The Rationale for Lowering the BAC Limit for Driving to 0.05 in the United States

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What is a BAC?

Blood alcohol concentration, also referred to as BAC, refers to the percentage of alcohol in a person's bloodstream. A BAC of 0.10% means that a person's blood supply contains one part ethyl alcohol for every 1000 parts of blood. In 49 States and the District of Columbia, drivers over 21 test as legally impaired to drive a vehicle at 0.08% BAC. In Utah, the BAC limit for driving has been lowered to 0.05%.

Lowering the per se level to 0.05 BAC has been a proven strategy backed by numerous studies that show 1) drivers are significantly impaired at a 0.05 BAC, and 2) lowering to 0.05 BAC reduces drinking and driving and the related consequences. Over 100 countries worldwide, including most industrialized countries, have already lowered their per se BAC levels to 0.05 or lower.

Why Lower the BAC Limit for Driving from 0.08 to 0.05?

Lowering the BAC from 0.08 to 0.05 is a general deterrent to impaired driving and affects all would-be-drinking drivers.
Research is clear that lowering the BAC limit from 0.08 to 0.05 is a deterrent to **ALL** those who drink and drive because it sends a message that the government is getting tougher on impaired driving, and society will not tolerate impaired drivers (Fell & Voas, 2014). Such legislation reduces the number of drinking drivers involved in fatal crashes at all BAC levels (BACs>0.01; BACs>0.05; BACs>0.08; BACs>0.15) (Voas et al., 2000; Wagenaar et al., 2007; Hingson et al., 1996; Thomas et al., 2022).

Virtually all drivers are impaired concerning driving performance at 0.05 BAC.
Laboratory and test track research show that the vast majority of drivers, even experienced drinkers who typically reach BACs of 0.15 or greater, are impaired at 0.05 BAC and higher concerning critical driving tasks (e.g., Ferrara et al., 1994; Howat et al., 1991; Moskowitz et al., 2000; Moskowitz & Fiorentino, 2000).

The risk of being involved in a crash increases significantly at 0.05 BAC.
The risk of being involved in a crash increases at each positive BAC level. However, it rises rapidly after a driver reaches or exceeds 0.05 BAC compared to drivers with no alcohol in their blood systems (Compton & Berning, 2015, February). Studies indicate that the relative risk of being killed in a single-vehicle crash for drivers with BACs of 0.05 to 0.079 is at least seven times that of drivers at .00 BAC (Voas et al., 2012; Zador et al., 2000).

The success of Utah's 0.05 BAC limit.

Utah's fatal crash rate declined by 19.8% in 2019, the first year under the 0.05 BAC limit, compared to the rest of the United States, which had a 5.6% fatal crash reduction in 2019. More than 22% of Utah drivers who drank alcohol reported changing their drinking and driving behavior once the 0.05 law went into effect. The study also showed that there were no economic declines in alcohol consumption, tourism, and revenues at restaurants and bars impacts in the State (i.e., no economic declines with the change from 0.08 to 0.05 BAC (Berning, 2022, February; Thomas et al., 2022, February).

Lowering the illegal per se limit to 0.05 BAC is a proven effective countermeasure worldwide.
Lowering the BAC limit to .05 or lower has reduced alcohol-related traffic fatalities in several countries, most notably Australia and Japan (Brooks & Zaal, 1993; Homel, 1994; Nagata et al., 2008). A meta-analysis of international studies on lowering the BAC limit, in general, found an 11.1% decline in fatal alcohol-related crashes from lowering the BAC to 0.05 or lower and estimated that 1,790 lives would be saved each year if all states in the United States adopted a 0.05 BAC limit (Fell & Scherer, 2017).

0.05 BAC is a reasonable standard to set.
A 0.05 BAC is not typically reached with a couple of beers after work, a glass of wine, or two with dinner. It takes at least four drinks for the average 170 lb. male to exceed 0.05 BAC in two hours on an empty stomach (3 drinks for the 137 lb. female) (NHTSA, 1994). Surveys show that the public believes one should not drive after having 2 or 3 drinks within 2 hours (Royal, 2000). That is lower than a 0.05 BAC for most people.

Most industrialized nations have set BAC limits at 0.05 BAC or lower.
All states in Australia have had a 0.05 BAC limit for over 30 years. France, Austria, Italy, Spain, and Germany lowered their limit to 0.05 BAC, while Sweden, Norway, Japan, and Russia have set their limit at .02 BAC (WHO, 2013).

0.05 BAC legislation will reduce impaired driving at all BAC levels, including higher ones.
Studies show that lowering the BAC levels will reduce the number of drinking drivers involved in fatal crashes at all BAC levels (Voas et al., 2000; Wagenaar et al., 2007; Hingson et al., 1996; Thomas et al., 2022).

A 0.05 BAC limit will significantly reduce the number of non-fatal crashes and related consequences.
All alcohol-related traffic incidents do not result in fatalities. However, they create numerous other significant consequences and harms affecting drivers, passengers, pedestrians, cyclists, and others sharing the roadways. Non-fatal injuries can require significant medical treatment and hospitalization, temporary and permanent disabilities, loss of work and income to individuals and families, and trauma and mental health problems for crash victims and their families. A meta-analysis of prior studies of the effects of lowering the BAC limit indicated that non-fatal alcohol-related crashes were reduced by 5%, which was significant (Fell & Scherer, 2017).

A 0.05 BAC limit would reduce the economic burden of alcohol-impaired driving to the State, including first responders. A 0.05 BAC would reduce alcohol-impaired driving and crash rates, resulting in lower economic costs and resources for the State. Economic costs include first

responder and hospital ER resources to respond to the incidents, associated medical costs, court costs, damages and repairs to roadways, and the loss of work production.

REFERENCES

Arnold, LS and Tefft, BC (2016). Driving Under the Influence of Alcohol and Marijuana: Beliefs and Behaviors, United States, 2013-2015. AAA Foundation for Traffic Safety, Washington, DC, May 2016, 1-19.

Berning, A. (2022, February). Evaluation of Utah's .05 BAC per se law. Traffic Tech Technology Transfer Series, DOT HS 813 234, National Highway Traffic Safety Administration.

Brooks C, Zaal D (1993). Effects of a reduced alcohol limit in driving, in Alcohol, Drugs and Traffic Safety, Alcohol, Drugs and Traffic Safety (Utzelmann HD, Berghous G, Kroj G eds), pp 860-865, Verlag TÜV Rheinland, Cologne, Germany.

Compton, R. P. & Berning, A. (2015, February). Drug and alcohol crash risk. (Traffic Safety Facts Research Note, Report No. DOT HS 812 117). Washington, DC: National Highway Traffic Safety Administration.

Dang, Jennifer N. (2008). *Statistical analysis of alcohol-related driving trends, 1982-2005*. (DOT HS 810 942). Washington, DC: National Highway Traffic Safety Administration. Retrieved from http://www-nrd.nhtsa.dot.gov/Pubs/810942.pdf.

Fell, J. C, & Voas, Robert B (2014). The effectiveness of a 0.05 blood alcohol concentration (BAC) limit for driving in the United States. *Addiction*, 109; 869-874.

Fell, J. C., Beirness, D. J., Voas, R. B., Smith, G. S., Jonah, B., Maxwell, J. C., Price, J., Hedlund, J. (2016). Can Progress in Reducing Alcohol-Impaired Driving Fatalities be Resumed? Results of a Workshop sponsored by the Transportation Research Board, Alcohol, Other Drugs, and Transportation Committee (ANB50). *Traffic Injury Prevention*, 17(8), 771–781. http://dx.doi.org/10.1080/15389588.2016.1157592

Fell, James C., Scherer, Michael (2017). Estimation of the Potential Effectiveness of Lowering the Blood Alcohol Concentration (BAC) Limit for Driving from 0.08 to 0.05 grams per Deciliter in the United States. Alcoholism: Clinical and Experimental Research, 41 (12), 2128-2139.

Ferrara, S.D., Zancaner, S., and Georgetti, R. (1994). Low blood alcohol levels and driving impairment. A review of experimental studies and international legislation. *International Journal of Legal Medicine, 106*(4), 169-177.

Hingson, R., Heeren, T., and Winter, M. (1996). Lowering state legal blood alcohol limits to 0.08 percent: The effect on fatal motor vehicle crashes. *American Journal of Public Health, 86*(9), 1297-1299.

Homel R (1994). Drink-driving law enforcement and the legal blood alcohol limit in New South Wales. Accident Analysis and Prevention 26:147-155.

Howat, P., Sleet, D., & Smith, I. (1991). Alcohol and driving: Is the 0.05% blood alcohol concentration limit justified? *Drug and Alcohol Review, pp. 10*, 151–166.

Moskowitz, H., Burns, M., Fiorentino, D., Smiley, A., and Zador, P. (2000). *Driver characteristics and impairment at various BACs*. (DOT HS 809 075). Washington, DC: US Department of Transportation, National Highway Traffic Safety Administration.

Moskowitz, H., and Fiorentino, D. (2000). *A review of the literature on the effects of low doses of alcohol on driving-related skills*. (DOT HS 809 028). Washington, DC: US Department of Transportation, National Highway Traffic Safety Administration.

Nagata T, Setoguchi S, Hemenway D, Perry M (2008). Effectiveness of a law to reduce alcohol-impaired driving in Japan. Injury Prevention 14:19-23.

National Center for Statistics and Analysis. (2022, May). State alcohol-impaired-driving estimates: 2020 data (Traffic Safety Facts. Report No. DOT HS 813 301). National Highway Traffic Safety Administration.

National Highway Traffic Safety Administration (1994). Computing a BAC Estimate. US Department of Transportation, Washington, DC.

Royal, D. (2000 December). A national survey of drinking and driving: Attitudes and behavior: 1999 (DOT HS 809 190 – Vol. I: Findings). Washington, DC: National Highway Traffic Safety Administration.

Thomas, F. D., Blomberg, R., Darrah, J., Graham, L., Southcott, T., Dennert, R., Taylor, E., Treffers, R., Tippetts, S., McKnight, S., & Berning, A. (2022, February). Evaluation of Utah's .05 BAC per se law (Report No. (DOT HS 813 233). National Highway Traffic Safety Administration.

Voas, R.B., Tippetts, A.S., and Fell, JC (2000). The relationship of alcohol safety laws to drinking drivers in fatal crashes. *Accident Analysis and Prevention, 32*(4), 483-492.

Voas, R. B., Torres, P., Romano, E., & Lacey, John H. (2012). Alcohol-related risk of driver fatalities: An update using 2007 data. *Journal of Studies on Alcohol and Drugs, 73*(3), 341–350.

World Health Organization (2013). List of countries' BAC limits for driving: World Health Organization; 2013. Available online: http://apps.who.int/gho/athena/data/GHO/SA_0000001520.html?profile=ztable&filter=COUNTRY:*;BACGROUP:*. Last accessed on May 9, 2013.

Wagenaar, A., Maldonado-Molina, M., Ma, L., Tobler, A., and Komro, K. (2007). Effects of legal BAC limits on fatal crash involvement: Analyses of 28 states from 1976 through 2002. *Journal of Safety Research, 38*, 493-499.

Zador, Paul L., Krawchuk, Sheila A., and Voas, Robert B. (2000). Alcohol-related relative risk of driver fatalities and driver involvement in fatal crashes in relation to driver age and gender: An update using 1996 data. *Journal of Studies on Alcohol, 61*(3), 387–395.

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James C. Fell has been a Principal Research Scientist with NORC at the University of Chicago in the Bethesda, Maryland office since 2016. His areas of research include traffic safety behavioral programs, alcohol and drug impaired driving, underage drinking and cannabis use, alcohol and cannabis policies. Mr. Fell is currently President of the International Council on Alcohol, Drugs, and Traffic Safety (ICADTS). He worked as a researcher for 30 years at the National Highway Traffic Safety Administration (NHTSA).