



## NATIONAL SAFETY COUNCIL

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### Position/Policy Statement

#### Low Alcohol Concentration National Culture Change

This policy supersedes Position/Policy Statements:

#58 – Impairment at Low Alcohol Concentrations

#93 -- 0.08 BAC Standard

#100 – Alcohol Impairment Concentrations

Impairment from alcohol begins with the first drink. With more knowledge around this fact, people can make safer decisions and reduce crash risk. Therefore, the National Safety Council supports a national education campaign to inform Americans that impairment begins with the first drink.

The National Safety Council also supports efforts by states to lower the legal alcohol limit for motor vehicle operators in the United States.

Fatal crashes involving alcohol-impaired drivers fell significantly through the 1980s and early 1990s as effective laws were passed and enforced, and strong educational campaigns were executed nationwide. However, progress has stalled. Since then there has been no further reduction in the proportion of deaths in crashes involving alcohol. Drivers at or above the 0.08<sup>1</sup> legal limit have been involved in one-third of fatal crashes for the past 20 years. To reduce this toll, additional significant efforts are needed. The legal impaired alcohol concentration driving limit in all states is 0.08. However, research shows that for the majority of drivers, driving performance has already deteriorated significantly by the time they reach this level. In order to reduce alcohol-involved crash rates, there is a need to educate the American public about the safety effects of low alcohol concentration levels in order to facilitate culture change. There is some evidence that targeting lower alcohol concentrations also reduces the incidence of driving at higher alcohol concentrations.

For the past 20 years, drivers with alcohol concentrations at or above 0.08 have remained involved in one-third of all traffic fatalities in the U.S., which equates to about 10,000 lives lost every year. We saw significant reductions in alcohol-involved crashes in the 1980s with national strategies such as lowering the legal driving limit to 0.08, increasing the minimum legal drinking

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<sup>1</sup> In this document, alcohol concentration units are g/dL or g/210L. For example, the current legal limit for operating a motor vehicle in the U.S. is 0.08 g/dL for a blood test and 0.08 g/210L for a breath test.

age to 21, and instituting educational campaigns about drinking and driving. Unfortunately, for decades now, there hasn't been a further reduction in the proportion of crash deaths that involve alcohol, despite our current laws, enforcement, technology and education strategies.

One tactic is to lower the national alcohol concentration limit to the level of most other industrialized countries, which is 0.05 or lower. Research states that lowering the national standard from 0.08 to 0.05 could save 538 lives each year.<sup>i</sup> There is also evidence that lowering the limit could significantly reduce injury and crashes at high alcohol concentrations<sup>ii,iii</sup>. However, the current U.S. culture regarding driving and alcohol is not supportive of lowering driving limits for all adult drivers. And despite drivers' views of drinking and driving as a very serious threat, more than 1 in 8 drivers admit to driving in the past year when they thought they were close to or over the legal limit.<sup>iv</sup>

An effort to lower alcohol limits requires societal support, and to change American culture regarding drinking and driving there must be a significant shift in attitudes and beliefs. A strategy grounded in human behavior theory is needed as a catalyst to change attitudes and beliefs, and ultimately influence widespread culture and behavior change.

Please see the attached supporting pages for an explanation of scientific evidence of low level alcohol impairment, and sources of information.

*This position statement reflects the opinions of the National Safety Council but not necessarily those of each member organization.*

Adopted by the National Safety Council, July 2016

## Driver Impairment at Low Alcohol Concentrations

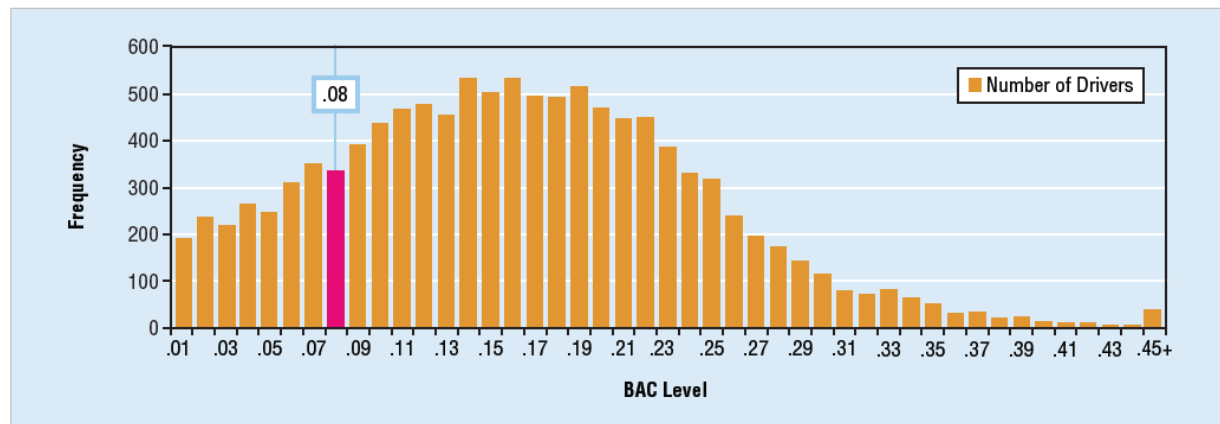
### What is the impaired driving crash problem in the U.S.?

Fatal crashes involving impaired drivers fell significantly through the 1980s and early 1990s as effective laws were passed and enforced nationwide:

- 0.08 alcohol concentration laws
- Minimum drinking age law
- Zero tolerance laws for drivers under age 21

However, for the past two decades, there has been no further reduction in the proportion of crash deaths involving alcohol-impaired drivers. It has remained at around one-third of crash fatalities. In 2014, there were 9,967 fatalities in crashes that involved a driver with an alcohol concentration of 0.08 or higher.<sup>v</sup> There were 1,764 fatalities involving drivers with lower levels of alcohol in their systems – 0.01 to 0.079:

Distribution of BACs for Drivers With BACs of .01 g/dL or Higher Involved in Fatal Crashes, 2014

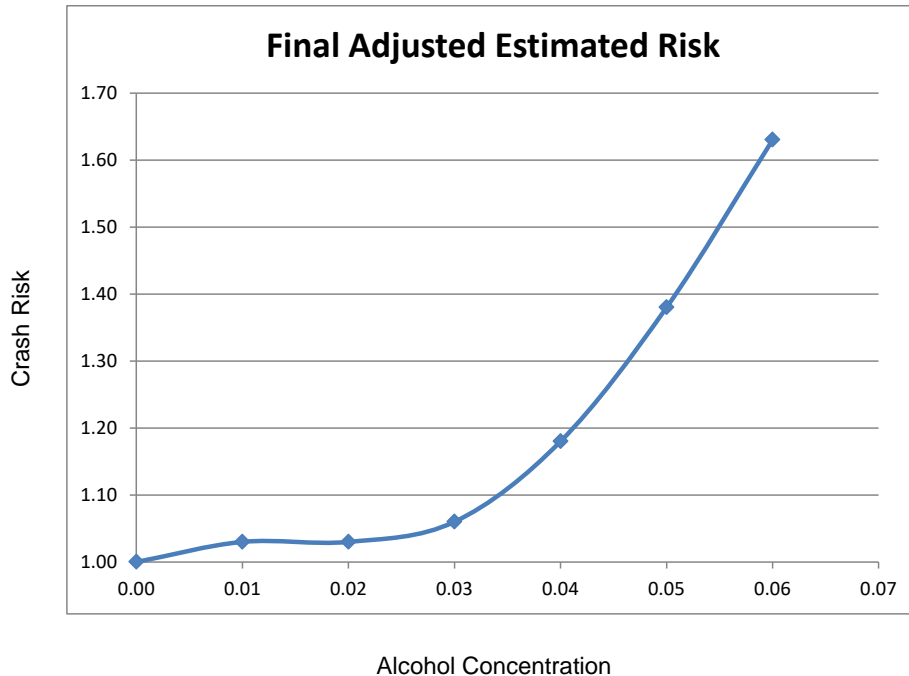


Source: FARS 2014 ARF.

Source: NHTSA Traffic Safety Facts 2014 Data, Alcohol-Impaired Driving

### What is evidence of impairment and risk at low alcohol concentrations?

Members of the National Safety Council Alcohol, Drugs and Impairment Division (ADID) conducted an extensive scientific literature review in 2014 that examined crash risk at low alcohol concentrations.<sup>vi</sup> The review gathered ample support that crash risk involving alcohol impairment begins at very low alcohol concentrations and rapidly rises:



Most crash risk charts show risk of alcohol concentrations beginning at 0.08 and upwards. The extremely high crash risk at high alcohol levels makes it difficult to see the dramatic increasing risk that also occurs at low alcohol levels. The above chart reflects crashes of all severities. When we look at crash risk for alcohol concentrations below 0.08, as the chart above shows, the risk is easily visible:

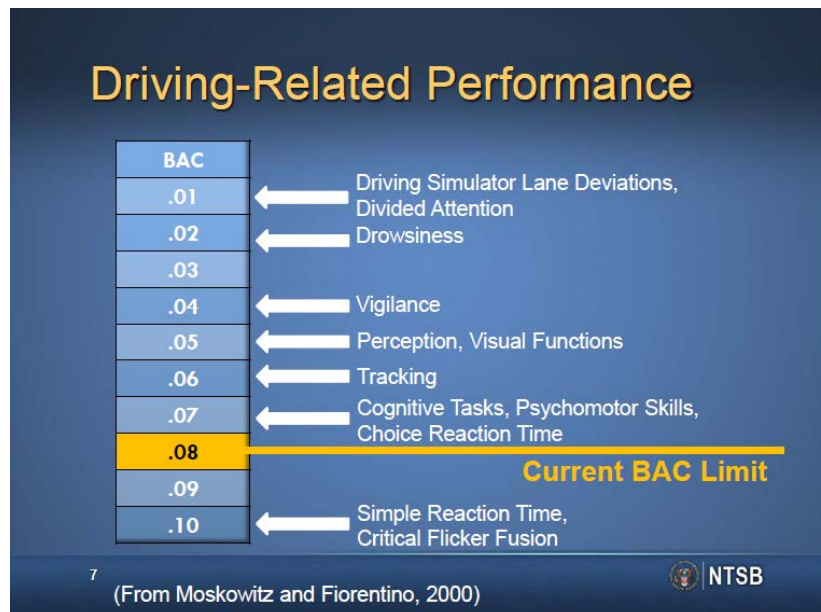
- After 0.03, crash risk rises rapidly.
- At 0.04, there is an 18% increased risk.
- At 0.05, risk is 40% higher than it is at zero alcohol concentration.<sup>vii</sup>

The ADID review found that:

- Each drink of alcohol consumed increases the risk of crashing, beginning with the first drink.
- For single-vehicle fatal crashes, about twice the number of drivers will be involved in crashes at every 0.02 increase in alcohol concentration, compared to drivers with zero alcohol concentration.
- A threefold increase in injury crash risk has been found with alcohol concentrations below 0.05.
- The risk applies beyond the drivers. People who consumed only one drink were more likely to ride in a car with an alcohol-impaired driver, increasing their risk of crash involvement by almost four times.

To explain the increased crash risk at these low levels, ADID members reviewed studies on alcohol impairment at low alcohol concentrations. Research shows that alcohol impairment begins at very low alcohol concentrations, as low as 0.015.

In its 2013 report "Reaching Zero: Actions to Eliminate Alcohol-Impaired Driving," the National Transportation Safety Board (NTSB) summarized research findings of driver impairment, showing performance decrements beginning at 0.01, similar to the ADID findings:



The NTSB summarized findings of a review of 112 scientific papers in the graph above. The review found that the majority of the studies found significant impairment among drivers before reaching 0.05 alcohol concentration.<sup>viii</sup> Visual acuity, vigilance, drowsiness, psychomotor skills and information processing are impaired<sup>ix</sup> at low alcohol levels.

Some of the most significant effects occur with divided attention when drivers must attend to several aspects of driving at once, such as controlling the vehicle while paying attention to stimuli that requires a response. We are using this ability nearly constantly for safe driving. Yet divided attention shows impairment at very low alcohol concentrations, starting at 0.01.<sup>x</sup>

Recent research has found that by 0.048, there are significant decrements in speed of information processing, reductions in working memory, and increases in errors of commission.<sup>xi</sup>

Fifty years of scientific evidence shows a direct relationship between increasing alcohol concentrations and crash risk. The body of evidence shows driving performance deteriorates for most drinking drivers by the time they reach 0.05 alcohol concentration.<sup>xii xiii</sup>

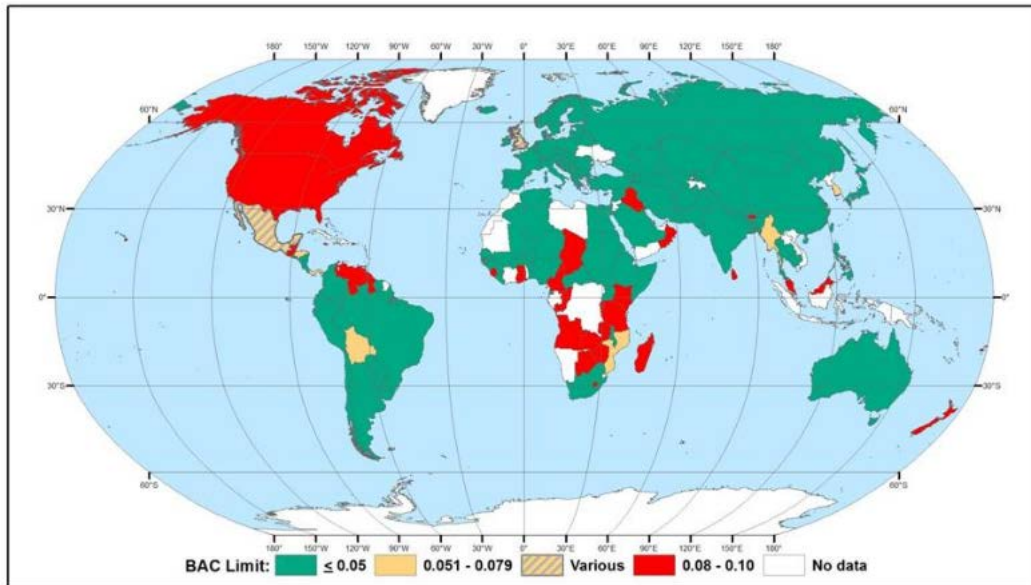
### How does the U.S. compare to the rest of the world?

Other countries have been faster to recognize impairment at low levels, and they have been faster to respond to prevent the crash risks.

More than half of the countries in the world -- including most other industrialized countries<sup>2</sup> -- have set 0.05 alcohol concentration (AC) or lower as the legal limit. The limit is 0.05 in

<sup>2</sup> For a list of limits in all countries as of February 2016, visit the International Alliance for Responsible Drinking at <http://www.iard.org/bac-brac-limits/>, "BAC and BrAC Limits."

Argentina, Australia, Austria, Belgium, Denmark, Finland, France, Germany, Greece, Israel, Italy, the Netherlands, Portugal, South Africa, Spain, Switzerland and Turkey. It's even lower in some countries: 0.03 in India and Japan; 0.02 in China, Norway, Poland and Sweden; 0.0 (absolute sobriety) in Brazil.



Many people justify the difference by stating that transportation in the U.S. is different than other countries because Americans are very car-dependent and many live in rural areas without other transportation options. While this is true in most of the U.S., many of these other countries also have large rural areas without public transportation. The issue for the U.S. may lie more in our culture regarding drinking and driving.

### What is public opinion in the United States?

Unfortunately, most people do not understand the correlation between AC level and the number of drinks consumed to reach that level. Nor do they understand how the AC number correlates to their own impairment and driving ability.<sup>xiv</sup> We know alcohol affects judgment and decision-making, so soon after a person starts drinking alcohol it is difficult to recognize impairment and respond appropriately. Only very rarely is anyone aware of their AC when drinking.

People do understand numbers of drinks, and surveys have shown that most people believe they should not drive after 2 or 3 drinks.<sup>xv</sup> For many people, this is equivalent to 0.05 AC. But when people think they will be *told* that they cannot drive after 2 or 3 drinks, opinions change. For example, discussions about lowering the legal alcohol driving limit are met with loud public opposition.

There is a need to help the public understand impairment at alcohol levels below the current 0.08 limit and have a more productive conversation about reducing risk.

## What is the likelihood of changing public opinion?

This country has accepted many cultural shifts that were not easy to achieve, and even some that people thought were impossible. Consider these major shifts in public acceptance and laws:

- **Tobacco.** Decades ago, we had very different attitudes about smoking. People could legally smoke at work and in restaurants, hospitals and grocery stores. Once the connection between smoking, cancer, and other health conditions was known, it took many decades of advocacy and laws to reach what we take for granted today – smoke-free public areas and workplaces. Secondhand smoke research that showed effects on people other than the smoker was key to this shift.
- **Seat belts.** There was a time when cars did not have seat belts. Over the past 30 years, seat belt usage has gradually increased to today when about 9 out of 10 people wear seat belts. It took a combination of laws, high visibility enforcement, technology and education to reach this culture and behavior change success.
- **Alcohol impaired driving as a criminal offense.** Many lives have already been saved by shifting public opinion about alcohol impaired driving. In 1982, more than 21,000 people were killed in crashes that involved alcohol. Since then, we have cut that figure in half. Decades ago, not all states had alcohol per se laws or zero tolerance laws for underage drivers. Utah was the first state to pass a 0.08 AC law in 1983 and 21 years later, Delaware was the last to pass 0.08 law in 2004. It took a generation of time, but it happened. It has been estimated that 538 more lives could be saved each year if the alcohol limit were reduced to 0.05.<sup>xvi</sup>

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<sup>i</sup> Alexander C. Wagenaar, Mildred M. Maldonado-Molina, Linan Ma, Amy L. Tobler, Kelli A. Komro. Effects of Legal BAC Limits on Fatal Crash Involvement: Analyses of 28 States from 1976 through 2002. *Journal of Safety Research*. 38 (2007) 493-499.

<sup>ii</sup> McLean, A.J., Kloeden, C.N., McColl, R.A. & Laslett, R. (1995). Reduction in the legal blood alcohol limit from 0.08 to 0.05: Effects on drink driving and alcohol-related crashes in Adelaide. In A.J. McLean & C.N. Kloeden (Eds.), *Proceedings of the 13th international conference on alcohol, drugs and traffic safety: August 13-18, 1995*. Adelaide, Australia: NHMRC Road Accident Research Unit.

<sup>iii</sup> Brooks, C & Zaal, D. Effects of a reduced alcohol limit for driving. In H.-D. Utselmann, G. Berghaus and G. Kroj (Eds.), *Alcohol, Drugs and Traffic Safety: Verlag TUV Rheinland, Cologne, Germany, 1993*, 860-865.

<sup>iv</sup> AAA Foundation for Traffic Safety. (2016). 2015 Traffic Safety Culture Index.

<sup>v</sup> Traffic Safety Facts, 2014 Data, Alcohol-Impaired Driving, DOT HS 812 231, National Highway Safety Administration, December 2015. <http://www.nrd.nhtsa.dot.gov/Pubs/812231.pdf>

<sup>vi</sup> Canfield, D.V., Dubowski, K.M., Cowan, M. & Harding, P.M. (2014). Alcohol Limits and Public Safety. *Forensic Science Review*. 26 (1) 10-22.

<sup>vii</sup> Chart adapted by ADID from: Blomberg RD, Peck RC, Moskowitz H, Burns M, Fiorentino D: The Long Beach/Fort Lauderdale relative risk study; *J Safety Res* 40:285; 2009.

<sup>viii</sup> Moskowitz, H. & Fiorentino, D. (2000, April). A review of the literature on the effects of low doses of alcohol on driving-related skills (DOT HS 809 028). Washington, DC: Department of Transportation, National Highway Traffic Safety Administration.

<sup>ix</sup> Moskowitz, H., Burns, M., Fiorentino, D., Smiley A., & Zador, P. (2000, August). Driver characteristics and impairment at various BACs (DOT HS 809 075). Washington DC: Southern California Research Institute, National Highway Traffic Safety Administration.

<sup>x</sup> Allen, R.W., Parseghian, Z., & Stein, A.C. (1996). A driving simulator study of the performance effects of low alcohol concentration. *Proceedings of the Human Factors and Ergonomics Society 40th Annual Meeting*.

<sup>xi</sup> Dry, M.J., Burns, N.R., Nettelbeck, T., Garquharson, A. L., & White, J. M. (2012) Dose-Related Effects of Alcohol on Cognitive Functioning. *PLoS ONE*. 7 (11): e50977.

<sup>xii</sup> U.S. Department of Health and Human Services. (1987). Handbook for evaluating drug and alcohol prevention programs: Staff/team evaluation of prevention programs. Bethesda, MD: U.S. Department of Health and Human Services.

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<sup>xiii</sup> Transportation Research Board (TRB). (1987). Zero alcohol and other options. Limits for truck and bus drivers (Special Report 216). Washington, DC: Transportation Research Board, National Research Council.

<sup>xiv</sup> National Highway Traffic Safety Administration (NHTSA). (1994, October). Computing a BAC estimate. Washington, DC: National Highway Traffic Safety Administration.

<sup>xv</sup> Royal, D. (2000, December). National survey of drinking and driving: Attitudes and behavior: 1999 (DOT HS 809 190 – Vol. 1: Findings). Washington, DC: National Highway Traffic Safety Administration.

<sup>xvi</sup> Alexander C. Wagenaar, Mildred M. Maldonado-Molina, Linan Ma, Amy L. Tobler, Kelli A. Komro. Effects of Legal BAC Limits on Fatal Crash Involvement: Analyses of 28 States from 1976 through 2002. *Journal of Safety Research*. 38 (2007) 493-499.