

# *FEATURE ARTICLE*

## **The NHTSA's Evaluation of Automobile Safety Systems: Active or Passive?**

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### **I. Introduction**

Since the first Ford Model T rolled off the assembly line, the regulation of automobile safety systems (“safety systems”) has changed drastically. While the regulation of safety systems was non-existent at the birth of the Model T, the practice is abundant today. Modern automobile safety regulation saw its beginning in the late 1960s with the advent of seat belt laws, vehicle crashworthiness tests, and more recently the regulation of air bags. As a result, the United States has developed some of the world’s most stringent automobile safety standards.

Despite stringent application of the safety standards, 2.9 million people were injured and 42,643 died as a result of 6.3 million reported traffic crashes in 2003.<sup>1</sup> While not all of these crashes can be attributed to the lack of regulatory consideration of a specific feature, a number of crashes resulting from loss of vehicle control could have been prevented had the vehicles been equipped with Electronic Stability Control (“ESC”), a type of Active safety system<sup>2</sup> available today. In 2004, the Insurance Institute for Highway Safety determined that “[i]f all vehicles on U.S. roads had ESC, we might avoid as many

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<sup>1</sup> National Center for Statistics and Analysis, Traffic Safety Facts – 2003 Data, <http://www-nrd.nhtsa.dot.gov/pdf/nrd-30/NCSA/TSF2003/809767.pdf> (last visited Feb. 21, 2007).

<sup>2</sup> See *infra* § II(B) and accompanying notes.

as 800,000 of the 2 million or so single vehicle crashes that occur each year. About 14,000 fatal single vehicle crashes occurred in 2003, which means [there is] a potential to save more than 7,000 lives each year.”<sup>3</sup>

The regulation of seat belts and air bags, both Passive safety systems,<sup>4</sup> has been chaotic.<sup>5</sup> In 1967, the appearance of the primary Passive system standard regulating seat belts prompted the National Highway Traffic Safety Administration (“NHTSA”), the frontline regulator of automobile safety in the U.S., to issue specific safety standards. Congress, courts, and presidential administrations, as well as the automobile industry and private and public interest groups, have since cajoled and directly lobbied the NHTSA to adopt a patchwork of contradictory regulations. One stark example is the air bag safety standard, which the NHTSA enacted, revoked, suspended and reinstated with disastrous consequences. The NHTSA’s inertia in regulating air bags resulted in varying air bag designs that ultimately harmed U.S. consumers, particularly children and improperly seated vehicle occupants.<sup>6</sup>

The NHTSA has largely ignored Active safety systems.<sup>7</sup> It only recently began considering such systems after Congress’s directive to mandate a Tire Pressure Monitoring System (“TPMS”) – an Active safety system.<sup>8</sup> Still, the NHTSA was susceptible to pressures from the automobile industry as it attempted to mandate an inferior, albeit slightly cheaper, TPMS standard for automobile manufacturers. Ultimately, private interest groups and the judiciary directed the NHTSA to mandate the more effective TPMS standard.

As far as ESC, the NHTSA announced only in late 2006 that it is considering mandating the safety system on all passenger vehicles starting in 2009.<sup>9</sup> Given the agency’s chaotic regulatory track

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<sup>3</sup> INSURANCE INSTITUTE FOR HIGHWAY SAFETY (IIHS), ELECTRONIC STABILITY CONTROL FOUND EFFECTIVE: MAIN EFFECT IS TO REDUCE SINGLE-VEHICLE CRASH RISK, INCLUDING THE RISK OF FATAL SINGLE-VEHICLE CRASHES (Oct. 28, 2004), available at [http://www.iihs.org/news/2004/iihs\\_news\\_102804.pdf](http://www.iihs.org/news/2004/iihs_news_102804.pdf) (last visited Feb. 27, 2007) [hereinafter *IIHS Study*].

<sup>4</sup> See *infra* § II(A) and accompanying notes.

<sup>5</sup> *Id.*

<sup>6</sup> *Id.*

<sup>7</sup> See *infra* § II(B) and accompanying notes.

<sup>8</sup> *Id.*

<sup>9</sup> Joe Benton, *Feds Order Electronic Stability Control on All Cars*, CONSUMER AFF. (Sept. 2006), [http://www.consumeraffairs.com/news04/2006/09/nhtsa\\_stability.html](http://www.consumeraffairs.com/news04/2006/09/nhtsa_stability.html) (last visited Mar. 26, 2007).

record, this is still an open question.

The NHTSA has failed to take initiative in evaluating new safety systems for regulatory consideration because it lacks a standard by which to evaluate safety systems. Consequently, the agency must now develop a fair way to evaluate whether a safety system is ripe for present regulatory consideration.

In this Note, I propose a framework the NHTSA could use to evaluate whether a safety system is ripe for present regulatory consideration or whether it deserves deferred consideration pending a timely re-evaluation. Section II discusses the evolution of automobile safety regulation in the U.S. and examines the regulation of Passive and Active safety systems. Section III first suggests that the NHTSA must take greater initiative in evaluating safety systems for regulatory consideration. Second, it examines the current standard for regulation of safety systems. Third, it proposes a framework for regulation of safety systems. Fourth, the section provides a practical application of the proposed framework. Fifth, it evaluates a current Active safety system - ESC, within the proposed framework. Last, it considers the steps the agency should take after completing the evaluation.

## II. The Evolution of Automobile Safety Regulation in the United States

In 1966, the U.S. Congress enacted a new strategy for decreasing highway fatalities. Spurred by an increasing number of automobiles on U.S. roads and the resulting increase in deaths on U.S. highways, Congress opted to refocus federal oversight on improving automobile design and safety systems.<sup>10</sup> Unfortunately, the few safety systems that existed at the time were in their infancy.<sup>11</sup> Before requiring that automobile manufacturers implement a particular safety system, Congress considered several factors, including the system's overall usefulness and its relative costs and benefits.<sup>12</sup> Congress attempted to address the increase in automobile-related fatalities by enacting the National Traffic and Motor Vehicle Safety Act of 1966 ("Motor Vehicle Safety Act").<sup>13</sup> Despite numerous revisions over the years, the basic mandate of the Motor Vehicle Safety

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<sup>10</sup> *Motor Vehicle Mfrs. Ass'n of the United States v. State Farm Mut. Auto. Ins. Co.*, 463 U.S. 29, 33 (1983).

<sup>11</sup> *Id.*

<sup>12</sup> *Id.*

<sup>13</sup> *Id.*

Act remains the same.<sup>14</sup> The Act requires the Secretary of Transportation to prescribe automobile safety standards that are practicable, meet the need for motor vehicle safety, and are stated in objective terms.<sup>15</sup>

The Motor Vehicle Safety Act delegates the responsibilities of the Secretary of Transportation to the Administrator of the National Highway Traffic and Safety Administration (“NHTSA”),<sup>16</sup> an agency of the U.S. Department of Transportation (“DOT”).<sup>17</sup> As an agency of the DOT, the NHTSA has a legislative mandate under the Motor Vehicle Safety Act to issue Federal Motor Vehicle Safety Standards (“Safety Standards”) that automobile manufacturers must follow.<sup>18</sup> The Safety Standards are the minimum safety performance requirements for automobiles.<sup>19</sup> Today these standards cover everything from rear-view mirrors<sup>20</sup> to occupant crash protection.<sup>21</sup>

Automobile safety systems, which cover a wide range of features, are divided into two classes: Passive safety systems and Active safety systems. Since the systems are fundamentally different in nature, it is helpful to trace the development of each system separately.

## A. Passive Safety Systems

### 1. Definition of Passive Safety Systems

Passive safety systems (“Passive systems”) are automobile

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<sup>14</sup> Motor Vehicle Safety Act (codified as amended at 49 U.S.C. §§ 30101–30170 (2005)) [hereinafter *Motor Vehicle Safety Act*].

<sup>15</sup> *Id.* § 30111(a).

<sup>16</sup> Cynthia M. Certo, Comment, 1993 Changes to Safety Standard 208: Deploying an (Air) Bag Full of Product Liability Claims?, 67 TEMP. L. REV. 673, 674 (1994).

<sup>17</sup> U.S. Department of Transportation, DOT Agencies (2007), <http://www.dot.gov/DOTagencies.htm> (last visited Feb. 27, 2007) (listing the agencies that are under the authority of the Department of Transportation).

<sup>18</sup> National Highway Traffic Safety Administration, Booklet on Federal Motor Vehicle Safety Standards (1999), <http://www.nhtsa.dot.gov/cars/rules/import/FMVSS> (last visited Feb. 28, 2007) (providing an overview and brief description of safety standards in effect as of Dec. 1998) [hereinafter *Booklet on Federal Motor Vehicle Safety Standards*].

<sup>19</sup> *Id.*

<sup>20</sup> Federal Motor Vehicle Safety Standards, 49 C.F.R. § 571.111 (2005).

<sup>21</sup> *Id.* § 571.208.

safety systems that are only deployed or effective in response to an automobile crash. These systems protect drivers and passengers from injury once a collision occurs.<sup>22</sup> Passive systems include seat belts, air bags, headrests, and the passenger-safety cage.<sup>23</sup>

The air bag, a Passive system which is now mandatory in every new automobile sold in the U.S.,<sup>24</sup> works in conjunction with the seat belt to provide two levels of safety in the event of a crash. Although current NHTSA regulations require air bags only for front passengers, many advocates are pushing for the installation of advanced air bags to protect all passengers.<sup>25</sup> Advanced air bags include “smart” air bags and front and rear side “curtain” air bags that provide greater protection than regular air bags for all passengers in the event of an accident. Smart air bags detect passenger weight and proximity and tailor air bag deployment to passengers’ needs.<sup>26</sup> Curtain air bags extend from the front to the rear of the vehicle like an inflatable curtain, protecting both front and rear passengers.<sup>27</sup>

Vehicle crashworthiness (“Crashworthiness”) is another regulated Passive system. The regulation of Crashworthiness began in the late 1960s<sup>28</sup> and today all vehicles in the U.S. are required to pass mandated Crashworthiness tests before they are sold to the public.<sup>29</sup> Crashworthiness includes vehicle design and the use of advanced metal alloys in vehicle construction. Thus, improved Crashworthiness results in better protection for vehicle occupants.

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<sup>22</sup> Ben Whitworth, *Safe Bet to Sell Cars*, PROF. ENGINEERING, Feb. 23, 2000, at 45.

<sup>23</sup> Miles Budimir, *Coming: Cars Smarter than Their Drivers*, MACHINE DESIGN, Sept. 2, 2004, at 75.

<sup>24</sup> Public Citizen, Key Advanced Air Bag Legislative History (providing that the Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA) requires all passenger cars manufactured on or after September 1, 1997 to be equipped with driver and passenger air bags and manual lap-shoulder belts), [http://www.citizen.org/autosafety/Air\\_Bags/articles.cfm?ID=6022](http://www.citizen.org/autosafety/Air_Bags/articles.cfm?ID=6022) (last visited Feb. 27, 2007) [hereinafter *Key Air Bag Legislative History*].

<sup>25</sup> *Id.* (providing that the Transportation Equity Act for the 21<sup>st</sup> Century (TEA-21) of 1998, authorizes the NHTSA to mandate the use of advanced air bags).

<sup>26</sup> Nargess Shahmanesh, *On the Development of Passive Safety Systems at Mercedes-Benz*, AUTOMOTIVE ENGINEER, Nov. 1999, at 44, 45.

<sup>27</sup> *Id.* at 44.

<sup>28</sup> *Booklet on Federal Motor Vehicle Safety Standards*, *supra* note 18 (providing that the first Safety Standard on Crashworthiness was effective on a number of vehicles manufactured on or after Jan. 1, 1968).

<sup>29</sup> Federal Motor Vehicle Safety Standards, 49 C.F.R. § 571.208 (2005).

## 2. The Evolution of Passive Safety System Regulation in the United States

The DOT's regulation of Passive systems, particularly seat belts and air bags, has resulted in a confusing and contradictory array of standards. Passive system requirements have been "promulgated, revoked . . . suspended, extended, amended, reinstated and generally scrutinized by [the executive, legislative and judicial branches of government]."<sup>30</sup>

In 1967, the DOT issued Standard 208 – the primary Safety Standard for Passive systems.<sup>31</sup> Standard 208, effective in 1968, required that simple seat belts be installed in automobiles.<sup>32</sup> The public, however, was slow to use these seat belts.<sup>33</sup> As a result, the DOT amended Standard 208 in 1972 to require the installation of automatic seat belts<sup>34</sup> and air bags in automobiles manufactured after 1975.<sup>35</sup> Automobile manufacturers challenged the amended Standard 208 in *Chrysler Corp. v. Department of Transportation*.<sup>36</sup> In *Chrysler Corp.*, the U.S. Court of Appeals for the Sixth Circuit held that despite being practicable and meeting the need for motor vehicle safety, the DOT failed to state Standard 208 in objective terms.<sup>37</sup> The court ordered that implementation of Standard 208 be delayed.<sup>38</sup> Thus, the DOT shelved Standard 208 for five years under pressure from the automobile industry and under fear of further public resistance.<sup>39</sup>

In 1977, President Jimmy Carter reinstated Standard 208<sup>40</sup> requiring seat belts and air bags in all automobiles manufactured after

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<sup>30</sup> Certo, *supra* note 16, at 679.

<sup>31</sup> *State Farm Mut. Auto. Ins. Co.*, 463 U.S. at 34.

<sup>32</sup> *Booklet on Federal Motor Vehicle Safety Standards*, *supra* note 18.

<sup>33</sup> *State Farm Mut. Auto. Ins. Co.*, 463 U.S. at 34.

<sup>34</sup> *Id.* at 35. An automatic seat belt is "a traditional safety belt, which when fastened to the interior of the door remains attached without impeding entry or exit from the vehicle, and deploys automatically without any action [by] the passenger." *Id.*

<sup>35</sup> *Id.*

<sup>36</sup> *Chrysler Corp. v. Dep't of Transp.*, 472 F.2d 659, 663 (6th Cir.1972).

<sup>37</sup> *Id.* at 676.

<sup>38</sup> *Id.* at 681.

<sup>39</sup> *State Farm Mut. Auto. Ins. Co.*, 463 U.S. at 36-37.

<sup>40</sup> Lauren Pacelli, Note, *Asleep at the Wheel of Auto Safety? Recent Air Bag Regulations by the National Highway Traffic Safety Administration*, 15 J. CONTEMP. HEALTH L. & POL'Y 739, 753 (1999).

1982.<sup>41</sup> In 1981, as a result of an economic recession and its effect on the automobile industry, the NHTSA ordered a one-year delay on the implementation of the Passive system requirement of Standard 208 – which now mandated seat belts and air bags in all automobiles manufactured after 1982.<sup>42</sup> Soon after, however, the NHTSA revoked the Passive system requirement from Standard 208 entirely.<sup>43</sup>

Automobile insurance companies challenged the NHTSA's rescission of the Passive system requirement from Standard 208. In 1983, the U.S. Supreme Court in *Motor Vehicle Mfrs. Ass'n of the United States v. State Farm Mut. Auto. Ins. Co.* held that the NHTSA's rescission of the Passive system requirement from Standard 208 was arbitrary and capricious,<sup>44</sup> and remanded the matter back to the NHTSA for further consideration.<sup>45</sup> The NHTSA reinstated the Passive system requirement into Standard 208, effective as of 1989.<sup>46</sup> The Passive system requirement, however, was a compromise between automobile manufacturers and air bag proponents.<sup>47</sup> Standard 208 allowed automobile manufacturers to implement the Passive system requirement by selecting either “[1] a driver's side air bag system and automatic front seat belts, [2] automatic front seat belts, or [3] manual front seat belts with a belt warning system.”<sup>48</sup> Consequently, automobile manufacturers were still able to avoid installing air bags by choosing automatic front seat belts or manual front seat belts with a belt warning system.

Finally, in 1991, Congress forced the NHTSA to require air bags in vehicles by enacting the Intermodal Surface Transportation and Efficiency Act (“ISTEA”).<sup>49</sup> Under the ISTEA, most automobiles were required to have driver and passenger air bags in addition to seat belts by 1998.<sup>50</sup> In 1998, the NHTSA implemented this

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<sup>41</sup> *Id.*; *State Farm Mut. Auto. Ins. Co.*, 463 U.S. at 38.

<sup>42</sup> *State Farm Mut. Auto. Ins. Co.*, 463 U.S. at 38.

<sup>43</sup> *Id.*

<sup>44</sup> *Id.* at 46.

<sup>45</sup> *Id.* at 57.

<sup>46</sup> Pacelli, *supra* note 40, at 754.

<sup>47</sup> *Id.*

<sup>48</sup> *Id.*

<sup>49</sup> *Id.* See generally, Intermodal Surface Transportation Efficiency Act of 1991, Pub. L. No. 102-240, 105 Stat. 1914 (codified as amended at 49 U.S.C. § 30102 (1994)).

<sup>50</sup> *Key Air Bag Legislative History*, *supra* note 24.

change in Standard 208.<sup>51</sup>

Although the NHTSA was eventually required to include air bags as a Passive system in automobiles under the ISTEA, Congress passed the Act far too late. Over the previous thirty years, market forces had driven automobile manufacturers to satisfy the consumer demand for air bags, notwithstanding congressional hesitancy.<sup>52</sup> Without a legal standard in place, however, automobile manufacturers installed air bags that were dangerous for children and un-buckled occupants.<sup>53</sup>

As a result, Congress pushed the NHTSA to protect children and un-buckled occupants by enacting the Transportation Equity Act for the 21<sup>st</sup> Century (“TEA-21”).<sup>54</sup> The TEA-21 set goals to regulate air bag production that the NHTSA must achieve by 2006.<sup>55</sup> Despite the Passive system debacle that continued for thirty years, the NHTSA is still not proactive in regulating safety systems. The agency continues to be directed by the executive, legislative and judicial branches of government, the automobile industry, and public and private interest groups.

### 3. Active Safety Systems

#### a. Definition of Active Safety Systems

Active safety systems (“Active systems”) help drivers avoid accidents. These systems function behind the scenes, monitoring the driving conditions and actively adjusting the driving dynamics of the vehicle to minimize the risk of an accident.<sup>56</sup> Active systems provide a degree of protection for occupants unavailable in Passive systems and they reduce the likelihood of a situation that would require the use of Passive systems.

The Antilock Braking System (“ABS”) is one type of Active

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<sup>51</sup> *Booklet on Federal Motor Vehicle Safety Standards*, *supra* note 18.

<sup>52</sup> Pacelli, *supra* note 40, at 754-55.

<sup>53</sup> *Id.*

<sup>54</sup> *Key Air Bag Legislative History*, *supra* note 24; Transportation Equity Act for the 21st Century, Pub. L. No. 105-178, 112 Stat. 107 (1998).

<sup>55</sup> Transportation Equity Act for the 21st Century, Pub. L. No. 105-178, § 7103(a), 112 Stat. 107 (1998).

<sup>56</sup> Electronic Stability Control Coalition, [http://www.dinkaboy.com/about\\_esc/how\\_esc\\_works/index.html](http://www.dinkaboy.com/about_esc/how_esc_works/index.html) (last visited Feb. 28, 2007).

system.<sup>57</sup> While a regular braking system relies on human input – the driver pushing the brake pedal, the ABS is controlled by a microprocessor that forces the system to brake up to fifteen times per second<sup>58</sup> to bring the vehicle to a stop as soon as possible.<sup>59</sup> The ABS is superior to regular braking in preventing wheels from locking up, because human input-controlled standard braking systems cannot match the rapid pulsing created by the microprocessor-controlled ABS.<sup>60</sup> As such, on slippery surfaces, the ABS provides better control than a regular braking system and may yield shorter stopping distances.<sup>61</sup>

The Tire Pressure Monitoring System (“TPMS”) is another type of Active system.<sup>62</sup> The TPMS alerts drivers when their vehicle’s tire pressure is severely above or below the required pressure.<sup>63</sup> Tire pressure is an essential factor in vehicle safety and control because it determines the quality of contact between the vehicle and the road. A typical TPMS has sensors inside each tire that send a pressure reading every 30-60 seconds to a receiver inside the vehicle.<sup>64</sup> If any tire’s pressure falls below or goes above a preset threshold value, the driver is alerted to take appropriate action via a signal in the vehicle’s instrument panel.<sup>65</sup>

Electronic Stability Control (“ESC”) is an Active system that is increasingly found in a greater number of vehicles. The ESC system is based on the premise that a computer-controlled system can effectively monitor driving conditions and actively intervene before an accident can occur.<sup>66</sup> The ESC system includes sensors in the wheels and braking system that provide real-time information about

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<sup>57</sup> *Id.*

<sup>58</sup> Martin Lesae, *Tips & Tricks - ABS Brakes*, THE CAR MAG., available at <http://web.archive.org/web/20050216175345/http://www.thecarmagazine.com/en/info/tips/view.spy?artid=599> (last visited Feb. 21, 2007).

<sup>59</sup> National Highway Traffic Safety Administration, Antilock Brake Systems (ABS), <http://www.nhtsa.gov/cars/problems/Equipment/absbrakes/index.html> (last visited Mar. 1, 2007).

<sup>60</sup> *Id.*

<sup>61</sup> *Id.*

<sup>62</sup> Glen Benard, *Tire Pressure Monitoring Systems*, BRAKE & FRONT END (Oct. 2004), <http://www.brakeandfrontend.com> (last visited Mar. 1, 2007).

<sup>63</sup> *Id.*

<sup>64</sup> *Id.*

<sup>65</sup> *Id.*

<sup>66</sup> Whitworth, *supra* note 22, at 45-46.

the intended course of the vehicle.<sup>67</sup> Data from the sensors are used to compare a driver's intended course with the vehicle's actual movement; thus the ESC system can detect any deviation from the vehicle's intended path.<sup>68</sup> If there is any deviation, the ESC system automatically intervenes by applying brakes and cutting engine power as needed to bring the vehicle back to its intended course.<sup>69</sup> For example, if the system detects that the vehicle's rear wheels are slipping and causing the vehicle to yaw counter-clockwise to the right, the ESC system may apply the brake to the right front wheel.<sup>70</sup> A clockwise spin will then counteract the yaw and stabilize the vehicle.<sup>71</sup>

### **b. The Evolution of Active Safety System Regulation in the United States**

The NHTSA did not regulate Active systems until Congress required such regulation under the Transportation Recall Enhancement, Accountability and Documentation Act ("TREAD Act") of 2000.<sup>72</sup> Nevertheless, as with Passive system regulation, the executive, legislative and judicial branches of government, automobile manufacturers, and private and public interest groups direct the regulation of Active systems.

The TREAD Act prompted the NHTSA to consider regulating Active systems, in particular, a TPMS.<sup>73</sup> The Act forced the NHTSA to mandate a Safety Standard requiring a TPMS in all new motor vehicles by 2003.<sup>74</sup> In response, the NHTSA conducted comparative studies of the two types of TPMS available on the market to gauge

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<sup>67</sup> *Id.*

<sup>68</sup> JENNIFER N. DANG, U.S. DEP'T OF TRANSP., EVALUATION NOTE: PRELIMINARY RESULTS ANALYZING THE EFFECTIVENESS OF ELECTRONIC STABILITY CONTROL (ESC) SYSTEMS (2004), *available at* [http://www.nhtsa.dot.gov/cars/rules/regrev/evaluate/809790\\_files/809790.pdf](http://www.nhtsa.dot.gov/cars/rules/regrev/evaluate/809790_files/809790.pdf) (last visited Mar. 1, 2007) [hereinafter *NHTSA ESC Preliminary Results*].

<sup>69</sup> *Id.*

<sup>70</sup> *Id.*

<sup>71</sup> *Id.*

<sup>72</sup> Transportation Recall Enhancement, Accountability, and Documentation Act, Pub. L. No. 106-414, 114 Stat. 1800 (2000).

<sup>73</sup> *Id.* § 13.

<sup>74</sup> *Id.*

the benefits of a TPMS.<sup>75</sup> The first type, a “direct” TPMS, alerts the driver when the pressure in any tire falls below 80 percent of its recommended value.<sup>76</sup> A direct TPMS operates on vehicle start-up and is effective independent of road conditions.<sup>77</sup> The second type is an “indirect” TPMS, which alerts the driver when the pressure in any tire falls below 70 percent of its recommended value.<sup>78</sup> An indirect TPMS, however, only starts to work after the vehicle has been driven for several minutes and is not effective on uneven surfaces.<sup>79</sup> Moreover, the NHTSA estimated that a direct TPMS has the potential to save 141-145 lives annually and to decrease the severity of 10,270 injuries annually.<sup>80</sup> An indirect TPMS, however, was estimated to save 79 lives annually and to decrease the severity of 5,176 injuries annually.<sup>81</sup> Therefore, the NHTSA determined that a direct TPMS was preferable to an indirect TPMS as an Active system.<sup>82</sup>

In 2002, despite the research results and under pressure from the automobile industry,<sup>83</sup> the NHTSA issued Safety Standard 138, which gave automobile manufacturers the option of installing the in-

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<sup>75</sup> NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION, AN EVALUATION OF EXISTING TIRE PRESSURE MONITORING SYSTEMS (2001), available at <http://www-nrd.nhtsa.dot.gov/vrtc/ca/capubs/tpms.pdf> (last visited Jan. 30, 2007).

<sup>76</sup> Press Release, Public Citizen, Automakers Cannot Install Ineffective Systems for Detecting Under-inflated Tires, Appeals Court Rules (Aug. 7, 2003), available at <http://www.citizen.org/pressroom/release.cfm?ID=1520> (last visited Mar. 1, 2007) [hereinafter *Public Citizen - Automakers Cannot Install Ineffective Systems*]; Tejas Desai, *Steering Safer Wheels for America's Motorists*, ACTIVE COMPONENTS 50, 56 (June 2004), available at [http://rfdesign.com/mag/radio\\_steering\\_safer\\_wheels/](http://rfdesign.com/mag/radio_steering_safer_wheels/) (last visited Feb. 21, 2007).

<sup>77</sup> *Public Citizen - Automakers Cannot Install Ineffective Systems*, supra note 76; Desai, supra note 76.

<sup>78</sup> *Id.*

<sup>79</sup> Consumers Union, Consumers Union Comments to National Highway Traffic Safety Administration on RIN 2127-AI33 Federal Motor Vehicle Safety Standards: Tire Pressure Monitoring Systems; Controls and Displays (Aug. 24, 2001), [http://web.archive.org/web/20051204080709/http://www.consumersunion.org/other/tire\\_dc\\_1101.htm](http://web.archive.org/web/20051204080709/http://www.consumersunion.org/other/tire_dc_1101.htm) (last visited Mar. 2, 2007).

<sup>80</sup> *Public Citizen - Automakers Cannot Install Ineffective Systems*, supra note 76.

<sup>81</sup> *Id.*

<sup>82</sup> Public Citizen, Tire Pressure Monitoring Systems (TPMS), <http://www.citizen.org/autosafety/nhtsa/tread/tpms/index.cfm> (last visited Jan. 30, 2007).

<sup>83</sup> *Id.*

ferior indirect TPMS.<sup>84</sup> By giving automobile manufacturers the option to select their system of choice, the NHTSA took the same course as it had done in 1989 with the Passive system Standard 208.<sup>85</sup>

Just as Congress took the initiative on Standard 208 by enacting the ISTEA in 1991, consumer advocacy groups took the initiative on Standard 138 by filing a legal action against the NHTSA for buckling under pressure from the automobile industry and for violating the purpose of the TREAD Act.<sup>86</sup> In *Public Citizen, Inc. v. Norman Mineta*,<sup>87</sup> the United States Court of Appeals for the Second Circuit held that “the [NHTSA’s] adoption of [an indirect TPMS] was both contrary to law and arbitrary and capricious, and [the] adoption of [a direct TPMS] [was] not.”<sup>88</sup> Therefore, in 2003, Safety Standard 138 was vacated and remanded to the NHTSA for revisions.<sup>89</sup> The NHTSA at last issued a final Safety Standard for a TPMS in 2005, five years after Congress directed the NHTSA to issue a TPMS Safety Standard under the TREAD Act of 2000.<sup>90</sup>

With respect to ESC, an Active system, the NHTSA only in late 2006 expressed an interest to mandate the system in all automobiles in the U.S. starting with the 2009 model year.<sup>91</sup> The Agency has issued a notice of a proposed rule.<sup>92</sup> However, given its chaotic track record both with Passive systems and with the TPMS, the end result remains to be seen.

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<sup>84</sup> Federal Motor Vehicle Safety Standard 138, 49 C.F.R. § 571.138 (2002).

<sup>85</sup> See *supra* § II(A)(2) and accompanying notes.

<sup>86</sup> Danny Hakim, The Center for Auto Safety, U.S. Court Rejects Tire Safety Rule, (Aug. 7, 2002), <http://www.autosafety.org/article.php?scid=186&did=1147> (last visited Jan. 30, 2007).

<sup>87</sup> *Public Citizen, Inc. v. Norman Mineta*, 340 F.3d 39, 63 (2d Cir. 2003).

<sup>88</sup> *Id.* at 62.

<sup>89</sup> *Id.* at 63.

<sup>90</sup> National Highway Traffic Safety Administration, TREAD Milestones, <http://www.nhtsa.gov/cars/rules/rulings/TREAD/MileStones/index.html> (providing completion dates for TPMS proposed rules but no completion date for the final rule).

<sup>91</sup> See Benton, *supra* note 9.

<sup>92</sup> DEPARTMENT OF TRANSP., NAT’L HIGHWAY TRAFFIC SAFETY ADMIN., NOTICE OF PROPOSED RULEMAKING, 49 CFR PARTS 571 AND 585, FEDERAL MOTOR VEHICLE SAFETY STANDARDS; ELECTRONIC STABILITY CONTROL SYSTEMS, *available at* [http://www.nhtsa.gov/staticfiles/DOT/NHTSA/Rulemaking/Rules/Associated%20Files/ESC\\_NPRM.pdf](http://www.nhtsa.gov/staticfiles/DOT/NHTSA/Rulemaking/Rules/Associated%20Files/ESC_NPRM.pdf).

### III. The Need for Greater Initiative in Regulating Safety Systems

#### A. Current Standard for Regulation of Safety Systems

The NHTSA has historically been passive in considering safety systems for regulation. Its regulatory experience with Passive systems has been chaotic, particularly with air bags. Although the NHTSA originally took the initiative to propose a Safety Standard for Passive systems, Standard 208 was ultimately pushed through the regulatory process by the government, the automobile industry, and interest groups. In the case of air bags, the NHTSA spent almost thirty years being pushed in various directions before Congress directed it to mandate air bags under the ISTEA.<sup>93</sup>

The NHTSA's regulatory experience with Active systems has been even bleaker than with Passive systems. The agency displayed little initiative in considering any Active systems for regulation until Congress passed the TREAD Act of 2000. Due to the TREAD Act's congressional mandate to consider a TPMS for regulation, the NHTSA researched and published a Safety Standard in 2002.<sup>94</sup> However, since automobile manufacturers influenced the Safety Standard, public interest groups, through the judiciary, sought a revision of the Standard that forced the NHTSA to revise its Safety Standard. The final revised Safety Standard was published in 2005, five years after Congress pushed the NHTSA to consider an Active system.

Although a fixed process is lacking, the regulation of a safety system usually involves the preliminary study of a safety system, followed by a proposed Safety Standard and then a final Safety Standard.<sup>95</sup> The NHTSA's inertia is most damaging in the preliminary research phase – the decision-making process that leads the agency to evaluate whether a safety system is ripe for regulatory consideration.

The NHTSA has failed to learn from its historical experience, and thus the agency does not subscribe to a fixed standard when determining whether to evaluate a safety system for regulatory consid-

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<sup>93</sup> See *supra* § II(A)(2) and accompanying notes.

<sup>94</sup> See *supra* § II(B)(2) and accompanying notes.

<sup>95</sup> National Highway Traffic Safety Administration, Vehicle Safety Rulemaking Priorities and Supporting Research: 2003-2006 – Introduction, <http://www.nhtsa.dot.gov/cars/rules/rulings/PriorityPlan/FinalVeh/Index.html#idx1> (last visited Mar. 1, 2007) [hereinafter *Rulemaking Priorities*].

eration. The NHTSA claims that it evaluates safety systems for regulatory consideration based on “[the] likelihood of solutions, [e]xecutive initiatives, [c]ongressional interest and mandates, petitions to the agency . . . recommendations . . . and changes needed as a result of new vehicle technologies.”<sup>96</sup> The NHTSA also considers cost-benefit estimates and the severity of the problem in prioritizing safety systems for consideration.<sup>97</sup> Under this fluctuating standard, the NHTSA has deferred consideration of Active systems such as ESC.<sup>98</sup>

The lack of a fixed standard and the delayed consideration of Active systems indicates that the NHTSA lacks a mechanism to evaluate the ripeness of a safety system for regulatory consideration. To determine whether a safety system is ripe for regulatory consideration, the agency should consider the safety system under a more concrete standard, such as a defined factor framework.

## B. Proposed Standard for Regulation of Safety Systems

The framework for analyzing whether a safety system is ripe for regulatory review was developed after considering the NHTSA’s congressional mandate,<sup>99</sup> its historical experience<sup>100</sup> and the fluctuating standard that is currently employed in considering safety systems.<sup>101</sup> As a result, the framework can be used to decide which safety systems deserve to be considered for further evaluation. The factors of the framework, (1) safety track record, (2) preliminary cost-benefit analysis, and (3) availability, are explained below.

### 1. Safety Track Record

A safety system’s safety track record can be traced back to the NHTSA’s congressional mandate under the Motor Vehicle Safety Act. This legislation requires in part that the NHTSA<sup>102</sup> “consider

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<sup>96</sup> *Id.*

<sup>97</sup> *Id.*

<sup>98</sup> *Id.* (providing that the ESC system is a future consideration).

<sup>99</sup> *See supra* § II and accompanying notes.

<sup>100</sup> *Id.*

<sup>101</sup> *See supra* § III(A) and accompanying notes.

<sup>102</sup> The Motor Vehicle Safety Act states “Secretary of Transportation,” however, as described in § II *supra*, the same responsibility falls on the NHTSA as an agency of the Department of Transportation.

relevant available motor vehicle safety information”<sup>103</sup> to determine Safety Standards.<sup>104</sup> (Emphasis added). A vehicle’s safety track record is the relevant available motor vehicle safety information. Accordingly, the NHTSA has congressional authority to use the safety track record as a factor in evaluating new safety systems.

The NHTSA’s current research practice uses vehicle crash data in evaluating the effectiveness of a safety system. In September 2004, the agency conducted a preliminary study of the ESC Active system using national crash data from state and federal databases.<sup>105</sup> The NHTSA concluded that it would “feel more confident about the overall effectiveness of ESC when [there] is *enough data on a more representative cross-section of the [U.S. automobile] fleet including non-luxury vehicles and a wider variety of manufacturers.*”<sup>106</sup> (Emphasis added). Although the NHTSA uses the safety track record as part of its research of a safety system, its main focus is on national crash data. In its preliminary study of the ESC system, the NHTSA used “crash data . . . from 5 States, [and] . . . also evaluated [the ESC system] by analyzing FARS [Fatality Analysis Reporting System] data.”<sup>107</sup> FARS data contain crash information from “the [fifty] States, the District of Columbia, and Puerto Rico.”<sup>108</sup> The NHTSA’s additional sources of data are also based on national crash statistics.<sup>109</sup>

Under the NHTSA’s congressional mandate, the safety track record should cover a range of data broader than merely national crash data. The NHTSA’s mandate is to consider “relevant”<sup>110</sup> and

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<sup>103</sup> *Motor Vehicle Safety Act*, *supra* note 14, § 30111(b)(1).

<sup>104</sup> *Id.*

<sup>105</sup> *NHTSA ESC Preliminary Results*, *supra* note 68.

<sup>106</sup> *Id.*

<sup>107</sup> *Id.*

<sup>108</sup> National Highway Traffic Safety Administration, Fatality Analysis Reporting System (FARS) Brochure, <http://www-nrd.nhtsa.dot.gov/pdf/nrd-30/NCSA/FARS/809-726/index.htm> (last visited Jan. 30, 2007) (providing that the Fatality Analysis Reporting System (FARS) contains data derived from a census of fatal traffic crashes within the fifty States, the District of Columbia, and Puerto Rico).

<sup>109</sup> NAT’L HIGHWAY TRAFFIC SAFETY ADMIN., NAT’L CENTER FOR STATISTICS AND ANALYSIS (NCSA) BROCHURE (2001), *available at* <http://www-nrd.nhtsa.dot.gov/pdf/nrd-30/NCSA/NCSABrochure.pdf> (last visited Jan. 30, 2007) (listing all data sources used by the NHTSA).

<sup>110</sup> *Motor Vehicle Safety Act*, *supra* note 14.

“available”<sup>111</sup> vehicle safety data. Thus, relevant data should encompass a larger sample than simply a representative cross-section of the national automobile fleet. The better approach is to consider not only national crash data, but also to seek out available data from foreign experience and findings from private research.

The fundamental difference between Passive and Active systems justifies the expansion of what is seen as relevant safety data. Passive systems function only after an automobile accident has occurred.<sup>112</sup> In contrast, Active systems function continuously, working to keep the occupants safe at all times.<sup>113</sup> As a result, data on the effectiveness of Passive systems are readily available after an accident regardless of whether the systems functioned properly or not. Data on Active systems, however, are most often available only when such systems fail to function. Since Active systems work behind the scenes to actively monitor the vehicle, the times that they actually work will not be accurately reflected in statistical data. Thus, the NHTSA’s national data centered approach for safety track record is ineffective for Active systems.

To evaluate a safety track record for Active systems, the relevant data considered should include: (a) national government crash data, (b) foreign government crash data, and (c) national and foreign private research. The evaluation of national government crash data is a continuation of the NHTSA’s current practice of evaluating data from state and federal crash databases. Foreign government crash data covers all relevant and available studies conducted by governmental agencies overseas. National and foreign private research covers all relevant and available studies conducted by non-governmental entities. Expanding the available data set helps provide a more comprehensive picture, and thus puts the NHTSA in a better position to evaluate the safety track record of Active systems. Moreover, since this approach builds upon the NHTSA’s current method, it may also be effective with Passive systems. Finally, based on the relevant data, a determination is made on whether the safety system being evaluated has a strong or weak safety track record.

## 2. Preliminary Cost-Benefit Analysis

The preliminary cost-benefit analysis factor is also rooted in the NHTSA’s congressional mandate under the Motor Vehicle Safety

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<sup>111</sup> *Id.*

<sup>112</sup> *See supra* § II(A)(1) and accompanying notes.

<sup>113</sup> *See supra* § II(B)(1) and accompanying notes.

Act. The Motor Vehicle Safety Act requires that the NHTSA consider “whether a proposed standard is reasonable, *practicable*, and appropriate for the particular type of motor vehicle.”<sup>114</sup> (Emphasis added). The word “practicable” was understood by legislators to “include technological ability to achieve the goal of a particular standard as well as *consideration of economic factors*.”<sup>115</sup> (Emphasis added). Furthermore, the Senate Commerce Committee that recommended the Motor Vehicle Safety Act recognized that in issuing Safety Standards “the Secretary [of Transportation] will necessarily consider [the] reasonableness of cost.”<sup>116</sup> Preliminary cost-benefit evaluation involves the consideration of economic factors and the reasonableness in cost of a proposed standard. The NHTSA claims that it uses cost-benefit analysis in its regulatory evaluation.<sup>117</sup> The agency uses “best educated estimates of the cost and . . . of potential benefits.”<sup>118</sup> However, there is no explanation on what such educated estimates include.

Although an in-depth cost-benefit analysis is a detailed statistical inquiry, the preliminary phase of selecting a safety system for consideration requires only a simple preliminary cost-benefit analysis. The purpose of such an analysis is to filter out extreme cases in which the costs of a safety system are currently so prohibitive that the safety system fails to justify consideration at the moment.

To perform a preliminary cost-benefit analysis, the NHTSA should define the safety system’s cost as the product of the average market price of the safety system and the number of automobiles in the U.S. (“National Price”). The system’s benefit should be defined as the estimate of the number of lives saved by implementing such a system (“Lifesaving Potential”). The average market price of the safety system is determined by conducting a survey of automobile manufacturers that offer the safety system in their automobiles. The number of automobiles in the U.S. is gathered from the appropriate Census figures. Relevant studies on the efficacy of the system are used to obtain an estimate of the number of lives that could be saved.

To analyze the safety system’s National Price and Lifesaving Potential, the system is compared to a safety system that the NHTSA

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<sup>114</sup> *Motor Vehicle Safety Act*, *supra* note 14, § 30111(b)(3).

<sup>115</sup> *H & H Tire Co. v. United States Dep’t of Transp.*, 471 F.2d 350, 353 (7th Cir. 1972) (citing House Debate 112 Cong. Rec. 19648 (Aug. 17, 1966)).

<sup>116</sup> *Id.* (citing 2 U.S. Code Cong. & Adm. News, 89th Cong., 2d Sess., 1966, p. 2714).

<sup>117</sup> *Rulemaking Priorities*, *supra* note 95.

<sup>118</sup> *Id.*

has regulated in the past. The most likely candidates are Passive systems.<sup>119</sup> The National Price of the Passive system and its Lifesaving Potential can then be compared with the National Price and Lifesaving Potential of the safety system being evaluated. On one hand, the benefit of a safety system being evaluated will outweigh its cost if the National Price and Lifesaving Potential of the system are similar to those of a Passive system – one that the NHTSA presumably accepted if it was regulated. On the other hand, the cost of the safety system under evaluation will outweigh its benefit if the National Price and Lifesaving Potential vary significantly.

In the specific analysis above, a safety system's cost is limited to its National Price and its benefit is limited to its Lifesaving Potential, primarily for pragmatic and illustrative purposes. However, a number of ways exist to determine a safety system's cost and benefit. For example, cost could include other available data such as an increase in a vehicle's fuel consumption due to the added weight of the safety system. This added cost may change the outcome of the cost-benefit analysis. In the same way, benefit could include projections of a reduction in injuries or in insurance claims. The values used to determine cost and benefit can also be adjusted for inflation. Ultimately, the purpose of this factor is to roughly address the economic costs of a safety system, not to perform a complex mathematical calculation. Thus, for ease of illustration, cost is limited to the National Price of a safety system while the benefit is limited to its Lifesaving Potential.

### 3. Availability

The availability of a safety system on the market has historically played a part in the regulation of safety systems.<sup>120</sup> In 1972, the DOT<sup>121</sup> recognized that automobile manufacturers would not voluntarily install air bags into new vehicles. Thus, the DOT took on the task of mandating the air bag as part of a Passive system requirement under Standard 208, albeit unsuccessfully.<sup>122</sup> In 1991, Congress also recognized that despite the revised Standard 208, automobile manufacturers did not incorporate air bags into new vehicles. As a result, Congress required the NHTSA to mandate air bags under the

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<sup>119</sup> See *supra* § II(A) and accompanying notes.

<sup>120</sup> See *supra* § II(A) - (B) and accompanying notes.

<sup>121</sup> See *supra* § II and accompanying notes.

<sup>122</sup> See *supra* § II(A)(2) and accompanying notes.

ISTEA.<sup>123</sup> Thus, the availability of a safety system has been an important factor in safety system regulation.

A safety system's availability can be determined by examining the proportion of the national automobile fleet which currently offers the particular safety system. If a safety system is not offered at all, it is *unavailable*. If it is offered only in luxury vehicles and not across the national automobile fleet, it has *limited availability*. If, however, a safety system is offered in both luxury and non-luxury vehicles, and across the national automobile fleet, it is *readily available*.

To evaluate the availability of a safety system, it must be compared with the availability of the same system overseas. This evaluation is accomplished by considering the automobile fleets in other developed countries. If such a comparison demonstrates a large gap between U.S. availability and overseas availability, that may be grounds for concern. Nevertheless, if a safety system is available overseas and not in the U.S. or vice versa, that does not necessarily indicate a problem. Such a discrepancy in availability, however, raises a flag and calls for closer scrutiny of the safety system.

The NHTSA's historical experience with air bags demonstrates that when a safety system with varying standards is left to the will of automobile manufacturers, long run problems for consumers may ensue.<sup>124</sup> Therefore, even if a safety system is readily available, the NHTSA should evaluate whether the system has varying standards that may be a cause for concern.

### C. Practical Application of the Proposed Standard for Regulation of Safety Systems

Once a safety system has been evaluated under the factor framework described above, the NHTSA must decide whether the factors point towards considering the safety system or towards delaying consideration of the system. To decide this issue, I propose that the safety track record, the preliminary cost-benefit analysis, and availability of the safety system on the market are independently evaluated and each is assigned a value ranging from 1 to 4.<sup>125</sup> Thus, for the safety track record factor, a value of 1 indicates a weak safety track record, while a value of 4 indicates a strong safety track record. Likewise, for the preliminary cost-benefit analysis factor, a value of 1

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<sup>123</sup> *Id.*

<sup>124</sup> See *supra* § II(A)(2) and accompanying notes.

<sup>125</sup> Values ranging from 1 to 4 were selected to facilitate illustration. The NHTSA may select a larger range, for example from 1 – 100.

indicates that the system's cost outweighs its benefit, while a value of 4 indicates that the system's benefit outweighs its cost. For the availability factor, however, a value of 1 indicates that the safety system is readily available while a value of 4 indicates that the system is unavailable. The values of each factor are then added together to obtain a final determining number.

Thus, if a safety system (1) has a strong safety track record (value = 4); (2) has benefit that outweighs its cost (value = 4); and (3) is unavailable (value = 4), the sum of the values from all three factors yields a total of 12. If however, a safety system (1) has a weak safety track record (value = 1); (2) has a cost that outweighs its benefit (value = 1); and (3) is readily available (value = 1), the sum of the values from all three factors yields a total of 3. A total of 12 indicates that a safety system is ready for present consideration. Conversely, a total of 3 indicates that a safety system is not yet ripe for consideration and may be deferred. See Table 1 below.

**Table 1. Proposed Standard for Regulation of Safety Systems**

Factors	Values (ranging from 1 - 4)	
	Safety track record	1
Preliminary Cost-Benefit Analysis	1	4
Availability	1	4
<b>Total</b>	<b>3</b>	<b>12</b>
	Defer until later date	Consider at present time

As the totals move away from the minimum of 3 and maximum of 12, it is less clear what course of action the NHTSA should pursue. The purpose of the factor framework, however, is not to reduce a subjective inquiry into a rigid mathematical formula. The purpose of this exercise is to provide a structure for evaluating whether a safety system is presently worthy of consideration. The objective is not to translate the totals into absolute courses of action; these totals only serve as a guide and are subject to interpretation.

The NHTSA could assign each of the above factors different weights depending on which factor is most important in the agency's view. For the purpose of clarity and ease of illustration in this Note, all three factors in the framework are presumed to have equal weight.

The NHTSA could also add factors to the framework. Safety track record, preliminary cost-benefit analysis, and availability were

chosen as factors based on their importance in determining whether a safety system should be considered by the NHTSA. They are not, of course, the only factors worthy of consideration.

#### **D. Evaluation of the ESC Active Safety System Using the Proposed Standard**

To demonstrate how the NHTSA could use such a framework, merits of a current Active system on the market – the ESC system – are evaluated.

##### **1. Safety Track Record**

To evaluate the ESC system's safety track record, the relevant data to consider should include: (1) national government crash data, (2) foreign government crash data, and (3) national and foreign private research.<sup>126</sup>

First, national government data demonstrate the lifesaving potential of the ESC system. A 2004 NHTSA study shows that the ESC system, an Active system, is effective at reducing single vehicle crashes.<sup>127</sup> The study analyzed state and federal crash data from 1997 to 2003 and compared vehicle models with the ESC system against earlier versions of the same vehicle models without the ESC system.<sup>128</sup> The results demonstrated that the ESC system reduced single vehicle crashes in passenger cars<sup>129</sup> by 35 percent and reduced such crashes in Sport Utility Vehicles (“SUVs”) by 67 percent.<sup>130</sup> The study also found that single vehicle crashes resulting in fatalities were reduced by the ESC system. The fatality reduction was 30 percent for passenger cars and 63 percent for SUVs.<sup>131</sup> The NHTSA concluded that “[the ESC system] appears to provide safety benefits by reducing the number of crashes due to driver error and loss of control, because it has the potential to anticipate situations leading up to

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<sup>126</sup> See *supra* § III(B) and accompanying notes.

<sup>127</sup> *NHTSA ESC Preliminary Results*, *supra* note 68 at 2-3 (single vehicle crashes are those crashes that involve only one vehicle, and include roll-overs and collisions with fixed objects).

<sup>128</sup> *Id.*

<sup>129</sup> *Id.* (passenger cars include all cars except Sport Utility Vehicles and trucks).

<sup>130</sup> *Id.* at 3 (Table 1).

<sup>131</sup> *NHTSA ESC Preliminary Results*, *supra* note 68 at 3 (Table 2).

some crashes before they occur[.]”<sup>132</sup> Since the data were gathered mainly from luxury automobiles, however, the NHTSA stated that it would be more confident about the effectiveness of the ESC system once there are data from a “more representative cross-section” of the U.S. automobile fleet.<sup>133</sup>

Second, foreign government experience also supports the effectiveness of the ESC system. In Germany, Mercedes-Benz together with Bosch Corporation developed the first ESC system for luxury vehicles, which was available in the mid-1990s.<sup>134</sup> By 1999, Mercedes-Benz was the first automobile manufacturer to offer the ESC system as a standard feature in its entire vehicle lineup.<sup>135</sup> In 2002, a German government study found a 29 percent reduction in accident rates for Mercedes-Benz vehicles between 1999 and 2000 where the ESC system was a standard feature in such vehicles.<sup>136</sup> Specifically, the study found that while 15,000 crashes involved Mercedes-Benz vehicles in 1999, only 10,600 crashes involved such vehicles in 2000 and 10,700 crashes involved such vehicles in 2001.<sup>137</sup> These figures are consistent with what the NHTSA found in its 2004 ESC system study.

Third, private research supports the ESC system’s effectiveness as a lifesaving system. The Insurance Institute for Highway Safety (“IIHS”) found in a 2004 study that “[the] ESC [system] reduced the risk of [fatal and non-fatal] single vehicle crashes by 41 percent.”<sup>138</sup> The IIHS relied on two years of state and federal crash data.<sup>139</sup> However, the IIHS study was more detailed than the NHTSA study, because in addition to the ESC system it accounted for design changes that may have impacted the analysis.<sup>140</sup> The IIHS concluded that “[i]f all vehicles on U.S. roads had [the] ESC [system], we might avoid as many as 800,000 of the 2 million or so single vehicle crashes that occur each year. About 14,000 fatal single vehicle crashes oc-

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<sup>132</sup> *Id.* at 1.

<sup>133</sup> *Id.* at 4.

<sup>134</sup> CBS News, *Stability Control’ for Vehicles* (July 21, 2003), <http://www.cbsnews.com/stories/2003/07/21/tech/main564126.shtml> (last visited Mar. 1, 2007).

<sup>135</sup> *Id.*

<sup>136</sup> *Id.*

<sup>137</sup> *Id.*

<sup>138</sup> *IIHS Study, supra* note 3, at 2.

<sup>139</sup> *Id.*

<sup>140</sup> *Id.* at 3.

curred in 2003, which means [there is] a potential to save more than 7,000 lives each year.”<sup>141</sup> The IIHS results were consistent with the NHTSA study and the German government study.<sup>142</sup>

Therefore, national government crash data, foreign government crash data and private research demonstrate that the ESC Active system has a *strong* safety track record. Nevertheless, the strong safety track record must be viewed in perspective of the remaining two factors and assigned a value based on the process explained above. The possible values range from 1 to 4, with 1 indicating a weak safety track record and 4 indicating a strong safety track record. Under my proposed framework, the evaluation of the ESC system indicates a strong safety track record and therefore the ESC system receives a value of 4 for the safety track record factor.

## 2. Preliminary Cost-Benefit Analysis

The preliminary cost-benefit analysis under my proposed framework first requires the determination of a safety system’s National Price<sup>143</sup> and Lifesaving Potential.<sup>144</sup> Next, it requires the comparison of the safety system’s National Price and Lifesaving Potential with a currently regulated Passive system’s National Price and Lifesaving Potential. Therefore, the ESC system’s National Price and Lifesaving Potential will be compared against the National Price and Lifesaving Potential of air bags, a Passive system that is currently regulated.

The ESC system’s National Price first requires the determination of the system’s average market price and second, the determination of the number of vehicles in the U.S. market.

First, the average market price is determined by sampling local and foreign automobile manufacturers that supply automobiles to the U.S. market. A limited number of manufacturers offer the ESC system as an option on their U.S. vehicle fleet. Most luxury vehicle manufacturers include the ESC system as a standard feature, but they include the cost of the safety system within the vehicle’s price. Nevertheless, Chrysler offered the ESC system as an option on its 2005 Chrysler 300 for \$1,025;<sup>145</sup> Nissan offered a version of the ESC sys-

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<sup>141</sup> *Id.* at 4.

<sup>142</sup> *Id.*

<sup>143</sup> *See supra* § III(B)(2) and accompanying notes.

<sup>144</sup> *Id.*

<sup>145</sup> Chrysler, Build & Price 2005 Chrysler 300, Options, <http://www-5.chrysler.com/vehsuite/dispatch.do> (last visited Mar. 1, 2007).

tem as an option on its 2005 Maxima for approximately \$400,<sup>146</sup> and Volkswagen offered a version of the ESC system as an option on its 2005 Jetta for \$280.<sup>147</sup> From this data, treating Chrysler's price as an outlier, the current market price for the ESC system is approximately \$340.<sup>148</sup>

Second, the most recent data on the number of automobiles in the U.S. indicate that there are approximately 135,920,677 automobiles in the U.S.<sup>149</sup> Therefore, the ESC system's National Price, the product of the average market price and the number of automobiles in the U.S., is approximately \$46.2 billion.<sup>150</sup>

Having approximated the ESC system's National Price, the next step is to calculate the system's Lifesaving Potential. The IIHS determined that around 14,000 fatal single vehicle crashes occurred in 2003.<sup>151</sup> The NHTSA's figures were more aggressive at 15,621 fatalities resulting from single vehicle crashes in 2003.<sup>152</sup> Thus, the approximate number of fatal single vehicle crashes is the average of the IIHS and NHTSA figures: 14,810.<sup>153</sup>

The IIHS further found that the ESC system reduced the fatal-

<sup>146</sup> Nissanhelp.com, 2005 Nissan Maxima Price, <http://www.nissanhelp.com/Models/2005/Maxima/Price.htm> (last visited Mar. 2, 2007) (providing price of package including full size spare tire for \$600. Full size spare ordinarily costs \$200, thus approximate price of VDC is \$400) [hereinafter *Nissan Price*].

<sup>147</sup> JB Car Pages, 2005 Volkswagen Jetta 2.5, <http://volkswagen.jbcarpages.com/Jetta/2005/> (last visited Jan. 27, 2005) [hereinafter *Volkswagen Price*].

<sup>148</sup> *Compare Nissan Price with Volkswagen Price* (determining average of Nissan and Volkswagen prices  $(\$280 + \$400) / 2 = \$340$ ). This is a preliminary estimate for illustrative purposes. The sample size could be increased for greater accuracy.

<sup>149</sup> U.S. Department of Transportation, Bureau of Transportation Statistics, 2005 Pocket Guide to Transportation, Table 9 - 2002 Census, [http://www.bts.gov/publications/pocket\\_guide\\_to\\_transportation/2005/html/table\\_09.html](http://www.bts.gov/publications/pocket_guide_to_transportation/2005/html/table_09.html) (last visited Mar. 1, 2007).

<sup>150</sup> (average market price x total number of vehicles in U.S. :  $\$340 \times 135,920,677 = \$46,213,030,180$  or approximately \$46.2 billion.)

<sup>151</sup> *IIHS Study, supra* note 3, at 2.

<sup>152</sup> National Highway Traffic Safety Administration, Study Finds Electronic Stability Control Benefits (Sept. 23, 2004), <http://www.dot.gov/affairs/nhtsa4204.htm> (last visited Jan. 30, 2007) [hereinafter *ESC Study Report*].

<sup>153</sup> *Compare IIHS Study, supra* note 3, at 4 with *ESC Study Report, supra* note 149 (calculating average of IIHS and NHTSA figures  $(14,000 + 15,621) / 2 = 14,810.5$  or approximately 14,810 fatal single vehicle crashes).

ity risk from single vehicle crashes by 56 percent.<sup>154</sup> The NHTSA found that the ESC system reduced fatal single vehicle crashes by 30 percent.<sup>155</sup> Hence, an approximate reduction in fatal single vehicle crashes is the average of the IIHS and NHTSA estimates: 43 percent.<sup>156</sup>

The benefit provided by the ESC system in terms of its Life-saving Potential is determined by examining the average fatal single vehicle crashes at 14,810 and the average reduction in fatal single vehicle crashes at 43 percent. Forty-three percent of 14,810 is 6,368 potential lives saved per year. Thus, the ESC system's benefit, its Lifesaving Potential, is 6,368 lives saved per year.

Having obtained the ESC system's cost and benefit figures, the numbers must be compared to those of a Passive system that is regulated by the NHTSA. Thus, the cost and benefit figures for air bags, a Passive system, are determined next.

The cost of air bags was estimated by the NHTSA to be between \$479.52 and \$579.42 per vehicle in 1997,<sup>157</sup> which averaged \$529.47 per vehicle.<sup>158</sup> Since the number of vehicles in the U.S. in 1997 was 129,748,704,<sup>159</sup> the cost of requiring air bags in all vehicles in the U.S. in 1997 was approximately \$68.7 billion.<sup>160</sup> The NHTSA estimated the benefit in terms of lives saved per year to be approximately 6,840.<sup>161</sup>

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<sup>154</sup> IIHS Study, *supra* note 3, at 2.

<sup>155</sup> NHTSA ESC Preliminary Results, *supra* note 68, at 3.

<sup>156</sup> Compare IIHS Study, *supra* note 3, at 2 with NHTSA ESC Preliminary Results, *supra* note 68, at 3 (calculating average of IIHS and NHTSA estimates: (56 percent + 30 percent) / 2 = 43 percent).

<sup>157</sup> National Highway Transportation Safety Administration, Final Economic Assessment of FMVSS 208 - Costs of Recent Passenger Car Rulemakings, <http://web.archive.org/web/20050413102527/http://www.nhtsa.dot.gov/airbag/AAPFR/econ/Chapter10.html> (last visited Mar. 1, 2007) (This cost includes added weight and fuel impact and thus it may be slightly overstated) [hereinafter *Air Bag Cost-Benefit*].

<sup>158</sup> See *Air Bag Cost-Benefit*, *supra* note 157 (providing numbers to calculate the average cost of air bag per vehicle:  $(\$429.52 + \$579.42) / 2 = \$529.47$ ).

<sup>159</sup> U.S. DEPARTMENT OF TRANSP., BUREAU OF TRANSP. STATISTICS, 2000 POCKET GUIDE TO TRANSPORTATION, 1997 CENSUS at 11 (1999), [http://www.bts.gov/publications/pocket\\_guide\\_to\\_transportation/2000/pdf/entire.pdf](http://www.bts.gov/publications/pocket_guide_to_transportation/2000/pdf/entire.pdf) (last visited Jan. 28, 2007).

<sup>160</sup> National Cost of air bags: (average cost per car x total number of cars in U.S.) =  $(\$529.47 * 129,748,704 = \$68,698,046,306.88$ . or approximately \$68.7 billion).

<sup>161</sup> *Air Bag Cost-Benefit*, *supra* note 157. After Safety Standard 208 required

The cost of the ESC system is \$46.2 billion and its benefit is 6,368 lives saved per year. The cost of air bags, however, was \$68.7 billion while its benefit was 6,840 lives saved per year. A preliminary analysis indicates that air bags cost approximately \$22.5 billion more than the ESC system, while providing a similar benefit. Therefore, a preliminary cost-benefit analysis of the ESC system yields a benefit that outweighs its cost. Accordingly, this factor is assigned a value of 4 under my proposed framework.

### 3. Availability

To determine the availability of a safety system, the NHTSA should compare the proportion of the U.S. vehicle fleet that offers the safety system with that of a comparable market, such as Europe. The NHTSA stated that in 2003 only 7.4 percent of the vehicles sold in the U.S. had some form of the ESC system.<sup>162</sup> In Europe, however, 33 percent of the vehicles sold had some form of the ESC system.<sup>163</sup>

More recent data showed that for model year 2005, the ESC system was a standard feature in only 21.6 percent of the vehicles sold in the U.S. and optional in only 19.3 percent of the vehicles sold.<sup>164</sup> Thus, the ESC system has limited availability in the U.S. market. Such a finding requires giving the availability factor a value of 3 since it is available, albeit in limited quantities.

### 4. Application of Assigned Values

Once a safety system has been evaluated under the factor framework and each factor has been assigned individual values, the decision whether to consider the system or to defer its consideration is determined via the total value. For the ESC system (1) there is a strong safety track record (value = 4), (2) the benefit outweighs the

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air bags, the NHTSA estimated that 4,570 – 9,110 lives would be saved per year. The average of this estimate is:  $(4,570 + 9,110) / 2 =$  approximately 6,840 lives saved per year. *Id.*

<sup>162</sup> *ESC Study Report*, *supra* note 152.

<sup>163</sup> Dee-Ann Durbin, *Electronic Stability Control Not Gaining a Foothold in U.S. Auto Market*, Associated Press (July 21, 2003), <http://www.theautochannel.com/news/2003/07/20/165181.html> (last visited Mar. 1, 2007).

<sup>164</sup> *Auto Experts Recommend Two Key Safety Features on Vehicles*, CRASHWORTHINESS NEWS, Dec. 26, 2004, *available at* <http://www.crashworthiness.com/articles/vehicle-safety.html> (last visited Jan. 28, 2007).

cost (value = 4) and (3) there is limited availability (value = 3). Thus, the sum of the factors' values is 11.<sup>165</sup> See Table 2 below. A total value of 3 indicates deferred consideration while a total value of 12 indicates present consideration. Therefore, a total value of 11 indicates that the ESC system should presently be considered by the NHTSA for further evaluation instead of being deferred.

**Table 2. Evaluation of the ESC Active Safety System Using the Proposed Standard**

<b>Factors</b>	<b>Values (ranging from 1 – 4)</b>
Safety track record	4
Preliminary Cost-Benefit Analysis	4
Availability	3
<b>Total</b>	11
	Most Likely Consider

#### **E. Next Steps After Evaluating the Safety System Using Proposed Standard**

Once the evaluation of a safety system under the factor framework has provided guidance on whether the system should be presently considered or deferred by the NHTSA, the agency should make a concerted effort to act.

If the factor framework calculation indicates deferring consideration of a safety system, the NHTSA should set a date to re-evaluate the system before deferring consideration. The agency could achieve a re-evaluation cycle with periodic re-evaluations of the safety systems. For example, it could conduct an annual, semi-annual or quarterly evaluation. Thus, by consistently evaluating safety systems under a factor framework, the NHTSA will be better prepared to take the proper initiative to consider safety systems.

If the factor framework calculation indicates that a safety system should be presently considered, the NHTSA should actively investigate the safety system to determine the best course of action. Regulation, however, is not the only means of making automobiles safer for U.S. consumers. The NHTSA's purpose of "reduc[ing] traffic accidents and deaths and injuries resulting from traffic accidents"<sup>166</sup> may be achieved via other means.

<sup>165</sup> (4+4+3 = 11)

<sup>166</sup> *Motor Vehicle Safety Act*, *supra* note 14, § 30101.

First, if the problem is the lack of consumer demand for a safety system, the NHTSA could attempt to stimulate that demand by undertaking consumer education campaigns or by encouraging public and private interest groups to educate consumers about the merits of the safety system. By bridging the supply-demand gap, the NHTSA could achieve its purpose without the expenses of regulation.

Second, the problem may be the lack of a safety system. Automobile manufacturers may not provide the safety system on U.S. market automobiles or may limit availability to a small proportion of U.S. market automobiles. In such a case, the NHTSA could attempt to stimulate supply by offering automobile manufacturers incentives to increase the availability of the safety system on the U.S. market. Accordingly, the NHTSA could once again bridge the supply-demand gap and achieve its purpose without the expenses of regulation.

Third, there may not be a market for a safety system because of both the lack of demand and the lack of supply of the system. Consumers could either be unaware of the merits of a safety system or may not want such a system due to its cost. Likewise, automobile manufacturers may either be unaware of the merits of a safety system or may not want to offer the system because of its effect on the bottom-line price of a vehicle. In such a case, the NHTSA may also attempt to create consumer awareness and automobile manufacturer awareness or it may offer incentives for automobile manufacturers to make the safety system available on the U.S. market at a reasonable price. However, if all else fails, the NHTSA has the option to issue a safety standard which requires that the safety system be installed by automobile manufacturers.

#### **IV. Conclusion**

The NHTSA's current standard for determining whether to consider a safety system for regulatory review is loose and undisciplined. The standard leaves control over such decisions to the executive, legislative and judicial branches of government, automobile manufacturers and public and private interest groups. Although the standard mentions pertinent factors for consideration, such as cost-benefit analysis, and the likelihood of solutions, it is largely an unorganized mix of factors with no guidance for application. Thus, the current standard fails to provide a concrete framework in which to evaluate new safety systems.

The proposed framework for considering safety systems for regulatory review is concrete and provides a level of objectivity. Moreover, it equips the NHTSA with a tool to effectively consider

the factors that it claims to currently consider. The primary factors for the framework: (1) safety track record, (2) preliminary cost-benefit analysis and (3) availability, were identified after tracing the NHTSA's regulatory history, legislative mandate and current practice.<sup>167</sup> The proposed framework is an attempt to organize decision-making processes at the NHTSA so that valuable safety features with lifesaving potential are not overlooked.

The primary factors were selected specifically with Active systems in mind, because the NHTSA has largely ignored Active systems other than a TPMS – which came after the passage of a congressional act requiring the agency to consider such a system. The agency only recently began considering ESC, an Active system that had proven to be worthy of consideration a long time ago. Also, the fundamental difference between Active and Passive systems calls for a fresh approach to regulatory consideration.

The system of assigning values to each factor after an independent evaluation of each aids the decision-making process. The approach is not intended to reduce the inquiry to a simple mathematical question. The purpose is to provide a tangible framework that allows for a structured basic evaluation.

The evaluation of a safety system for regulatory consideration does not end after a value is determined and a decision is made whether to presently consider the system or to defer its consideration indefinitely. An evaluation that indicates present consideration requires the NHTSA's full attention and further concrete steps. Such steps could involve educating consumers on the merits of a safety system, incentivizing automobile manufacturers to make the system readily available or further analyzing the system. If all else fails, the NHTSA can always regulate. The agency should also seriously address an evaluation that indicates deferral of consideration. In such a case, the safety system could be deferred to timely periodic reviews that would continue the evaluation of the system within the framework and allow the NHTSA to actively consider safety systems for regulatory review.

With this new approach, the NHTSA can finally be the driving force behind its own actions. The agency is no longer relegated to a passive role in the back seat of automobile safety evaluation. It can now take the driver's seat and steer automobile safety in the U.S.

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<sup>167</sup> See *supra* § III and accompanying notes.