006.] NHTSA started an investigation in May 2000, and, ultimately, over 14 million tires were recalled. *Id*. During the investigation, evidence emerged that tires on a substantial percentage of the Ford Explorers were under-inflated. Ford had established a placard inflation level of 26 psi, but there was evidence obtained in one State that these tires were being operated at an average pressure of between 15 and 20 psi. Alliance Comments, p. 4 (03/26/01). [JA0023.]

In September 2000, Congress held hearings to investigate events leading to the tire recall and to consider a possible legislative response. *See* S. Rep. No. 106-423, at 2-3 (2000). Both Houses of Congress held hearings on the matter, concluding, in the words of the House report, "that NHTSA's reaction to these matters was lacking in several respects." H. R. Rep. 106-954 at 7. The TREAD Act was enacted in November 2000. *See* Pub. L. No. 106-414, 114 Stat. 1800 (2000) (codified at 49 U.S.C. § 30101 *et seq*. (2003)).

In section 13 of the TREAD Act, Congress directed NHTSA to promulgate regulations within one year of enactment to require a warning system

in new motor vehicles to indicate to the operator when a tire is significantly under-inflated. P.L. 106-414, 114 Stat. 1806. Its first TPMS regulations were issued in final form on June 5, 2002. 67 Fed. Reg. 38704 (NHTSA Final Rule – TPMS) [JA0419.]

The regulations were then challenged by Public Citizen (among others) and were invalidated by the Second Circuit in August 2003. *Public Citizen*, 340 F.3d 39. The Second Circuit held that the regulations did not correctly implement the TREAD Act because the standards were not stringent enough. Specifically, the court found that NHTSA had improperly interpreted the TREAD Act as allowing a one-tire 30 percent standard. The agency's 2002 standards allowed manufacturers to install an indirect TPMS that would "warn drivers when the tire pressure in one tire fell 30 percent or more below the placard pressure, or to a minimum level of pressure to be specified in the standard, whichever tire pressure was higher." *Id*. at 49. The "adoption of a standard that permits installation of plainly inferior systems" was "arbitrary and capricious," particularly since the agency's own cost-benefit analysis supported a more protective approach. *Id*. at 56. The Second Circuit emphasized that the agency should put a "thumb on the safety side of the scale." *Id*. at 58.

On remand, NHTSA issued a notice of proposed rulemaking on September 16, 2004. 69 Fed. Reg. 55896 (NHTSA Notice of Proposed Rulemaking). [JA0976.] Comments on the NPRM were submitted by a number of

organizations, including Public Citizen, TIA, and the Rubber Manufacturers Association ("RMA"). RMA's members include the four tire manufacturers that are Petitioners here. NHTSA issued the final rule establishing FMVSS 138 on April 8, 2005. 70 Fed. Reg. 18136 (NHTSA Final Rule – TPMS). [JA1105.] After a number of parties petitioned for reconsideration, the agency issued another order on September 7, 2005. 70 Fed. Reg. 53079. [JA1535.]

C. The Tire Reserve Pressure Proceedings

In the proceedings below, RMA requested that NHTSA revise its safety standards to require that the driver be warned if the pressure in any tire dropped below the minimum pressure required to carry the maximum weight of the vehicle and its contents safely, as established by the T&RA standards. The pressure above the T&RA tire pressure level is referred to as the reserve pressure. RMA urged the agency to require a large enough reserve so that as the tire pressure dropped from the placard to 25 percent below placard, the pressure still would be sufficient to support the vehicle in a fully loaded condition. The tire would never be overloaded before the warning light came on. In the alternative, RMA urged the agency to cast aside TPMS standards that require dashboard warnings based upon a uniform 25 percent reduction from the placard pressure and uniform

minimum activation pressures, such as 20 psi for sedans.[3] Essentially, RMA's view was that a dashboard warning should be triggered whenever the inflation pressure is insufficient to support the actual vehicle load (or if actual load is unknown, the maximum allowed load).[4] In 2002, RMA requested this relief both in the TPMS rulemaking and in a petition for a separate rulemaking.

RMA submitted additional evidence and argument in 2003 and 2004. *See, e.g.*, RMA Comments, pp. 2-10 (11/10/04). [JA1024-32.] Among other things, RMA explained that the regulations enforced by NHTSA's sister agency, the Federal Motor Carrier Safety Administration ("FMCSA"), specifically addressed tire pressure requirements for commercial vehicles, including vehicles weighing more than 10,000 pounds and 8 passenger vans for hire. *Id*. pp. 4-5, 9-10, [JA1026-27, 1031-32] *citing inter alia* 49 C.F.R. §§ 390.5, 393.75. Those regulations expressly incorporated NHTSA safety standards for tires, which in turn incorporate the T&RA tables. In particular, FMCSA regulations provide that "no motor vehicle shall be operated on a tire which has a cold inflation pressure less than that specified for the load being carried." 49 C.F.R. § 393.75(h). Thus, the load tables that the U.S. Department of Transportation ("DOT") uses to ensure the

[3] *See generally* RMA Petition for Reconsideration (07/22/02) [JA0466] and RMA Petition for Rulemaking (09/12/02) [JA0606]; *see also* Goodyear Comments (09/05/01) [JA0227] and TIA Comments (11/15/04) [JA1076].

[4] *See* RMA Petition For Reconsideration, pp. 5-6 (07/22/02) [JA0471-72]; RMA Comments, pp. 2-4, 6-7 (11/10/04) [JA1024-26, 1028-29]; and TIA Comments p. 3 (11/15/04) [JA1078].

safe operation of vehicles over 10,000 pounds and other commercial vehicles were inexplicably disregarded in the proposed TPMS standards for passenger cars and light trucks.

NHTSA did not take any action on RMA's request for a rulemaking for several years. In 2005, however, shortly after it decided not to build a tire reserve pressure requirement into the TPMS regulations, NHTSA ruled on RMA's 2002 petition for a rulemaking. In a decision issued May 19, 2005, the agency denied RMA's petition. 70 Fed. Reg. 28888 (NHTSA Denial of Petition for Rulemaking) [JA1510.]

II. STATEMENT OF THE FACTS

A. The Effects Of Under-Inflation On Tires And Vehicles

A tire is a "complex engineering composite that has evolved over the past century to function as a crucial structural and dynamic component of the vehicle."[5] The air in a pneumatic tire holds the weight of the vehicle and its contents.[6] Any load placed on a tire causes it to bend, or deflect, in response to the

[5] *Transportation Research Board Special Report, National Academy of Science, Tires and Passenger Vehicle Fuel Economy,* p. 34 (2006) ("NAS Tire Report"), available at www.trb.org/publications/sr/sr286.pdf. These same principles are explained in various tire industry submissions (*see* footnote 6 below), NHTSA Preliminary Economic Assessment, p. ii (07/01/01) [JA0045] and 66 Fed. Reg. 38982, 38986 (NHTSA Notice of Proposed Rulemaking) [JA0160, 0164].

[6] Tire pressure and the load are interrelated. Tire pressure is the force per unit area exerted by the air in the tire measured in pounds per square inch (psi). The rubber in the

(continued...)

weight. A "rubber tire interacts with the hard road surface by deforming under load, thereby generating the forces responsible for traction, cornering, acceleration, and braking." NAS Tire Report, p. 43 (2006). Thus, the "more a tire at a given pressure is loaded, the more it deforms . . . ."[7]

All tires are designed to operate within defined limits of pressure, load, and deflection. At similar deflections, larger tire sizes are able to bear more load than smaller tires.[8] The ability to flex, however, is not unlimited and may be exceeded. In any event, automobile manufacturers are required to set a recommended tire pressure – the placard pressure – for each of their vehicles.[9]

Under-inflation of tires has many harmful effects. It increases the risk of tire failure and impacts a vehicle's handling. Under-inflation increases the likelihood of crashes by lengthening the required stopping distance. It also creates a heightened risk of "hydroplaning" and an increased risk of "skidding and/of loss

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(continued...)

pneumatic tire under stress flexes, allowing continued safe use. RMA Comments, Attachment, pp. 4, 6-7 (09/06/01) [JA0246, 0248-49].

[7] NAS Tire Report p. 46.

[8] RMA Comments, Attachment p. 7 (09/06/01) [JA0249].

[9] The placard pressure set by the vehicle manufacturer takes into account the tire's load-carrying limit as a significant input, but also considers other factors, such as ride and handling, tire wear, pass-by noise, and fuel economy. Alliance Comments, Appendix A, p. 5 (09/07/01) [JA0298]; RMA Comments, Attachment p. 12 (09/06/01) [JA0254]; RMA Petition for Rulemaking, pp. 3-4 (09/12/02) [JA0608-09].

of control." *See generally* 70 Fed. Reg. at 18179 (NHTSA Final Rule – TPMS) [JA1149.]

Under-inflation also has physical impacts on tires and vehicle performance. For example, it increases tread wear on the outside edges (or shoulders) of the tire, shortening the tire's lifespan. Under-inflation also generates excessive heat, which reduces tire durability. Additionally, under-inflation reduces fuel economy by increasing rolling resistance. Essentially, soft or under-inflated tires force the engine to burn more fuel in order to achieve desired driving speeds.[10]

A multitude of factors may affect the inflation pressure in tires that are in active use. NHTSA estimates that tires in service lose an average 1 psi of pressure per month.[11] Tires may also experience sudden damage and deflation due to a minor collision or crash.

Despite continuing changes in pressure, a substantial majority of drivers do not check their tire pressure on a regular basis. A 2001 NHTSA survey found that only 33 percent of drivers reported they manually checked tire pressure on a weekly or monthly basis. *See* FRIA at VI-14 (2005) [JA1301]. Some 25 percent of drivers reported that they checked tire pressure only when the tires were

[10] NHTSA itself has acknowledged these effects in its TPMS decisions and in the related technical documents placed in the record. *See generally*, *NHTSA Notice of Proposed Rulemaking*, 66 Fed. Reg. 38982, 38985-87 (07/26/01) [JA0160, 0163-65].

[11] FRIA on TPMS, FMVSS No. 138, p. V-5 (04/15/05) [JA1215].

visibly under-inflated, and another 28 percent reported that they checked tire pressure only when a vehicle was being serviced. *Id*. Approximately 5 percent of drivers reported that they never checked tire pressure. As the NHTSA study used self-reporting, these statistics likely overstate the level of tire maintenance that actually occurs.[12]

Not only do consumers check their tire pressure erratically, but field data also confirm that many tires in use are under-inflated. A 2000 NHTSA study found that 26 percent of passenger cars and 29 percent of pick-up trucks, SUVs and vans had at least one tire that was under-inflated by at least 25 percent below the placard pressure. *See* 70 Fed. Reg. at 28891 (Denial of Petition for Rulemaking). [JA1513.]

B. The Various Types Of Tire Pressure Monitoring Systems

Broadly speaking, there are three kinds of TPMSs. *See Public Citizen*, 340 F.3d at 45-48. The first is the direct system. A direct TPMS consists of a pressure monitoring device attached to each wheel, and each device has a tiny radio transmitter. The transmitter broadcasts to an onboard computer which

[12] During the controversy relating to the Ford Explorer, Ford dealers measured air pressure of tires in the vehicles brought in for service. A very high percentage of these vehicles had tires with insufficient pressure. The placard pressure for the Firestone tires used on the Ford Explorer was 26 psi. Yet the tires turned in to Louisiana car dealers had an average pressure of 15 to 20 psi. Alliance Comments, p. 4 (03/26/01) [JA0023]. This tire had a placard pressure that was set by Ford at the T&RA design standard. As a result, this tire had no reserve margin whatsoever.

operates a warning light system that notifies the driver that certain warning criteria have been met.[13]

The second type of system (the indirect system) measures tire pressure indirectly, using an algorithm based on the rotational speed of the car's wheels, measured by the car's anti-lock braking system. When the rotational speeds differ between tires, this indicates that one or more of the tires is under-inflated. Since an indirect system functions by analyzing differences between wheel rotational speeds, it does not indicate when all tires are under-inflated or when various combinations of two tires are under-inflated. Nor will an indirect system identify on the dashboard which specific tire is under-inflated. Moreover, the system will not work when two tires on the same side or axle are equally under-inflated, nor will it work under many environmental and road conditions.

The third type is the so-called hybrid system. This system places sensors on two of the tires, but measures pressure in the other two tires indirectly. Unlike a direct system, a hybrid system is unable to provide a dashboard indicator specifying which individual tire(s) have insufficient air pressure. A hybrid system,

[13] There are numerous TPMS suppliers, and direct systems vary considerably. Some do not require radio waves to travel through the walls of each tire. As a result, the transmission of the signal is not affected by the presence of high levels of steel or carbon in particular tires. *See* generally ETV Comments (11/04/04) [JA1009]; *see also* ETV Petition for Reconsideration (05/27/05) [JA1531].)

however, is able to provide a dashboard warning indicating that at least one of the four tires is under-inflated. *See generally id*.

In its 2002 rules, the agency adopted performance standards that allowed for the use of indirect systems. *See id.* at 50-52; 67 Fed. Reg. 38704 (NHTSA Final Rule – TPMS). [JA0419.] The agency's 2002 rules gave vehicle manufacturers two options. They could install a TPMS that would warn drivers when the tire pressure in one or more tires fell 25 percent or more below the placard pressure or below specified minimum levels. Alternatively, they could install a TPMS that would warn drivers when the tire pressure in *one* tire fell 30 percent or more below the placard pressure or below a specified minimum level. *Public Citizen*, 340 F.3d at 49. This one-tire standard would not have required a warning when the tire pressure fell simultaneously in two, three or four of the vehicle's tires.

The agency's approach, however, was rejected by the Second Circuit. The court found that "the agency's adoption of a one-tire 30 percent option was both contrary to law and arbitrary and capricious. . . ." *Id.* at 62. In its opinion, the Second Circuit focused on the fact that the one-tire 30 percent standard was designed to allow use of inferior indirect systems. *Id*. at 56-57.

In the proceedings below, NHTSA indicated that no existing indirect system could meet the performance standards imposed by the 2005 final rule; however, the agency weakened its standards to allow use of hybrid systems. For

example, because hybrid systems need a longer time than direct systems to measure tire pressure, NHTSA lengthened the detection time standard. This is the time that the vehicle may operate (now 20 minutes) before the TPMS is required to provide a warning. These changes in the agency's safety standards do not apply only to hybrid systems; the performance standards for all TPMSs were watered down so that hybrid systems – which are less expensive – could meet the standards. *See* ETV Petition For Reconsideration (05/27/05) [JA1531].

C. NHTSA's Actions On The Critical Issues

1. NHTSA Rejected The Proposed Tire Reserve Pressure Requirement

(a) The RMA Proposal And Related Proposals By TIA And Public Citizen

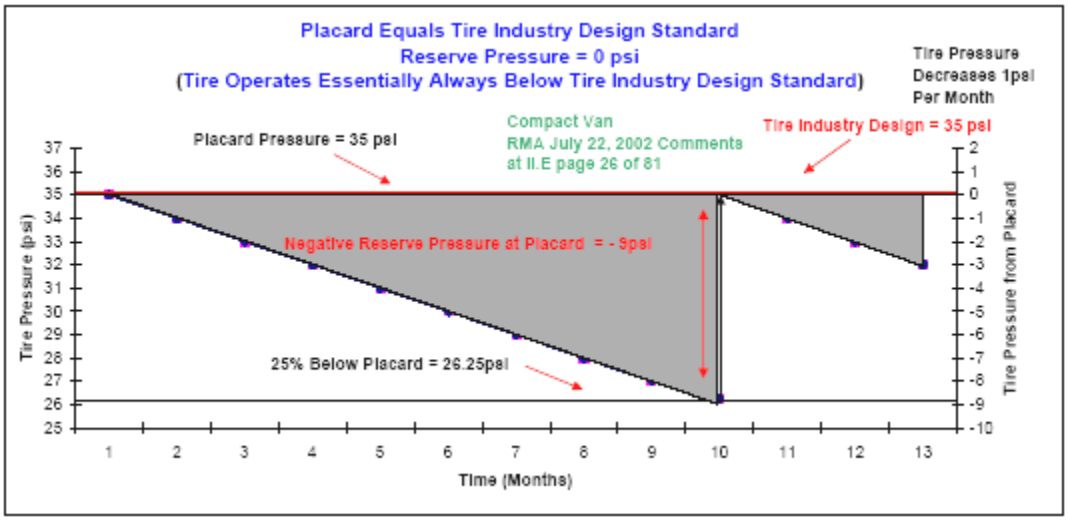
In the proceedings below, Public Citizen explained that the uniform 25 percent NHTSA had proposed was based upon "inferior technology," and thus not consistent with the Second Circuit's decision. *See* 70 Fed. Reg. at 18145 (NHTSA Final Rule – TPMS) [JA1115]. TIA argued that the uniform 25 percent standard was too lenient, and recommended that the TPMS give a warning "before there is a serious problem," namely at 1-2 psi below placard pressure. *Id*.

As explained above, RMA urged NHTSA to establish a tire reserve pressure requirement. In the alternative, RMA urged NHTSA to require dashboard warnings whenever a tire had insufficient pressure to support the fully loaded

vehicle. *See generally* RMA Petition For Reconsideration, pp. 5-7 (07/22/02) [JA0471-73]; RMA Comments, pp. 2-4, 6-9 (11/10/04) [JA1024-26, 1028-31].

The RMA proposal (which was endorsed by T&RA, TIA, Public Citizen, and number of other tire industry groups)[14] is perhaps best illustrated with a real-world example. For one actual compact van and tire combination, the placard pressure is the same as the T&RA standard – 35 psi. (*See* Figure 1, below.)

FIGURE 1: Vehicle Operates Below Tire Industry Design Standard



In this real-world example, the reserve margin is zero. However, the warning light required by the TPMS rule would not illuminate until the tire had deflated to 26.25 psi (after approximately 9 months if the tires lose pressure at the average rate). For consumers that fail to check pressure manually, the tire would operate for virtually its entire service life at pressures below the minimum pressure

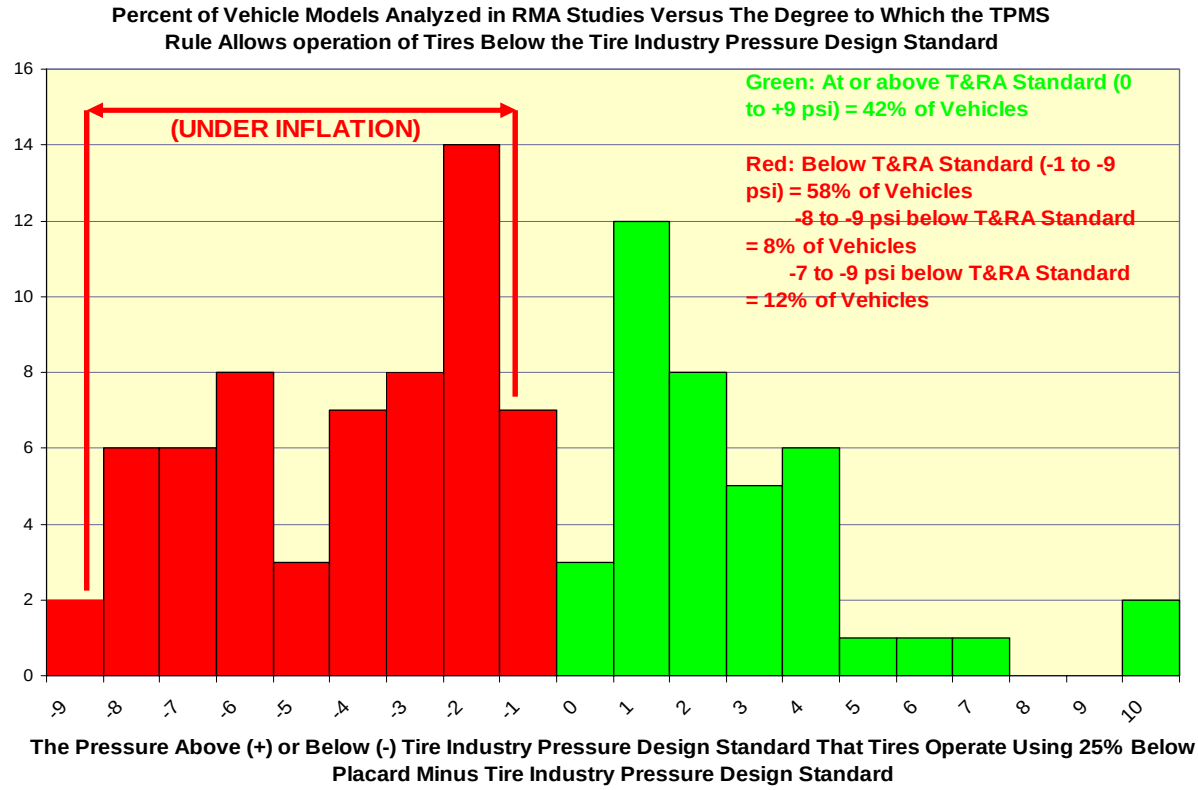
[14] *See, e.g.*, TIA Comments, pp. 3, 5 (11/15/04) [JA1078, 1080] and Public Citizen Comments, p. 4 (11/22/04) [JA1085].

required to carry the maximum load safely (*i.e.*, the T&RA floor of 35 psi). RMA's reserve pressure proposal would require the vehicle manufacturer to set the placard pressure for this tire/vehicle combination at 44 psi (*i.e.*, thereby including a reserve of 25 percent or 9 psi).

RMA submitted data for over 100 vehicle-tire combinations. RMA Petition for Reconsideration, Attachment II.E (07/22/02) [JA0493-0573]. These data indicate that a rule which uses a uniform trigger of 25 percent below placard would mean that 58 percent of these vehicles would run on tires having pressure below the levels required to carry the maximum load (the T&RA standard). (*See* Figure 2.)[15]

[15] RMA calculated the difference between the pressure corresponding to 25 percent below placard (*i.e.*, the TPMS rule) and the tire industry design standard (*i.e.*, the tire industry reserve pressure proposal). *See* RMA Petition for Reconsideration, Attachment II.C. p. 1 and Attachment IV.A, p. 2 (07/22/02) [JA0481, 0576]. RMA analyzed 100 different vehicle models representing millions of vehicles produced between 1997 and 2003. In order to illustrate the effect of using the TPMS rule alone versus the tire industry reserve pressure approach, we added the number of vehicles with each increment of pressure and plotted this data (Figure 2). Since there were 100 vehicles, the number of vehicles equals the percentage of vehicles.

FIGURE 2: Percentage Of Vehicles That Would Operate Below The T&RA Minimum Pressure Using NHTSA's TPMS Rule



Data Source: RMA Petition for Reconsideration (7/22/02). [JA0466.]

(b) NHTSA's Rationale For Rejecting A Tire Reserve Pressure Requirement

In 2005, while acknowledging that selecting the notification threshold was one of the most fundamental matters to be resolved as part of this rulemaking, NHTSA rejected all proposals that would embed objective safety considerations into the baseline for defining "significantly under inflated." 70 Fed. Reg. at 18145-18146, 18161 (NHTSA Final Rule – TPMS) [JA1115-16, 1131]. The final TPMS rule requires the illumination of a dashboard warning light (a) not more than 20 minutes after the inflation pressure in one or more of the tires falls 25 percent

below the manufacturer's recommended cold inflation pressure (*i.e.*, the placard pressure) or; (b) not more than 20 minutes after the inflation pressure in one or more of the tires falls to the psi level specified in Table 2 of the rule (called the minimum activation pressure or "MAP") for the tire in question, whichever is higher.

NHTSA emphasized that vehicles often were operated without passengers and without substantial cargo. In the agency's view, it therefore was not necessary to set the TPMS activation pressures at the pressure levels required to support the maximum vehicle loads. The agency did not deny that the maximum load figures for cars and trucks have always been used by the agency in both the safety standards governing tire selection and in the T&RA guidelines, 49 C.F.R. § 571.110. In the agency's view, however, the "tire industry tables are conservative and *may* contain some built-in safety margin." 70 Fed. Reg. at 28893 (NHTSA Denial of Petition for Rulemaking) (emphasis added). [JA1515.]

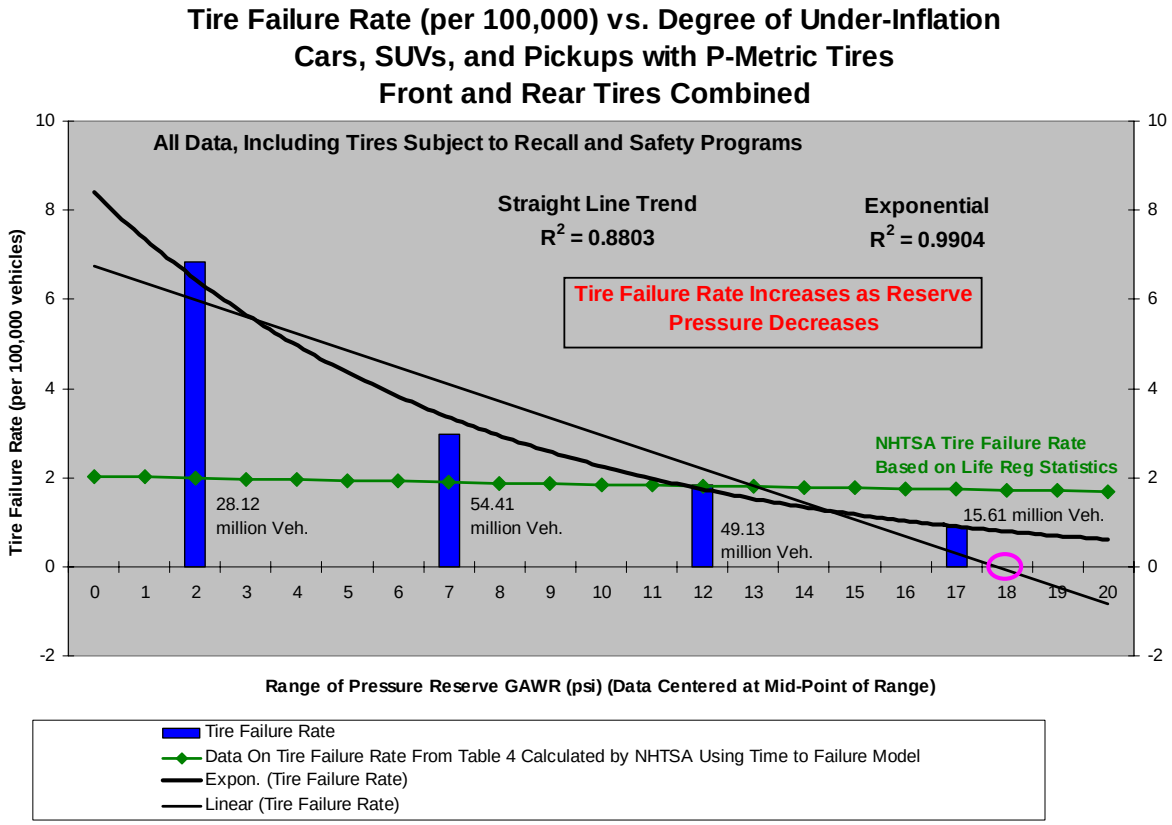
NHTSA also asserted that "independent studies have not shown a reliable or *conclusive* relationship between tire pressure reserve and tire failure claims in the field." 70 Fed. Reg. at 28895 (NHTSA Denial of Petition for Rulemaking) (emphasis added). [JA1517.]

The agency stated that "the data for certain vehicles with a tire pressure reserve suggested (but did not establish) a lower incidence of tire

failures." 70 Fed. Reg. at 28889 (NHTSA Denial of Petition for Rulemaking) [JA1511]. "Not only were the results conflicting, but in none of those cases were the results statistically significant." *Id.* NHTSA also stated that it divided the tire failure data into 14 categories based upon tire type, axle, and vehicle type. While there were "sufficient" data in 10 of these 14 categories, the agency "found only one statistically significant result suggesting an association between tire failure and tire pressure reserve (P-metric tires on the rear axle of passenger cars)." *Id*. at 28894 [JA1516].[16] (As explained below, the Petitioners later aggregated the data for all vehicles equipped with P-metric tires. When aggregated, the results *are* statistically significant.)

[16] Petitioners prepared a simple graph combining all data for cars, SUVs, and pick-up trucks with P-metric tires. This graph, reprinted here in Figure 3, shows that on an exponential basis, the failure rate declined as the reserve pressure increased. The data fit extremely well to an exponential curve.

FIGURE 3



Data Source: NHTSA Report on Data on Tire Reserve Pressure (05/17/05) [JA1410].

The agency acknowledged that use of the T&RA guidelines – the heart of the tire reserve pressure proposal – likely would have the potential benefit of preventing "731 crashes (with roughly $2 million in property damage and travel delay savings), 4 fatalities, and 96 injuries in all cases involving blowouts or flat tires." 70 Fed. Reg. at 28895 (NHTSA Denial of Petition for Rulemaking) [JA1517]. In the agency's view, however, this benefit was insufficient in light of the $132 million cost allegedly required to increase the size of tires to meet such a standard. *Id.*

Based upon a survey of consumers, RMA had argued that with the arrival of TPMS, many consumers would check their tire pressure on an even more sporadic basis than in the past. 70 Fed. Reg. at 28892 (NHTSA Denial of Petition for Rulemaking) [JA1514.]. Consumers would be lulled into believing that manual checking of tire pressure was unnecessary. Based in part on field data supplied by GM dealers in Michigan, NHTSA decided that RMA's concerns were unwarranted. In the agency's view, the GM field data for the high-end vehicles that then had a TPMS option suggested that under-inflation would remain at manageable levels. *Id*.

NHTSA also began its own study of the impact of TPMS on tire pressures but cancelled it before having obtained statistically significant data. NHTSA nonetheless cited its survey in rejecting the results from RMA's phone survey. 70 Fed. Reg. at 28892-93 (NHTSA Denial of Petition for Rulemaking) [JA1514-15].

In addition, NHTSA relied upon laboratory tests it had conducted as part of the original TPMS rulemaking. NHTSA ran tires on a dynamometer for 90 minutes at 75 mph, with a full load and at 20 psi. 67 Fed. Reg. at 38726 (NHTSA Final Rule – TPMS) [JA0442]. No tires failed this test. 70 Fed. Reg. at 28894 (NHTSA Denial of Petition for Rulemaking) [JA1516]. NHTSA, however, also ran another dynamometer test, which it did not cite in the May 19, 2005 decision. The agency ran tires inflated to 20 psi for a total of 180 minutes, using 67 percent

of the rated load. The tires were run for 90 minutes at 75 mph, and 30 minutes at 87, 93, and 99 mph. *See* FRIA at II-6 [JA1177]. Some 30 percent of tires *failed* this test. *Id*.

Finally, in its September 7, 2005 Order, NHTSA stated that its existing rules provided for a reserve pressure at the "vehicle normal load." 70 Fed. Reg. at 53089 [JA1545]. The agency explained that under FMVSS No. 110 (49 C.F.R. § 571.110), "normal load" is defined as two persons for a vehicle for four seating positions and three persons for a vehicle with five seating positions. *Id.* In 2003, the agency had amended FMVSSs 109 and 110 to increase the "vehicle normal load" requirement from 88 percent of the tire's maximum load rating to 94 percent of the tire's load rating at the placard pressure. *Id*. NHTSA estimated that placard pressures would increase by 1 or 2 psi as a result of this change, mitigating to some extent the potential for under-inflation identified by RMA. *Id.*, citing 68 Fed. Reg. 38141. Still, the agency did not question the fact that under its TPMS rule, many drivers would not receive a dashboard warning when the air pressure was insufficient to support a vehicle fully loaded.

2. NHTSA Excluded Replacement Tires From Its TPMS Rules

In contrast to its 2002 TPMS rule, NHTSA did not issue any requirements that ensure monitoring systems will function on replacement tires. This creates a significant loophole in the rule: A majority of tires in use at any given time are replacement tires, for the simple reason that tires have a

significantly shorter useful life, in miles, than do vehicles. Over its lifespan, a car or truck will typically have three of four sets of tires. 70 Fed. Reg. at 18158 (NHTSA Final Rule – TPMS) (referring to RMA comments) [JA1128]. As TIA noted in its comments, "in recent years, the number of tires shipped has been about four times the number of [original equipment] tires shipped." *Id*.

NHTSA's own data indicate that tires last an average of 45,000 miles, while passenger cars and light trucks have an average lifespan of 126,678 miles and 153,319 miles, respectively. FRIA on TPMS, p. II-12 (04/15/05) [JA1183]. Thus, approximately 64 percent of passenger car mileage and 71 percent of light truck mileage is driven on replacement tires. *Id*. Nevertheless, NHTSA exempted replacement tires, deciding instead to allow a mere malfunction light, which (after 20 minutes of driving) would indicate to drivers that their replacement tires were "incompatible" with the TPMS system. The same light would also illuminate whenever there is any other type of TPMS malfunction, making its meaning fairly obscure.[17]

NHTSA explained its failure to require TPMSs to work with replacement tires in two ways. First, the agency noted that TPMSs probably would work with most replacement tires. Second, NHTSA was concerned certain replacement tires would interfere with the operation of the monitoring systems.

[17] *See* 70 Fed. Reg. at 18150-51, 18159-60 (NHTSA Final Rule – TPMS) [JA1120-21, 1129-30].

Specifically, in the agency's view, tires with high carbon content, steel in the sidewalls, or run-flat designs could potentially interfere with the radio transmission of the TPMS.[18] NHTSA estimated that perhaps one percent of replacement tires would not work with the TPMS system. The one-percent figure was a mere estimate – NHTSA admitted that the number may be as high as ten percent, thus increasing the number of affected drivers by an order of magnitude. FRIA on TPMS, p. II-10-12 (04/15/05) [JA1181-83].

3. NHTSA Adopted A TPMS Standard Requiring Dashboard Warnings Only After 20 Minutes Of Driving On An Under-Inflated Tire

Initially, as in 2002, NHTSA had proposed that the TPMS only be required to operate after 10 minutes of vehicle operation. Automobile manufacturers recommended lengthening the time, while Public Citizen suggested that the time be reduced to one minute. *See* 70 Fed. Reg. at 18147 (NHTSA Final Rule – TPMS) [JA1117]. RMA also objected to the 10-minute period as unsafe and excessive. RMA Comments, p. 14 (11/10/04); [JA1036]. One TPMS manufacturer explained that its system would work effectively upon starting the ignition. *See* ETV Comments (11/04/04) [JA1009], ETV Petition for

[18] NHTSA seemed to assume that all TPMSs would rely upon radio transmission from sensors located inside the tire. Yet at least one TPMS manufacturer (ETV) had indicated that its system had a direct data connection from inside the tire cavity to an external receiver located in the rim. As a result, its system was not dependent upon the transmission of radio waves through the walls of the tire and therefore was unaffected by tire sidewall content. *See generally* ETV Comments (11/04/04) [JA1009]; *see also* ETV Petition For Reconsideration (05/27/05) [JA1531].

Reconsideration (05/27/05) [JA1531]. Nonetheless, in the final rule, NHTSA *lengthened* the time for detection to 20 minutes. 70 Fed. Reg. at 18147-48 (NHTSA Final Rule – TPMS) [JA117-18.]. In the agency's view, the danger to the driving public was minimal, and the benefit of a standard that could accommodate future indirect and/or hybrid systems was worth the risk. "Most indirect and hybrid TPMSs cannot currently meet the four-tire, 25 percent under-inflation detection threshold within 20 minutes." *Id*. at 18148 [JA1118]. Consequently, to allow hybrid systems a place in the TPMS marketplace, NHTSA set the detection time at 20 minutes.

4. NHTSA Required That TPMSs Be Tested Only In A Narrow Range Of Temperatures And Speeds And With Inclusion Of A 1 psi Cushion

The agency initially proposed testing TPMSs in ambient temperatures between 32 and 104 degrees Fahrenheit, only on dry roads, and only at speeds between 31 and 62.2 miles per hour. 70 Fed. Reg. at 18167 (NHTSA Final Rule – TPMS) [JA1137]. TIA, Public Citizen, and the RMA all commented on the test conditions, pointing out that tires are frequently operated in less than optimal conditions. *Id*. NHTSA rejected these comments, complaining that the commenters had not established that testing in a narrow range of conditions was an unreasonable way to design a system. *Id*.

A number of parties sought reconsideration, arguing again that tests should be conducted at higher and lower temperatures, higher and lower speeds,

and in weather conditions that better reflect actual driving conditions. Again, NHTSA simply brushed the criticism off:

> After considering the petitioners' comments regarding test conditions, we have decided that no further modifications to the test conditions in S5 are necessary. The agency's intention in developing the test procedure for TPMS-equipped vehicles was not to test the TPMS at every conceivable vehicle operating condition, but to instead evaluate the system at operating conditions that are typically encountered during normal driving. The RMA and ETRTO did not present any new data or arguments regarding the adequacy of the final rule's test conditions, nor did they specify any recommendations for test parameters that they believe would be more reflective of real world driving conditions….
>
> For these reasons, we continue to believe that the test conditions specified in the final rule will result in robust TPMSs that will function normally over a wide range of operating conditions.

70 Fed. Reg. at 53093 [JA1545].

In addition to allowing testing in a narrow range of conditions, NHTSA specified that tires could be deflated to 1 psi below the trigger pressure before notification is required. *Id.* at 53079, 53094-95 [JA1535, 1550-51]. Essentially, a monitoring system would pass the agency's test if the warning alerts the driver at 1 psi *below* the level required by the MAP and 25 percent standard. The agency acknowledged that a 1 psi cushion in testing permits TPMSs that warn a driver only when tire is well under the 25 percent below placard standard. Without this "cushion," for a tire with a 30 psi placard, the TPMS would illuminate at 22.5 psi. Under NHTSA's test conditions, including the 1 psi cushion, a

warning light may not illuminate until the pressure reaches 21.5 psi, or more than 28 percent below the placarded level.

III. SUMMARY OF ARGUMENT

The fundamental purpose of the Safety Act was to reduce the number of traffic accidents and to lower the number of deaths and injuries stemming from such accidents. 49 U.S.C. § 30101. In the original 1966 legislation, Congress sought to achieve this objective by requiring NHTSA to adopt standards that "meet the need for motor vehicle safety. . . ." *Id.* § 30111(a). In 2000, finding that this general directive was insufficient, Congress enacted the TREAD Act and specifically instructed NHTSA to adopt safety standards requiring the installation of tire pressure monitoring systems. Congress required that such systems provide a warning to consumers whenever "a tire" is "significantly under inflated." *Id.* § 30123 (historical note).

The standard adopted by NHTSA does not meet these requirements. The agency's approach will not ensure that consumers receive warnings whenever "a tire" is "significantly under-inflated," as Congress intended. The fundamental problem is that NHTSA has not grounded its baseline defining the practical meaning of "significantly under inflated" in anything more scientific or safety-related than a manufacturer's choice of placard pressure. NHTSA also carved out substantial loopholes in its standards and test conditions, substantially reducing the benefits to consumers. The agency's approach fails to provide adequate warnings

to drivers and is therefore both contrary to law and arbitrary and capricious in three areas.

Tire Reserve Pressure. At the urging of the automobile industry, the agency rejected any tire reserve pressure requirement and tied the dashboard warnings to a uniform 25 percent reduction in pressure, as measured against the placard pressure selected by a vehicle manufacturer. For many automobiles, light trucks and SUVs, however, the placard pressure selected by a vehicle manufacturer has little or no margin of safety. When a vehicle manufacturer elects to set the placard pressure at a level that barely meets the tire industry design standard embedded in the T&RA tables and in NHTSA's own regulations (49 C.F.R. § 571.110), it means that the tires on that vehicle cannot withstand a 25 percent drop in pressure and still support the vehicle in a fully loaded condition. Indeed, data submitted to NHTSA by the tire industry showed that at least 58 percent of sampled vehicles did not have reserve pressure sufficient to withstand a 25 percent reduction in pressure.

NHTSA never questioned the reserve pressure data supplied by the tire industry, but insisted that since many vehicles are operated without maximum loads, the number of vehicles operating with insufficient air pressure will be smaller than these statistics indicate. Yet this does not justify the agency's action. Unless the TPMS rule is altered to require sensors that measure actual vehicle loads and provide a warning concerning whether the actual load can be supported,

the only safe approach is to provide a dashboard warning when the air pressure is insufficient to support the vehicle in a fully loaded condition. Without this threshold, the rule fails to assure that drivers receive a dashboard warning whenever "a tire" is significantly under-inflated.

NHTSA acknowledged that in all likelihood, a tire reserve pressure requirement would reduce fatalities, injuries, and property damage. The agency claimed, however, that based upon data supplied by the auto industry, such a requirement would cost over $132 million and therefore would not be cost-effective.

In reality, however, the agency's cost-benefit analysis was flawed in many respects. The agency's methodology also was inconsistent with its own approach in calculating cost and benefits for other aspects of the TPMS rule. On the cost side, the agency assumed that a tire reserve pressure requirement would require vehicle manufacturers to increase tire size on 70 percent of vehicles, at a cost of $11.08 per vehicle. Yet the evidence indicated that there were many low or zero-cost alternatives to increasing the size of tires.

Furthermore, there is a practical way to impose a tire reserve pressure requirement that involves no change whatsoever in existing tire sizes. Specifically, rather than adjusting the tire selection standard (49 C.F.R. § 571.110), the agency could simply have adopted a variable trigger for activation of the dashboard warnings. Instead of illuminating when the pressure drops by 25 percent or when

the pressure drops below a fixed activation pressure (such as 20 psi for sedans), the dashboard symbol could be illuminated whenever, on a particular vehicle, the pressure drops below the tire design standard embedded in the T&RA tables and in NHTSA's own regulations. This variable-trigger approach would require little or no change in tire sizes.

The agency's cost-benefit analysis was equally flawed on the benefit side. Among other things, the agency substantially understated the number of deaths that would be prevented by a tire pressure reserve requirement. NHTSA asserted that a tire pressure reserve requirement would avoid at most 4 fatalities. The agency's own analysis of the TPMS rule indicated, however, that 112 fatalities would be avoided by raising the average tire pressure level by 4.5 psi on 27.5 percent of the vehicle population. A tire reserve pressure requirement would increase average tire pressure levels by *another* 4.5 psi for 58 percent of the total vehicle population. Thus, relying upon the agency's own numbers and its approach, a tire reserve pressure requirement should eliminate at least 236 fatalities.

Additionally, on the benefits side, NHTSA completely ignored the economic benefits associated with improved fuel efficiency, reduced tire wear, and decreased property damage. Using NHTSA's own methods, and even using NHTSA's now-obsolete estimated gasoline price of $1.08 per gallon, Petitioners have calculated that these benefits alone equal $1.1 to $1.3 billion. Thus, when all

known benefits are included, the economic benefits of a tire pressure reserve requirement dwarf the $132 million cost cited by the agency.

Overall, the agency did not evaluate the linkage between tire failure rates and reserve pressure in a neutral or objective way. NHTSA's approach was arbitrary and capricious and should be rejected by this Court.

Replacement Tires. The agency's approach with regard to replacement tires is flatly inconsistent with statutory requirements. The TREAD Act requires that tire pressure warning systems illuminate whenever "a tire" is significantly under-inflated. 49 U.S.C. § 30123 (historical note); *see also Public Citizen*, 340 F.3d at 54. Congress did not limit this requirement to tires that are original equipment. The plain language of the statute applies to all tires, including the four original tires, the original spare tire, and replacement tires.

The agency's approach was also was arbitrary and capricious. NHTSA was concerned that certain tire pressure monitoring systems would not function effectively on run-flat tires or on tires with high-steel or high carbon content. There was, however, undisputed evidence that at least one TPMS manufacturer was selling a system that would work effectively with these tires; such a system is technologically feasible. Ultimately, the agency's action failed to ensure that the benefits of tire pressure monitoring systems would be available universally, or even to the majority of drivers.

NHTSA is correct that, by happenstance, tire pressure monitoring systems may operate effectively with many replacement tires. Nevertheless, its approach unnecessarily creates the risk that, over time, millions of vehicles will be operated without functional TPMSs, severely undermining the statutory objective of providing certainty to consumers regarding safe levels of tire inflation.

NHTSA's 20 Minute Standard And Its Lax Test Conditions. Courts have emphasized that safety should be the overriding consideration in NHTSA's development of minimum standards for automotive components. In these proceedings, however, NHTSA weakened the standards for tire pressure monitoring systems to accommodate lower-cost hybrid systems. By allowing or encouraging the use of an inferior technology, the agency made essentially the same error that led to the invalidation of the prior TPMS standards by the Second Circuit.

The agency's embrace of inferior technology was evident in its shift to a safety standard requiring that a dashboard warning illuminate only after 20 minutes of driving. On this issue, NHTSA irrationally sacrificed safety in an effort to protect an inferior technology. For the same reasons, NHTSA adopted test conditions that do not cover a full range of driving conditions. The agency required, for example, that tire pressure monitoring systems be tested only in dry conditions, not in rainy conditions. Similarly, the agency required testing only at speeds less than 63 miles per hour and only in a limited temperature range.

For these reasons, NHTSA's approach to setting test conditions was arbitrary and capricious. The agency should have selected test conditions that cover the full range of driving conditions. If hybrid systems could not be designed to function effectively in a full range of conditions, then the agency should have accepted that result and required a more effective system. The agency should have sought to protect vehicle occupants, not to preserve inferior technology.

IV. THE PETITIONERS HAVE STANDING TO CHALLENGE THE AGENCY'S ACTIONS

Petitioners' standing is self-evident based upon the evidence of record. NHTSA, however, has questioned the standing of certain Petitioners. For that reason, Petitioners addressed standing in a Statement Concerning Standing submitted in No. 05-1188 on September 1, 2005. The affidavits presented with that Statement are included in an Addendum submitted with this brief. Since the agency has signaled its intent to challenge the standing of certain Petitioners, the key points are summarized here.

A. While The Standing Of Petitioners Is Self-Evident, The Petitioners Have Submitted Detailed Evidence On Standing

Petitioners are Public Citizen, TIA, Bridgestone/Firestone, Cooper, Goodyear, and Pirelli. Each has substantial interests in the outcome of this action, because, as is demonstrated in the attached declarations, each Petitioner will suffer

an imminent and concrete injury due to NHTSA's actions. That injury can be redressed by a grant of the relief that petitioners are seeking.

Petitioners fall into three groups. First, there are four tire manufacturers: Goodyear, Bridgestone/Firestone, Cooper, and Pirelli. Second, TIA is a non-profit association that represents all or nearly all segments of the tire industry, including entities that repair, recycle, sell or service new or retreaded tires. *See* Littlefield Decl. ¶ 2. Finally, Public Citizen is a not-for-profit advocacy group, with thousands of members who will be directly affected by the NHTSA regulations. *See* Claybrook Decl. ¶¶ 2-4.

1. Tire Manufacturers

Four declarations are attached to this brief from tire manufacturer declarants: James C. Stroble, Manager of the Product Analysis Department for Goodyear; Brian Queiser, Manager of Product Analysis Department for Bridgestone/Firestone; Bradley J. Rump, Manager of Technical Relations for Cooper; and E. Paul Daniels, External Consultant for Pirelli. *See* Stroble Decl. ¶ 1; Queiser Decl. ¶ 3; Rump Decl. ¶ 1; Daniels Decl. ¶ 1. Each declaration sets forth the specific harm that each of the tire companies will suffer as a direct result of the NHTSA regulations. Underlying each declaration is the conclusion – conceded by NHTSA during the rulemaking and in related proceedings – that the requirements set forth in the regulation are not as strict as they might be; as a result, there will be

additional tire failures, warranty claims, fatalities, injuries, and property damage, all of which will adversely affect the petitioners.[19]

Goodyear, Bridgestone/Firestone, Pirelli, and Cooper manufacture and sell tires in the United States and elsewhere. The tires are designed to be safe when used as directed. *See generally* Rump Decl. ¶¶ 40, 44; Queiser Decl. ¶¶ 11-12, 20-22. Nevertheless, it is still possible to operate the tires in a manner that increases the risk of tire failure. Operation of the tires at significantly less than the minimum tire pressure required for the maximum load can increase such risks. *See, e.g.*, Stroble Decl. ¶¶ 7-10, 20-27; Daniels Decl. ¶¶ 7-10. Consequently, all of these tire companies and the TIA recommend that drivers monitor their tire pressure and maintain the pressure at the recommended (placard) level.[20]

Tire failure, whether or not accompanied by serious injury, often leads to economic injury to the tire companies. Each tire company has a warranty on its tires. These warranties cover all tires sold by the four tire company Petitioners. Warranty claims inevitably generate costs for manufacturers, and these costs include both investigating and resolving the claim. *See, e.g.*, Stroble Decl. ¶¶ 34-37; Rump Decl. ¶¶ 29-32. In addition, some vehicle accidents lead to tort claims

[19] Nothing in this brief and nothing in the Declarations should be viewed as an admission in any product liability litigation. The causes of accidents are complex and involve vehicle design, driver behavior, road conditions, punctures, and other factors.

[20] *See* Queiser Decl. ¶ 27; Daniels Decl. ¶ 50; Stroble Decl. ¶ 50; Rump Decl. ¶ 44.

against tire manufacturers. Even when groundless, these suits impose a considerable cost on tire manufacturers. Although less easily quantifiable, there is often a significant loss of company goodwill as a result of tire disablement or failure. *See, e.g.*, Stroble Decl. ¶¶ 34-37; Rump Decl. ¶¶ 29-32.

2. Tire Retailers

TIA is a trade association with more than 4,000 members, including tire dealers and retreaders, tread rubber manufacturers, tire wholesalers, distributors, and suppliers. *See* Littlefield Decl. ¶ 2. Injuries to tire retailers are similar but not identical to the injuries to tire manufacturers. That is, warranty claims, even when primarily the responsibility of tire manufacturers, nonetheless impose some costs, and other burdens, on retailers. Littlefield Decl. ¶¶ 3-5; Vizyak Decl. ¶¶ 2-5. From time to time, retailers also face tort claims and other litigation relating to tire damage. *Id*.

Moreover, in the event of a tire failure involving a replacement tire, depending upon the circumstances, the consumer may attribute blame to the tire retailer, focusing on tire installation or on the types of tires recommended by the retailer. As with the tire companies, regardless of whether these concerns are well founded, they have a tendency to undermine the goodwill and the public image of the retailer. *See* Littlefield Decl. ¶ 2.

3. Public Citizen

The standing of petitioner Public Citizen is no less clear. Indeed, the Second Circuit allowed Public Citizen to challenge an earlier version of FMVSS 138, striking down the earlier rule.

Public Citizen is a non-profit, nationwide consumer advocacy organization founded in 1971 with a current membership of approximately 130,000. Claybrook Decl. ¶ 2. Public Citizen advocates before Congress, administrative agencies, and the courts for strong and effective health and safety regulation and has a long history of advocacy on matters related to auto safety. *Id.* ¶¶ 3-5.

Nearly all of Public Citizen's members either drive or ride in cars as passengers; given the number of members in this organization, it is inevitable that some will ride in vehicles equipped with a TPMS. Claybrook Decl. ¶ 2. Since under-inflated tires contribute to automobile crashes, Public Citizen's members will be subjected to a higher risk of injury than they would be if NHTSA required effective tire pressure monitoring systems. *See generally id.* ¶¶ 2-6.

As shown in the Declaration of Mr. David Westerlund and Ms. Joan Claybrook, Public Citizen has at least one member who plans to purchase an automobile covered by the TPMS rule. As the TPMS requirements are phased in, many more members will certainly purchase and ride in vehicles that will be equipped with a TPMS. Any injury that could occur to any driver or passenger in a

car, or to the owner of a car, can and will occur to Public Citizen members. Claybrook Decl. ¶ 2.

B. NHTSA's Decisions Have Caused Injury In Fact To Petitioners, And That Injury Will Be Redressed By A Favorable Court Decision

Article III standing requires a showing that: (1) a petitioner has suffered an injury that is concrete and particularized, and either actual or imminent (rather than conjectural); (2) the injury to the petitioner is causally related to conduct of the respondent; (3) it is likely, not speculative, that the injury will be redressed by a favorable decision. *Lujan v. Defenders of Wildlife*, 504 U.S. 555, 560-61 (1992). For the second element, Petitioners need not show that the acts of NHTSA "are the very last step in the chain of causation." *Bennett v. Spear*, 520 U.S. 154, 169 (1997). Under *Bennett*, Petitioners' injury is "fairly traceable" to the NHTSA standards if those standards permit automobile manufacturers to select and install TPMS systems in a manner that will lead to injury to Petitioners.

In addition, standing need not be shown for each petitioner – if any one petitioner has standing to pursue a claim, the standing of other petitioners is irrelevant. Further, to establish that they have standing, petitioners are not required to show that they will prevail on the merits. *Competitive Enter. Inst. v. NHTSA*, 901 F.2d 107, 113 (D.C. Cir. 1990) ("CEI"). Indeed, in evaluating standing, the Court presumes that the petitioners will prevail. *Florida Audubon Soc'y v. Bentsen*, 94 F.3d 658, 664 n.1, 665 (D.C. Cir. 1996).

Membership organizations – such as Public Citizen and TIA – have "associational standing" if (a) some members would have standing in their own right; (b) the interests the organization seeks to advance in the suit are germane to the organization's purpose; and (c) neither the claim asserted nor the relief requested require that the individual member participate in the suit. *Hunt v. Wash. State Apple Adver. Comm'n*, 432 U.S. 333, 343 (1977); *Nuclear Energy Inst., Inc. v. EPA*, 373 F.3d 1251, 1265 (D.C. Cir. 2004). As the Court observed in *CEI*, "[g]ermaneness is satisfied by a 'mere pertinence' between litigation subject and an organization's purpose." 901 F.2d at 111 (*quoting Humane Soc. of the U.S. v. Hodel*, 840 F.2d 45, 58 (D.C. Cir. 1988)).

Petitioners satisfy all the elements of Article III standing. The two Petitioners that are non-profit organizations are seeking to advance their interests in automotive safety and tire safety; these interests are certainly "germane" to the purposes of these organizations. *See, e.g.*, Claybrook Decl. ¶¶ 2-5. Additionally, NHTSA's decisions can effectively be reviewed without the participation of members from these organizations. Moreover, the declarations demonstrate comprehensively that each of the Petitioners will suffer an injury from the unsafe operation of tires that the NHTSA rules allow. Also, redress is available; a favorable decision by this Court would prevent or substantially reduce this injury.

Unless the agency's action is overturned by this Court, NHTSA's lax approach will certainly cause injury-in-fact to Petitioners. NHTSA's standards

will continue to allow for the operation of significantly under-inflated tires. NHTSA has already admitted that its TPMS standards will lead to more injuries, and more serious injuries, than the tire industry's alternative proposals. As noted above, NHTSA estimated that there would be more tire failures, more fatalities, more injuries and millions more in property damage if the TPMS rule, as promulgated, is implemented, compared to Petitioners' proposals. In sum, NHTSA has conceded that the injuries that all three classes of Petitioners claim are certain to occur, and that this harm is traceable to NHTSA's decision to adopt less stringent standards than those advocated by these parties.

In addition to Article III's requirements for standing, the Supreme Court has imposed judicially created prudential limits on the exercise of federal jurisdiction. To decide whether a litigant has prudential standing, the Court must ordinarily identify the interest that "the litigant seeks to vindicate and then decide if that interest is 'arguably within the zone of interests to be protected or regulated by the statute.'" *PDK Labs, Inc. v. DEA*, 362 F.3d 786, 791 (D.C. Cir. 2004) (*quoting Ass'n of Data Processing Serv. Orgs., Inc. v. Camp*, 397 U.S. 150, 153 (1970)). The "zone of interests" test, however, is "negate[d]" and need not be addressed where Congress specifically adopted legislation allowing any injured "person" to challenge agency actions. *Bennett*, 520 U.S. at 163-165. Here, NHTSA's enabling act specifically authorizes any "person adversely affected" by a NHTSA safety standard to file a petition for review challenging that standard. 49

U.S.C. § 30161(a). This eliminates any need to consider whether Petitioners have interests that are within the "zone-of-interests" protected by the statute.

In any event, the "zone-of-interest" test "is not demanding," and does not depend upon whether Congress intended to benefit or regulate the litigant. *PDK Labs*, 362 F.3d at 791. Rather, the zone-of-interest test "exclude[s] only those whose interests are so marginally related to or inconsistent with the purposes implicit in the statute that it cannot reasonably be assumed that Congress intended to permit the suit." *Clarke v. Securities Indus. Ass'n*, 479 U.S. 388, 399 (1987). Petitioners need only show that their interests are "arguably one regulated or protected by the statutory provision at issue." *Id*.

The interests Petitioners seek to vindicate here – avoiding injury by monitoring tire pressure – are not merely arguably within the purposes of the TREAD Act and the Safety Act, but *are* the purposes of the statutes. For these reasons, each of the Petitioners has standing to challenge the agency's actions.

V. ARGUMENT

A. Since The Issues Were All Raised And Decided In The TPMS Rulemaking, The Same Standard Of Review Applies To All of NHTSA's Actions

Previously, NHTSA argued that the agency's May 19, 2005 decision declining to initiate a rulemaking on tire reserve pressure should be subject to a more deferential standard of review than the agency's TPMS standards. This argument disregards the close connections between these two administrative

proceedings. To start with, the tire reserve pressure issue was expressly addressed in *both* proceedings. *See, e.g.*, 70 Fed. Reg. at 53088-53089 [JA1544-45]. Furthermore, in the TPMS rulemaking, NHTSA adopted the uniform 25 percent standard, but rejected RMA's argument that dashboard warnings should be illuminated when the inflation pressure falls below the level specified in the T&RA tables. Substantively, the same issues are implicated by the agency's adoption of the 25 percent trigger and by the agency's denial of RMA's petition for a rulemaking.

In this context, the only rational approach is to apply the same standard of review to all three issues raised by Petitioners. NHTSA's orders on safety standards should be "set aside if found to be arbitrary, capricious, an abuse of discretion, or otherwise not in accordance with the law." *Motor Vehicle Mfrs. Ass'n*, 463 U.S. at 41. This Court may not substitute its judgment for that of NHTSA, but is required to ensure that NHTSA "examine[d] the relevant data and articulate[d] a satisfactory explanation for its action including a 'rational connection between the facts found and the choice made.' In reviewing that explanation, [a reviewing court] must 'consider whether the decision was based on a consideration of the relevant factors and whether there has been a clear error of judgment.'" *Id*. at 43 (quoting respectively *Burlington Truck Lines v. United States*, 371 U.S. 156, 168 (1962), and *Bowman Transportation Inc. v. Arkansas-Best Freight Sys., Inc.*, 419 U.S. 281, 285 (1974)). "Normally, an agency rule

would be arbitrary and capricious if the agency has relied on factors which Congress has not intended it to consider, entirely failed to consider an important aspect of the problem, offered an explanation for its decision that runs counter to the evidence before the agency, or is so implausible that it could not be ascribed to a difference in view or the product of agency expertise." *Id*.

Ordinarily, a different standard may apply to an agency's decision not to *initiate* a rulemaking. Such decisions may be overturned "only for compelling cause, such as plain error of law or a fundamental change in the factual premises previously considered by the agency." *National Customs Brokers & Forwarders v. United States*, 883 F.2d 93, 97 (D.C. Cir. 1989). This standard, however, should not be applied to Petitioners' challenge to NHTSA's May 19, 2005 order for three reasons. First, the issues raised by the May 19 order are identical to issues raised and resolved in the agency's April 8, 2005 and September 7, 2005 orders.

Second, this is not a case in which the agency's priority setting is at issue. NHTSA did not avoid treatment of the issues discussed in the May 19, 2005 order, but considered and resolved them as part of the TPMS rulemaking. Consequently, the record is well developed, and in reviewing the agency's action, the Court will not be setting the agency's priorities any more than it does in reviewing any final rule.

Third, agency decisions relating to public safety are in a different category and require more probing judicial review. As the Court noted in *National*

Customs Brokers, when the case implicates "grave health and safety problems for the intended beneficiaries of the statutory scheme," the Court can and should ensure that these problems are appropriately addressed. 883 F.2d at 103 (citing *Farmworker Justice Fund, Inc. v. Brock*, 811 F.2d 613, 633, *vacated as moot*, 817 F.2d 890 (D.C. Cir. 1987); *AHPA v. Lyng*, 681 F. Supp. 949, 958 (D.D.C. 1988); and *Public Citizen v. Heckler*, 653 F. Supp. 1229, 1241 (D.D.C. 1986)).

In any event, the touchstone of any and all judicial review of agency action is the statutory mandate. Congress has required that safety shall be the overriding consideration in the issuance of standards, and, in the TREAD Act, specifically directed NHTSA to promulgate a standard that applies to all tires. No matter what standard of review applies to NHTSA's decision-making, it is evident that NHTSA has failed to meet these requirements.

B. NHTSA's Adoption Of The 25 Percent Standard And Its Failure To Establish A Tire Reserve Pressure Requirement Was Inconsistent With Statutory Requirements And Was Arbitrary And Capricious

1. NHTSA's Failure To Adopt A Tire Reserve Pressure Requirement Was Unlawful

Congress directed NHTSA to develop a rule requiring a dashboard warning light whenever a tire was significantly under-inflated. Although Congress did not expressly define "significantly under inflated" as "below the T&RA safety standards embedded in NHTSA's regulations," there is ample basis for concluding that this was indeed what Congress intended. Long before enactment of the

TREAD Act, Congress directed NHTSA to establish safety standards requiring that all vehicles are "equipped with tires that meet maximum load standards when the vehicle is loaded with a reasonable amount of luggage and the total number of passengers the vehicle is designed to carry." 49 U.S.C. § 30123(c) (previously 49 U.S.C. § 30123(f)). For decades, NHTSA has met this Congressional mandate by adherence to the T&RA standards. *See* 49 C.F.R. § 571.110. Consequently, the logical way to reconcile Section 13 of the TREAD Act with the original statutory provision is to connect the definition of "significant under-inflation" to the T&RA standards. Unless a monitoring system is able to measure actual vehicle load, a tire without the inflation pressure necessary to support a vehicle's maximum load should be considered significantly under-inflated.

In its TPMS standards, however, in setting the trigger for activation of dashboard warnings, the agency rejected use of these long-established T&RA standards. The agency decided that TPMS warnings would not be based upon whether the tires have the air pressure necessary to support the vehicle's *actual load*. Nor would the warnings be based upon whether the tires have the air pressure necessary to support the vehicle's *maximum load*. Instead, the warnings would be triggered by a uniform 25 percent drop from the vehicle manufacturer's recommended placard pressure. Yet, as explained below, neither the starting point

chosen by the agency nor the 25 percent figure provide any consistent level of safety for consumers.[21]

Furthermore, the T&RA tables are used by NHTSA's sister agency, the FMCSA, to ensure the safe operation of commercial vehicles, including vehicles over 10,000 pounds. *See* 49 C.F.R. §§ 390.5, 393.75; *see also* RMA Comments, pp. 4-5, 9-10 (11/10/04); [JA1026-27, 1031-32]. The very load tables used to ensure the safe operation of commercial vehicles were inexplicably disregarded in NHTSA's TPMS standards applicable to passenger cars and light trucks. RMA raised this point during the rulemaking, but the agency never directly responded. This was itself arbitrary and capricious. *Cross-Sound Ferry Servs., Inc. v. ICC*, 738 F.2d 481, 484 (D.C. Cir. 1984). Since the agency never dealt with this point, it failed to consider all "relevant factors." *Citizens to Preserve Overton Park v. Volpe*, 401 U.S. 402, 416 (1971).

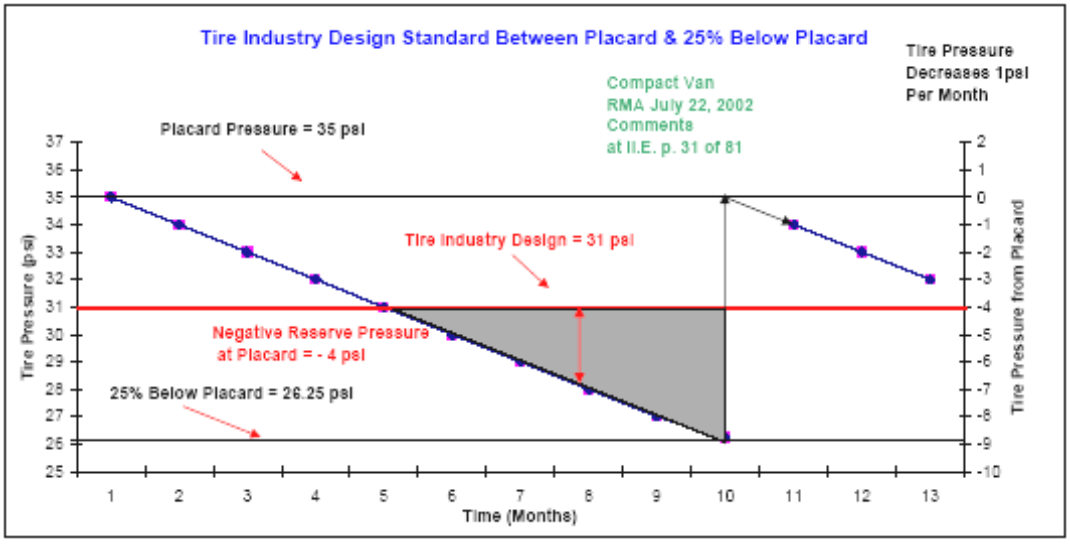
[21] In 2003, the Second Circuit upheld the 25 percent test that was then embedded in NHTSA's TPMS rule. *Public Citizen*, 340 F.3d at 61-62. The Second Circuit's ruling, however, was based on the cost-benefit analysis prepared by the agency in 2002. *Id*. Extensive new evidence on the effects of the 25 percent standard was submitted to NHTSA *after* the Second Circuit's ruling. The agency's 2005 decision therefore must stand or fall based upon this new evidence. Additionally, the agency's 2002 decision adopting a 25 percent test was coupled with a decision establishing a 10 minute activation period. The agency later jettisoned the 10 minute activation period, thereby increasing the harmful effects of the 25 percent standard. *See generally* RMA Comments, pp. 4-6, 14-15 (11/10/04) [JA1026-28, 1036-37].

2. In Using The Placard Pressure As The Starting Point And In Requiring Warnings Based Upon A Uniform 25 Percent Standard, NHTSA's Overall Approach Was Arbitrary And Capricious

As explained above, the placard pressure established by the vehicle manufacturer is not, primarily, a safety standard (*i.e.*, a numerical limit derived based on safety considerations typically with some margin of safety). The placard level is established by taking into account ride comfort and other factors. In fact, using the placard pressure as the starting point and a uniform 25 percent standard results in many tires operating well below the T&RA standards. This was confirmed by the real-world examples cited in RMA's submissions to NHTSA and is illustrated in Figure 4 below and Figure 1 above at p. 20.

In the first example (involving a compact van) (Figure 4), the vehicle operates without adequate pressure for substantial periods of time, typically for as long as five months if pressure is unadjusted and is lost on a gradual basis.

FIGURE 4: Vehicle Operates Below Tire Industry Design Standard Much of the Time



A second real world example shows a vehicle with the same placard pressure of 35 psi (Figure 1, above at p. 20). Yet this vehicle operates essentially its entire service life at pressures below the T&RA standard.[22]

If the uniform 25 percent below placard pressure is used to trigger a warning, roughly 58 percent of the vehicle-tire combinations will operate at tire pressures between 1 psi and approximately 9 psi below the T&RA design standard. The time period ranges from a short period of time to essentially the entire service life of the tire. Essentially, then, NHTSA's approach provides varying degrees of protection for consumers. The agency's approach certainly did not ensure that all or even most drivers would receive warnings when "a tire" is "significantly under inflated," as directed by Congress.[23]

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[22] This example can be found at RMA Petition for Reconsideration, Attachment II.E, p. 52 (07/22/02) [JA0544].

[23] This is especially true with respect to 15 passenger vans, where NHTSA ignored the recommendation of a sister agency in setting pressure levels. NHTSA and the National Transportation Safety Board (another safety agency within the U.S. Department of Transportation) have issued five advisories warning that 15-passenger vans are unsafe partly because under-inflation of tires poses substantial risk to drivers and passengers. In fact, the NTSB recommended that NHTSA "should adopt more stringent detection standards than "25 . . . percent below manufacturer-recommended levels, since pressures at those levels can have an adverse effect on safe handling. . . ." *See* NTSB Safety Recommendation In Reply to H-033-12 through 17, p. 11 (August 9, 2003).

3. In Rejecting A Tire Reserve Pressure Requirement And In Rejecting A Variable Trigger For Dashboard Warnings, NHTSA Relied Upon A Flawed Cost-Benefit Analysis

(a) NHTSA Understated the Economic Benefits of the Tire Reserve Pressure Requirement

As NHTSA acknowledges, both "[t]heory and limited testing show that low tire pressure has a significant impact on all [sudden air loss, vehicle handling, and hydroplaning accidents]."[24] Under-inflated tires can contribute to sudden air loss or tire failure, "crashes which result from: an increase in stopping distance; skidding and/or a loss of control of the vehicle in a curve or in a lane change maneuver; or hydroplaning on a wet surface."[25] Nevertheless, in calculating the potential benefit of a tire reserve pressure requirement, the agency failed to take into account many of these impacts. Specifically, NHTSA did not consider *any* cost savings resulting from reduced tread wear, greater fuel efficiency, and avoided property damages and travel delays.[26]

The economic benefits of requiring all tires to operate at or above the tire industry design standard can be derived from the economic benefits NHTSA calculates for the final TPMS rule. NHTSA computed cost savings from increased fuel efficiency, reduced tire wear and reduced property damage of between $521 to

[24] NHTSA Preliminary Economic Assessment, p. ii (07/01/01) [JA0045].

[25] NHTSA Notice of Proposed Rulemaking, 66 Fed. Reg. at 38988 [JA0166].

[26] FRIA on TPMS, pp. ii-iii (04/15/05) [JA1166-67].

$596 billion in present value.[27] NHTSA assumed that gasoline cost $1.03 to $1.08 per gallon (excluding fuel taxes of $0.38 per gallon, since these are a transfer payment and not a cost to society). FRIA on TPMS, pp. V-56-57, Table V-26 and V-27 (04/15/05) [JA1266-67]. Gasoline prices were projected "to steadily decline from 2001 through about 2005 when they will level off." FRIA on TPMS, p. V-55 (04/15/05) [JA1265]. The assumption of $1.08 per gallon for gasoline was obviously out-of-date even at that point in time, and understates the benefits substantially. In any event, more fully inflated tires provide increased fuel efficiency and reduce tire wear.[28] NHTSA calculated this economic benefit based solely on an average increase in tire pressure of 4.5 psi in 27.5 percent of the vehicles covered by the rule.[29]

A tire reserve pressure requirement would of course increase the effective floor on tire pressure from 25 percent below placard to the tire industry design standard. NHTSA calculated that the average tire pressure prior to the implementation of the rule (*e.g.*, 23.2 psi for passenger vehicles) would increase by

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[27] This total benefit ranged from $392 to $312 million due to increased fuel economy, $72 to $103 million due to decreased tread wear, and $132 to $106 million due to reduced property damage/travel savings. *See* FRIA on TPMS, pp. iii and iv (04/15/05) [JA1167, 1169].

[28] The relationships given in the FRIA are confirmed in the NAS Tire Report, pp. 73-74 (2006).

[29] "26 percent of passenger cars and 29 percent of LTVs have at least one tire that is 25 percent or more below recommended placard pressure." FRIA on TPMS, p. V-21 (04/15/05) [JA1231]. The average is 27.5 percent.

3.8 psi for passenger vehicles and by 5.2 psi for light trucks (with a weighted average of 4.5 psi). *See generally* FRIA on TPMS, pp. V-5 to V-6 and V-54 to V-63 (04/15/05) [JA1215-16, 1264-73]. Similarly, if the warning is provided whenever the tire pressure reaches the T&RA standard, the average pressure further improves above that achieved by NHTSA's TPMS rule by approximately 4.5 psi.[30] Moreover, this increase applies to 58 percent of the vehicles in the fleet.[31]

The economic benefit of increasing the lowest permissible pressure should be directly proportional to the economic benefits calculated for the final TPMS rule. NHTSA simply *assumed* (without support in the administrative record) that any further increase in tire pressure would result in no benefits.[32] Yet the National Academy of Sciences recently concluded that:

> the relationship between rolling resistance and sidewall deflection due to load is approximately **linear**, so

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[30] This results in an average improvement in the tire pressure of about 4.5 psi based on the RMA study of the difference between minimum tire pressure allowed by the TPMS rule (*i.e.*, 25 percent below placard) and the T&RA tire pressure design standard. *(See* Figure 2). 4.5 psi is one half of the 9 psi range of differences in pressure. Also, the average is 4.5 psi if one weights each psi increment of pressure below the T&RA standard by percentage of vehicles in that psi increment (*i.e.,* 1 psi times 7 percent plus 2 psi time 14 percent, etc. divided by the total percentage with pressure differences (58%).

[31] *See* RMA Petition for Reconsideration, Attachment II.C, p. 1 and Attachment IV.A, p. 2 (07/22/02) [JA0481, 0576].

[32] "[I]f the placard pressure were 30 psi, and a warning were given at 22.5 psi (25 percent below placard), **no benefits are assumed for** those vehicles that have tires with lowest pressure above 22.5 psi." FRIA on TPMS, p. V-54 (04/15/05) [JA1264].

> increasing the load on a tire results in a near-proportional increase in total rolling resistance … [which in turn is related to fuel efficiency and tire wear. T]his linear relationship allows rolling resistance to be expressed as a coefficient with respect to load under normal operating conditions. . . . for conventional passenger tires, an increase in inflation pressure from **24 to 29 pounds** per square inch (psi) will reduce rolling resistance by 10 percent. For a tire inflated to pressures between **24 and 36 psi**, each drop of 1 psi leads to a 1.4 percent increase in its rolling resistance. The response is even greater for pressure changes below 24 psi. Maintenance of tire pressure is therefore important in preventing excessive deformation and hysteresis, as well as in achieving intended wear, traction, handling, and structural performance.[33]

NAS specifically found that there was a linear relationship between rolling resistance (and, therefore, fuel economy and tire wear) when pressure increases from 24 psi to 36 psi, precisely the increase which NHTSA claimed had no benefit. NHTSA's claim that no benefits occur above a pressure equal to 25 percent below the placard also was inconsistent with the Goodyear data that NHTSA relied upon in calculating benefits for the rule.[34] Furthermore, NHTSA concluded in 2002 that triggering a TPMS warning at 20 percent of the placard (approximately 1.5 psi higher than 25 percent below placard for the average placard) would result in benefits "higher than from the 25 percent threshold."[35]

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[33] NAS Tire Report, p. 46 (2006) (emphasis added).

[34] The Goodyear data utilized by NHTSA included data at pressures ranging from 17 psi to 35 psi. FRIA on TPMS, p. III-5 (04/15/05) [JA1193].

[35] FRIA on TPMS, p. II-14 to II-15 (04/15/05) [JA1185-86].

Using a simple ratio approach, the economic benefit of using the T&RA standard as a baseline for tire pressure warnings is 2.11 times the economic benefit of the TPMS rule.[36] This is equal to $1.1 billion to $1.3 billion in avoided costs.

(b) NHTSA Understated The Number of Fatalities And Injuries That Would Be Avoided By A Tire Reserve Pressure Requirement

In addition to understating the economic benefits of the tire reserve pressure, NHTSA underestimated the non-economic benefits.

(i) NHTSA's Estimate Of Fatalities and Injuries Avoided Is Inconsistent With Its Estimate Of Fatalities Saved From the TPMS Rule

As with the economic benefits, NHTSA's prediction of a total of 4 "fatalities avoided" from the difference in benefits in the TPMS rule and T&RA proposal is contradicted by NHTSA's own benefits estimate of 122 fatalities avoided by the increase of 4.5 psi resulting from its final TPMS rules.

The agency estimated the fatalities avoided by determining the total universe of tire-related fatalities and reducing the total number of fatalities by the percentage reduction in tire failure rate as the reserve pressure at GAWR increases from 2 psi to 8 psi (Table 1). NHTSA assumed that "fatality and injury reductions

[36] The increase in the average tire pressures in the TPMS and tire industry proposal are the same (4.5 psi). Thus, the benefit increases by 58 percent divided by 27.5 percent or 2.11.

were proportional to failure reduction." Using the same proportional relationship, the estimated fatalities avoided from the RMA proposal would be 257 (112 times 2.11), not 4. [37]

[37] NHTSA Report on Data on Tire Reserve Pressure, p. 28 (05/17/05) [JA1444].

TABLE 1: NHTSA'S CALCULATION OF FATALITIES REDUCTION

Data Source	Fig.	R^2 Exp	R^2 Straight Line Trend+	Tire Failure Rate At GAWR 2 PSI+	Tire Failure Rate 8 PSI	% Reduction Tire Failure Rates++	Calculation	Fatalities Avoid-ed+++
NHTSA Special Order Analysis	**5**	NA	NA	1.988	1.882	2.15%	**2.15% x 414 x 0.436**	**4**
PETITIONERS' REVISED ESTIMATE OF FATALITIES AVOIDED USING ALL DATA								
Cars, SUVs and Pickups with P-Metric Tires, Front and Rear Tires Combined	**5**	**Exponential Trend Line**						
		0.990	NA	6.5	2.9	55.4% ((6.5 – 2.9)/6.5)	**55.4% x 745**	**412**
		Straight Line Trend						
		NA	0.880	6.0	3.8	36.7% ((6.0 – 3.8)/6.0)	**36.7% x 745**	**273**
PETITIONERS' REVISED ESTIMATE OF FATALITIES AVOIDED USING DATA EXCLUDING TIRES SUBJECT TO RECALLS AND SAFETY PROGRAMS								
Cars, SUVs and Pickups with P-Metric Tires, Front and Rear Tires Combined	**6**	**Exponential Trend Line**						
		0.680	NA	2.1	1.4	33.3% ((2.1 – 1.4)/2.1)	**33.3% x 745**	**248**
		Straight Line Trend						
		NA	0.720	1.9	1.5	21.1% ((1.9 – 1.5)/1.9)	**21.1% x 745**	**157**
Fatalities Avoided Based on NHTSA's TPMS Benefits Calculation	**Not applicable—Simple Ratio Method**							**236**

Data Source: NHTSA Report on Tire Pressure Reserve (05/17/05) [JA1410].

Explanation of Table

+ See Figures 2 and 4.

++ The 2.15 percent utilized by NHTSA is derived from the output of the LifeReg statistical program. (NHTSA Report on Tire Pressure Reserve; [JA1410].) The percentage reductions in this Table are the tire failure rate where the trend line for

either exponential or straight line trend crosses 2 psi minus the tire failure rate where the trend line crosses 8 psi divided into the tire rate for 2 psi times 100.

+++ The fatalities avoided equals the total universe of tires times percent reduction in the tire failure rate from 2 psi to 8 psi. NHTSA's fatalities avoided calculation for the tire reserve pressure requirement assumed that the total tire-related fatalities (which the agency claimed was 414) should be reduced by 43.6 percent because the tire failures excluding the tire subject to a recall and safety program are 43.6 percent of the total tire failures reported.

Even using NHTSA's own conceptual method (*i.e.*, multiplying the percent reduction in tire failures due to increased tire pressure by the total universe of tire-related failures), the estimated fatalities avoided range from 157 to 412. This range is based upon use of all of the actual data on total fatalities and the trends in decreasing tire failure rates as reserve pressure at GAWR; this range does not apply an unnecessary and inappropriate model that suppresses the impact of under-inflation. As is readily apparent from Table 1, moreover, the Special Order data indicate that the reduction in fatalities is much greater than the 2.15 percent estimated by NHTSA. The correct figure is actually 21.1 percent (if recalls are omitted) or 55.4 percent (if data from recalls are included).

(ii) NHTSA Ignored Its Own Estimates of Fatalities Related to Tires

NHTSA also under-estimated fatalities insofar as it did not include fatalities avoided from skidding accidents and decreased stopping distance.[38] The

[38] FRIA on TPMS, p. V-53, Table V-24 (04/15/05) [JA1263]. The TPMS rule contains extensive calculations to translate degree of under-inflation into the effect on skidding, loss of control, stopping distance among other things. For the purpose of this discussion, these calculations have been accepted. As noted above in discussing the

(continued...)

total number of fatalities is 745 (414 from sudden air loss, as calculated by NHTSA, plus 247 from loss of control and skidding accidents as calculated by NHTSA,[39] and 84 from lower stopping distances based on NHTSA's calculation from the TPMS rule, adjusted for the greater number of vehicles affected[40]).

Indeed, NHTSA's estimate of annual fatalities of 414 for sudden air loss is 56 percent lower than the 647 fatalities for sudden air loss reported by NHTSA's own Fatality Analysis Reporting System.[41] The discrepancy between these figures – the hundreds of fatalities versus the 4 fatalities assumed by NHTSA – is striking.

(continued...)

economic benefits, nothing in the FRIA (except conclusory statements) and nothing in the data, the NAS report, or generally accepted scientific principles provide any basis for concluding these benefits would simply cease at a pressure equal to 25% below placard.

[39] FRIA on TPMS, p. IV-5 (04/15/05) [JA1204].

[40] NTSHA calculated 40 avoided fatalities due to shorter stopping distances from the implementation of the TPMS rule. This reduction in the stopping distance was calculated based on the average increase in tire pressure. The decrease in stopping distance is a function, *inter alia*, of the amount of physical friction between the tire and the road. The lower the pressure in the tire, the less ability the tire possesses to grip the road and, therefore, the longer the distance between initiation of braking and stopping. In fact, "NHTSA developed a model that predicts Mu, based on Vi and inflation pressure" based on the data supplied by Goodyear. 84.4 fatalities avoided is derived from the 40 fatalities multiplied the 2.11 factor used to convert the TPMS rule benefits to the tire reserve pressure rule benefits. FRIA on TPMS, p. V-53, Table V-24 and pp. V-27 and V-28 (04/5/05) [JA1263, 1237-38].

[41] FRIA on TPMS, p. IV-8 (04/15/05) [JA1207].

(iii) NHTSA's Exclusion of Recalled Tire Data

NHTSA originally requested extensive information on tire failures on tires subjective to recalls and safety programs (such as the Firestone tires and the Ford safety program) in its January 2003 Special Order. Yet in its analysis of the Special Order data, the agency completely excluded all tire failure data on tires subject to recalls and safety programs.[42] This directly impacted the agency's assessment of trends in tire failure rates (and the resulting calculation of the percentage reduction in tire failure rates from 2 psi to 8 psi).[43] It also lowered the number of total tire-related fatalities (reducing the total fatalities by 43.6 percent to reflect the ratio of non-recall tire failure claims to the total number of tire failure claims).[44]

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[42] Additionally, NHTSA excluded all tires with the same model, size, and year as those subjected to a particular recall that was announced after it received the Special Order data. NHTSA Report on Data on Tire Reserve Pressure, p. 11 (05/17/05) [JA1427].

[43] The agency's approach obscured the exponential trend clearly visible in the plots using all data. (*Compare* Figures 5 and 6). Further, the ability to calculate tire failure rates becomes difficult, if not impossible, when there are too few measurements. Dr. Coffey (at p. 7) cites W. G. Cochran's paper, Sidney Siegel's book, and the NIST/SEMATECH online Engineering Statistics Handbook. (*See* generally RMA Letter and Chi Studies Review, p. 7 (04/02/03) [JA0789].)

[44] NHTSA Paper on Analysis of Tire Reserve Load, p. 5 (05/17/05) [JA1471]. Only 3.2 million of the recalled tires had failure rates that were excessive compared to the industry average.

NHTSA excluded these data even though it did "not know how tire recalls influence claims for recalled tires and for other, similar tires." The agency admitted that this "question may have implications for the analysis."[45]

The agency's approach ultimately created a serious bias. Discarding the "recall" data removed 17.3 million tires subject to a recall or safety program. (This was 9.6 percent of the total number of tires, and 4,828 tire failures or 63.8 percent of the total tire failures).[46] More significantly, this removed 58 percent of the tire failures with reserve pressures between 0 to 5 psi, 20 percent of the tire failures with reserve pressures between 6 to 10 psi, and only 3.7 percent of the tires with reserve pressure of between 15 psi to 20 psi. As a result, removal of the recall and safety program tire failure rate data preferentially removes most of the data in the very tire pressures of most significance.

Despite the fact that it had already concluded that under-inflation was one of the factors leading to the recalls, NHTSA assumed all recalled and safety program tires were *defective* and, therefore, would provide no meaningful

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[45] NHTSA Report on Data on Tire Reserve Pressure, p. iv (05/17/05) [JA1416].

[46] NHTSA found that only 3.2 million of the recalled tires had failure rates that were excessive compared to the industry average. (NHTSA ODI Resume, Investigation EA00-23, Tire Tread Separation, Tire Failure Report Summary (12/10/01). *See also* Bridgestone/Firestone Root Cause Analysis Report available at: http://www.bridgestoneamericas.com/news/mediacenter/recall_archives/homeimgs/rootcause.htm in Figure 13. *See also* n.49, *infra*. Additionally, tires removed from service pursuant to a safety program by the vehicle manufacturer might have been removed for commercial reasons (*e.g.*, customer goodwill) and may not have been defective at all.

information on the impact of under-inflation on tire failure rates for non-defective tires.[47] NHTSA, however, previously concluded that "under-inflation was one of the factors contributing to the Firestone ATX and Wilderness tires" on the Ford Explorer.[48] In fact, according to NHTSA, the "rate of tread separation failures" of the Firestone tires on the Ford Ranger pickup trucks (a vehicle which uses the same vehicle frame as the Ford Explorer) "is lower tha[n] the rate of such failures on [Ford] Explorers for a variety of reasons, including that ... the tires on the Explorer had a significantly lower recommended inflation pressure [*i.e.*, 26 psi versus 30 psi] (especially on the rear wheels)."[49] Thus, the largest portion of the tires excluded from the analyses (the Firestone tires) showed increased tire failures due to under-inflation.

NHTSA's reduction of the total tire-related fatalities by 43.6 percent because of the large number of recall and safety program tire claims was particularly inappropriate because the tire failure data utilized by NHTSA was

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[47] 67 Fed. Reg. 10050, 10051 (March 5, 2002) [JA0382-83]. *See also* NHTSA Final Regulatory Evaluation - New Pneumatic Tires, p. I-2 (06/12/03) [JA0800].

[48] 67 Fed. Reg. 10050, 10051 (March 5, 2002) [JA0382-83]. *See also* NHTSA Final Regulatory Evaluation - New Pneumatic Tires, p. I-2 (06/12/03) [JA0800].

[49] NHTSA, Engineering Analysis Report and Initial Decision Regarding EA00-023: Firestone Wilderness AT Tires, p. 3 (October 4, 2001), *available at*: http://199.79.180.162/prepos/files/Artemis/Public/Recalls/2001/T/RCNOC-01T016-4537.pdf.

based on information from 1995 to 1998. This was prior to the Firestone recall in 2000.[50]

More importantly, the benefits of a tire reserve pressure requirement should include any fatalities avoided, even when the tire is otherwise subject to a recall or safety program. If higher inflation reduces tire failure (and prevents fatalities) for tires subject to a future recall or safety program, this is still a benefit.

(iv) NHTSA Used Inappropriate Subcategories of Vehicles

In order to determine the trend in tire failure rates with pressure, NHTSA disaggregated tire failure data into 14 categories.[51] This resulted in many categories containing too few vehicles upon which to calculate the tire failure rates to provide meaningful information. Even according to NHTSA, tire failure rates are "unreliable" when there are "small" numbers of vehicles in the subcategory that is being statistically compared.[52] The tire industry had warned NHTSA that "all but a few of the" subcategories of vehicles selected "violated basic [statistical]

[50] FRIA on TPMS, p. IV-8 (04/15/05) [JA1207].

[51] Front and rear tires; cars, sports utility vehicles, light trucks, and vans; vehicles with passenger (or P-metric) tires and those with light truck tires.

[52] NHTSA Report on Relationship Between Tire Reserve Load Percentage and Tire Failure Rate, p. 3 (11/02/05) [JA1560].

requirements" because "these tests contained too few observations to support reliable statistical testing."[53]

(v) The Special Order Data Do Not Support NHTSA's Conclusion

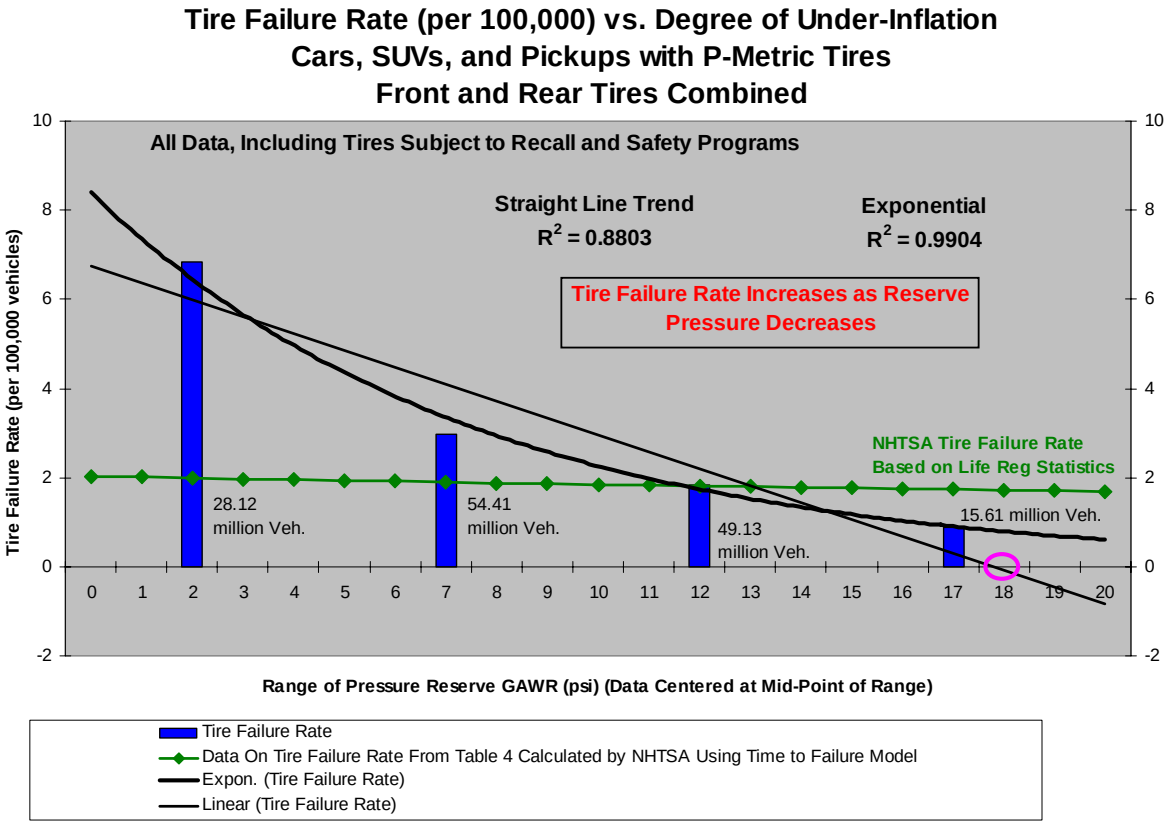
NHTSA concluded that there was either no increase in tire failure rates with lower tire reserve pressure, or only a small linear increase. 70 Fed. Reg. at 28895 [JA1517]. The record shows otherwise.

When actual tire failure rates are plotted versus the reserve pressure at GAWR, there is a clear, undeniable exponential trend of increasing tire failure rates as tire pressure decreases. The tire failure rates for all passenger tires on SUVs, light trucks, and passenger vehicle increase exponentially as tire pressure decreases.[54]

[53] RMA Letter and Chi Studies Review, pp. 2-3 (04/02/03) [JA0784-85].

[54] These figures simply plot the data in Table 4 of NHTSA's Report on Data on Tire Pressure Reserve from using the standard Microsoft Excel spreadsheet [JA1426]. The Excel spread sheet has an automatic function that plots trend lines. Trend lines are used to graphically display trends in data. When a trend line is fitted to data, the Excel program can calculate the R-squared value (also known as the "goodness of fit"). This is a statistical test of how much variation there is between actual data and the line that represents the equation to which the data is being applied. A trend line is most reliable when its R-squared value is at or near 1. For the data in Figure 5, the fit for the exponential curve is 0.9904.

FIGURE 5



Data Source: NHTSA Report On Data On Tire Pressure Reserve (05/17/05) [JA1410].

The tire failures for passenger cars, SUVs, and pickup trucks using P-metric tires were combined and the total number of vehicles in these subcategories divided into the tire failures to obtain the tire failure rates for this combined subcategory. These tire failure rates were plotted versus the reserve pressure at GAWR to assess the shape of the trend of tire failure with decreasing tire pressure. This subgroup was selected because: (1) the vehicles have generally similar handling, weight, and uses; (2) the tires are similar; (3) these vehicles account for roughly 83 percent of the total number of vehicles; (4) the total number of vehicles

that is represented by each point is substantial (15.6 to 54.4 million vehicles for each tire failure rate plotted); (5) it excludes categories that have large variations in tire failure rates and vehicle characteristics (such as vans);[55] and (6) this grouping avoids overemphasis on categories with small numbers of tire failures or vehicles.[56] This is actually similar to what NHTSA did. NHTSA "considered separately tires designed for passenger cars ("P-metric tires"), which are usable on many smaller light trucks and SUVs, and those designed specifically for light trucks ("LT tires")."[57]

Even when the actual data are plotted excluding the tire failures for tires subject to recalls or safety programs, as NHTSA did, the data still show an increase in the tire failure rate as pressure decreases.

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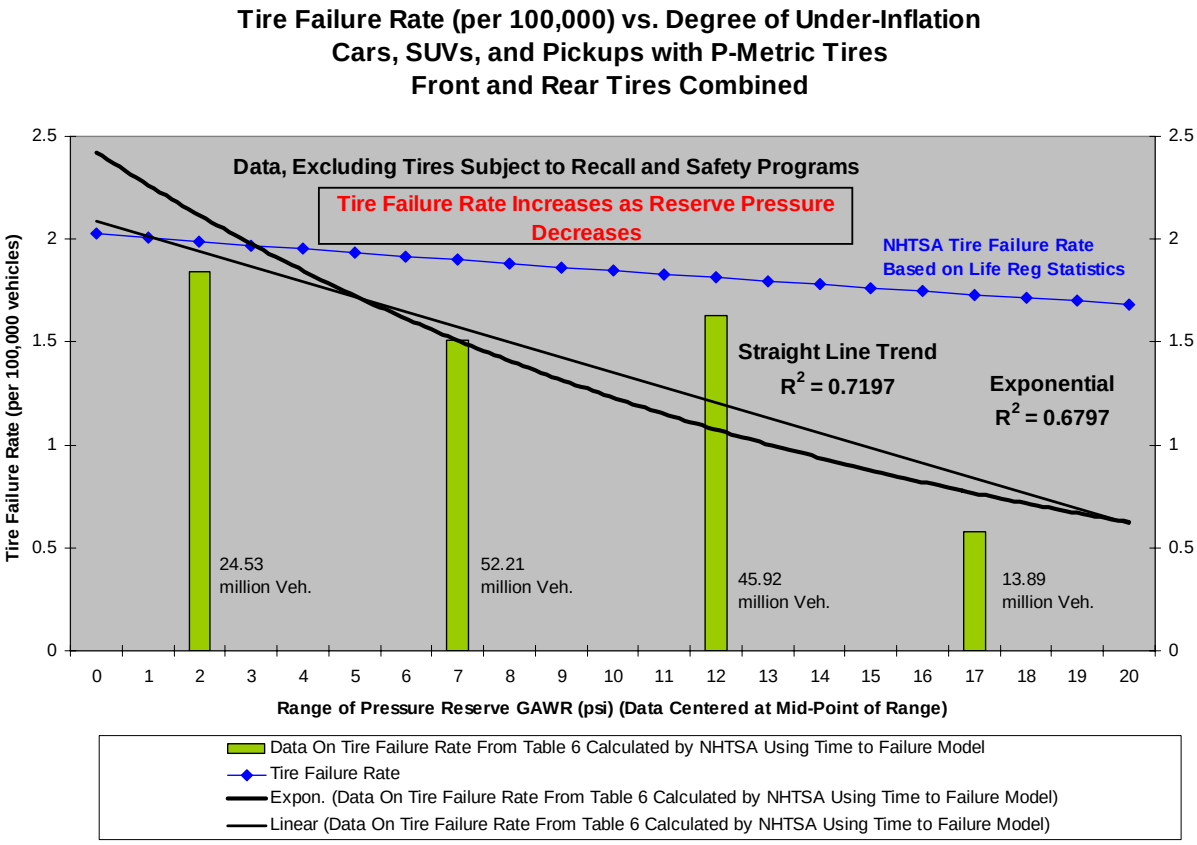
[55] According to NHTSA, the "rate for large vans … should not be used to make assessments of the fatality rate to the occupants of 15-Passenger Vans" because the "largest proportion [of vans] included in . . . [this vehicle category] are cargo and other commercial vans." NHTSA, Traffic Safety Facts, Research Note, Passenger Vehicle Occupant Fatality Rates By Type and Size of Vehicle, p. 2 (January 2006), *available at*: http://www-nrd.nhtsa.dot.gov/pdf/nrd-30/NCSA/RNotes/2006/809979.pdf.

[56] Table 4 from NHTSA's Report on Data on Tire Pressure Reserve [JA1426] shows that tire failure rates increase as tire reserve pressure decreases in 10 of these 14 categories selected by NHTSA (representing a little over 86 percent of vehicles produced). The categories in this Table that do not show an increase in tire failure rates as pressure decreases are categories with very small numbers of vehicles or tire failures or which involve a category of vehicles which is not homogeneous.

[57] NHTSA Paper on Analysis of Tire Reserve Load, p. 2 (05/17/05) [JA1468].

FIGURE 6



The data better fit an exponential trend line; however, to avoid overstating the rate of change, both exponential and linear trend lines are plotted. Thus, the actual Special Order data (with or without the recalls and safety program data) show a direct relationship between tire pressure and tire failure.

The percentage reduction in tire failure rate is derived from the actual tire failure rates in Figures 5 and 6 for the reserve pressure at GAWR as it changes from 2 psi to 8 psi (*i.e.*, the same reference pressures chosen by NHTSA). Plugging these values into Table 1, on page 60 above, shows how badly NHTSA's analysis distorted the true impact of a tire reserve pressure.

(vi) NHTSA Substituted an Inappropriate Model for Analysis of its Data

Rather than use the actual failure rates derivable from its own data, NHTSA used a model to calculate a "lifetime" tire failure rate.[58] This model, LifeReg, showed a rate which is almost constant over the life of a tire.[59] This approach did not properly reflect the evidence in the record.[60]

NHTSA candidly admits that it selected the version of the model that it used because it "produced estimates that the failure rate was constant over the age of the vehicle."[61] This "result seemed preferable to … [a]ll other forms [of the

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[58] Based on the administrative record, it was not possible to determine what NHTSA did to derive the 2.15 percent incremental tire failure rate, how this statistical model was applied and what underlying assumptions were used in the model. Through a series of Freedom of Information Act ("FOIA") requests, petitioners obtained from NHTSA over 200 computer files consisting of 1,796 pages, which provide some of the missing explanations. These FOIA documents were placed in the administrative record on August 3, 2006. [JA1717-18.]

[59] The LifeReg statistical program calculated that the tire failure rate for all tires on all vehicles varied from 1.882 to 1.988 per 100,000 vehicles as the reserve pressure increases from 2 psi to 8 psi. Effectively, this is nearly a constant rate (*see* green lines on Figures 5 and 6). NHTSA Statistical Analysis of Tire Failure vs. Tire Reserve Load Percentage, p. 22 (11/02/05) [JA1613].

[60] NHTSA did not need to convert the reported tire failure rates to a "lifetime tire failure rate" in this situation, and it provided no clear explanation for making this conversion. The un-manipulated average tire failure rate is a sound measure of the average tire failure rate, as the un-manipulated data is a snapshot of the actual conditions of actual tires. While the universe examined (tires which failed from 1996 to 2002), includes some new and old original equipment tires and some new and old replacement tires, there is no reason to conclude the distribution of tires, tire failures or fatalities dramatically changed over this particular period. Thus, the snapshot provided by the actual data should be accurate and reflect reality.

[61] NHTSA Report on Data on Tire Reserve Pressure, p.20 (05/17/05) [JA1436].

model which] produced estimates that the failure rate increased greatly with age."[62] That is, NHSTA picked this model because it was the only one that did not show increases in tire failure rates as vehicles age. NHTSA's approach apparently was based on the assumption that tire failure rates "among non-recalled tires are fairly level for vehicles aged 1 through 4 years."[63] Yet this assumption was not supported by the data in the record.

NHTSA overlooked the fact that "[b]eginning in about the third year, some fraction of owners begin to replace their original equipment (OE) tires and this fraction grows rapidly in the fourth and fifth years."[64] The effect of the replacement of most of the tires due to tire wear prior to tire failure is to artificially lower the estimated tire failure rates for the older vehicles (compared to the level of tire failure that would exist if tires were not removed from service). The calculated failure rate is reduced since these replacement tires are mostly new tires. NHTSA's reliance on tire failure versus the years of *vehicle* use is thus misplaced

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[62] NHTSA Report on Data on Tire Reserve Pressure, p.20 (05/17/05) [JA1436].

[63] *Id.*

[64] RMA Letter and Chi Studies Review, p. 4 (04/02/03) [JA0786]. These results are also consistent with the Transportation Research Board's recent conclusion that motorists can be expected to purchase a complete set of four tires "about every 3.5 years." NAS Tire Report, p. 113 (2006). Similarly, RMA's 2005 evaluation of 14,271 tires from scrap tire facilities that indicates that only 40.2 percent tires remain in service after 4 years, and only 10.6 percent remain in service after seven years. Interim Results, RMA/Society of Automobile Engineers Tire Service Life: Study of Scrap Tires (05/09/06). *Available at*: http://www.rma.org/getfile.cfm?ID=53&type=release.

since the key factor in determining tire condition is the amount of tire use, not years of vehicle use.

NHTSA should have been well aware that it had chosen the wrong model. The official guide for the LifeReg program (published by SAS Corporation, the vendor for this program) cautions against using the LifeReg statistical program precisely in a situation similar to this one, where the observations are terminated for reasons beyond the control of the investigator.[65]

In *Gas Appliance Mfrs. v. Department of Energy*, 998 F.2d 1041 (D.C. Cir. 1993), this Court described its approach to agency reliance on computer models:

> [A]lthough "computer modeling is a useful and often essential tool for performing the Herculean labors Congress imposes on [administrative agencies]", "such models, despite their complex design and aura of scientific validity, are at best imperfect and subject to manipulation". *Sierra Club v. Costle*, 657 F.2d 298, 332 (D.C. Cir. 1981). Since the accuracy of any computer model "hinges on whether the underlying assumptions reflect reality," *id.*,
>
> the agency must sufficiently explain the assumptions and methodology used in preparing the model; it must provide a complete analytical defense of its model and respond to each objection with a reasoned presentation. . . . There must be a rational connection

[65] Statisticians call this "randomly censored" data. "Random censoring occurs when observations are terminated for reasons that are *not* under the control of the investigator," such as people replacing the tires because of low tread depth, uneven wear or any other reason. "Survival Analysis Using SAS: A Practical Guide," p. 12 ("SAS Guide for LifeReg Program") [JA1721].

> between the factual inputs, modeling assumptions, modeling results and conclusions drawn from these results.

998 F.2d at 1045-46. In this case, the agency used a model either as a substitute for the actual data or as a tool to adjust the data. Either way, the agency cannot establish that its approach was rational.

(c) NHTSA Overstated the Costs of a Tire Reserve Pressure Requirement

NHTSA calculated the cost of creating a reserve requirement as $132 million. It based this conclusion largely on the assumption that manufacturers would have to increase the size of 70.3 percent of the tires on vehicles to comply with the reserve pressure requirement. The agency stated that "70.3 percent of the vehicles had less than 8 psi of tire reserve load on either" the front, rear or both tires. NHTSA Paper on Analysis of Tire Reserve Load, p. 6 (05/17/05) [JA1472]. Based on this upsizing cost, NHTSA calculated the average cost per tire could increase by an average of $2.77. *Id.* Assuming that all tires were required to increase the reserve pressure to at least 8 psi, the agency's estimated cost was $132 million. This was based on 17 million vehicles produced each year (*i.e.*, $2.77 per tire times 4 tires per vehicle, multiplied by 17 million vehicles times 70.3 percent. *Id*. at 5-6 [JA1471-72].

Fundamentally, NHTSA's approach ignored the alternative prong of the relief sought by RMA. RMA had asked the agency either to modify the tire selection standard *or* to establish a variable trigger for activation of dashboard

warnings. Rather than triggering a warning at 25 percent below placard, this alternative approach would trigger a warning when the pressure on any tire was below the T&RA level. This alternative approach would alter the 25 percent standard but would impose no costs whatsoever on vehicle manufacturers. The agency's analysis, however, missed this basic point.

Furthermore, even as applied to RMA's request for a tire pressure reserve requirement, the evidence simply does not support NHTSA's assumption that 70 percent of the vehicle fleet would require larger tires. As RMA had explained, most vehicles would not need to increase its tire size because manufacturers could use higher placard pressure;[66] the period of compliance could be spread out over several years; and the vehicle manufacturer could modify the maximum load allowed for the vehicle.[67] In fact, NHTSA previously acknowledged that since an increase of "1 or 2 psi" in the placard pressure "does not have a meaningful effect on the ride, comfort and, consequently, the marketability of a vehicle, this provision should impose little or no cost on the industry."[68] Thus, contrary to NHTSA's findings, there were numerous alternatives to upsizing tires.

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[66] RMA Petition for Rulemaking, pp. 6-7 (09/12/02) [JA0610-11].

[67] *Id.* [JA0610-11.]

[68] *See* 68 Fed. Reg. 38116, 38141 (06/26/03) [JA0902, 0928].

Additionally, the evidence presented by RMA indicated that only a small fraction of vehicles had a reserve pressure that was grossly inadequate. (*See* Figure 2 herein.) Approximately 8 percent of the vehicles sampled needed a reserve of 8 to 9 psi, and approximately 12 percent of the vehicles needed a reserve of 7 to 9 psi. Averaging these two categories together, approximately 10 percent of vehicles require a substantial increase in reserve pressure. It is only these vehicles that would likely require larger tires. Therefore, 10 percent is a reasonable estimate of the number of tires that would need to be upsized, not the 70 percent figure used by NHTSA. Accordingly, the cost of RMA's proposal would be at most $19 million (10 percent divided by 70 percent times $132 million).

4. NHTSA Offered No Other Rational Basis For Rejecting The Tire Reserve Pressure Requirement And The Variable Trigger

In addition to its flawed cost-benefit analysis, NHTSA offered other reasons for its rejection of the tire reserve pressure proposal. Yet none of these additional arguments provides a rational basis for NHTSA's decision.

First, the agency purported to rely upon the results of prior laboratory testing with a dynamometer. 70 Fed. Reg. at 28894 (NHTSA Denial of Petition for Rulemaking) [JA1516]. While tires tested in these artificial conditions met the 90 minute 75 mph test, a huge percentage failed the 180 minute test. Thus, even if reliance of laboratory testing could reasonably substitute for real world conditions,

and even if a 90 minute test could reveal *anything* about how tires are going to function when driven for much longer periods, over rougher surfaces, when subjected to the stress of turning, stopping or any other real world condition, the dynamometer tests still demonstrated that the MAP levels set by NHTSA simply are not safe. NHTSA relegated its treatment of the 90 minute test to a footnote in the May 19 order, and ignored the 180 minute test altogether. Once again, NHTSA's conduct virtually defines arbitrary and capricious.

Second, in the proceeding below, RMA pointed out that consumers manually check their tire pressure on an erratic basis. RMA submitted survey data suggesting that with the onset of TPMS, such manual checking would be likely to diminish from already insufficient levels. In rejecting RMA's argument, the agency purported to rely on its own study. 70 Fed. Reg. at 28892-93 (NHTSA Denial of Petition for Rulemaking) [JA1514-15]. Yet the agency concedes that its study was never completed. *Id*. at 28893 [JA1515]. The document placed in the record by the agency staff expressly stated that the survey "was compromised, resulting in a sample that lacked almost all the statistical properties" needed for reliable data and, therefore, "the data are not adequate … to provide statistical evidence of these differences."[69]

[69] Analysis of TPMS Survey Data, p.3 (05/17/05). [JA1475] RMA submitted a detailed critique by Dr. Coffey of a prior GM study which concluded that the GM study was not usable because of the number and severity of the errors (including the use of

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Third, with respect to the supposed 1 or 2 psi placard gain that will result from the 2003 amendment to FMVSSs 109 and 110, the agency record in that proceeding is much less clear than statements in the September 7, 2005 order would indicate. 70 Fed. Reg. at 53088-53089 [JA1544-45]. As the 2003 record makes clear, NHTSA did not expect all tires to be placarded 1 or 2 psi higher as a result of the 2003 change. Rather, it found that for those tires for which the 2003 amendment requires any change at all, the required change would be small – on the order of 1 or 2 psi.[70] Accordingly, the actual data simply do not support the agency's analysis.

C. NHTSA's Failure To Require That Tire Pressure Monitoring Systems Operate With Replacement Tires Was Inconsistent With Statutory Requirements And Was Arbitrary And Capricious

NHTSA's 2002 rule was applicable to replacement tires. The 2002 rule specified that each TPMS "must continue to meet the requirements of this standard when the vehicle's original tires are replaced with tires of any optional or

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(continued...)

averages, confounding factors, and the fact that unusually severe events (outliers) made interpretation difficult if not impossible). RMA Comments (04/02/03) [JA0776].

[70] NHTSA Final Regulatory Evaluation – New Pneumatic Tires For Light Vehicles pp. II-48 to II-56 (06/12/03) [JA0856-64]. Table II-14 indicated that the reserve pressure decreased for some vehicle-tire combinations and increased for others. The average may have been a 1 or 2 psi increase, but this change actually worsened the reserve pressure for many vehicles.

replacement size(s) recommended for the vehicle by the vehicle manufacturer." 67 Fed. Reg. at 38746 [JA0462]. In the comment period below, RMA, Public Citizen, and TIA each argued for full application of the TPMS to replacement tires. 70 Fed. Reg. at 18158 (NHTSA Final Rule – TPMS) [JA1128].[71] NHTSA, however, decided not to require that tire pressure monitoring systems function with all replacement tires and spare tires.

The agency decided instead to require a malfunction light, which would inform drivers that their replacement tires were "incompatible" with the TPMS system. 70 Fed. Reg. at 18159-60 (NHTSA Final Rule – TPMS) [JA1129-30]. The same light would also be on whenever there is any other kind of TPMS malfunction,[72] for example, "when a [replacement] tire is significantly under-inflated," thus making it a very poor substitute for applying the TPMS to replacement tires. Indeed, drivers with even only one or two incompatible replacement tires installed on their vehicle will operate with a malfunction light on

[71] *See, e.g.*, RMA Comments at 15-16 (11/10/04) [JA1037-38]; TIA Comments pp. 3-4 (11/10/04) [JA1078-79]; Public Citizen Comments p. 5-6, 10 (11/22/04) [JA1086-87, 1091]. Public Citizen urged the agency either to (1) require that all tires be TPMS-compatible, with a carve-out as necessary for tires with high carbon, steel bands, or run-flat capability or (2) require that the TPMS system function fully with a set of identified and published manufacturer recommended tires. *See generally* Public Citizen Comments at 5-6, 10 (11/22/04) [JA1086-87, 1091]; Public Citizen Petition for Reconsideration (05/23/05) (later withdrawn) [JA1526].

[72] *See* 70 Fed. Reg. at 18150-51 (NHTSA Final Rule – TPMS) [JA1120-21].

for the duration of their operation, meaning that the system is essentially disabled for all four tires.

Inasmuch as replacement tires – that is, tires that are not sold as original equipment – account for the majority of all tires in use, the agency's approach is directly inconsistent with the mandate of Congress. Congress intended the TPMS rules to cover all tires: the words "whenever a tire" in section 13 of the TREAD Act are unambiguous. By referring to "a tire," the statute includes tires that are sold with the car (including spare tires), tires that a consumer buys the day after having bought the car, tires that the car owner buys three years after buying the car, and any other tires the owner uses. *See Public Citizen*, 340 F.3d at 54 ("[T]he TREAD Act's "a tire" plainly means one tire, two tires, three tires, or all four tires. . . .").

In contrast, elsewhere in the Safety Act, Congress imposed requirements that apply only to tires that are sold with the vehicle. 49 U.S.C. § 30123(c). Obviously, then, when Congress intends a provision to apply only to tires supplied as original equipment, it has made this limitation explicit.

NHTSA's decision to exempt replacement tires from the TPMS rule also was arbitrary and capricious. As the agency recognized, many more vehicles on the road have replacement tires than original tires. Obviously, because the TPMS rule will not apply to replacement tires, the benefits that would flow from a proper implementation of Congress's mandate – in lives saved, injuries avoided,

fuel costs saved – are substantially lost or reduced. To the extent that TPMSs fail to function on replacement tires, the risks associated with use of these tires will be far higher than with other tires, an outcome that is the opposite of the new baseline for tire safety that Congress sought to achieve.

The reasons offered by NHTSA for exempting replacement tires are exceedingly weak. The agency stated that some tires will not work with TPMSs, but then essentially threw up its hands, asserting at one point that it could not identify the affected tires. 70 Fed. Reg. at 18159 (NHTSA Final Rule) [JA1129]. In other parts of its decision, NHTSA does clarify that for certain types of tire pressure monitoring systems, the tires most likely to have difficulties are those with high carbon content, steel in the sidewalls, or run-flat designs. *Id*. at 18158-18159 & n.36 [JA1128-29]. Even for this small group of specialty tires, NHTSA did not find that it was impossible to design a TPMS system that could comply with the statute by notifying a driver when a tire has become significantly under-inflated.[73]

As evidence in the record shows, there are direct TPMSs that function without transmitting radio waves through the sidewall of tires. Consequently, even

[73] Certain tire pressure monitoring systems on the market are capable of working with the full range of tires. Specifically, any TPMS that has a direct data connection, from within the tire cavity out to an external receiver will not be affected by the tires, carbon or iron content or by the thickness of run-flat tires. *See generally* ETV Comments (11/04/04) relating to VisiTyre TPMS technology [JA1009].

replacement tires with high levels of steel or carbon in the sidewall can be covered by a warning system. Adequate technology is available now, and additional technology could be developed under NHTSA's guidance, if necessary.

NHTSA also concluded that, despite the absence of a requirement, existing TPMSs would work with most replacement tires. This was based on the fact that, at the time of a 2003 GM letter, there were 4 million TPMSs in use, and no significant performance problems were yet reported. 70 Fed. Reg. at 18159 & n.37 (NHTSA Final Rule) (referring to a September 11, 2003 GM letter (04/08/05)) [JA1129]. What this letter did not tell NHTSA, and what NHTSA did not know, was whether the TPMSs would properly function over the long run with replacement tires. TPMSs were still relatively new in 2003. Presumably, then, these four million TPMSs were mainly installed on cars that are far newer (and far more upscale) than the average vehicle. The replacement tires on these vehicles – however many there were – are by definition newer still. That no notable difficulties arose by October 2003 proves little about whether TPMSs will continue to work on replacement tires years from now.

NHTSA estimated that perhaps one percent of replacement tires would not work with the TPMS system. The one percent estimate was just an estimate – NHTSA admitted that the number of incompatible replacement tires may be as high as ten percent, thus increasing the number of affected drivers by an order of magnitude. *See* FRIA on TPMS, p. II-10. – II-12 (04/15/05) [JA1181-83].

Obviously, NHTSA could have complied with the mandate of Congress by requiring the use of monitoring systems that are not hindered by use of tires with high carbon content, steel in the sidewalls, or run-flat design. Alternatively, NHTSA could have conducted a formal exemption analysis under 49 U.S.C. § 30113, to determine whether an equivalent level of safety could be provided without the TPMS warnings for specific types of tires, such as run-flat tires.[74] In the end, NHTSA did not pursue any of these approaches. Instead NHTSA simply ignored the mandate of Congress.

D. NHTSA's Relaxation Of Standards To Accommodate Inferior Technology Was Inconsistent With Statutory Requirements And Was Arbitrary And Capricious

Despite a clear Congressional mandate to provide for systems that would warn drivers whenever any tire was significantly under-inflated, NHTSA's standard fails to meet this basic requirement. In at least two instances, the agency's performance standards were deliberately relaxed so that particular technologies that do not strictly meet Congress's goal could be used. For this same flaw, the Second Circuit reversed NHTSA's first TPMS rulemaking. Here, this Court should do the same.

[74] Under-inflation of run-flat tires is less dangerous than under-inflation of other tires, because run-flat tires are designed to operate with *little or no* air pressure for some period of time.

1. NHTSA's Adoption Of A 20-Minute Detection Time Standard Was Unlawful And Arbitrary And Capricious

In its 2002 rule, NHTSA required that a TPMS system be functional after 10 minutes of driving. 67 Fed. Reg. at 38746 [JA0462]. In 2005, the agency moved backwards and only required that a TPMS system be functional after 20 minutes of operation. 70 Fed. Reg. at 18146-18148 (NHTSA Final Rule) [JA1116-18]. Obviously, it is essential that any TPMS function after 20 minutes of operation. Just as obviously, to achieve their purpose, the TPMS must function prior to the expiration of 20 minutes: tires certainly can fail with less than 20 minutes of operation while under-inflated, especially when the vehicle is repeatedly operated at shorter intervals.[75] Under NHTSA's approach, a driver who drops children at school, goes to work, and goes shopping, all with short drives, may go weeks with under-inflated tires in high risk conditions without triggering the warning light.

Additionally, if a tire runs over a nail, a 10 minute activation standard or an immediate activation standard would encourage the driver to pull of the road and check the tires far more promptly. Indeed, if a puncture occurs on the highway, a stricter activation standard would encourage drivers to exit from the highway without a substantial time lag and before a tire is completely flat. This

[75] At least one tire pressure monitoring system now on the market is able to provide dashboard warnings immediately upon activation of the ignition. *See* ETV Comments, pp. 5-6 (11/04/04) [JA1013-14].

could help to avoid many injuries and fatalities. *See generally* RMA Comments, pp. 9-10 (11/10/04) and Attachment B, Letter dated 05/18/04 from RMA President Donald B. Shea To NHTSA Administrator [JA1031-32, 1042-43].

As noted by one of the TPMS manufacturers, the agency's 20 minute standard is the equivalent of checking a parachute after jumping out of a plane. ETV Petition for Reconsideration (05/27/05) [JA1531]. The agency's approach was not required from the standpoint of TPMS technology, as direct systems exist that can detect under inflation immediately – that is "when" a tire is under-inflated. To be sure, operation of a tire warms it and, through the application of Boyle's Law, increases pressure. This factor can and should be dealt with as a matter of TPMS technology, rather than by simply exempting millions of miles driven by millions of drivers from a safety requirement intended by Congress to protect them.

2. NHTSA's Adoption Of A Narrow Range Of Test Conditions Was Arbitrary And Capricious

NHTSA's conclusions regarding test conditions are simply unsustainable. NHTSA acknowledged comments calling for test procedures that "capture a fuller range of real world driving conditions." 70 Fed. Reg. at 18142 (NHTSA Final Rule) [JA1112]. However, the agency found that commenters had not *proven* that a system tested only in dry conditions, and at limited speeds and temperatures, would not work in other circumstances. *Id*. at 18167 [JA1137]. NHTSA also complained that commenters had not suggested speeds or

temperatures beyond the limited ranges it had proposed, or specified how slippery the road surfaces for the tests should be. *Id.* Ultimately, NHTSA claimed that the test conditions it had prescribed would "result in TPMSs that will function over a wide range of operating conditions." *Id.*

In arguing that RMA and other parties had not "proven" that testing was required in real world conditions, the agency's approach was irrational. The best way to ensure that monitoring systems will function in a wide range of conditions is to require testing in those conditions. The agency simply disregarded this fundamental point.

Moreover, the requests that "real world" conditions be employed in tests were not in any way ambiguous. NHTSA was well aware of the ranges of temperatures that occur in the United States and of the speeds at which ordinary vehicles are driven. NHTSA knew that it rains and snows in the United States, and that Americans frequently drive their cars during and after storms. It therefore was irrational to require testing only in dry conditions, on smooth roads, at temperatures above 32º Fahrenheit, [76] and at speeds below 63 miles per hour.

Lastly, NHTSA's allowance of a 1 psi cushion in testing was arbitrary and capricious. The point of testing is to see whether a system will work when it is

[76] Many tire pressure monitoring systems rely upon battery-powered radio transmitters. The manufacturers of such batteries have indicated that extreme temperatures could have a negative effect on battery life. *See generally* http://etv.com.av/BatteryProblem.htm.

supposed to do so. In the case of a TPMS, the point of the test is to see whether the warning light will illuminate when the tire pressure reaches the MAP or the level 25 percent below the placard. A test to determine whether the light will illuminate at a level below the triggering pressure does not meet this requirement. Additionally, RMA supplied the agency with a test protocol that would address the temperature change of concern to the agency without imposing any "cushion." *See* RMA Petition For Reconsideration (05/23/05) [JA1518]. This protocol simply relied upon a brief delay during the testing process but was ignored by the agency.

CONCLUSION

For the reasons stated above, the Court should reverse NHTSA's decisions and hold that the TPMS rule is contrary to law and arbitrary and capricious.

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CERTIFICATE OF COMPLIANCE

I, Charles H. Carpenter, hereby certify that Petitioners' Brief complies with the word limitation specified in the Court's order dated June 6, 2006. As measured by Microsoft Word, Petitioners' Brief contains 20,805 words.

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CERTIFICATE OF SERVICE

I hereby certify that on this 22nd day of January, 2007 copies of the foregoing Final Brief of Petitioners were served by first-class mail on the following persons:

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