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Comments of Consumer Reports to the National Highway Traffic Safety Administration on the Advance Notice of Proposed Rulemaking: Advanced Impaired Driving Prevention Technology Docket No. NHTSA-2022-0079

Consumer Reports (CR), the independent, nonprofit, and nonpartisan member organization,¹ welcomes the opportunity to comment on the advance notice of proposed rulemaking (ANPRM) by the National Highway Traffic Safety Administration (NHTSA) regarding advanced drunk and impaired driving prevention technology.

This technology, which would restrict vehicle operation if a driver is impaired, has immense potential to make U.S. roads safer. In particular, the technology would greatly reduce and potentially even eliminate drunk driving, which has harmed many millions of people nationwide. Drivers who are drunk or otherwise impaired pose a danger to everyone who uses the road. Prevention—stopping this dangerous driving before it happens—is vitally important.

In 2021, Congress directed NHTSA to issue a federal rule by November 15, 2024, requiring all new passenger vehicles to be equipped with technology that can passively and accurately detect when driver blood alcohol content (BAC) is at or above 0.08, monitor driver performance to detect whether the driver is impaired, or both; and also prevent or limit vehicle operation accordingly.² The technology would need to be effective, and it would work in the background, meaning that drivers would not be required to do anything extra or change how they use their car. Auto manufacturers would be required under the law to build the technology into

¹ Founded in 1936, Consumer Reports (CR) is an independent, nonprofit, and nonpartisan organization that works with consumers to create a fair and just marketplace. Known for its rigorous testing and ratings of products, CR advocates for laws and company practices that put consumers first. CR is dedicated to amplifying the voices of consumers to promote safety, digital rights, financial fairness, and sustainability. The organization surveys millions of Americans every year, reports extensively on the challenges and opportunities for today's consumers, and provides ad-free content and tools to 6 million members across the United States.

² Section 24220 of the Infrastructure Investment and Jobs Act of 2021, Pub. L. 117–58, 135 Stat. 429.

all new passenger vehicles at a date to be determined two to three years after the rule becomes final. Eventually, as the U.S. vehicle fleet turns over, every car on the road would be built to prevent drunk and impaired driving.

CR strongly supported enactment of this provision,³ and now we are urging NHTSA to move expeditiously to develop performance requirements. NHTSA should ensure that all new passenger vehicles must come equipped with an effective system that will save lives. Importantly, such a system should be used solely for crash prevention, and should be designed and built to inherently protect consumers' privacy and minimize security vulnerabilities.

In the following sections, we share CR's comments on information that NHTSA has requested and convey our recommendations for how NHTSA might optimally implement the requirements for advanced drunk and impaired driving prevention technology. We dedicate particular focus to areas on which CR has significant testing and/or policy expertise, including direct, largely camera-based driver monitoring systems (DMS); warnings and interventions in response to driver inattention or disengagement; and consumer data privacy and security.

I. New Requirements Are Urgently Needed, and Should Be Implemented to Maximize Both Near-Term and Future Safety Benefits

U.S. traffic crash deaths and injuries are persistently high, and many crashes are related to impaired driving. In 2021, the most recent year with final NHTSA data available, 42,939 people were killed and an estimated 2.5 million people suffered nonfatal injuries in motor vehicle crashes on U.S. roads.⁴ Included among those killed were 13,384 people who lost their lives in crashes involving alcohol-impaired driving; on average, there was one such fatality every 39 minutes.⁵ Of the 1,184 total U.S. traffic fatalities in 2021 among children 14 and younger, 25 percent (294) occurred in alcohol-impaired-driving crashes.⁶

Technology that can work passively and accurately to prevent people from drinking and driving could save more than 10,000 lives per year, according to the Insurance Institute for Highway Safety (IIHS)—preventing fully one-quarter of all road fatalities.⁷ According to NHTSA, the estimated economic cost of alcohol-impaired motor vehicle traffic crashes in the U.S. in 2019 was \$58 billion in tangible economic costs and \$296 billion in total costs if also considering the value of lost quality-of-life from serious injuries or deaths.⁸ It is also likely that numerous additional lives could be saved, injuries prevented, and costs minimized through

³ See, e.g., CR (Aug. 4, 2021) (online at: <u>advocacy.consumerreports.org/press_release/consumer-reports-road-safety-measures-in-infrastructure-bill-include-important-steps-missed-opportunities</u>) (press release).

⁴ NHTSA, *2021 Data: Summary of Motor Vehicle Traffic Crashes* (Oct. 2023) (online at: <u>crashstats.nhtsa.dot.gov/</u><u>Api/Public/ViewPublication/813515</u>).

⁵ NHTSA, *2021 Data: Alcohol-Impaired Driving* (June 2023) (online at: <u>crashstats.nhtsa.dot.gov/Api/Public/View</u> <u>Publication/813450.pdf</u>).

⁶ *Id.* Of these 294 child deaths: 162 were passengers of vehicles with alcohol-impaired drivers; 100 were occupants of other vehicles; 28 were pedestrians, cyclists, or other nonoccupants; and 4 were child drivers.

⁷ IIHS, "Alcohol and drugs" (updated Oct. 2023) (online at: <u>www.iihs.org/topics/alcohol-and-drugs</u>).

⁸ Supra note 5.

technology to reduce other types of impairment behind the wheel, such as distraction and drowsiness.⁹

Consumer Reports, along with more than a dozen other traffic safety experts and organizations, is a part of the Technical Working Group on Advanced Impaired Driving Prevention Technology (TWG). The TWG was formed in June 2022 to review existing technologies and systems in development that have the potential to satisfy the congressional mandate for advanced drunk and impaired driving prevention technology. After months of research, meetings, and discussions with experts in the field, the group agrees that it is both essential and feasible for NHTSA to move forward expeditiously to ensure the technology comes standard on all new passenger vehicles as required by law.¹⁰

CR, together with other members of the TWG, is urging NHTSA to take an iterative and phased approach to implementation, recognizing that:

(1) Technology does not need to be fully developed and ready for deployment at the time a standard is promulgated; rather, safety standards can incentivize and lead technology development, and encourage investments for public benefit; and

(2) Taking a phased or incremental approach to the federal requirements can be an essential tool for NHTSA, and help achieve significant near-term benefit while also committing to larger-scale progress in the future.¹¹

As the TWG has commented to NHTSA:

Rather than a single requirement for impairment prevention technology, we need a regulatory trajectory with a series of progressive requirements that incentivize technology investment, deliver life-saving benefits in the near term, and allow development time for expanded functions and even greater benefits in the longer term.¹²

¹² Id.

⁹ See NHTSA, "NHTSA Reminds Drivers to Avoid Distractions, Launches Distracted Driving Campaign" (Apr. 3, 2023) (online at: <u>www.nhtsa.gov/press-releases/nhtsa-reminds-drivers-avoid-distractions-launches-</u>

distracted-driving-campaign) (press release). NHTSA identified 3,522 fatalities in 2021 in crashes involving a distracted driver. The agency also acknowledges that distraction is likely underreported because the behavior is difficult to detect during crash investigations, and police reports likely understate its incidence. A separate NHTSA analysis found distraction was involved in 29% of all crashes in 2019, resulting in 10,546 fatalities, 1.3 million nonfatal injuries, and \$98.2 billion in economic costs. *See also* NHTSA, "Drowsy Driving," *Countermeasures That Work* (11th Edition, 2023) (online at: www.nhtsa.gov/book/countermeasures-that-work/drowsy-driving). NHTSA identified 684 fatalities in 2021 in crashes involving a drowsy driver, though the agency acknowledges that—much like distracted driving—it is often difficult to determine whether drowsy driving contributed to a crash. An analysis by the AAA Foundation for Traffic Safety indicates that the impact of drowsy driving is far greater, and on the basis of this research, NHTSA suggests that more than 8,300 people may have died in drowsy-driving-related motor vehicle crashes across the U.S. in 2021.

¹⁰ See TWG, "Submission by the Technical Working Group on Advanced Impaired Driving Prevention Technology to Rulemaking Docket (NHTSA-2022-0079) regarding the Advance Notice of Proposed Rulemaking on Advanced Impaired Driving Prevention Technology" (Feb. 29, 2024) (online at: <u>impaireddrivingtwg.files.wordpress.com/2024/</u>02/twg-docket-submission.feb29.pdf).

¹¹ Id.

CR concurs that this is the optimal approach for NHTSA to take with respect to implementing the congressional mandate, and encourages the agency to review the full TWG filing.

Additionally, while it is essential for NHTSA to take great care in the rules it sets—including to help avoid false positives and determine appropriate steps for the technology to take in response to impairment—we emphasize that the agency should also be sure not to let the perfect be the enemy of the good. NHTSA has indicated in the ANPRM that it believes advanced drunk and impaired driving technology must be responsible for "distinguishing between different impairment states." This is a worthy goal, especially for deployment of systems designed specifically to detect whether a driver's BAC is 0.08 or higher; however, it might not be possible in all cases to determine if impairment is due to alcohol, drugs, distraction, drowsiness, or another factor, or a combination of these factors.

A broader "fitness to drive" measurement would be sufficient in many cases, and simpler to implement than a requirement for a system to specifically identify the impairment state. The system would need to determine the degree of driving fitness, rather than the reason for impairment, and respond accordingly with the appropriate warning and/or active intervention. At its most basic, this concept could involve the technology distinguishing between a driver who is fully alert and engaged; a driver who is mildly impaired but alert; a driver who is moderately impaired; and a driver who is impaired to a dangerous or illicit extent, or is unresponsive. The system could use this classification to determine which countermeasure to deploy.

Permitting use of a "fitness to drive" measurement could also help NHTSA reverse the misguided decision to exclude drugged driving from the scope of this rulemaking effort. CR strongly urges NHTSA to recognize that driving under the influence of drugs can be feasibly addressed using some of the same technology that is being considered in the ANPRM and already is available in the marketplace. Carving out drugged driving from the rulemaking would leave any final rule glaringly incomplete, and we urge NHTSA to fully include consideration of drugged driving in the rulemaking process going forward.

II. Advanced Technology That Can Help Address Impaired Driving Is Progressing Rapidly and Already Being Deployed Today

Consumer Reports independently buys about 50 vehicles annually, just as a consumer would, and we thoroughly put them through their paces, driving them over 2,000 miles before our test protocol even begins. We are nationally recognized as a leading independent evaluator of new car models.

Accordingly, CR has significant understanding of the state of the marketplace with respect to certain technologies that can help address impaired driving. While we will defer to others on the current state of technologies that are not yet available on vehicles that are for sale to consumers, we will, in the following section, detail the state of the marketplace as we

understand it with respect to both direct driver monitoring systems (DMS) and warning escalation strategies that have been deployed in vehicles with active driving assistance systems.¹³

Direct driver monitoring systems (DMS)

CR has conducted several off-the-record meetings and working groups related to DMS with automakers that have a significant presence in the U.S. market, as well as trade groups and safety organizations. These discussions, which began in early 2019, led to the development of CR's scoring rubric and timeline for DMS in vehicles equipped with active driving assistance systems.¹⁴ Under this rubric, tested vehicles that are equipped with active driving assistance are awarded or deducted points from their CR Overall Score based on whether they have an adequate DMS, which we define as a system that effectively and directly detects the driver's gaze; attempts to elicit the driver's gaze if it is not not directed toward the roadway; and triggers an adequate driver re-engagement system if the driver does not respond to warnings.

Automakers have told CR that they expedited their DMS research and development based on CR's timeline for awarding bonus points to or making deductions from the Overall Score. When CR first published our scoring rubric and timeline in 2020, only one automaker had a vehicle equipped with a DMS. Today, CR currently has vehicles from nine different automakers in our fleet that are equipped with such a system. CR typically purchases the highest-volume trim/version of a vehicle model, so this data is generally representative of market availability.¹⁵

Specifically, CR has information to confirm that all automakers that sell a significant number of vehicles in the U.S. currently have or are developing direct, camera-based DMS hardware. We currently have vehicles from BMW, Ford/Lincoln, GM, Lucid, Mercedes-Benz, Nissan/Infiniti/Mitsubishi, Rivian, Tesla, and Toyota/Lexus that are equipped with DMS cameras. We have had first-hand experience with DMS cameras on prototype vehicles from an additional three automakers that we cannot name publicly. All other automakers in the U.S. that sell a significant number of vehicles to consumers have either publicly stated or provided CR with confidential information that they have DMS cameras in development.

Given this rapid progress in the U.S. marketplace, CR considers NHTSA rulemaking involving DMS to be timely and feasible to implement. We are even more confident in calling for NHTSA to require camera-based DMS in new U.S. vehicles because of progress abroad.

The European Union has promulgated regulations that will require automakers to equip vehicles with Advanced Driver Distraction Warning (ADDW) systems beginning on July 7, 2024, building on the momentum generated by existing Euro NCAP assessments for DMS to prevent crashes associated with distraction, fatigue, and unresponsive drivers. EU Regulation 2023/2590 defines technical requirements and test procedures that could be adopted in the U.S.

¹³ Active driving assistance refers to SAE Level 2 driving automation systems, which utilize lane centering assistance and adaptive cruise control capabilities at the same time.

¹⁴ CR, "Driver Monitoring Systems Can Help You Be Safer on the Road" (updated Feb. 17, 2022) (online at: <u>www.consumerreports.org/cars/cars/afety/driver-monitoring-systems-ford-gm-earn-points-in-cr-tests-a6530426322</u>).

¹⁵ We are aware that additional models offer a DMS on higher trims than those purchased by CR.

without the need for significant, if any, modifications.¹⁶ Currently, CR is engaging with the IIHS, automakers, and a variety of experts to establish similar test procedures for DMS performance that will be rolled into our scoring in the coming years.

While we address consumer privacy and data security in greater detail below, it is also worth pointing out that both CR's DMS scoring and the new EU regulations include privacy provisions—namely, that the DMS must operate in a closed loop and cannot record or transmit data from the camera. It is our understanding that it is not necessary for DMS to collect, store, or transmit user data to operate correctly and be effective. Many systems currently on the market operate at a very high level of accuracy and do not record or transmit data, proving that this is a realistic requirement, in addition to being a necessary one. Both for the protection of their digital rights and for consumer acceptance of DMS technology, consumers must be able to have confidence that DMS is there for their own safety—and that it is preventative, not punitive.

Warning escalation strategies for active driving assistance

As they are with DMS, the bulk of consumer-facing automakers in the U.S. already are moving forward with warning escalation strategies for use with active driving assistance (ADA) systems, in the event of inattention/disengagement by the driver. Please see the chart below for the strategies currently employed, which we think could be highly relevant to NHTSA's rulemaking.¹⁷ We especially encourage NHTSA to note the wide range of strategies employed currently, and to understand that, based on our conversations with automakers, we expect continued rapid development in this space.

Brand(s)	Keeps ADA Engaged	Seat Vibration	Rapid/Hard Braking	Seatbelt Tension	Horn	Hazards	Slows/Stops	eCall
BMW	0	8	\bigcirc	8	×		Stops	×
Ford / Lincoln	0	\bigotimes		×	×	8	Slows	×
GM (Cadillac, Chevrolet, Buick, GMC)	0	Ø	I	Ø	\otimes	Ø	Stops	
Honda / Acura	×	8	\bigcirc	×	×	8	8	×
Hyundai / Kia / Genesis	8	8	8	8	×	8	Slows*	×
Jaguar / Land Rover	0	8	Ø	8	×		Stops	* *
Lucid	0	8	\bigcirc	×	×	I	Stops	×
Mercedes	0	\otimes	8	×	×	I	Stops	\checkmark
Nissan / Infiniti / Mitsubishi	0	8	Ø	8	×		Stops	×
Rivian	0	\bigotimes	8	\bigotimes	8		Stops	×
Subaru	×	×	8	\otimes	×	\otimes	8	×
Tesla	0	\bigotimes	8	8	8		Stops	×
Toyota / Lexus	0	×	8	×	×		Stops	×
Volvo / Polestar	0	8	\bigcirc	\otimes	×		Stops	×
VW / Audi	0	×		\checkmark	\bigcirc		Stops	×

¹⁶ European Union EUR-Lex, *Commission Delegated Regulation (EU) 2023/2590* (Nov. 22, 2023) (online at: <u>eur-lex.europa.eu/eli/reg_del/2023/2590</u>).

¹⁷ This is an internal CR tracking document that has not been published previously.

III. NHTSA Should Consider Certain Technical Recommendations as It Proposes Warnings and Interventions to Prevent Impaired Driving

NHTSA is early in the rulemaking process, but as we have commented, CR is urging the agency to move forward expeditiously to implement the congressional mandate and meet its timelines. Accordingly, in this section, we provide relatively technical recommendations that typically would not be a part of comments until the notice of proposed rulemaking stage. We offer these comments to NHTSA now in the hope that it might assist the agency.

- *First detection of potential impairment after vehicle start-up:* In response to NHTSA question 2.14, regarding temporal considerations for performance requirements, we encourage NHTSA to specify the amount of time a system needs to make a first detection upon/after start-up. For the direct, camera-based DMS we have used, it does take a short amount of time for the system to calibrate to the driver, especially since no data should be stored from an earlier ride. We suggest that NHTSA specify a maximum of one minute to complete this calibration to align with EU Reg 2023/2590 test procedures.
- *Technologies aimed at a combination of driver impairment and BAC detection:* In response to NHTSA's questions 3.1-3.4, CR does consider a hybrid approach—making use of both BAC detection and a camera system—to be the best solution we are aware of given our current knowledge of the technologies. We are confident that a DMS camera can aid in preventing intentional spoofing or defeats of the BAC detection system. With respect to preventing false positives, we also think that using a DMS camera together with BAC detection—and relying on their combined accuracy—is far preferable to the phased approach to BAC detection outlined in question 3.4. We do not support a phased approach in which the first phase of BAC detection addresses only those drivers with a BAC at a significantly higher level than 0.08, as this approach would undercut the rule's safety benefits and fail to comply with Congress' direction. In particular, we would have grave concerns with a BAC detection system that fails to respond until a driver is found to have a BAC of 0.15—an extremely dangerous level of impairment behind the wheel.
- *Vehicle warnings and interventions once impairment is detected on-road:* In response to NHTSA's questions 5.1-6.3, we offer the following comments regarding vehicle warnings and interventions once impairment is detected on-road.
 - If the driver is nonresponsive, the vehicle should initiate a driver re-engagement process similar to what is used in some active driving assistance systems. Consistent with what CR is now recommending to automakers, this process should ultimately end with the vehicle keeping the active driving assistance system engaged and slowing the vehicle in a safe and controlled manner.
 - If the driver is impaired, but engaged and responsive, then the system could repurpose and tailor existing functionalities common to most new cars. One example is creating and activating a drive mode, similar to turning on "eco mode," in which the vehicle reduces throttle/accelerator response so that the car cannot speed up as quickly. Another is "limp home mode," in which the vehicle

has a certain number of miles to get to a safe place to stop. A third example is "<u>teen driver mode</u>," in which the top speed and audio volume may be limited and various safety systems are turned on.

IV. NHTSA Must Build Clear Privacy and Security Protections into Advanced Impaired Driving Prevention Technology

As part of the deployment of these new technologies, NHTSA should require that they adhere to the fundamental principle of *data minimization*—that is, the sensors should only collect, process, share, and retain data as needed for the specific safety purposes articulated by the agency. Any additional secondary data processing should be strictly prohibited, with narrow exceptions for internal operational purposes such as security, analytics, and debugging. Other non-essential secondary uses such as use for targeted advertising or other monetization of personal data must be clearly proscribed.¹⁸

Such restrictions are not only consistent with reasonable consumer preferences and expectations, but also necessary to overcome consumer reluctance to embrace technology that is potentially invasive. A car is an incredibly personal object, and for most consumers, it is one of the most, if not *the* most, expensive purchases they will make. Consumers have resisted certain mandated safety technologies in the past, so NHTSA should adopt policies designed to reassure consumers that these monitoring technologies will not be repurposed for objectionable ends. In engendering consumer trust, transparency will be essential. Buyers of the vehicle should understand prior to purchase exactly the types of sensors that are in the car, how they operate, the data they collect, and who that data is shared with. They should not be required to navigate clunky opt-outs or consent to walls of boilerplate language; instead, the manufacturer should explain how the system functions and that the sensors or the data they collect may not be used for other purposes.

The ANPRM asks commenters which performance-based security controls NHTSA should consider. While we understand that 49 U.S.C. 30111 requires standards to be practicable, meet the need for motor vehicle safety, and be stated in objective terms, we disagree that performance is the best way to assess the sufficiency of security controls. In practice, it is almost impossible to measure a cybersecurity outcome because the optimal outcome is simply avoiding an attack.¹⁹ However, there is not necessarily a causal relationship between avoiding an attack and having sufficient cybersecurity. Thus, a more practical approach would be for NHTSA to ask for *processes* that reduce or manage the security risk for advanced impaired driving technology.

The agency should consider the National Institute of Standards and Technology (NIST) Cybersecurity Framework 2.0 in considering the appropriate safeguards for advanced impaired

¹⁸ For more information on how to implement data minimization, *see* Consumer Reports and the Electronic Privacy Information Center, *How the FTC Can Mandate Data Minimization Through a Section 5 Unfairness Rulemaking*, (Jan. 26, 2022) (online at: <u>advocacy.consumerreports.org/wp-content/uploads/2022/01/CR_Epic_FTCData Minimization 012522_VF_.pdf</u>).

¹⁹ Jim Dempsey. "Cybersecurity Regulation: It's Not 'Performance-Based' If Outcomes Can't Be Measured." Lawfare. (Oct. 6, 2022) (online at: <u>www.lawfaremedia.org/article/cybersecurity-regulation-its-not-performance-based-if-outcomes-cant-be-measured</u>).

driving prevention technology.²⁰ However, this will not cover specific vulnerabilities inherent to *sensors*. Depending on the sensor architecture, there could be additional vulnerabilities such as those caused by using a wireless network to communicate sensor information back to a central processing unit on the car or outside of the vehicle. Sensors that detect BAC using infrared monitoring of skin should consider ways that those devices might be hacked or rendered less performant using analog interference.²¹

The Security for IoT Sensor Networks Building Management Systems Case Study from NIST and MITRE,²² which has entire sections dedicated to maintaining sensor security as well as securing the communications by sensors over radiofrequency and wired networks, covers more detailed requirements for securing sensors such as verifying the integrity of the sensor data, verifying the identity of the physical sensor (to prevent duplicative sensors), and verifying the sensor firmware and configuration.

NHTSA should also emphasize in any guidance or standards that security is an ongoing endeavor, and deployers have an obligation to support connected detection systems for the reasonable life of the vehicle. As such, in-car systems need to be updatable, and tested and recalibrated over the life of the sensor system.

Finally, while somewhat outside the scope of security, NHTSA should also require systems to be tested and deployed to address potential concerns around discrimination and bias, such as whether systems generate inequitable results based on attributes such as skin color.²³

V. Conclusion

Consumer Reports is pleased to have the opportunity to comment in response to NHTSA's ANPRM on advanced drunk and impaired driving prevention technology. Consistent with the direction of Congress, we urge NHTSA to move forward expeditiously in this rulemaking process, which has immense potential to save lives and prevent injuries. Drivers who are drunk or otherwise impaired pose a danger to everyone who uses our roads, and it is crucial to stop this dangerous driving before it happens.

As NHTSA writes a proposed rule, we urge the agency to consider our comments and feel free to reach out to us with any questions. We stand ready to work together toward a strong and durable final rule that accounts for the current and emerging state of the marketplace—so

²⁰ NIST, *The NIST Cybersecurity Framework (CSF) 2.0.* (2024), NIST Cybersecurity White Paper (CSWP) NIST CSWP 29 (online at: <u>doi.org/10.6028/NIST.CSWP.29</u>).

²¹ Yan, Chen & Shin, Hocheol & Bolton, Connor & Xu, Wenyuan & Kim, Yongdae & Fu, Kevin, *SoK: A Minimalist Approach to Formalizing Analog Sensor Security*, 233-248. 10.1109/SP40000.2020.00026 (2020).

²² Jason Ajmo, Jeffrey Cichonski, Nelson Hastings, Jeffrey Marron, Rahmira Rufus, *Security for IoT Networks: Building Management Case Study*, The National Cybersecurity Center of Excellence and National Institute of Standards and Technology (Feb. 2019) (online at: <u>www.nccoe.nist.gov/sites/default/files/legacy-files/iot-sniot-sensor-network-project-description-draft.pdf</u>).

²³ Wassenaar, E.B., Van den Brand, J.G.H, *Reliability of Near-Infrared Spectroscopy in People With Dark Skin Pigmentation*, J Clin Monit Comput 19, 195–199 (2005) (online at: <u>doi.org/10.1007/s10877-005-1655-0</u>).

that the rule does not become outdated quickly—and makes consumer privacy and data security a core priority.

Thank you for your consideration.

Respectfully submitted,

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