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DWI History of Fatally Injured Pedestrians

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16. Abstract The number of fatally injured <i>drivers</i> who had blood alcohol concentrations (BAC) of .08 g/dL or more at the time of their crashes has decreased in recent years in the United States while the number of <i>pedestrians</i> killed at similar BACs has increased. A BAC of .08 g/dL was the legal per se limit for drivers in all States at the time of this study. The objective of this study was to conduct analyses of demographic and driving record data for pedestrians killed in motor vehicle crashes to identify whether those killed with high BACs (.08 g/dL or more) had more prior alcohol-related driving offenses (e.g., DWI, DUI) on their driving records than did fatally injured pedestrians at BACs below .08 g/dL. The study obtained crash information and driving records for fatally injured pedestrians from five States, Florida, Massachusetts, Tennessee, Texas, and Washington. Overall, males represented 71.2 percent of the fatally injured pedestrians (BAC ≥ .08 78.6% male; BAC < .08 65.9% male). For the entire sample, 60 percent was middle-aged (30-59 years), 22 percent were 60+ years old, and 18 percent were less than 30 years old. Most of the BAC ≥ .08 males and females were 30-59 years old (7.0% and 72.5% respectively); 2.5 percent of the BAC ≥ .08 females were 60+ years old compared to 14.3 percent for the males; and 25 percent of the BAC ≥ .08 females were less than 30 years old compared to 15.7 percent of the males. When driving records were available (68.5% of the total sample of fatally injured pedestrians), about 45 percent of the males and 34 percent of the females who were BAC ≥ .08 had prior alcohol-related offenses compared to 21 percent of the males and 14 percent of the females who were BAC < .08. This finding suggests that people with prior alcohol related driving offenses may be at greater risk for being killed as high-BAC pedestrian than those without a prior alcohol offense. The study then identified strategies and countermeasure approaches with the potential to reduce impaired pedestrian fatalities given the study findings. Eight subject matter experts and the project staff generated a total of 50 countermeasure ideas in seven categories (reducing or preventing alcohol use; preventing or limiting/controlling walking or driving after high alcohol consumption; interventions by medical and social service personnel; interventions by law enforcement, courts, and probation; third-party interventions; increased awareness of the problem; and general pedestrian and traffic safety) that could potentially address the problem.			
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Introduction

According to the National Center for Statistics and Analysis (NCSA), between 2007 and 2017 the total number of drivers killed in fatal crashes with blood alcohol concentrations (BAC) of .08+ grams per deciliter (g/dL)¹ decreased from 8,644 to 6,618 (NCSA, 2008; NCSA, 2018a). Over the same period, however, the total number of pedestrian fatalities with BACs of .08+ g/dL went from 1,605 to 1,903—a 19 percent increase (NCSA, 2008; NCSA 2019). Also, total pedestrian fatalities went from 4,699 in 2007 to 5,977 in 2017—a 27 percent increase (NCSA, 2018b; NCSA 2019). No reliable pedestrian exposure data is available to determine how much of the increase in pedestrian fatalities and the associated increase in pedestrian fatalities with BACs of .08+ may have resulted from more people walking or greater walking distance.

One of the common sanctions for drivers convicted of driving while intoxicated (DWI), driving under the influence (DUI), or operating under the influence (OUI)² is license suspension or revocation. The possibility therefore exists that convicted DWI offenders are overrepresented among fatally injured pedestrians with elevated BACs at least in part because the withdrawal of their driver licenses increased their exposure as pedestrians who are walking at high BAC rates.

Past research has shown that alcohol use by pedestrians, particularly when it results in BACs in excess of .10 g/dL, significantly increases the risk of a pedestrian crash (Blomberg, Fell, & Anderson, 1979; Clayton, Colgan, & Tunbridge, 2000). Fatally-injured pedestrians are typically male, killed at night, and between 21-49 years old (Blomberg, Fell, & Anderson, 1979; Eichelberger, Cicchino, & McCartt, 2013). Beyond these basic characteristics, those who had been drinking prior to their crashes are more likely to have arrest records (Blomberg, Fell, & Anderson, 1979) or have been involved in previous crashes (as pedestrians or motorists) where their alcohol consumption was cited as a factor (Lindsay, 2012). In addition, a small-scale study involving interviews with severely injured pedestrian crash victims found that 14 of the 20 (70%) did not have driver licenses at the time of their crashes and 3 (15%) admitted to having their driver licenses revoked after one or more DWI convictions prior to their pedestrian crashes (Blomberg & Cleven, 2000).

The extraordinarily high BACs, extensive arrest records, and apparently lower licensure rates of crash-involved pedestrians led to speculation that pedestrian alcohol crash victims with high BACs might be former DWI-convicted drivers (Blomberg, Fell, & Anderson, 1979). Thus, more information is needed on the population of fatally injured pedestrians and whether those who are at high BACs at the time of their deaths are somehow different than those who were at low BACs or alcohol-free. This study used crash information and driver record data to examine the issue in more depth. The study results were then presented to a panel of experts to gather their thoughts on countermeasures that could be developed to address the problem of impaired pedestrians. A number of innovative ideas were suggested and may warrant further development as jurisdictions combat the problem of impaired pedestrians.

¹ Since all BACs reported herein are for fatally injured pedestrian victims, it is presumed measurement for all or virtually all samples was by post mortem analysis of blood or other bodily fluid.

² The terms DWI and DUI are used interchangeably in this report to refer to the offense of driving while under the influence of alcohol or any similar charges such as driving in excess of a per se alcohol limit.

Objectives

The first objective of this study was to compare the demographic information and driving records of pedestrians with high BACs killed in motor vehicle crashes with the same measures for a group of pedestrians killed in crashes but who were not drinking or were at low BACs. The focus was on providing insights on whether particular groups such as prior DWI offenders were overrepresented among those pedestrians who had high BACs at the time of their deaths. The second objective of the project was to suggest possible strategies and countermeasure approaches to reduce any identified problems.

Methods

Achieving the study objectives required gathering crash information and driving records from several States and merging them. The process described below resulted in a dataset for each of five studied States that contained the driving records of fatally injured pedestrians for whom measured BACs were available.

State Selection

This study was exploratory in nature and sought a sample that considered State-level factors such as the number of annual pedestrian fatalities, DWI arrests rates, and the extent to which reliable BAC data for the fatally injured pedestrians was available. The project solicited participation from Florida, Massachusetts, Tennessee, Texas, and Washington because of their robust crash reporting and driver records systems. All five States agreed to provide the requested crash and driver records. While the final set of States was somewhat geographically diverse, it must be emphasized that no attempt was made to assemble a representative sample of the United States.

Data Acquisition and Final Sample

The process of acquiring the data differed somewhat across the five States due to their recordkeeping approaches and requirements for identity protection. The basic approach involved using fatal crash data from each State to identify pedestrians over the age of 16 who were killed in motor vehicle crashes. Table 1 shows for each State the years of data available to the study, total number of pedestrian fatalities, and average fatalities per year.

Table 1. Fatally Injured Pedestrians by State (≥ 16 years old)

State	Years of Data	Fatalities	Avg. Per Year
<u>Total</u>		4,496	214
Florida	2013-2016	2,193	548
Massachusetts	2011-2015	372	74
Tennessee	2014-2016	274	91
Texas	2015-2016	1,147	574
Washington	2009-2016	510	73

The next step involved the selection of only cases for which the pedestrian’s measured BAC was recorded. The study did not impute a BAC if a measured BAC was not available in the crash data. Table 2 presents the number and percentage of cases for each State for which measured BACs and ages were available. As can be seen in the table, the availability of measured BACs varied substantially by State.

Table 2. Availability of Measured BAC

State	Measured BAC N (%)
<u>Total</u>	1,972 (43.9)
Florida	542 (NA)*
Massachusetts	253 (68.0)
Tennessee	103 (37.6)
Texas	614 (53.5)
<u>Washington</u>	<u>460 (90.2)</u>

*A sample of 550 reports with known measured BACs were randomly selected for Florida out of the total 2,193 fatalities in that State. The actual rate of measured BACs recorded on reports in Florida, therefore, is unknown. Eight of these reports were excluded because they did not contain the ages of the pedestrians. All other States used the entire samples of pedestrian fatalities during the selected timeframes.

If the crash information contained a driver license number, the State could readily access the person’s driving record. If no license number was available, the State used name and date of birth to search for the victim’s driving record. Table 3 presents the number and percentage of cases where a driver record could be identified when BAC was reported. A killed pedestrian may not have a driver record in a given State if the person never obtained a driver license or ID card and never received a traffic citation in that State. A person would, however, have a record if he or she had been cited or arrested while driving without a license. If the person was licensed in a State other than the State of death, a driving record would only be available if the person had ever been cited or arrested in the State of death, or if the person had been previously licensed in that State.

Table 3. Driver Record Available When BAC Recorded

State	Driver Record Available N (%)
<u>Total</u>	1,351 (68.5)
Florida	424 (78.2)
Massachusetts	198 (78.3)
Tennessee	73 (70.9)
Texas	377 (61.4)
<u>Washington</u>	<u>279 (60.7)</u>

The end result in each State was a de-identified set of case data for the person fatally injured pedestrians that included demographic and measured BAC data from the crash reports and counts of alcohol and serious moving offenses from the driver records.

Results

All of the results in this section apply only to the fatally injured pedestrians for whom both a measured BAC and driver record data were available in the samples from the five studied States. Ten drivers in the total sample were missing a recorded sex, and one driver was missing a recorded age. The Ns for any analyses involving age and sex reflect these missing data. Results are reported separately by State where appropriate. In general, based on the available information, the fatally injured pedestrians with driver records and a BAC were not atypical of all fatally injured pedestrians with a measured BAC in the sample. Basic demographic information and BACs comparing fatally injured pedestrians with and without driving records in the sampled States can be found in Appendix A:

The reader is cautioned that this study is based on a convenience sample from five States that could theoretically have affected the results. In particular, statistical results should be interpreted with care as the findings may not be applicable to the larger population of fatally injured pedestrians in the country. A random sample from all fatally injured pedestrians across the country could potentially produce different results than those presented here.

Definition of Alcohol-Impairment Groups

A variety of BAC cutoffs were explored to define a pedestrian as having a high BAC. Ultimately, if a person had a BAC greater than or equal to .08 g/dL, he or she was placed in the high-BAC group. This was a logical dividing point because it was the universal State-level per se limit for DWI/DUI at the time the studied crashes occurred and is at or near the point at which the crash risk curves for both drivers and pedestrians start to increase exponentially. Also, only 86 of the cases with driver records available involved measured BACs greater than .00 but less than .08. Overall, the $BAC \geq .08$ group had very high BACs ($M = .23$; $SD = .08$), and the $BAC < .08$ drivers generally had zero BACs ($M = .00$; $SD = .01$).

Definition of Relevant Alcohol Offenses

The central objective of the study was to see if fatally injured pedestrians in the $BAC \geq .08$ group had more DWIs or similar offenses on their driving records than did those pedestrians in the $BAC < .08$ group. In four of the five selected States, law enforcement and prosecutorial personnel had the option of invoking an administrative license revocation (ALR) when a driver was apprehended with a BAC of .08+ and failed a chemical test or refused to submit to one. Tennessee does not have an ALR statute. In addition, all five States have implied consent laws, but did not report violations of them in the data provided. When examining prior alcohol offenses, it was therefore decided to group DWI/DUI and ALR entries on each driver's record. It is not known if or how differences in the frequency of use of ALR in the four States where it existed and the absence of ALR in Tennessee may have affected the offense totals reported here.

Demographics and BACs

Table 4 shows the average age and percentage that was made for each BAC group. Those with BACs $\geq .08$ were younger on average (44.18 years old) than the BAC $< .08$ group (48.96 years old), $t(1,348) = 5.32, p < .001$.³ The BAC $\geq .08$ group was also more likely to be male (78.6%) than the BAC $< .08$ group (65.9%), $\chi^2(1, N = 1,341) = 25.38, p < .001$.

Table 4. Demographics of Fatally Injured Pedestrians

	Age Years		Male
	Mean (SD)	Range	% (N)
<u>Total</u>	46.98 (16.44)	16 - 94	71.2 (955)
BAC $< .08$	48.96 (17.97)	16 - 94	65.9 (515)
BAC $\geq .08$	44.18 (13.53)	16 - 84	78.6 (440)

Table 5 shows the age and sex distributions of the studied pedestrians by BAC group. Both overall and by sex, there were significantly more pedestrians in the middle ages for the high-BAC group (Overall, $\chi^2[2, N = 1,341] = 59.26, p < .001$; males $\chi^2[2, N = 955] = 32.29, p < .001$; females $\chi^2[2, N = 386] = 36.57, p < .001$). Z-tests of column proportions were conducted to determine which age groups within each sex had differences by alcohol impairment.

Table 5. Age Group and Sex Distribution of Fatally Injured Pedestrians

	Age Group			Total N (%)
	< 30 year-olds N (%)	30-59 year-olds N (%)	60+ year-olds N (%)	
<u>Total with known age/sex</u>	243 (18.1)	809 (60.3)	289 (21.6)	1,341 (100)
BAC $< .08$	144 (18.4)	414 (53.0)	223 (28.6)*	781 (100)
BAC $\geq .08$	99 (17.7)	395 (70.5)*	66 (11.8)	560 (100)
<u>Males</u>	165 (17.3)	583 (61.0)	207 (21.7)	955 (100)
BAC $< .08$	96 (18.6)	275 (53.4)	144 (28.0)*	515 (100)
BAC $\geq .08$	69 (15.7)	308 (7.0)*	63 (14.3)	440 (100)
<u>Females</u>	78 (20.2)	226 (58.5)	82 (21.2)	386 (100)
BAC $< .08$	48 (18.0)	139 (52.3)	79 (29.7)*	266 (100)
BAC $\geq .08$	30 (25.0)	87 (72.5)*	3 (2.5)	120 (100)

*Significantly higher by z-test ($p < .05$) than the other impairment group within the sex category.

³ The reader should note that all inference testing presented in this report applies only to the study sample and should not be generalized to broader populations. Thus, for example, the results of this particular hypothesis test that pedestrians with BACs $\geq .08$ were younger on average than those with BACs $< .08$ applies only to pedestrians involved in fatal crashes in the five States, 16 or older, with measured BACs and available driving records who were in the study sample.

Information on the licensure status of the fatally injured pedestrians at the time of their deaths was only available for Florida, Massachusetts, and Texas. Overall, a higher percentage of the BAC $\geq .08$ group was unlicensed (39.8%) than the BAC $< .08$ group (32.2%), $\chi^2(1, N = 998) = 6.00, p = .01$. As shown in Figure 1, this pattern was consistent in all three States for which data was available.

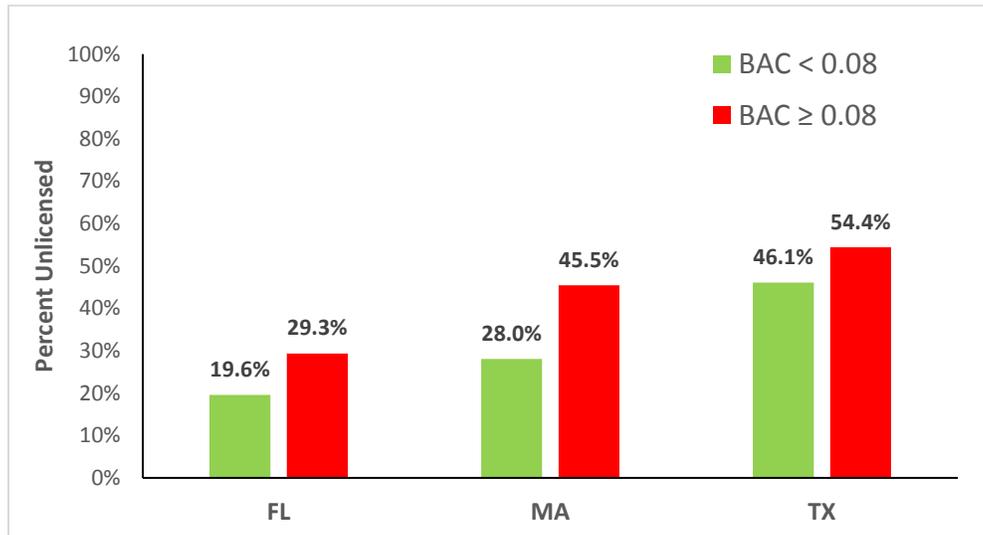


Figure 1. Percentage of unlicensed by group for Florida, Massachusetts, and Texas

Prior Impaired-Driving Offenses

As discussed above, DWI/DUI and ALR counts were combined into a single “alcohol offense” category. This study was most interested in whether a person ever had an alcohol driving offense, not necessarily how many the person had. In fact, only 390 of the 1,351 drivers in the sample yielded all of the 1,036 convictions. Table A-1 in Appendix A provides the total DWI and ALR counts by State and BAC group for this study’s sample.

Figure 2 shows the overall percentage of pedestrians in the two BAC groups across all five States combined who each had one or more alcohol offenses. As can be seen in the figure, fatally injured pedestrians in the BAC $\geq .08$ group were more than twice as likely to have prior alcohol offenses on their driving records (42.8%) compared to the BAC $< .08$ group (19.0%), $\chi^2(1, N = 1351) = 90.44, p < .001$.

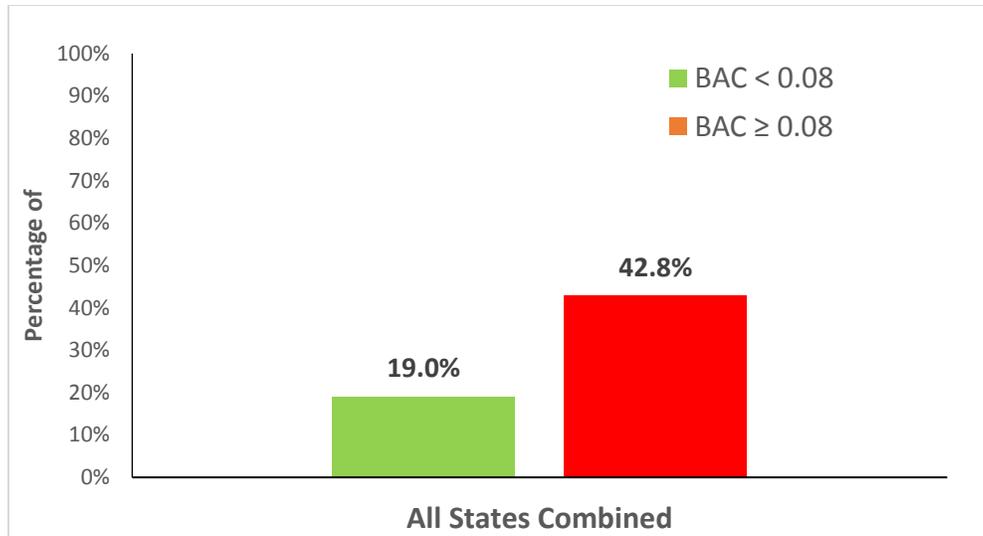


Figure 2. Alcohol offense on driving record: All States combined

Figure 3 presents alcohol offenses by State and BAC group. The pattern is strikingly similar across all States except Massachusetts. No ready explanation could be found for the differences in Massachusetts, but, although the percentages in both groups were higher than in the other States, the overall pattern in Massachusetts was not dissimilar. Across all States, the BAC ≥ .08 group were much more likely to have prior alcohol offenses on their driving records compared to the BAC < .08 group (all *ps* < .05).

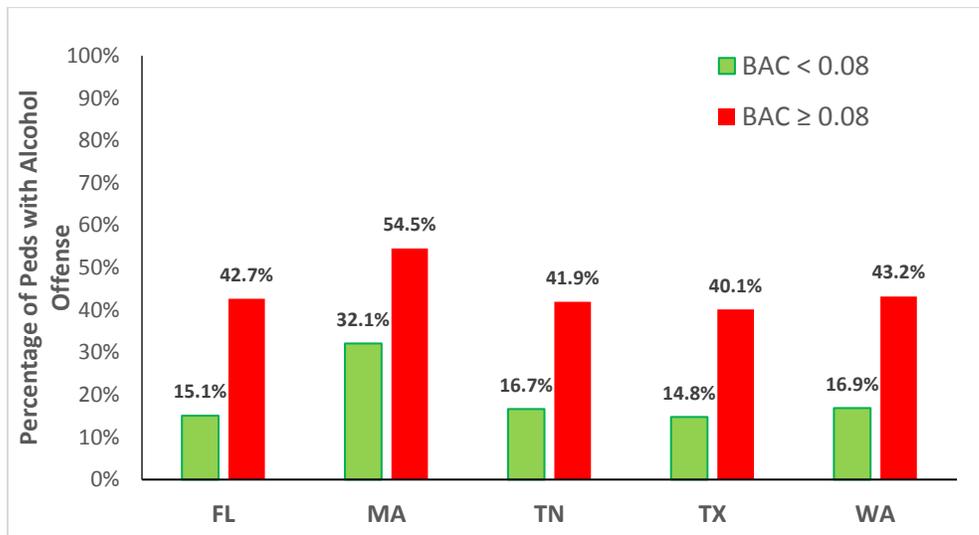


Figure 3. Alcohol offense on driving record, by: State

Figure 4 shows the percentages of $BAC \geq .08$ and $BAC < .08$ pedestrians in each age group who had one or more alcohol convictions on their driving records. Overall, the age groups differed in the likelihood of having an alcohol offense, $\chi^2(2, N = 1,350) = 64.13, p < .001$. Z-tests of column proportions showed that 30-to 59-year-olds (36.7%) were more likely than pedestrians younger than 30 (12.8%) or pedestrians 60 and older (20.7%) to have had alcohol offenses. The 60+ age group was also more likely than the under-30 age group to have alcohol offenses. Critically, as evident in the figure, $BAC \geq .08$ pedestrians were much more likely to have alcohol offenses than $BAC < .08$ pedestrians in the 30-to-59 age group, $\chi^2(1, N = 813) = 64.65, p < .001$, and 60+ age group, $\chi^2(1, N = 294) = 21.04, p < .001$. No difference in the percentages of alcohol offenses were found between $BAC \geq .08$ and $BAC < .08$ pedestrians under 30, $\chi^2(1, N = 243) = .02, p = .89$. The analyses were not conducted with sex as an additional factor because some of the cell counts were too small.

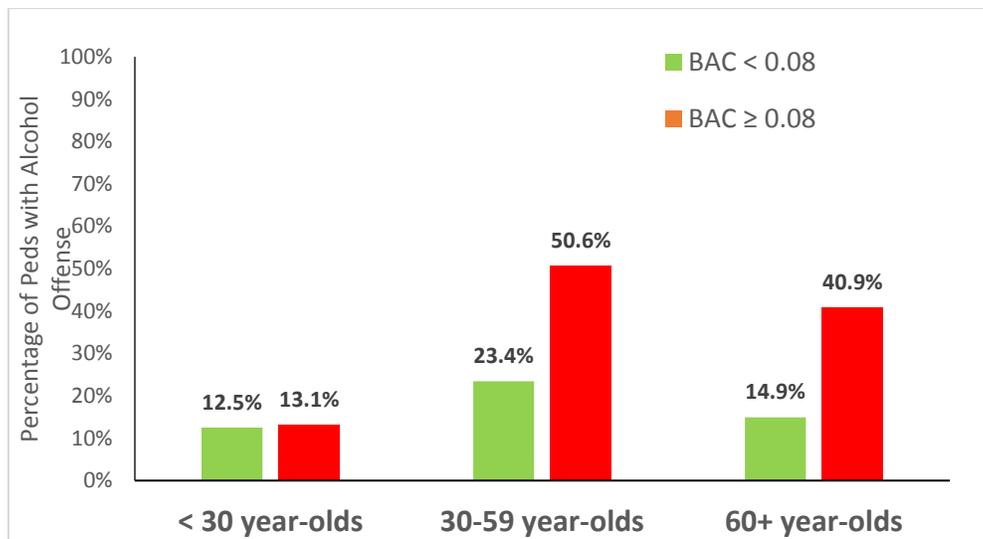


Figure 4. Alcohol offense on driving record by age group

Figure 5 shows the percentages of $BAC \geq .08$ and $BAC < .08$ pedestrians by sex who each had one or more alcohol convictions on their driving records. Overall, males (32.4%) were more likely than females (20.5%) to have alcohol offenses, $\chi^2(1, N = 1,341) = 18.90, p < .001$. For both sexes, however, $BAC \geq .08$ pedestrians were more than twice as likely as $BAC < .08$ pedestrians to have alcohol offenses; males, $\chi^2(1, N = 955) = 61.76, p < .001$; females, $\chi^2(1, N = 386) = 2.08, p < .001$.

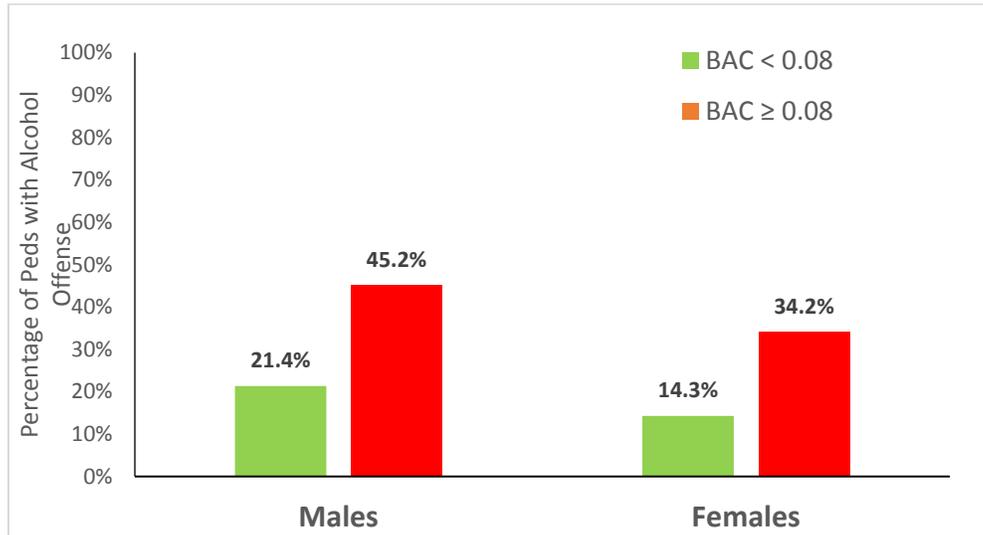


Figure 5. Alcohol offense on driving record by sex

Summary Results

Four of the five States produced strikingly similar distributions of fatally injured pedestrians who had prior alcohol offenses on their driving records, and the fifth State, Massachusetts, was not dissimilar. The fatally injured pedestrians in this sample of five States who were $BAC \geq .08$ were reliably more likely to have alcohol offenses than those pedestrians who were $BAC < .08$ at the times they were fatally injured. While males represented the great majority of fatalities, both males and females showed similar patterns with the high alcohol groups at time of death being more likely to have prior alcohol offenses.

This study found that middle-aged pedestrians in the collected sample were more likely than the other age groups studied to be in the $BAC \geq .08$ group. This is consistent with previous findings (e.g., Blomberg, Fell, & Anderson, 1979). These middle-aged pedestrians were also more likely than the other age groups to have alcohol offenses. The middle-aged and older pedestrians studied who had BACs of $.08+$ at death were much more likely to have prior alcohol offenses than their low/zero BAC counterparts. Younger pedestrians showed similar rates of prior alcohol offenses regardless of BAC level at the time of death.

Development of Remedial Strategies/Countermeasures

The second study objective dealt with the generation of remedial approaches to any identified problem. The findings from the analyses of crash information and driver records were used to stimulate the generation of ideas for remedial strategies or specific countermeasure programs. The goal was to generate as many potentially viable ideas as possible. This was a brainstorming exercise, and not specifically an attempt to produce evidence-based solutions such as might be found in *Countermeasures That Work* (Richard, Magee, Bacon-Abdelmoteleb, & Brown, 2018).

Approach

The common characteristic among the crash victims of interest, besides the fact that each was killed as a pedestrian in a crash with a motor vehicle, was that each had a high BAC at the time the person was killed. Many of these people also had one or more DWIs and/or ALRs on their driving records. The high BAC at death and higher likelihood of past alcohol driving offenses suggest that these people likely had alcohol use disorders (AUD). Thus, the victims had come into contact with, or certainly had the opportunity to be in contact with, a variety of people and organizations with the potential ability to intervene before the fatal crashes. These groups include the following.

- Law enforcement
- The courts
- The probation system
- Medical practitioners
- Social services and counseling
- Family/friends personal interactions
- Employers and the work environment
- The hospitality industry and alcohol sellers/servers
- Media (public service and paid)

Given this breadth of expertise that could be part of a remedy to the problem, researchers decided to augment their own experiences in the development and evaluation of DWI countermeasures with input from a group of eight subject matter experts (SMEs). The eight SMEs selected included the following people.⁴

- Devin Burke, highway safety specialist, NHTSA Impaired Driving Division
- Kathie Durbin, chief of Licensure, Regulation & Education, Montgomery County, Maryland, Department of Liquor Control
- Ralph W. Hingson, Sc.D., M.P.H., director, National Institute on Alcohol Abuse and Alcoholism (NIAAA), Division of Epidemiology and Prevention Research
- Nathan Lowe, Ph.D., program director, Grants and Research at Council of State Governments/American Probation and Parole Association

⁴ Detailed biographies for the SMEs can be found in Appendix B:

- John Moffat, retired NHTSA Regional Administrator; retired captain, Seattle Police Department
- Janet Selway, DNSc, AGNP-C, ANP-BC, CPNP-PC, FAANP, assistant professor, School of Nursing, Catholic University of America
- Carl A. Soderstrom, M.D., retired adjunct professor, University of Maryland School of Medicine; retired chief of the Medical Advisory Board of the Maryland Motor Vehicle Administration
- Hon. Michael Yavinsky, supervising judge of Brooklyn, New York, Criminal Court

Each SME was sent a package of material that included:

- A memo describing the project, the specialty areas for which the SME was selected, and procedures for completing the idea generation task;
- An eight-page description of the problem (essentially the results presented above);
- A document containing a set of forms on which to capture countermeasure ideas as well as the example form shown in Figure 6.

Idea Example	
Label	Content
Name of Idea	Walking While Intoxicated (WWI) law
Description	A law like DWI/DUI that makes it illegal to walk at a BAC ≥ 0.08 , permits law enforcement personnel to test a suspected pedestrian's breath, and permits law enforcement to remove the pedestrian from the street if BAC ≥ 0.08
Intervention Point	After DWI conviction while person is walking at elevated BAC
Implementer(s) (Check all that apply and write in any others)	<ul style="list-style-type: none"> • Law enforcement <input checked="" type="checkbox"/> • The courts <input type="checkbox"/> • The probation system <input type="checkbox"/> • Medical practitioners <input type="checkbox"/> • Social services and counseling <input type="checkbox"/> • Family/friends personal interactions <input type="checkbox"/> • Employers and the work environment <input type="checkbox"/> • The hospitality industry and alcohol sellers/servers <input type="checkbox"/> • Others <i>Must have support of legislators to pass</i>
How it Works	Just as DWI. Officer sees cues and develops probable cause, stops ped and conducts preliminary breath test, cites ped and removes from street to safe holding area. Could add mandatory alcohol counseling to sanction if ped was a prior DWI or BAC ≥ 0.15 . Reduces exposure and provides opportunity for interventions focused on drinking problem
Experience/Evidence	Puerto Rico has (had?) a WWI law that seemingly worked until resources ran low
Likely Cost	Medium. Need enforcement with PBTs plus facilities where ped can be taken
Impediments	Need to pass law; police resources; lack of holding facilities; cost; civil liberties complaints
Research Suggestions	Determine if combining WWI with established brief interventions could enhance success; brainstorm other types of interventions when ped is removed from street
Comments	The analogy to driving, boating, flying, etc. is strong. The relative risk curve for pedestrians is known. Dealing with societal values and norms as well as resource availability (as always) are the major hurdles

Figure 6. Example Given SMEs

It is important to understand that even though SMEs were selected for their specific expertise, the task assigned to the SMEs was a brainstorming exercise prompted by the stimulus of the study findings relating to high BACs at time of death and the overrepresentation of prior DWIs. Accordingly, the memo to the SMEs suggested the following five ground rules.

1. There are no bad ideas. We are interested in thoughts and conjecture (no matter how “way out”) as well as existing, speculated, or contemplated approaches whether or not they have been proved. The more ideas, the better.
2. Evidence is not necessary. We want to capture your rationale for the idea, but it does not have to be supported by data.
3. It is OK (but not necessary) to discuss this with colleagues, friends, and family to generate as many strategy concepts as possible.
4. Granular details are not required. We are interested in concepts. If you have thought through some details on how the strategy can be implemented, we would welcome them, but it is not necessary for you to fully flesh out your ideas.
5. Do not be reluctant to suggest ideas from a specialty area not your own or not on the list. Any idea is fair game.

Strategy and Countermeasure Ideas

The eight SMEs and the project staff generated a total of 50 ideas for possible global strategies or specific countermeasure approaches, each of which holds the potential to lessen the identified problem. The research staff placed these ideas in seven different classes or groups based on their intended effect on the problem and/or who must implement them. The ideas have not been evaluated or ranked based on possible effectiveness. All ideas generated are presented here.

The completed idea forms (similar to Figure 6 above) for each of the generated ideas are contained in Appendix C:. A brief description of the seven countermeasure areas and each of the ideas in them follows.

Reduce or prevent alcohol use. These approaches reduce the availability of alcohol to the driver/pedestrian either before or after a DWI conviction, prevent or discourage the person from consuming alcohol, or generally make alcohol more difficult or costly to obtain.

- Sentencing requirement for complete abstinence from alcohol—Courts and probation systems would institute and enforce a requirement for complete abstinence from the consumption of alcohol by a convicted DWI. Monitoring devices might be used as well as testing during probation visits.
- Driver’s License (or ID) “DWI Zebra Tag” or “Vertical License” —When a person is arrested for a DWI, a “DWI zebra tag” would be applied to the driver’s license or other State-issued identification card, or the person would receive a “vertical license,” which would prevent the person from being able to purchase alcohol. This could also be an indicator that the person should not be consuming any alcohol as part of probation.
- Path to re-licensing as a motivation not to drink—Jurisdictions could aggressively encourage suspended/revoked drivers to pursue paths to getting conditional licenses

based upon meeting certain treatment-based criteria that include abstinence from alcohol. If they complied, the incidence of high-BAC illegal driving or walking would be reduced.

- Increase price of alcohol—Employ classic economics to reduce demand by increasing price. Could be accomplished by raising minimum prices and/or increasing taxes.
- Reduce alcohol outlet density—Use zoning regulations or other mechanisms to reduce the number of sales outlets and, hence, reduce sales and consumption.
- Reduce alcohol hours and days of sale—Restrict the times and days when alcohol is available for purchase.
- Prevent privatization of alcohol sales—States would manage sales because privatization of sales has been shown to increase the per capita sale of alcohol.
- Increase enforcement of minimum legal drinking age of 21—Although there are very few underage drinking pedestrians in the studied crash data, the earlier a person starts drinking, the greater the likelihood of experiencing alcohol dependence and, hence, being at risk of being a high-BAC pedestrian.

Prevent or limit/control walking (or driving) after high alcohol consumption. These approaches either directly prevent walking at high BACs, seek to limit it, or make it less risky by providing innovative and safer transportation alternatives.

- Wearable Smart BAC Monitor—The smart watch or wrist device provides continuous BAC tracking and can provide an alert when BAC is above a set threshold. The system would provide direct feedback to a person in an attempt to alter drinking and driving/walking. It can also alert others through notifications that a person may need assistance.
- Walking While Intoxicated (WWI) Law—A law like DWI that makes it illegal to walk at a BAC above a specified limit, permits law enforcement personnel to test a suspected pedestrian's breath, and permits law enforcement to remove the pedestrian from the street if intoxicated.
- Relocation to Safer Place Law—More limited than a WWI law, this law would allow police officers to move intoxicated pedestrians from dangerous traffic places to locations where they would be safer.
- Statewide Coordination of DWI Case Responses—An intentional, coordinated effort to un-silo the various organizational points of contact for people who have alcohol issues and drive. If the heads of the agencies that made and implemented varying policies involving DWI arrestees (who have high BACs, get their licenses suspended or revoked, and become pedestrians with high BACs) came together to discuss ways to eliminate people from falling through cracks in the system, there would be a greater likelihood that everyone's intended goals and policies could get realized due to a committed partnership.

- “Walking Lifeguard”—An officer who views an “at-risk” pedestrian calls for a trained “walking lifeguard” who intercepts the pedestrian and walks with them. The lifeguard can make a brief intervention on alcohol and call a ride service if the pedestrian is too impaired to walk even with a companion.
- “Designated Walker”—A designated person in a social environment who limits his/her alcohol intake and sees to the welfare of the walkers either by walking with them or securing safe transportation for them. This is similar to the walking lifeguard, but is self-initiated by the walkers just as a designated driver program is operated by the drinkers who might drive. Students in the United States and walkers in some European countries are already using designated walkers as part of their social groups.
- Drunk in Traffic Ordinance—Ordinance would make it a misdemeanor to enter or remain in an active travel lane while intoxicated. As this would be a minor crime, police could arrest, detain, and possibly jail subjects, or they could remove high-BAC pedestrians to police stations to sober up before release with citations.
- Safe Ride Home (volunteer drivers)—Draw on community volunteers to offer rides to pedestrians who shouldn’t be walking in the opinion of police officers who find them impaired on the street.
- Safe Ride Home (paid drivers)—Provide experienced alcohol counselors/drivers to offer rides home to pedestrians who should not be walking in the opinion of police officers who find them impaired on the street. In this program, the call for a ride would come from police dispatch (not the pedestrian). The drivers could be trained to give brief interventions at these teachable moments.
- Expanded Urban Ride Options—Businesses or governments provide low-cost rides home using pedi-cabs or small motorized vehicles such as the tuk-tuks common in Asia.
- Wearable BAC Technology to Increase Conspicuity—The wearable device provides continuous BAC tracking and can provide a highly visible alert (e.g., flashing light at night, sound during daylight) when a person’s BAC is above a set threshold.
- Laws to Reduce Drinking and Driving Including Lowering the BAC limit to .05 g/dL—Tightening laws against drinking and driving should reduce those crashes that involve drivers at high BACs striking pedestrians whose BACs are also elevated.
- Preventing Repeat DWI Offenses and Crashes Through Specific Deterrence—Stronger enforcement of DWI laws should also reduce those crashes that involve drivers at high BACs striking pedestrians whose BACs are also elevated.

Interventions by medical and social service personnel. Typically in the form of counseling or information transfer, these approaches rely heavily on the source credibility of the deliverers as well as their ability to detect the problems during routine or crisis-related encounters.

- Modification of Screening, Brief Intervention, and Referral to Treatment (SBIRT)—Include advice about dangers of impaired walking. Educate providers/counselors to enhance SBIRT with advice about hazards of walking after excessive drinking.
- Addressing the Root Cause of Alcohol Misuse and Abuse—The criminal justice system is conditioned to address problems that are brought to its doorstep. This strategy would address the problems plaguing the DWI arrestee (who may also be a pedestrian with a high BAC) way before the day the person is arrested. It would necessarily have to be a cross-specialty, multidisciplinary intervention.
- Focused medical education—Required education for all clinicians, not only physicians and nurses but also dentists, physical therapists, and social workers. The primary goal would be the early identification of an AUD so that it could be treated before it resulted in a safety issue for a driver or pedestrian.

Interventions by law enforcement, courts, and probation. As with the medical and social service interventions, these take advantage of the knowledge of a possible AUD from a DWI encounter to prompt remedial steps by appropriate professionals. Members of the law enforcement, adjudication, and probation communities could provide information or take other direct actions to prevent high-BAC pedestrian crashes.

- Mandatory Alcohol Screening/Assessment Law—People arrested for a DWI or DWI-related offense would be mandated to undergo a screening and/or assessment by a licensed professional using objectively validated and accepted screening tools to determine whether the person needs treatment. This should shine a light on those with alcohol problems and allow licensed professionals to work with those people to make better/appropriate decisions about walking and driving after drinking.
- Mandatory Alcohol Screening/Assessment of All Probationers Upon Probation for a DWI or DWI-Related Offense—When sentenced to probation for a DWI, a license suspension/revocation is usually included. If a screening/assessment structure was imposed on all such defendants being supervised by the probation department, it could reduce the number of pedestrians with high BACs.
- MVA/DMV Involvement in Sanction Process—Based on input from investigating police and filed medical or family reports, the licensing authority would determine if the driver is considered at risk of being a high-BAC pedestrian victim if suspended. The MVA/DMV would then recommend AUD treatment and provide counseling on the risks of walking and driving while at elevated BACs.
- ID Check at Point-of-Sale—Police officers are allowed to check IDs of people purchasing alcohol. This provides an opportunity to interact with a person who walks to the point-of-sale. In the interaction, an officer can inform the pedestrian of risks while verifying eligibility to purchase alcohol. Could be combined with WWI or Relocation to Safe Place Law.

- “You’ll Be Walking” Information Pamphlet—A pamphlet included as part of the DWI arrest/adjudication process to advise newly suspended drivers of the risks they might face as they walk more to do things they previously did by driving.
- Transit Skills for Newly Suspended Drivers Guide—A guide explaining how to use transit and a number or web site for suspended drivers to use to seek advice on using transit to meet their needs. The guide would be given at the time of license suspension to help them and increase ridership.
- Training Community Outreach Officers—Community outreach officers, particularly in urban areas, often patrol on foot or bicycle. Increasing the awareness of the problem and the available interventions among these officers should result in positive preventative actions while on patrol.
- “Don’t Be Invisible” Campaign—An on-street effort by police officers to encourage increased conspicuity for intoxicated “at-risk” pedestrians. Officers would be trained to tell the pedestrian they were inconspicuous and to distribute high-visibility bands or other devices, encourage their use, and talk about being careful.
- Use of Actuarial Risk and Needs Assessment to Determine the Risk and Needs of People With AUDs—Risk and needs must be assessed using research-based criteria to identify the likelihood of future recidivism, issues with probationary supervision, and the extent behaviors and issues that contribute to high pedestrian risk are present.
- Target clients for appropriate interventions by employing the risk/needs/responsivity principles—This post-sentence intervention employs established principles with an additional focus on alcohol use, pedestrian behavior, and risk.

Third-party interventions. These approaches make use of intermediaries with a potential interest in the welfare of the drinker in an effort to prevent excessive drinking or make walking after drinking less risky. Alcohol sellers and servers, the beverage industry, and family or friends would fall in this category.

- Bartender Training—Bartenders and other servers represent a first line of defense against high-BAC crashes for people who drink alcohol outside of private settings. Existing bartender training focuses almost exclusively on DWI. This approach would extend the training to include the dangers of walking at high BACs and the identification of ride alternatives.
- Extended Server Liability/Dram Shop Laws—Hold sellers/servers/hosts responsible (criminally and civilly) for injuries to people to whom they served excess alcohol, regardless of the injury mechanism. Include initial and refresher training on the topic as part of the licensing process.
- Ride Service Terminals in Bars and Restaurants—Alcohol servers and sellers would get terminals or sign on to web sites that would call ride (e.g., Uber, Lyft) to transport high-BAC pedestrians home or other known safe locations. Payment would automatically be added to the person’s tab.

Increased awareness of the problem. Increasing awareness among those people at risk as well as those who interact with people at risk of the dangers of high-BAC walking can potentially alter behavior and prevent fatal pedestrian crashes at high BACs.

- Public Awareness Campaign on Impaired Pedestrians—Pamphlets, social media, and other low-cost information approaches could be distributed by courts, probation/parole, medical personnel, mental health counselors, and employers to warn of the problems excessive alcohol use can cause even if the person ceases driving.
- “Friends Don’t Let Friends Walk Drunk”—A public awareness campaign promoted jointly by the hospitality industry and government to convince relatives and friends to intervene not only to prevent drunk driving but also to stop impaired walking.
- “Don’t Get Smashed When You’re Smashed” YouTube videos—Use police body camera video of dramatic scenes of intoxicated people at risk in traffic, being interviewed by officers, and at crash scenes.
- “Be Wary of Walkers” Informational Piece—This campaign would remind drivers of the law that requires them to look out for and avoid hitting pedestrians and correct the error that assumes that people walking are looking out for themselves and being careful.
- Revise the Alcoholic Beverage Labeling Act—Increase the labeling requirements to include risks of crashes as a pedestrian (among other things) to increase awareness of the problem.

General pedestrian and traffic safety. By creating increased knowledge about pedestrian crashes and their causes, these approaches may improve pedestrian behavior even at elevated BACs and/or deter walking after excessive drinking.

- Community Effort Designed to Educate Everyone in How to Walk Properly in Crosswalks—This program could begin in grade school and then be carried forward in schools and by other groups such as medical, social services, and employers.
- “Keep Your Head on a Swivel” Safety Sign Campaign—Post “Keep Your Head on a Swivel” signs at crosswalks and at non-crosswalk locations where intoxicated people frequently cross streets to warn walkers that cars may come at them from many directions.
- Enhanced Crosswalks in Areas Frequented by High-BAC Pedestrians—Improve crosswalks with state-of-the-art flashers, illumination, etc., where high-BAC pedestrians are known to cross the roadway.
- Night Pedestrian Zone—Identify areas where alcohol sales, package stores, and bars/taverns serve populations who walk to them and apply enforcement, engineering, and education efforts specific to excessive drinking and walking.

- Improved Street Lighting in Areas Frequented by High_BAC pedestrians—Provide improved illumination using LED lamps of areas where high-BAC pedestrians are active, with the lighting set to illuminate the pedestrians, increasing their chances of being seen.
- Targeted Crosswalk Enforcement in Alcohol Service Areas—Use targeted crosswalk enforcement (decoy pedestrians) to enforce crosswalk laws at the time high-BAC pedestrians may be crossing. This should reduce crosswalk crashes in general and also benefit the high-BAC pedestrian who is in or near a crosswalk.
- Traffic Speed Reduction Through Lower Speed Limits and Enforcement—Speed reduction should both limit crashes and reduce fatal outcomes when crashes do occur.
- Improve Pedestrian Safety Through Changes in the Environment—Making the environment safer for walking, even at an elevated BAC, should reduce the studied crashes.

Overall, preventing walking at high BACs (13 ideas) and enforcement/adjudication (10 ideas) were the categories with the largest number of ideas, followed by reducing alcohol consumption and general safety improvement (8 ideas each). Notably, the generated countermeasure ideas covered short, medium, and long lead time approaches. Also, ideas to be implemented by all of the major groups associated with the problem -- enforcement, adjudication, medicine/social work, alcohol beverage industry -- were included in the list.

Discussion

This study focused first on determining if an overrepresentation of prior DWI offenders exists among fatally injured pedestrians who had BACs of .08+. It then examined possible remedial strategies and approaches that could be used as countermeasures to any problem identified. The processes employed by the project produced important findings detailed previously herein with respect to both of these questions. The possible implications of these findings as well as the limitations of the study are discussed below.

Representation of Prior DWI Offenses in BAC .08+ Pedestrian Fatalities

The first phase of this study clearly showed that pedestrians in the study sample with BACs of .08+ killed in a motor vehicle crash were reliably more likely to have prior alcohol driving offenses on their driving records than pedestrians in the sample who were killed at a lower or zero BACs. The similarity of the findings across the sample of five diverse States suggests the potential existence of a problem, at least in those States.

A number of interpretations of the data are possible but could not be further assessed with the current data. The authors believe that these results and the research literature suggest that people who drive with high BACs are also likely to walk with high BACs when they are not driving. We also find it reasonable that a prior driving alcohol offense conviction and associated sanctions can, in fact, lead to more walking and increased exposure as a high-BAC pedestrian. It is logical that the higher percentage of unlicensed pedestrians in the BAC \geq .08 group may have arisen from an increase in license withdrawals within that group. This, in turn, could result in

increased walking exposure for these people. Thus, the license suspension/revocation process for DWI could have unintended consequences.

It can be argued that walking at a high BAC only endangers the drinking person and is therefore preferable to letting that person continue to drive and endanger others. Nevertheless, it still must be considered unacceptable from a societal viewpoint to implement sanctions for DWI that place the offending person at an increased risk of injury and death from another behavior (walking in this instance). Also, the act of striking and killing a pedestrian, even if it is not the fault of the driver because the high-BAC pedestrian often behaves irrationally, can be traumatic and life-changing for the striking driver.

In addition, even though this study used a cutoff BAC of .08 to distinguish high from low BACs among the pedestrian fatalities, the actual BACs of the victims in the $BAC \geq .08$ group were much higher. This further suggests that these victims may be suffering from AUDs and are regularly at high BACs (e.g., American Psychiatric Association, 2013; Centers for Disease Control and Prevention, 2011; National Institute on Alcohol Abuse and Alcoholism, 2016; Rehm et al., 2003). The detrimental effects of suffering from an AUD go far beyond increased likelihood of pedestrian and other traffic crashes. Accidents of other types (e.g., falls) have been associated with alcohol impairment (e.g., Blomberg, Thomas, Long, Sifrit, & Korbelak, 2014) as have many deleterious medical conditions and anti-social behaviors. Therefore, there could be a benefit both to the person and to society as a whole if the process of apprehending and sanctioning drivers for DWI also addressed their AUD, which is arguably the underlying issue and root cause of their illegal driving behavior.

This study did not attempt to provide a national estimate of the percentage of fatally injured pedestrians with BACs of .08 or above who had DWIs on their driving records. It did, however, show that in our studied sample, if a fatally injured pedestrian had a BAC of .08 or greater, he or she was significantly more likely to be a prior DWI offender than was a fatally injured pedestrian in the same State who was at a lower BAC or zero BAC.

Countermeasure Ideas

The developed remedial approaches and countermeasure ideas ranged from media message themes whose production could be started almost immediately to long lead time items such as law changes and the implementation of appreciably altered adjudication processes for DWI offenders. Mounting any of the strategies will require some design or adaptation activities, pilot testing, and the development of supporting material.

The breadth of the suggestions and their focus on treating the problem holistically is noteworthy. As discussed throughout this report, the likely existence of an AUD in the fatally injured, high-BAC pedestrian is almost assuredly a root cause of their crashes. Thus, developing and disseminating more effective ways to diagnose and treat AUDs is one cornerstone to addressing the problem. Even when better identification and treatment are available, however, the challenge of integrating those techniques into the DWI enforcement and adjudication processes will remain. Several of the countermeasure ideas developed in this study address this challenge with the consistent theme of integrating health, enforcement, adjudication, and parole functions. This is a logical approach and one obviously held by several of the SMEs.

It must be remembered that this was an exploratory and not a design or development study with respect to countermeasures. As such, the developed ideas must be viewed in an appropriate light as the conjecture of experts on what might be effective and therefore worth pursuing. All of the suggested approaches appear to have some merit. Each can likely be valuable both as an initial concept and as a kernel for catalyzing other ideas and building operational countermeasures and recommended approaches. They are all worth considering but cannot be recommended until they are subjected to further research, development, and evaluation.

Limitations

As mentioned several times throughout this report, the data contained here is derived from a convenience sample of five States and should not be construed as a nationwide estimate. This is consistent with the study's objectives and does not undermine the basic finding that DWI offenses appear more frequently on the driving records of pedestrian fatalities with high as opposed to low/zero BACs.

Likewise, the sample of States studied was selected based on expediency and the ability of the State to facilitate the combining of pedestrian crash data with the driving records of the pedestrian victims. By chance, the sample covers multiple areas of the country (Florida, Massachusetts, Tennessee, Texas, and Washington) but was not intended to be and should not be interpreted as a representative sample. Within each State, study researchers relied on State personnel to extract the desired data, and it is believed they all followed the study-provided protocol thereby producing similar datasets. The consistency of the findings certainly suggests this is the case.

Finally, the list of 50 countermeasures and remedial approaches is not put forward as exhaustive or any type of model. The ideas represent the initial thoughts of the researchers and a group of prominent SMEs who volunteered their time to assist this study. They were asked to look at the data and provide their reactions to it in the form of remedial approaches. They complied admirably, and the final list should be of value to anyone working in this field. The extent of evidence supporting the ideas is varied. Some are simply raw ideas while others have been researched to various extents. No implication is intended, however, that any of these ideas is necessarily at a sufficient readiness level to be implemented without further development and evaluation.

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Appendix A: Additional Results

This Appendix contains additional results tables and figures to supplement those in the text.

Table A-1. Total Counts of DWI/DUI and ALR on Driver Records with BAC

State	Pedestrians with Alcohol Offense N (%)	Total DWI/DUI	Total ALR	Grand Total
<u>Total (N = 1,351)</u>	390 (28.9)	643	393	1,036
BAC < .08 (n = 790)	150 (19.0)	178	204	382
BAC ≥ .08 (n = 561)	240 (42.8)	465	189	654
<u>Florida (N = 424)</u>	126 (29.7)	201	58	259
BAC < .08 (n = 199)	30 (15.1)	36	12	48
BAC ≥ .08 (n = 225)	96 (42.7)	165	46	211
<u>Massachusetts (N = 198)</u>	71 (35.9)	44	233	277
BAC < .08 (n = 165)	53 (32.1)	20	164	184
BAC ≥ .08 (n = 33)	18 (54.5)	24	69	93
<u>Tennessee (N = 73)</u>	20 (27.4)	64	N/A	64
BAC < .08 (n = 42)	7 (16.7)	22	N/A	22
BAC ≥ .08 (n = 31)	13 (41.9)	42	N/A	42
<u>Texas (N = 377)</u>	93 (24.7)	147	55	202
BAC < .08 (n = 230)	34 (14.8)	45	15	60
BAC ≥ .08 (n = 147)	59 (40.1)	102	50	142
<u>Washington (N = 279)</u>	80 (28.7)	187	47	234
BAC < .08 (n = 154)	26 (16.9)	55	13	68
BAC ≥ .08 (n = 125)	54 (43.2)	132	34	166

Counts of speeding convictions were available for Florida, Massachusetts, Texas, and Washington (Figure A-1). The high-BAC group had a lower percentage of people with speeding convictions, $\chi^2(1, N = 1,278) = 7.64, p = .01$.

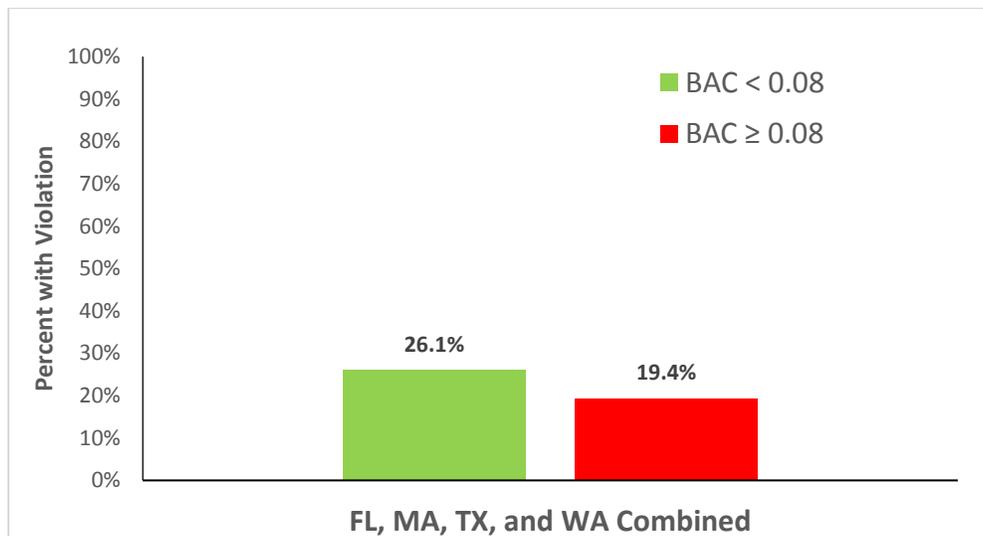


Figure A-1. Any speeding violation on driving record

Table A-2 shows the mean, standard deviation, and range of measured BACs for pedestrians classified as $BAC < .08$ or $BAC \geq .08$ in the total sample and separated by whether or not their driving record was obtained. As evident in the table, BACs for the $BAC < .08$ group were almost always at or near .00 g/dL. The BACs of the high-BAC group averaged .23 for the total sample with a range of .08 - .49 g/dL. The pattern was the same regardless of whether or not the person's driving record in the State where the person was killed was recovered, $t(1,971) = -.30$, $p = .20$. Thus, at least in terms of BAC at the time of death, the group for whom driving records were available to this study was not atypical of all fatally-injured pedestrians with a measured BAC.

Table A-2. BACs of Fatally Injured Pedestrians

	Mean (SD)	Range
<u>Total Sample</u>	.09 (.12)	.00 - .49
BAC < .08	.00 (.01)	.00 - .07
BAC \geq .08	.23 (.08)	.08 - .49
<u>No Driving Record</u>	.09 (.12)	.00 - .47
BAC < .08	.00 (.01)	.00 - .07
BAC \geq .08	.23 (.08)	.08 - .47
<u>Has Driving Record</u>	.10 (.12)	.00 - .49
BAC < .08	.00 (.01)	.00 - .07
BAC \geq .08	.23 (.08)	.08 - .49

Table A-3 shows the age of the pedestrians by alcohol impairment and the availability of a driver record. Overall, pedestrians in the $BAC \geq .08$ group were younger than pedestrians in the $BAC < .08$ group, $t(1970) = 8.85$, $p < .001$. While this general pattern held true for both pedestrians with and without driver records, pedestrians whose driver records could be obtained were younger than pedestrians whose driver records could not be acquired, $t(1,970) = 2.65$, $p < .01$.

Table A-3. Age of Fatally Injured Pedestrians

	Mean (SD)	Range
<u>Total Sample</u>	47.70 (17.77)	16 - 94
BAC < .08	50.55 (19.53)	16 - 94
BAC \geq .08	43.47 (13.74)	16 - 84
<u>No Driving Record</u>	49.26 (20.29)	16 - 94
BAC < .08	53.78 (22.05)	16 - 94
BAC \geq .08	41.76 (14.11)	16 - 77
<u>Has Driving Record</u>	46.98 (16.44)	16 - 94
BAC < .08	48.96 (17.97)	16 - 94
BAC \geq .08	44.18 (13.53)	16 - 84

Table A-4 shows the sex distributions of the studied pedestrians by BAC group and the availability of a driver record. Overall, pedestrians within the $BAC \geq .08$ group were more likely to be male than female, $\chi^2(1, N = 1956) = 48.94, p < .001$. No sex differences were found between the victims with and without driving records, $\chi^2(1, N = 1,956) = .09, p = .77$.

Table A-4. Sex of Fatally Injured Pedestrians

	Male %(N)
<u>Total Sample</u>	71.4 (1397)
BAC < .08	65.5 (762)
BAC \geq .08	80.1 (635)
<u>No Driving Record</u>	71.9 (442)
BAC < .08	64.7 (247)
BAC \geq .08	83.7 (195)
<u>Has Driving Record</u>	71.2 (955)
BAC < .08	65.9 (515)
BAC \geq .08	78.6 (440)

Appendix B: Biographies of Subject Matter Experts

This Appendix contains brief biographies of the eight SMEs who contributed ideas for countermeasures and remedial approaches. They are presented alphabetically and in the style and format provided by each SME.

Devin Burke, Highway Safety Specialist, NHTSA, Impaired Driving Division

Devin Burke is a highway safety specialist in the Impaired Driving Division at NHTSA. Her primary focus is impaired driving prevention among teen and older novice drivers and road users across the country. Prior to her position at NHTSA, Burke was the manager of Government Relations and Traffic Safety at the Foundation for Advancing Alcohol Responsibility in Arlington, Virginia, where she worked on underage drinking prevention campaigns and judicial education efforts. Burke is a graduate of Smith College.

**Kathie Durbin, Chief of Licensure, Regulation & Education, Montgomery County,
Maryland Department of Liquor Control**

Kathie Durbin joined the Department of Liquor Control in 2002 as a community outreach manager. She has served as the division chief of Licensure, Regulation and Education for 15 years and is responsible for alcohol licensing, alcohol policy, education, legislative initiatives, and business compliance. Durbin began her career as a Responsible Alcohol Beverage Service instructor for the Restaurant Association of Maryland Hospitality Education Foundation while working in restaurant management positions in DC and Maryland. Afterward, she spent 10 years working as a contractor in the county; first for the Montgomery County Department of Health and Human Services, where she wrote and managed State grants and mini-grants, and managed the local substance abuse prevention network. She also worked for the Conference and Visitor Bureau, developing county visitor guides for tournament participants. Later, as the executive director of the Montgomery County Restaurant Association, Durbin worked closely with the business community. She collaborated with local agencies and the executive board to craft meaningful alcohol legislation.

Durbin is a graduate of the University of Maryland in Baltimore County. She is certified by the State of Maryland as an Alcohol Server instructor and as a Substance Abuse Prevention professional. As an alcohol regulator, she plays a leadership role statewide as the current president of the Maryland Alcohol Licensing Association and is an active member of the National Alcohol Beverage Control Association, Responsible Hospitality Institute, and the Responsible Retailing Forum. Recognized in 2016 by the National Alcohol Licensing Professional Association for Innovation and Leadership and again in 2017 by the Center for Alcohol Policy as Regulator of the Year, Durbin is considered an expert in the field of alcohol regulation, education, and policy.

Ralph W. Hingson, Sc.D., M.P.H., Director, National Institute on Alcohol Abuse and Alcoholism, Division of Epidemiology and Prevention Research

Dr. Ralph Hingson is the director of the Division of Epidemiology and Prevention Research at the National Institute on Alcohol Abuse and Alcoholism (NIAAA). Before joining NIAAA, he was professor and associate dean for research at the Boston University School of Public Health. He has authored or co-authored 170 research articles and book chapters, including studies of the effects of (1) raising the legal drinking age, (2) zero-tolerance laws for drivers under 21, (3) .08 g/dL legal blood alcohol limits for adult drivers, (4) comprehensive community programs to reduce alcohol problems, (5) early drinking onset on alcohol dependence, traffic crashes, unintentional injuries and physical fights after drinking, as well as (6) assessments of morbidity and mortality associated with underage drinking, drinking by U.S. college students 18 to 24 years old, and interventions to reduce both underage and college drinking. Dr. Hingson currently serves on the World Health Organization coordinating council to implement WHO's global strategic plan to reduce the harmful use of alcohol.

In recognition of his research contributions, the Robert Wood Johnson Foundation honored Dr. Hingson in 2001 with its Innovators Combating Substance Abuse Award. In 2002 he received the Widmark Award, the highest award bestowed by the International Council on Alcohol Drugs and Traffic Safety (ICADTS). Dr. Hingson is a past president of ICADTS. In 2003 Mothers Against Drunk Driving instituted the Ralph W. Hingson Research in Practice Annual Presidential Award, with Dr. Hingson honored as its first recipient. In 2008 the American Society of Addiction Medicine conferred the R. Brinkley Smithers Distinguished Scientist Award to Dr. Hingson. In 2014 he received the University of Pittsburgh Legacy Laureate Award. In 2016, he received ICADTS' Borkenstein Award for "Outstanding contributions to international cooperation in alcohol and drug related traffic safety programs." In September 2017 Dr. Hingson received a National Institutes of Health 2017 Director's Award for his role as a member of the Surgeon General's Report Team for the recently released *Surgeon General's Report on Alcohol, Drugs, and Health*.

Nathan Lowe, Ph.D., Program Director Grants and Research at Council of State Governments/American Probation and Parole Association

Nathan Lowe, Ph.D., is the program director of grants and research with the American Probation and Parole Association. In this role he oversees the staff who work on the association's various grant-funded projects involving the provision of training, technical assistance, and research/evaluation to the community supervision field. Nathan also manages and directly contributes to such projects, as well as coordinates the production of APPA's journal *Perspectives*. As a former practitioner Lowe's areas of interest primarily concentrate on efforts to improve community supervision practices. Notably, he is co-author and manager of the Impaired Driving Assessment, a screening tool to identify risk and needs for people who are convicted of an impaired-driving offense. He has extensive experience in conducting research with populations involved with the justice system using mixed-mode methodologies and various statistical techniques. Lowe's work has been published in scholarly peer-reviewed journals, professional journals, and technical reports. He received his Ph.D. in sociology from the University of Kentucky.

John Moffat, Retired NHTSA Regional Administrator; Retired Captain, Seattle Police Department

John Moffat is a consultant working to prevent motor vehicle injuries. Previously, he was Regional Administrator for NHTSA’s Pacific Northwest Region 10, following service as director of the Washington Traffic Safety Commission, that State’s office of highway safety. During that service his State reached 95 percent seat belt use, the highest in the Nation. He was a pioneer of the “Toward Zero Deaths” initiative.

Before that, Moffat was a Seattle police officer, commanding the traffic division. During his police service, Seattle was the first to achieve 70 percent seat belt use (1991). He developed the concept of targeted crosswalk enforcement and focused the city’s efforts on protection of pedestrians.

Moffat served as Chairman of the Governor’s Highway Safety Association, where he was very active in the development of public policy. He was chairman of the safety committee of the *Partnership for a Walkable America*. Moffat has taught pedestrian safety enforcement strategy across the nation and abroad. He served as adjunct faculty at the University of North Florida’s Institute of Police Technology and Management. He is an honors graduate of Seattle University. His government service totals 46 years at Federal, State and municipal levels.

Janet Selway, DNSc, AGNP-C, ANP-BC, CPNP-PC, FAANP

Position Title: Director, Adult-Gerontology Primary Care Nurse Practitioner Program
The Catholic University of America School of Nursing (CUASON), Washington, D.C.

INSTITUTION AND LOCATION	DEGREE (if applicable)	YEAR(s)	FIELD OF STUDY
St. Joseph Hospital Sch. of Nursing, Towson, MD	RN Diploma	1971	Nursing
College of Notre Dame of MD, Baltimore, MD	BSN	1986	Nursing
University of Maryland, Baltimore, MD	MS	1988	Nursing- Adult NP
University of Maryland, Baltimore, MD	Post MS	1991	Nursing- Pediatric NP
The Johns Hopkins University, Baltimore MD	DNSc	2004	Nursing Science
The Catholic University of America, Wash., DC.	Post MS	2017	Nursing-Adult-Gero NP

Faculty Positions and Employment:

9/2018- Present Tenured Assoc. Prof. -CUASON
9/2017- Present Assoc. Prof. CUASON
9/2010-2017 Asst. Prof. CUASON

9/2007-9/2010 Asst. Prof.-U of Delaware SON
1/1997-6/2006 Instructor, The Johns Hopkins Univ. SON

Honors

2015 Awarded lifetime membership in the American Association of Nurse Practitioners
2014 Inducted as Fellow of the American Association of Nurse Practitioners
2002 Excellence in Teaching Award, Graduate Instruction, Johns Hopkins University Alumni Council

Funded Research Support

6/15 to Present: Steering Committee Member: *CUASON- DC VA Med Ctr VA Nursing Academic Partnership*
8/13-7/17 Team Member: *SAMHSA Launching SBIRT into the Community: A Multidisciplinary Approach* (Grant no. 5U79TI025411-01)
9/12-6/16 Project Director: HRSA Advanced Nursing Education grant *Technology-Enhanced Interprofessional Geriatric Advanced Nursing Education* (Grant no. D9HP25015)

Clinical Positions and Other

30 years experience in a variety of clinical NP positions in family practice, urgent care/ER and community health settings in the Greater Baltimore area.
2014- current: Vice Chair/Trustee- Political Action Committee of the American Assoc. of Nurse Practitioners
2011- 2012: Past President, American College of Nurse Practitioners
1993-1996: President, Nurse Practitioner Association of Maryland, Inc.

Carl A. Soderstrom, MD, Retired Adjunct Professor, University of Maryland, School of Medicine; Retired Chief of the Medical Advisory Board of the Maryland Motor Vehicle Administration

Dr. Soderstrom earned his M.D. degree from the State University of New York Downstate Medical Center (Brooklyn, New York), in 1969. He completed his surgery residency at the Beth Israel Medical Center in New York City. As a major in the U.S. Army Dr. Soderstrom was a member of the team that conducted the seminal research in the development of Kevlar body armor that for decades has been used worldwide by law enforcement.

After military service, Dr. Soderstrom completed a trauma/critical care fellowship at the Shock Trauma Center of the University Maryland (Baltimore) and joined the staff. In 1998, he was promoted to professor of surgery.

During his 25 years at the University of Maryland, including 10 years at its National Study Center for Trauma and EMS, Dr. Soderstrom focused his clinical and research activities on a wide spectrum of topics related to substance abuse and trauma, particularly as related to vehicular crashes. His peer reviewed papers, chapters, technical reports, abstracts, and posters number well over 150. He has been principal investigator for two NIH grants and a Robert Wood Johnson grant as well as other funded studies.

In 2002 Dr. Soderstrom was appointed associate chief of the Medical Advisory Board (MAB) of the Maryland Motor Vehicular Administration. In 2005 he was appointed board chief for the model system for referral and review for fitness to drive. Dr. Soderstrom was appointed to two terms to the Medical Review Board of the Federal Motor Carrier Safety Administration.

Dr. Soderstrom is currently involved in research efforts at the National Study Center and a Johns Hopkins University School of Public Health team (adjunct faculty) on its LongRoad longitudinal study of senior drivers. He is one of the creators of this AAA Research Foundation research effort.

Upon retirement in 2017 Dr. Soderstrom was awarded a Maryland Governor's Citation for service to the people of Maryland.

Hon. Michael Yavinsky, Supervising Judge of Brooklyn, New York, Criminal Court

Appointed to the bench by Mayor Michael Bloomberg in January of 2009 and reappointed by Mayor Bill DeBlasio in January of 2019, Judge Yavinsky was assigned in January 2013 to be the supervising judge of the NYC Criminal Court - Kings County. Prior to that, Judge Yavinsky presided in the NYC Criminal Court in both Queens County (2011-12) and New York County (2009-10). After receiving his law degree, Judge Yavinsky served as a staff attorney with the Criminal Defense Division of the Legal Aid Society of New York for 3 years and then continued to work as a public defender for 6 and a half years as a staff attorney at Queens Law Associates, P.C. In February 2003, Judge Yavinsky began working for the Judge Deborah Stevens Modica as her principal court attorney and the supervising court attorney of the New York City Criminal Court – Queens County, and was the Chief Court Attorney of the New York City Criminal Court from January 2004 to December 2008.

Judge Yavinsky was selected in 2017 to be a member of the New York Unified Court System's Criminal Curriculum Committee, and was appointed in 2015 by Governor Andrew Cuomo to be the judicial representative to the New York Council for the Interstate Compact for Adult Offender Supervision. He was also appointed in 2015 to the 18-B Advisory Panel for the Appellate Division, Second Department, and in 2010 to the Chief Administrative Judge's Advisory Committee on Criminal Law and Procedure. Judge Yavinsky is a graduate of the Northeastern University School of Law.

Appendix C: Detail on Countermeasure Strategies

This appendix contains copies of the countermeasure idea sheets prepared by the SMEs and project staff. The sheets have been edited slightly to use consistent nomenclature (e.g., DWI is used throughout rather than a mixture of DWI and DUI). Some of the ideas provided by the SMEs have been augmented with additional detail, but in no case has the basic idea been altered materially. The sheets have been sorted into the seven strategy areas discussed in the text.

Strategies to Reduce or Prevent Alcohol Use

Label	Content
Name of Idea	Alcohol abstinence and 24/7 monitoring
Description	As part of a plea or sentence, abstinence from alcohol would be required for the length of the offender's sentence.
Intervention Point	The court system/probation and parole
Implementers (Check all that apply by clicking on the associated box and write in any others)	<ul style="list-style-type: none"> • Law enforcement <input type="checkbox"/> • The courts <input checked="" type="checkbox"/> • The probation system <input checked="" type="checkbox"/> • Medical practitioners <input type="checkbox"/> • Social services and counseling <input checked="" type="checkbox"/> • Family/friends personal interactions <input type="checkbox"/> • Employers and the work environment <input type="checkbox"/> • The hospitality industry and alcohol sellers/servers <input type="checkbox"/> • Others
How It Works	At time of sentencing for DWI, a judge would use discretion to require that the offender abstain from consuming alcohol for the length of their sentence. If the case was settled and did not go to trial, the same requirement could be part of a plea deal. Sobriety could be monitored using a continuous alcohol monitor (CAM).
Experience/Evidence	Many States use CAM devices to ensure that offenders who are allowed to keep their driver licenses doesn't drink alcohol at all. Unlike an ignition interlock, which allows people to drink but not drive if they blow above .08 BAC, CAM devices do not allow for any alcohol consumption. This would mean that fewer DWI offenders would be pedestrians, because they could keep their licenses, and that they would likely be sober. They would also still be able to drive if they had a car, so they would not be as reliant on walking as a form of transportation.
Likely Cost	\$50-\$100 installation fee, \$5-\$15 daily monitoring fee. Cost can be \$450 a month, and is usually paid by the offender unless they are unable to afford the cost. Government subsidies are sometimes available.
Impediments	<ul style="list-style-type: none"> - CAM devices aren't perfect and aren't constantly monitored. If an offender consumed alcohol and went for a walk, a probation officer isn't going to immediately go find the person and prevent the person from being hit by a car. - Cost is significant. - Willingness of judges to sanction with CAM devices is lower than other forms of monitoring.
Research Suggestions	<ul style="list-style-type: none"> - Efficacy of CAM devices - Use rates of CAM devices – how many are being used nationally on average
Comments	

Label	Content
Name of Idea	Drivers license (or ID) “DWI Zebra Tag” or “Vertical License”
Description	When a person is arrested for a DWI, a “DWI zebra tag” would be applied to the driver license or other State-issued identification card, or the person would receive a “Vertical License,” which would prevent the person from being able to purchase alcohol. This could also be an indicator that the person should not be consuming any alcohol as part of probation.
Intervention Point	After arrest
Implementers (Check all that apply by clicking on the associated box and write in any others)	<ul style="list-style-type: none"> • Law enforcement <input checked="" type="checkbox"/> • The courts <input checked="" type="checkbox"/> • The probation system <input checked="" type="checkbox"/> • Medical practitioners <input type="checkbox"/> • Social services and counseling <input type="checkbox"/> • Family/friends personal interactions <input type="checkbox"/> • Employers and the work environment <input type="checkbox"/> • The hospitality industry and alcohol sellers/servers <input checked="" type="checkbox"/> • Others Driver License Agency and possibly legislators
How It Works	The zebra tag (obvious marking) is applied to the driver’s license or other identification card that signals to an alcohol retailer that this person is not allowed to purchase or consume alcohol. A vertical license option has all information printed vertically which is an easy indicator to not sell alcohol to a person. Any retail establishment that serves a person with the zebra tag or vertical license would be fined or shut down. In addition, law enforcement could ask to see the driver’s license of anyone observed drinking and determine if the person should not be consuming alcohol.
Experience/Evidence	Restriction codes on driver licenses are used in all States. Many States issue vertical drivers licenses to drivers under 21 as indicators that they should not be served alcohol. An obvious symbol or vertical license/ID could be issued to someone convicted of DWI.
Likely Cost	Very low; only cost is reprinting the license or ID.
Impediments	Minimal. Requires some form of alcohol abstinence or sobriety option be available after conviction. Most States already have the printing capabilities in place.
Research Suggestions	Pilot test the approach in a State and compare recidivism and crash rates after implementation.
Comments	

Label	Content
Name of Idea	Path to re-licensing as a motivation not to drink
Description	Every person who has a license suspension/revocation due to a DWI arrest or conviction is still a substantial risk to getting behind the wheel of a motor vehicle illegally. Jurisdictions have historically believed – mistakenly – that telling defendants they couldn't drive meant that they wouldn't drive. Jurisdictions could now aggressively encourage suspended/revoked drivers to pursue a path to getting conditional licenses based upon meeting certain treatment-based criteria.
Intervention Point	Department of Motor Vehicles
Implementers (Check all that apply by clicking on the associated box and write in any others)	<ul style="list-style-type: none"> • Law enforcement <input type="checkbox"/> • The courts <input type="checkbox"/> • The probation system <input type="checkbox"/> • Medical practitioners <input checked="" type="checkbox"/> • Social services and counseling <input checked="" type="checkbox"/> • Family/friends personal interactions <input type="checkbox"/> • Employers and the work environment <input type="checkbox"/> • The hospitality industry and alcohol sellers/servers <input type="checkbox"/> • Others Requires regulatory adjustment
How It Works	The New York DMV has historically granted conditional driving privileges to those who have had their driving privileges suspended or revoked due to a DWI arrest and/or conviction. If there was a strong effort to want to bring in the unlicensed pedestrians into a world that would accelerate their path to a lawful driving privilege, the DMV in a given State could leverage that carrot (of a driver's license) with a strong screening/assessment protocol that established different layers of requirements depending on an person's past. Aggravating factors might then require not only treatment participation and toxicology results but might also require extended use of a SCRAM device and ignition interlock devices.
Experience/Evidence	Similar structure used to enforce DWI sentences in courtrooms.
Likely Cost	Unknown
Impediments	Unknown
Research Suggestions	Develop and pilot test the approach
Comments	This would directly engage the pedestrian population and help attack the reason for why they are without a license – alcohol misuse and abuse.

Label	Content
Name of Idea	Increase price of alcohol
Description	
Intervention Point	State taxes and minimum prices
Implementers (Check all that apply by clicking on the associated box and write in any others)	<ul style="list-style-type: none"> • Law enforcement <input type="checkbox"/> • The courts <input type="checkbox"/> • The probation system <input type="checkbox"/> • Medical practitioners <input type="checkbox"/> • Social services and counseling <input type="checkbox"/> • Family/friends personal interactions <input type="checkbox"/> • Employers and the work environment <input type="checkbox"/> • The hospitality industry and alcohol sellers/servers <input type="checkbox"/> • Others State and Federal legislatures and chief executives Legislatures or alcohol beverage commissions
How It Works	Raising alcohol prices reduces consumption and related problems
Experience/Evidence	See Facing Addiction: The Surgeon General's Report on Alcohol, Drugs, and Health (chapter 3, p. 17, 24)
Likely Cost	Moderate
Impediments	Alcohol industry's opposition
Research Suggestions	Need research on alcohol price and minimum pricing, specifically on high-BAC pedestrian death rates.
Comments	Increasing alcohol price and setting minimum drink prices reduces consumption, alcohol-related traffic deaths, and a myriad of acute injuries and chronic diseases. It could reduce both driver and pedestrian alcohol involvement in pedestrian deaths. Only 4 States tax beer \geq \$1.00/gallon, 3 States tax spirits \geq \$8.00 gallon, 2 States tax wine \geq \$2.00/gallon

Label	Content
Name of Idea	Reduce alcohol outlet density
Description	
Intervention Point	Points of sale zoning regulation
Implementers (Check all that apply by clicking on the associated box and write in any others)	<ul style="list-style-type: none"> • Law enforcement <input type="checkbox"/> • The courts <input type="checkbox"/> • The probation system <input type="checkbox"/> • Medical practitioners <input type="checkbox"/> • Social services and counseling <input type="checkbox"/> • Family/friends personal interactions <input type="checkbox"/> • Employers and the work environment <input type="checkbox"/> • The hospitality industry and alcohol sellers/servers <input type="checkbox"/> • Others State and local government
How It Works	Fewer outlets lowers consumption.
Experience/Evidence	See Facing Addiction: The Surgeon General’s Report on Alcohol, Drugs, and Health (chapter 3, p. 3-18)
Likely Cost	Less than cost of alcohol-related harm
Impediments	Opposition by alcohol industries, bars, restaurants, distributors, and promoters
Research Suggestions	Need to study effect on high-BAC pedestrian death rates.
Comments	

Label	Content
Name of Idea	Reduce alcohol hours and days of sale
Description	
Intervention Point	Point of sale
Implementers (Check all that apply by clicking on the associated box and write in any others)	<ul style="list-style-type: none"> • Law enforcement <input checked="" type="checkbox"/> • The courts <input type="checkbox"/> • The probation system <input type="checkbox"/> • Medical practitioners <input type="checkbox"/> • Social services and counseling <input type="checkbox"/> • Family/friends personal interactions <input type="checkbox"/> • Employers and the work environment <input type="checkbox"/> • The hospitality industry and alcohol sellers/servers <input type="checkbox"/> • Others State government
How It Works	Reducing hours and days of sale would reduce drug and alcohol use accordingly
Experience/Evidence	See Facing Addiction: The Surgeon General's Report on Alcohol, Drugs, and Health (chapter 3, p. 18)
Likely Cost	Modest
Impediments	Alcohol industry opposition
Research Suggestions	Need to study effect on high-BAC pedestrian death rates.
Comments	May reduce both pedestrian and driver BAC

Label	Content
Name of Idea	Prevent privatization of alcohol sales
Description	Privatization increases alcohol sales
Intervention Point	State, Federal, and community legislatures
Implementers (Check all that apply by clicking on the associated box and write in any others)	<ul style="list-style-type: none"> • Law enforcement <input type="checkbox"/> • The courts <input type="checkbox"/> • The probation system <input type="checkbox"/> • Medical practitioners <input type="checkbox"/> • Social services and counseling <input type="checkbox"/> • Family/friends personal interactions <input type="checkbox"/> • Employers and the work environment <input type="checkbox"/> • The hospitality industry and alcohol sellers/servers <input type="checkbox"/> • Others State government
How It Works	Privatization increases per capita sales of alcohol
Experience/Evidence	See Facing Addiction: The Surgeon General's Report on Alcohol, Drugs, and Health (chapter 3, p. 18)
Likely Cost	Modest
Impediments	Alcohol industry
Research Suggestions	Study impact specifically on high-BAC pedestrian deaths
Comments	Privatization increases driver and pedestrian consumption

Label	Content
Name of Idea	Increase enforcement of minimum legal drinking age of 21
Description	Compliance checks, shoulder taps
Intervention Point	Federal and State legislatures
Implementers (Check all that apply by clicking on the associated box and write in any others)	<ul style="list-style-type: none"> • Law enforcement <input checked="" type="checkbox"/> • The courts <input type="checkbox"/> • The probation system <input type="checkbox"/> • Medical practitioners <input type="checkbox"/> • Social services and counseling <input type="checkbox"/> • Family/friends personal interactions <input type="checkbox"/> • Employers and the work environment <input type="checkbox"/> • The hospitality industry and alcohol sellers/servers <input type="checkbox"/> • Others
How It Works	Reduces commercial alcohol sales to minors
Experience/Evidence	See Facing Addiction: The Surgeon General's Report on Alcohol, Drugs, and Health (chapter 3, p. 20-22). Countermeasures That Work, 2017 (p. 60-61).
Likely Cost	Modest
Impediments	Cost of law enforcement
Research Suggestions	Study impact on high-BAC pedestrian death
Comments	<p>This will reduce underage consumption by drivers and pedestrians.</p> <p>Even though there are few young people in the studied crash group, the earlier a person starts drinking, the greater the likelihood of experiencing alcohol dependence, dependence at an earlier age, chronic-relapsing dependence, injury to drinkers and others, and motor vehicle crashes.</p> <p>Underage binge drinking has been linked to decrements in memory, spatial relations, executive function, and academic performance.</p> <p>Each drink increases traffic crash risk more for underage than adult drivers.</p>

**Strategies to Prevent or Limit Walking (or Driving)
After High Alcohol Consumption**

Label	Content
Name of Idea	Wearable smart BAC monitor
Description	The smart watch or wrist device provides continuous BAC tracking and can provide an alert when BAC is above a set threshold. This system is providing direct feedback to a person in an attempt to alter drinking and driving/walking.
Intervention Point	After DWI arrest or injury related to alcohol consumption. At the workplace during normal operations.
Implementers (Check all that apply by clicking on the associated box and write in any others)	<ul style="list-style-type: none"> • Law enforcement <input checked="" type="checkbox"/> • The courts <input checked="" type="checkbox"/> • The probation system <input checked="" type="checkbox"/> • Medical practitioners <input checked="" type="checkbox"/> • Social services and counseling <input checked="" type="checkbox"/> • Family/friends personal interactions <input checked="" type="checkbox"/> • Employers and the work environment <input checked="" type="checkbox"/> • The hospitality industry and alcohol sellers/servers <input type="checkbox"/> • Others
How It Works	The system uses a wristband sensor to provide real-time BAC monitoring and linked to a smart phone or smart watch. Once a person exceeds the set threshold, the person receives an alarm. The system can also send messages to others on the notification list to indicate the person could be in danger if driving or walking. This system is providing direct feedback to a person. While it could be used for parole purposes, it is primarily a behavior modification system to get the person to stop drinking or to alert others the person may need help.
Experience/Evidence	SCRAM-type systems have existed for a while but they do not provide direct feedback to the user. SCRAM systems often require a separate data download which is not ideal for intervening at the point of behavior. The proposed systems provide real time feedback and can provide alerts using cellular phone connections available in modern smart watches. https://biostrap.com/ www.cnet.com/news/bactrack-skyn-wearable-blood-alcohol-monitor-drunk-ces-2017/
Likely Cost	Moderate. The user would have to buy the device and pay for any monthly service fees. Given that smart watches are becoming more common, costs will be reduced as more people use the technology as part of their everyday lives.
Impediments	The system relies on the user wearing the device voluntarily and responding appropriately to the alerts, although it could be attached in a tamper-proof manner if it was sufficiently waterproof and rugged
Research Suggestions	Compare smart watch use to SCRAM use.
Comments	

Label	Content
Name of Idea	Walking while intoxicated (WWI) law
Description	A law like DWI that makes it illegal to walk at a BAC \geq .08, permits law enforcement personnel to test a suspected pedestrian's breath, and permits law enforcement to remove the pedestrian from the street if BAC \geq .08
Intervention Point	After DWI conviction while person is walking at elevated BAC
Implementers (Check all that apply and write in any others)	<ul style="list-style-type: none"> • Law enforcement <input checked="" type="checkbox"/> • The courts <input type="checkbox"/> • The probation system <input type="checkbox"/> • Medical practitioners <input type="checkbox"/> • Social services and counseling <input type="checkbox"/> • Family/friends personal interactions <input type="checkbox"/> • Employers and the work environment <input type="checkbox"/> • The hospitality industry and alcohol sellers/servers <input type="checkbox"/> • Others <i>Must have support of legislators to pass</i>
How It Works	Just as DWI. Officer sees cues and develops probable cause, stops ped and conducts preliminary breath test, cites ped and removes from street to safe holding area. Could add mandatory alcohol counseling to sanction if pedestrian was a prior DWI or BAC \geq .15. Reduces exposure and provides opportunity for interventions focused on drinking problem
Experience/Evidence	Puerto Rico has (had?) a WWI law that seemingly worked until resources ran low
Likely Cost	Medium. Need enforcement with PBTs plus facilities where pedestrian can be taken
Impediments	Need to pass law; police resources; lack of holding facilities; cost; civil liberties complaints
Research Suggestions	Determine if combining WWI with established brief interventions could enhance success; brainstorm other types of interventions when pedestrian is removed from street
Comments	The analogy to driving, boating, flying, etc. is strong. The relative risk curve for pedestrians is known. Dealing with societal values and norms as well as resource availability (as always) are the major hurdles

Label	Content
Name of Idea	Relocation to Safer Place Law
Description	Generally being under the influence of alcohol is not illegal and a person who is walking in a dangerous area is not so drunk that they can be forcibly sent to a DETOX facility. This law would allow police officers to move intoxicated pedestrians from a dangerous traffic place to a location where they would be safer.
Intervention Point	On street crisis – high risk pedestrian in traffic.
Implementers (Check all that apply by clicking on the associated box and write in any others)	<ul style="list-style-type: none"> • Law enforcement <input checked="" type="checkbox"/> • The courts <input type="checkbox"/> • The probation system <input type="checkbox"/> • Medical practitioners <input type="checkbox"/> • Social services and counseling <input checked="" type="checkbox"/> • Family/friends personal interactions <input type="checkbox"/> • Employers and the work environment <input type="checkbox"/> • The hospitality industry and alcohol sellers/servers <input type="checkbox"/> • Others
How It Works	Police observe a high risk situation or respond to a call for service reporting an inebriated person in a dangerous situation. They ask the person to move to a safer place. If the person declines to do so, the law would allow the police to require the person to accompany them to a safer location. This has the effect of immediately decreasing the risk, as well as providing a “teachable moment” for police to counsel the person of their elevated risk of traffic death in a pedestrian crash.
Experience/Evidence	This is done informally now and without authority it is risky for the police. Washington State has an intoxicated bicycle rider law that permits this mandatory relocation to a safer place.
Likely Cost	The cost would be in training and coaching the police involved. In large cities there will be crisis intervention officers who could apply this.
Impediments	Some risk in moving a person, thus the idea of going to a “safer” place, not guaranteed to be “safe”. Police may be reluctant to transport a person not under arrest, who may puke, may act up, or otherwise create trouble while they are trying to help them. Police have to make VERY clear that the person is not under arrest.
Research Suggestions	This could be trialed in a major city that has a record of intoxicated pedestrian crashes.
Comments	The police would like this authority, permits them to resolve crisis situations where a person declines to move out of danger.

Label	Content
Name of Idea	Statewide Coordination of DWI Case Responses
Description	This would involve an intentional, coordinated effort to un-silo the various organizational points of contact for people who have an alcohol issue and drive, which frequently results in license suspension/revocation.
Intervention Point	Macro-level Administrative Coordination
Implementers (Check all that apply by clicking on the associated box and write in any others)	<ul style="list-style-type: none"> • Law enforcement <input checked="" type="checkbox"/> • The courts <input checked="" type="checkbox"/> • The probation system <input checked="" type="checkbox"/> • Medical practitioners <input type="checkbox"/> • Social services and counseling <input checked="" type="checkbox"/> • Family/friends personal interactions <input type="checkbox"/> • Employers and the work environment <input type="checkbox"/> • The hospitality industry and alcohol sellers/servers <input type="checkbox"/> • Others DMV, the State entity that oversees medical practitioners and the treatment community that implements treatment programming, judicial educators, and judicial operations administrators.
How It Works	Frequently you will hear one side of the criminal justice system say, “You know, this would actually work if the courts actually enforced X,” or “You know, this would actually work if the DMV would actually check for Y when someone registers a car.” If the heads of the agencies that made and implemented varying policies involving DWI arrestees (who have high BACs, get their licenses suspended or revoked, and become pedestrians with high BACs) came together to discuss ways to eliminate people from falling through cracks in the system there would be a greater likelihood that everyone’s intended goals and policies could get realized due to a committed partnership amongst agencies to work together for a common goal.
Experience/Evidence	New York Impaired Driver Task Force
Likely Cost	Minimal
Impediments	Unknown
Research Suggestions	Develop and evaluate a model program
Comments	This exists in New York – probably could expand and be even stronger by adding judicial educators to the team.

Label	Content
Name of Idea	“Walking Lifeguard”
Description	Police see impaired pedestrian walking, without contacting the pedestrian they call a trained person who intercepts the pedestrian and walks with the person to the destination.
Intervention Point	On-street observed crisis
Implementers (Check all that apply by clicking on the associated box and write in any others)	<ul style="list-style-type: none"> • Law enforcement <input checked="" type="checkbox"/> • The courts <input type="checkbox"/> • The probation system <input type="checkbox"/> • Medical practitioners <input type="checkbox"/> • Social services and counseling <input checked="" type="checkbox"/> • Family/friends personal interactions <input type="checkbox"/> • Employers and the work environment <input type="checkbox"/> • The hospitality industry and alcohol sellers/servers <input type="checkbox"/> • Others
How It Works	Avoiding the need for a police officer contact, an officer who views an “at-risk” pedestrian calls for a trained “Walking Lifeguard” who intercepts the pedestrian and walks with them, providing lifeguard protection and looking out for the pedestrian’s safety. While walking with them, the lifeguard can make a brief intervention on alcohol, can discuss safer walk routes, and show the pedestrian safer ways to walk. If the person is too impaired to walk safely even with a lifeguard, a ride service would be called, and the lifeguard would accompany the pedestrian safely home.
Experience/Evidence	None known
Likely Cost	Expensive – need for trained personnel, may need many people
Impediments	Pedestrian may react violently to approach. Program may be held liable for mistakes made by lifeguard. Lifeguards may be tempted to take advantage of the impaired. Difficulty of returning lifeguards to service if they’ve walked a long way. Risk to lifeguard of taking walk with drunk stranger to unspecified destination.
Research Suggestions	Develop and evaluate a model program
Comments	This has the attraction of no arrest, no DETOX, no after-care issues and the ability to break off if not wanted. It also can use a community service officer rather than a commissioned police officer, who can engage in other social service duties when not needed as a walking lifeguard. This is similar to a free ride home, except everyone walks.

Label	Content
Name of Idea	“Designated Walker”
Description	Social groups including students and others planning activities that involve drinking designate one member to remain sober (i.e., limit drinking or abstain). That person either guides the walking of the others or secures safe transportation such as a taxi or shared ride service. The program concept could be promoted by public and private agencies (e.g., schools, government pedestrian safety groups, transportation companies) as well as alcohol sellers/servers.
Intervention Point	Decision to drink excessive amounts of alcohol in an organized social setting.
Implementers (Check all that apply by clicking on the associated box and write in any others)	<ul style="list-style-type: none"> • Law enforcement <input type="checkbox"/> • The courts <input type="checkbox"/> • The probation system <input type="checkbox"/> • Medical practitioners <input type="checkbox"/> • Social services and counseling <input type="checkbox"/> • Family/friends personal interactions <input checked="" type="checkbox"/> • Employers and the work environment <input checked="" type="checkbox"/> • The hospitality industry and alcohol sellers/servers <input checked="" type="checkbox"/> • Others Schools
How It Works	Social groups who embark on activity in which excessive drinking is likely to occur designate one or more group members to limit their drinking or abstain entirely. The group then either walks together under the guidance of the designated sober person or that person secures transportation for the other group members that is safe for a person with a high BAC.
Experience/Evidence	Some use in European countries (Belgium, France) and some use by university student groups in the United States
Likely Cost	Moderate—need to develop and test promotional and instructional material and then to promote the use of the approach.
Impediments	Obtaining funding to get started. Might be a good joint government/industry collaboration. Have to convince the people at risk of the benefits. Coupling this with some type of sanction for convicted DWI drivers if they are caught walking at high BACs could be helpful.
Research Suggestions	Development and evaluation of the best approach and supporting material.
Comments	A good “grass roots” approach and an opportunity for a public/private partnership at relatively low cost.

Label	Content
Name of Idea	Drunk in Traffic Ordinance – Traffic Law
Description	Being “drunk in public” formerly was a misdemeanor, no longer. People DIP now are removed to a non-criminal DETOX if available, sometimes sent to emergency rooms at hospitals. “Drunk in Traffic” is a different matter. Here the danger to the person is clear and it affects motorists who might hit them. A “DIT” ordinance would make it a misdemeanor to enter or remain in an active travel lane while intoxicated. The level of mental state would be ordinary negligence, failure to take ordinary care to avoid the risk of being hit. As this would be a minor crime, police could arrest, detain, and possibly jail subjects. At least they could remove the DIT to the police station before release with a citation.
Intervention Point	On-street encounter with an intoxicated pedestrian
Implementers (Check all that apply by clicking on the associated box and write in any others)	<ul style="list-style-type: none"> • Law enforcement <input checked="" type="checkbox"/> • The courts <input type="checkbox"/> • The probation system <input type="checkbox"/> • Medical practitioners <input type="checkbox"/> • Social services and counseling <input type="checkbox"/> • Family/friends personal interactions <input type="checkbox"/> • Employers and the work environment <input type="checkbox"/> • The hospitality industry and alcohol sellers/servers <input type="checkbox"/> • Others
How It Works	An ordinary minor criminal arrest by police
Experience/Evidence	None known
Likely Cost	Modest, police are prepared to make such arrests in the ordinary course of business.
Impediments	Intoxication erodes the culpability of an offender, a person who is so intoxicated that they are in danger is also hard to blame for their actions, not acting logically. Use of force may be necessary, the question remains, “What do you do with them?” Booking into jail is always very expensive and a poor use of scarce jail space.
Research Suggestions	Development and evaluation of a model law
Comments	This is a return to earlier practices that were dropped

Label	Content
Name of Idea	Safe Ride Home–volunteer driver program
Description	Draw on community of Alcoholics Anonymous and other community volunteers to offer rides to pedestrians who shouldn't be walking in the opinion of police officers who find them impaired on the street. In this program, the call for a ride would come from police dispatch, not the pedestrian. The ride would deliver the impaired pedestrian to the residence. The drivers could be trained to give a brief intervention at this teachable moment.
Intervention Point	On-street encounter of police with impaired pedestrian
Implementers (Check all that apply by clicking on the associated box and write in any others)	<ul style="list-style-type: none"> • Law enforcement <input checked="" type="checkbox"/> • The courts <input type="checkbox"/> • The probation system <input type="checkbox"/> • Medical practitioners <input type="checkbox"/> • Social services and counseling <input checked="" type="checkbox"/> • Family/friends personal interactions <input type="checkbox"/> • Employers and the work environment <input type="checkbox"/> • The hospitality industry and alcohol sellers/servers <input type="checkbox"/> • Others
How It Works	Police find impaired pedestrian who needs to be removed from dangerous traffic. Dispatcher phones volunteer driver who takes person to residence, may give some counsel while doing so. Removes hazard at critical moment.
Experience/Evidence	Similar to other “free ride home” programs
Likely Cost	Minimal, training and coaching of volunteers.
Impediments	Volunteers may be unwilling to carry intoxicated people. Issues of insurance for driver. Intoxicated people vulnerable to drivers, screening may not catch all risks. (Theft of valuables, sexual exploitation, etc.) Volunteers may be unavailable when needed. Program may be exploited by people who need transportation and know how to trigger a police request.
Research Suggestions	Development and evaluation of a model program
Comments	Would be supported by a relocation to safer place law

Label	Content
Name of Idea	Safe Ride Home–Paid staff drivers
Description	Provide experienced alcohol counselor/driver to offer rides to pedestrians who shouldn't be walking in the opinion of police officers who find them impaired on the street. In this program, the call for a ride would come from police dispatch, not the pedestrian. The ride would deliver the impaired pedestrian to their place of residence. The drivers could be trained to give a brief intervention at this teachable moment.
Intervention Point	On-street encounter of police with impaired pedestrian
Implementers (Check all that apply by clicking on the associated box and write in any others)	<ul style="list-style-type: none"> • Law enforcement <input checked="" type="checkbox"/> • The courts <input type="checkbox"/> • The probation system <input type="checkbox"/> • Medical practitioners <input type="checkbox"/> • Social services and counseling <input checked="" type="checkbox"/> • Family/friends personal interactions <input type="checkbox"/> • Employers and the work environment <input type="checkbox"/> • The hospitality industry and alcohol sellers/servers <input type="checkbox"/> • Others
How It Works	Police find impaired pedestrian who needs to be removed from dangerous traffic. Dispatcher sends staff driver who takes person to residence, driver is trained to give some counsel while doing so. Removes hazard at critical moment.
Experience/Evidence	Similar to other “ride home” programs
Likely Cost	Very high – May require more than one full time staff driver. Cost-per-ride could be extremely expensive. Staff may be idle most of the time, over drawn at other times unable to meet need.
Impediments	Staff may tire of serving intoxicated people. Supervision issues. Issues of insurance for activity. Intoxicated people vulnerable to drivers, screening may not catch all risks. (Theft of valuables, sexual exploitation, etc.) Staff may be unavailable when needed. Program may be exploited by people who need transportation and know how to trigger a police request.
Research Suggestions	Development and evaluation of a model program
Comments	This is an improvement over using volunteers but would be difficult to manage and fund.

Label	Content
Name of Idea	Pedi/mini cab
Description	Expanding urban ride options – Provide low cost rides home using pedi cabs or small motorized vehicles such as the tuk-tuks common in Asia.
Intervention Point	Restaurants
Implementers (Check all that apply by clicking on the associated box and write in any others)	<ul style="list-style-type: none"> • Law enforcement <input type="checkbox"/> • The courts <input type="checkbox"/> • The probation system <input type="checkbox"/> • Medical practitioners <input type="checkbox"/> • Social services and counseling <input type="checkbox"/> • Family/friends personal interactions <input checked="" type="checkbox"/> • Employers and the work environment <input checked="" type="checkbox"/> • The hospitality industry and alcohol sellers/servers <input checked="" type="checkbox"/> • Others
How It Works	Businesses/industry/government offers low cost pedicab ride home. Could also be set up using an Uber model where the rides are summoned via an app.
Experience/Evidence	Patrons won't be walking through the intersections
Likely Cost	Not sure- partnering with businesses and industry for sponsorship could defray costs
Impediments	Weather conditions, limited urban communities, terrain
Research Suggestions	Check to see if the current systems of pedicabs could be expanded to offer rides home in urban communities
Comments	Limited but could be fun and practical in the right environment!

Label	Content
Name of Idea	Wearable BAC technology to increase conspicuity
Description	The wearable device provides continuous BAC tracking and can provide a highly visible alert (e.g., flashing light at night, sound during daylight) when a person's BAC is above a set threshold.
Intervention Point	After DWI arrest or injury related to alcohol consumption.
Implementers (Check all that apply by clicking on the associated box and write in any others)	<ul style="list-style-type: none"> • Law enforcement <input checked="" type="checkbox"/> • The courts <input checked="" type="checkbox"/> • The probation system <input checked="" type="checkbox"/> • Medical practitioners <input checked="" type="checkbox"/> • Social services and counseling <input checked="" type="checkbox"/> • Family/friends personal interactions <input checked="" type="checkbox"/> • Employers and the work environment <input checked="" type="checkbox"/> • The hospitality industry and alcohol sellers/servers <input checked="" type="checkbox"/> • Others
How It Works	The system provides continuous transdermal alcohol concentration measurement and an alarm is set off when a set threshold is met. If it is nighttime, the alarm could be in the form of a flashing light (e.g., from a smart watch) which would be highly visible to the driver. The alarm could be audible if during daylight hours. The alarm system would make a person more conspicuous to motorists and may also serve as a deterrent to excessive drinking in order to avoid embarrassment while in public. The alarm would be a sign to servers to stop serving and person. Data could be uploaded in real time to parole officers or others monitoring offenders. The system could be designed to be tamperproof.
Experience/Evidence	No known fully functional device exists. A number of new devices are available that could be integrated into a complete system. https://biostrap.com/ www.cnet.com/news/bactrack-skyn-wearable-blood-alcohol-monitor-drunk-ces-2017/
Likely Cost	Medium. Users would have to buy the device.
Impediments	Voluntary compliance is unknown.
Research Suggestions	Develop and pilot test a system with a small set of problem drinkers.
Comments	This approach does not attempt to limit alcohol use directly but could due to social norming and as a reminder to stop drinking.

Label	Content
Name of Idea	Laws to reduce drinking and driving including setting a .05 gDL BAC limit
Description	General deterrence laws
Intervention Point	Federal and State legislatures
Implementers (Check all that apply by clicking on the associated box and write in any others)	<ul style="list-style-type: none"> • Law enforcement <input type="checkbox"/> • The courts <input checked="" type="checkbox"/> • The probation system <input type="checkbox"/> • Medical practitioners <input type="checkbox"/> • Social services and counseling <input type="checkbox"/> • Family/friends personal interactions <input type="checkbox"/> • Employers and the work environment <input type="checkbox"/> • The hospitality industry and alcohol sellers/servers <input type="checkbox"/> • Others: State legislatures to pass tighter laws
How It Works	Laws to deter drinking and driving
Experience/Evidence	Countermeasures That Work, 2017 (chapter 1); Fell & Voas (2013). <i>Addiction</i> , 109, 869-874.
Likely Cost	Medium (enforcement costs)
Impediments	Alcohol industry
Research Suggestions	Explore specific impact of these laws on high-BAC pedestrian deaths.
Comments	<p>These laws will reduce drivers who strike pedestrians. Laws include alcohol license revocation, open container laws, .08 gDL per se laws, minimum legal drinking age of 21 laws, use/lose laws, dram shop laws, social host liability, zero tolerance laws, and responsible beverage service.</p> <p>A literature review by Fell and Voas concludes that lowering the legal limit from .08 gDL to .05 gDL would produce a reduction of 500-800 deaths from fatal crashes involving drinking drivers. Two-thirds of the world's population lives in countries with legal blood alcohol limits of .05 gDL or lower. The World Health Organization has called on all nations to lower their legal blood alcohol limits to .05 gDL or lower.</p>

Label	Content
Name of Idea	Specific deterrence of drinking and driving
Description	Preventing repeat DWI offenses and crashes
Intervention Point	Federal and State legislatures
Implementers (Check all that apply by clicking on the associated box and write in any others)	<ul style="list-style-type: none"> • Law enforcement <input checked="" type="checkbox"/> • The courts <input checked="" type="checkbox"/> • The probation system <input checked="" type="checkbox"/> • Medical practitioners <input type="checkbox"/> • Social services and counseling <input type="checkbox"/> • Family/friends personal interactions <input type="checkbox"/> • Employers and the work environment <input type="checkbox"/> • The hospitality industry and alcohol sellers/servers <input type="checkbox"/> • Others
How It Works	
Experience/Evidence	Countermeasures That Work, 2017 (p. 60-61).
Likely Cost	Less than costs caused by repeat DWI offenders
Impediments	Alcohol industry opposition
Research Suggestions	Assess impact on high-BAC pedestrian deaths
Comments	DWI courts Limits on diversion and plea agreements Court monitoring Alcohol problem assessment and treatment Ignition interlock requirements Vehicle and license plate sanctions DWI offender monitoring Lower BAC limits for repeat offenders Alcohol screening, brief intervention, and referral

Strategies Involving Interventions by Medical and Social Service Personnel

(Note: Proposed changes to the SBIRT are shown in red)

Label	Content
Name of Idea	Modification of SBIRT to include advice about dangers of impaired walking.
Description	Educate providers/counselors to enhance SBIRT with advice about hazards of walking while impaired. Only need to do this if a brief intervention is indicated, because alcohol screen is positive for an alcohol use disorder.
Intervention Point	Interaction with health care provider/counselor in emergency care settings or in primary care settings.
Implementers (Check all that apply by clicking on the associated box and write in any others)	<ul style="list-style-type: none"> • Law enforcement <input type="checkbox"/> • The courts <input type="checkbox"/> • The probation system <input type="checkbox"/> • Medical practitioners <input checked="" type="checkbox"/> • Social services and counseling <input checked="" type="checkbox"/> • Family/friends personal interactions <input type="checkbox"/> • Employers and the work environment <input type="checkbox"/> • The hospitality industry and alcohol sellers/servers <input type="checkbox"/> • Others
How It Works	<p>There has been a huge effort to teach SBIRT to providers and counselors, for example, USPSTF clinical practice guidelines, NHTSA, SAMHSA, professional organizations such as the Emergency Nurses Association, all recommend implementation of SBIRT. Enhance SBIRT guideline to include advising people who have a positive screen for AUD to avoid walking while impaired.</p> <p>Large numbers of at-risk drinkers can be identified with SBIRT using validated tools such as the AUDIT-C or CAGE. If there is a positive screen for AUD, providers should already know to do a brief intervention, or are familiar with it.</p> <p>Example: A positive AUD screen prompts the need to provide a brief intervention (BI). The usual steps of SBIRT are in black. Comments in red are incorporated into the usual four steps of a brief intervention to illustrate how providers/counselors can address the hazards of walking while impaired: Step 1: Establish rapport; Raise the subject of alcohol. Step 2: Provide feedback <ul style="list-style-type: none"> a. Review current drinking pattern b. Make a connection between alcohol and other health problems. Discuss connection between recent pedestrian trauma data and prior DWI convictions </p>

Label	Content
	<p>Step 3: Enhance motivation</p> <ul style="list-style-type: none"> a. Assess readiness to change <p>Step 4: Negotiate and Advise</p> <ul style="list-style-type: none"> b. Discuss options and plan c. Give advice, with client’s permission Include an additional strategy to reduce harm: First goal is to advise against harmful drinking. But if harmful drinking occurs, advice can include avoidance of impaired walking as well as avoidance of impaired driving. d. Summarize: Provide a drinking agreement/handout Include the agreement to cut down. Also include: <ul style="list-style-type: none"> • If I drink, I will not drive. • If I drink, I will not walk- I will get a ride. <p>Provider education strategies:</p> <ol style="list-style-type: none"> 1. Target providers’ professional organizations about the SBIRT enhancement: <ol style="list-style-type: none"> a. Emergency Providers <ul style="list-style-type: none"> • American College of Emergency Physicians • Emergency Nurses Association b. Primary Care Providers <ul style="list-style-type: none"> • American College of Physicians (Internal Medicine MDs) • American Academy of Family Physicians • American Association of Nurse Practitioners • American Association of Physician Assistants c. Provider Educators <ul style="list-style-type: none"> • American Association of Colleges of Medicine • American Association of colleges of Nursing • National Organization of Nurse Practitioner Faculties.
Experience/Evidence	There is a wealth of evidence supporting both SBIRT and motivational interviewing. Enhancing what already exists seems a logical step
Likely Cost	Likely low cost- USPSTF and SAMHSA can recommend modification of SBIRT guideline.
Impediments	Resistance to change. Primary care providers and emergency care providers are already highly stressed with heavy patient volume, and may resist having to do one more thing. Any change to SBIRT will have to be framed as simple and easy.

Label	Content
Research Suggestions	<p>Before attempting to enhance the usual SBIRT steps, consider determining what percentage of providers implement SBIRT. Research Questions to consider:</p> <ul style="list-style-type: none"> • In a targeted location (large metropolitan area in Florida, for example), what percentage of emergency care providers (MD, PA, NP, Emergency RNs) implement standard SBIRT? • In a targeted location (large metropolitan area in Florida, for example), what percentage of primary care providers (MD, PA, NP) implement standard SBIRT? <p>If SBIRT is being implemented by at least half (?) of the selected provider population, the next question should be to determine feasibility of enhancing SBIRT. Could give a population of providers who perform SBIRT a new script that includes advice about hazards of walking while impaired within the brief intervention, then survey providers to see if enhancing SBIRT was feasible, and if they did it. The question would be:</p> <ul style="list-style-type: none"> • Is it feasible for providers to enhance SBIRT by including advice to avoid impaired walking, within a brief intervention? <p>If this is feasible, the next question would be:</p> <ul style="list-style-type: none"> • Does an enhanced SBIRT (inclusion of advice to people with a positive AUD screen to avoid impaired walking) reduce the number of pedestrian fatalities over a specific time period? <p>Could pilot this in a large metropolitan area in Florida or Texas, where your recent study of pedestrian trauma fatalities in five States took place. Florida and Texas had the largest number of pedestrian fatalities according to Table 1.</p>
Comments	

Label	Content
Name of Idea	Addressing the root cause of alcohol mis-use and abuse – trauma
Description	While the criminal justice system is conditioned to address a problem that is brought to its doorstep, the problems plaguing the DWI arrestee (who then becomes the pedestrian with a high BAC) started way before the day they got arrested with a .23 BAC in their system. It is more likely than not that the proverbial ball got rolling in childhood where the adult defendant suffered traumatic experiences during childhood that went unresolved into adulthood and which have manifested themselves with the risky behavior that resulted in the defendant having an alcohol problem and losing their license.
Intervention Point	School – elementary, middle and high school.
Implementers (Check all that apply by clicking on the associated box and write in any others)	<ul style="list-style-type: none"> • Law enforcement <input type="checkbox"/> • The courts <input type="checkbox"/> • The probation system <input type="checkbox"/> • Medical practitioners <input checked="" type="checkbox"/> • Social services and counseling <input checked="" type="checkbox"/> • Family/friends personal interactions <input checked="" type="checkbox"/> • Employers and the work environment <input type="checkbox"/> • The hospitality industry and alcohol sellers/servers <input type="checkbox"/> • Others
How It Works	The stigma surrounding mental illness in the United States has resulted in coordinated counselling in schools to be a taboo topic. However, unpacking childhood trauma and developing healthy coping skills would be so much more valuable than memorization of the Pythagorean theorem. It would help to address, and ultimately reduce, the total amount of harm done by people to others (like bullying, domestic violence and gun violence) as well as by people to themselves (like suicide and substance use/abuse.)
Experience/Evidence	
Likely Cost	Highly variable depending
Impediments	
Research Suggestions	Develop and evaluate a model approach based on inputs by subject matter experts
Comments	When these people get arrested and show up in a courthouse the problem already exists and we (the “system”) are left to reactively deal with the result. How novel an idea it would be to proactively work on preventing the natural consequences of traumatic childhood experiences so that the arrest (and corresponding results) are not necessarily a foregone, inevitable conclusion.

Label	Content
Name of Idea	Focused medical education
Description	Required education for all clinicians, not only physicians and nurses but also dentists, physical therapist, and social workers.
Intervention Point	Medical school, internship, or residency
Implementers (Check all that apply by clicking on the associated box and write in any others)	<ul style="list-style-type: none"> • Law enforcement <input type="checkbox"/> • The courts <input type="checkbox"/> • The probation system <input type="checkbox"/> • Medical practitioners <input checked="" type="checkbox"/> • Social services and counseling <input type="checkbox"/> • Family/friends personal interactions <input type="checkbox"/> • Employers and the work environment <input type="checkbox"/> • The hospitality industry and alcohol sellers/servers <input type="checkbox"/> • Others
How It Works	All medical and nursing school curriculum and related residency programs should be required to have education on these subjects. That education needs to teach that many alcohol use problems are the result of having an alcohol use disorder. While drink driving and other social consequences of alcohol mis-use are illegal, “falling off the wagon” is not immoral or bad behavior. It is relapse and treatable. Patients with insulin and anti-seizures medication who are non-compliant with treatment and cause crashes essentially have “fell off the wagon” and not treated with distain.
Experience/Evidence	A seminal NTSB hearing in the early 70s about medical fitness to drive for non-commercial drivers resulted in a limited recommendation that training about medical fitness to drive should be provided to all physicians at all stages of training and practice. Indeed, a NHTSA/AMA-sponsored <i>Physicians Guide to Assessing and Counseling the Older Driver</i> ⁵ became the “text” on the subject. The newer 2016 Clinicians Guide... by the American Geriatrics Society ⁶ gets it right. All clinicians, nurses, nurse practitioners, physician assistants, physical therapists, and others in addition to physicians should be involved in patient care and good health practices including injury prevention.

⁵ Wang, C. C., Kosinski, C. J., Schwarzberg, J. G., & Shanklin, A. V. (2003, September). *Physician’s guide to assessing and counseling older drivers* (AMA Report No. AA34:02-520:15M:7/03.NHTSA Report No. DOT HS 809 647). Chicago: American Medical Association, and Washington, DC: National Highway Traffic Safety Administration. Available at www.nhtsa.dot.gov/people/injury/olddrive/physician_guide/PhysiciansGuide.pdf

⁶ American Geriatrics Society & A. Pomidor, Ed. (2016, January). *Clinician’s guide to assessing and counseling older drivers*, 3rd edition. (Report No. DOT HS 812 228). Washington, DC: National Highway Traffic Safety Administration. The American Geriatrics Society retains the copyright. Available at www.nhtsa.gov/sites/nhtsa.dot.gov/files/812228_cliniciansguidetoolderdrivers.pdf

Label	Content
Likely Cost	Moderate
Impediments	Time constraints in already crowded curricula
Research Suggestions	Determine willingness and interest in the concept.
Comments	This seems to be a fundamental approach that sees limited or no use.

Strategies Involving Interventions by Law Enforcement, Courts, and Probation

Label	Content
Name of Idea	Mandatory alcohol screening/assessment law
Description	All people arrested for a DWI or DWI-related offense would be mandated to undergo a screening and/or assessment by a licensed professional using objectively validated and accepted screening tools to determine whether the person needs treatment.
Intervention Point	Following first court appearance/prior to imposition of any sentence.
Implementers (Check all that apply by clicking on the associated box and write in any others)	<ul style="list-style-type: none"> • Law enforcement <input type="checkbox"/> • The courts <input checked="" type="checkbox"/> • The probation system <input type="checkbox"/> • Medical practitioners <input checked="" type="checkbox"/> • Social services and counseling <input type="checkbox"/> • Family/friends personal interactions <input type="checkbox"/> • Employers and the work environment <input type="checkbox"/> • The hospitality industry and alcohol sellers/servers <input type="checkbox"/> • Others: Would require legislative action.
How It Works	The New York State legislature passed a law several years ago that required all defendants charged with DWI and DWI-related crimes undergo a screening or an assessment to determine whether they needed treatment for alcohol or drug use/abuse. Validated risk tools are designated for use and certain aggravating factors (e.g. high BACs or prior convictions within a certain period) trigger the defendant to undergo the more rigorous assessment. When defendant is found to need treatment the law also requires that the court mandate treatment as part of a sentence if a plea or verdict of guilt is entered.
Experience/Evidence	Mandatory treatment plus a strong monitoring structure (such as ignition interlocks and SCRAM bracelets and regular treatment visits for toxicology tests) can implement a system which shines a light on those with alcohol problems and work with those people to get them to make better/appropriate decisions about driving after drinking. This should translate into less impairment for the pedestrian crowd who became pedestrians due to a DWI conviction.
Likely Cost	Unknown
Impediments	Unknown
Research Suggestions	New York Division of Criminal Justice Services ongoing activities
Comments	Alcohol and substance misuse/abuse is the underlying issue that is the common denominator for all of this. Mandating treatment – in addition to license suspension/revocation – will assist pedestrians unable to drive due to a license sanction to be less likely to be walking with high BACs.

Label	Content
Name of Idea	Mandatory alcohol screening/assessment of all probationers on probation for a DWI or DWI-related offense
Description	A mandatory condition for all defendants sentenced to probation for a DWI or DWI-related conviction would be to undergo a screening/assessment for alcohol and be required to undergo treatment as a condition of probation
Intervention Point	When the defendant is sentenced to probation
Implementers (Check all that apply by clicking on the associated box and write in any others)	<ul style="list-style-type: none"> • Law enforcement <input type="checkbox"/> • The courts <input type="checkbox"/> • The probation system <input checked="" type="checkbox"/> • Medical practitioners <input type="checkbox"/> • Social services and counseling <input type="checkbox"/> • Family/friends personal interactions <input type="checkbox"/> • Employers and the work environment <input type="checkbox"/> • The hospitality industry and alcohol sellers/servers <input type="checkbox"/> • Others: Regulatory action required
How It Works	When a defendant is sentenced to probation on a DWI conviction it routinely also involves a license suspension/revocation that would turn a driver into a pedestrian. If a screening/assessment structure was imposed on all such defendants being supervised by the probation department it would reduce the number of pedestrians with high BACs. (Does require monitoring with things like toxicology screens and SCRAM bracelets, and ignition interlock devices for those with cars and permission to drive.)
Experience/Evidence	Similar answer from Problem #1.
Likely Cost	Unknown
Impediments	Unknown
Research Suggestions	New York Division of Criminal Justice Services ongoing activities
Comments	Alcohol and substance misuse/abuse is the underlying issue that is the common denominator for all of this. Mandating treatment – in addition to license suspension/revocation – will assist pedestrians unable to drive due to a license sanction to be less likely to be walking with high BACs while under probation supervision.

Label	Content
Name of Idea	MVA/DMV involvement in sanction process
Description	In addition to initiating or learning about all license suspensions and revocations for alcohol offenses, all driving administrations accept reports from police officers who are concerned about a medical problem and medical fitness to drive when they encounter a driver (not necessarily driving in a few cases). If the concerns raised in the report are such that the driver is considered at risk to being a high-BAC pedestrian victim if suspended, the MVA/DMV would recommend alcohol disorder treatment and provide counseling on the risks of walking and driving while at elevated BACs.
Intervention Point	Upon conviction for an alcohol-related traffic offense or referral to the MVA/DMV by a law enforcement officer or medical professional and as a condition of sentencing or probation.
Implementers (Check all that apply by clicking on the associated box and write in any others)	<ul style="list-style-type: none"> • Law enforcement <input checked="" type="checkbox"/> • The courts <input checked="" type="checkbox"/> • The probation system <input checked="" type="checkbox"/> • Medical practitioners <input checked="" type="checkbox"/> • Social services and counseling <input checked="" type="checkbox"/> • Family/friends personal interactions <input type="checkbox"/> • Employers and the work environment <input type="checkbox"/> • The hospitality industry and alcohol sellers/servers <input type="checkbox"/> • Others
How It Works	The MVA/DMV highlights people at risk based on its input information, and the courts, probation, and/or MVA/DMV require and apply a remedial program.
Experience/Evidence	Counseling of this type, including brief interventions, have worked in other settings.
Likely Cost	Moderate to high
Impediments	Funding. Recognition of the problem
Research Suggestions	Develop and evaluate a program that could be used and actually changes behavior
Comments	

Label	Content
Name of Idea	ID check at point-of-sale
Description	Police officers are allowed to check ID of people purchasing alcohol. This provides an opportunity to interact with a person who walks to the point-of-sale. In the interaction, officers can inform the pedestrian of risks while verifying eligibility to purchase alcohol
Intervention Point	User, Point-of-sale
Implementers (Check all that apply by clicking on the associated box and write in any others)	<ul style="list-style-type: none"> • Law enforcement <input checked="" type="checkbox"/> • The courts <input type="checkbox"/> • The probation system <input type="checkbox"/> • Medical practitioners <input type="checkbox"/> • Social services and counseling <input type="checkbox"/> • Family/friends personal interactions <input type="checkbox"/> • Employers and the work environment <input type="checkbox"/> • The hospitality industry and alcohol sellers/servers <input type="checkbox"/> • Others
How It Works	Officers observe liquor sales establishment and stop those who approached the store on foot AFTER they have made a purchase of alcohol. They verify the age of the purchaser and then make a brief intervention about the risks of impaired walking.
Experience/Evidence	None known, this is somewhat like an underage “shoulder tap” enforcement event.
Likely Cost	High
Impediments	Officer training, single person affected, may annoy rather than inform person contacted. Vendor may object on basis that this activity discourages lawful commerce in alcohol.
Research Suggestions	Development and pilot test
Comments	This has important alcohol beverage control impacts as well as potentially improving pedestrian safety.

Label	Content
Name of Idea	“You’ll be Walking” information pamphlet
Description	Newly suspended drivers receive formal notice that their license is suspended either by personal service or certified letter. A pamphlet should be included with that process for those whose license was suspended for an alcohol related traffic offense. This pamphlet would advise the newly suspended of the risk they might face as they walk more to do things they used to do driving. The danger of walking after drinking would be presented with the view of protecting the person.
Intervention Point	At notice of suspension of license to drive
Implementers (Check all that apply by clicking on the associated box and write in any others)	<ul style="list-style-type: none"> • Law enforcement <input type="checkbox"/> • The courts <input checked="" type="checkbox"/> • The probation system <input type="checkbox"/> • Medical practitioners <input type="checkbox"/> • Social services and counseling <input type="checkbox"/> • Family/friends personal interactions <input type="checkbox"/> • Employers and the work environment <input type="checkbox"/> • The hospitality industry and alcohol sellers/servers <input type="checkbox"/> • Others: Driver license authority
How It Works	Delivery of an informational folder/pamphlet by mail
Experience/Evidence	None known
Likely Cost	Relatively low, already mailing notice, pamphlet would add little cost. Cost of pamphlet printing, distribution and mailing should be manageable and could be underwritten by the State’s highway safety program.
Impediments	License agency must agree. Pamphlet must be high impact and attractive to get recipient to read. Language problems always an issue. May be difficult to get tone of concern correct when dealing with an offender.
Research Suggestions	Could be trialed in a willing State. Seems like a low-cost, low-risk experiment
Comments	Very difficult to know if this changes anything!

Label	Content
Name of Idea	Transit Skills for Newly Suspended Drivers Guide
Description	Newly suspended drivers may be unfamiliar with public transit and skeptical about using it. Many will have always driven everywhere and may know little about existing services or have completely wrong ideas. A guide explaining how to use transit in their situation and a number for them to seek advice on using transit to meet their needs may help them and increase ridership.
Intervention Point	At license suspension
Implementers (Check all that apply by clicking on the associated box and write in any others)	<ul style="list-style-type: none"> • Law enforcement <input type="checkbox"/> • The courts <input checked="" type="checkbox"/> • The probation system <input type="checkbox"/> • Medical practitioners <input type="checkbox"/> • Social services and counseling <input checked="" type="checkbox"/> • Family/friends personal interactions <input type="checkbox"/> • Employers and the work environment <input type="checkbox"/> • The hospitality industry and alcohol sellers/servers <input type="checkbox"/> • Others
How It Works	A newly suspended driver may think walking is the only alternative, whereas transit would be much safer, especially if the person is impaired.
Experience/Evidence	None known
Likely Cost	Minimal – production of a single page document or folder
Impediments	Whether transit would want an intoxicated walker to use the bus instead is a serious question. Driver may deny boarding if the person is not well behaved.
Research Suggestions	Could be trialed in a willing State. Seems like a low-cost, low-risk experiment
Comments	

Label	Content
Name of Idea	Law enforcement outreach
Description	In urban areas, there are frequently members of law enforcement either on foot or on bicycles. Highlighting the problem of impaired walking with these specific officers would raise awareness about this issue and encourage them to pay special attention to jay-walkers and the pedestrians around them who may be impaired.
Intervention Point	Roll call, police station breakroom
Implementers (Check all that apply by clicking on the associated box and write in any others)	<ul style="list-style-type: none"> • Law enforcement <input checked="" type="checkbox"/> • The courts <input type="checkbox"/> • The probation system <input type="checkbox"/> • Medical practitioners <input type="checkbox"/> • Social services and counseling <input type="checkbox"/> • Family/friends personal interactions <input type="checkbox"/> • Employers and the work environment <input type="checkbox"/> • The hospitality industry and alcohol sellers/servers <input type="checkbox"/> • Others
How It Works	It could be as simple as placing a poster with information about the number of impaired pedestrians killed each year in a breakroom, or providing State or city-specific statistics that someone could highlight during roll call before the officers hit the street.
Experience/Evidence	This approach – providing specific information about an issue directly to law enforcement during roll call or by posting material in a breakroom – is used frequently with good results. Roll call is an especially good time to share information, right before officers go out on patrol.
Likely Cost	Minimal once the messaging is gathered and packaged to be shared among officers. More if a video or other material is produced.
Impediments	
Research Suggestions	Investigate how many officers do foot or bike patrol and how often they encounter impaired pedestrians. See what the outcome of those interactions was.
Comments	

Label	Content
Name of Idea	“Don’t Be Invisible” campaign
Description	An effort to encourage increased conspicuity for intoxicated “at-risk” pedestrians.
Intervention Point	On-street effort by police officers seeing potential crash victims walking in their patrol district.
Implementers (Check all that apply by clicking on the associated box and write in any others)	<ul style="list-style-type: none"> • Law enforcement <input checked="" type="checkbox"/> • The courts <input type="checkbox"/> • The probation system <input type="checkbox"/> • Medical practitioners <input type="checkbox"/> • Social services and counseling <input type="checkbox"/> • Family/friends personal interactions <input type="checkbox"/> • Employers and the work environment <input type="checkbox"/> • The hospitality industry and alcohol sellers/servers <input type="checkbox"/> • Others
How It Works	People in urban areas often dress in dark attire and try not to draw attention. As a result, they are hard to see and may become invisible to motorists. Many motorists comment, “I never saw him,” after hitting a pedestrian. This campaign would give police small retro-reflective ankle bands/wrist slaps and key fobs that would be handed to pedestrians that they think are at risk. The officers would be trained to tell the pedestrian “Man, you are hard to see, somebody’s going to run you down!” The police hand out the bands, encourage use, and talk about being careful.
Experience/Evidence	Some States distribute such items. “Walk Smart Baltimore” (Blomberg & Cleven, 2000) successfully distributed conspicuous baseball caps that said, “Walk Smart Baltimore, but they did not appear to reduce crashes. If the cap had a sports team logo or a beer brand, it might have been worn more and therefore have been successful in reducing crashes.
Likely Cost	Could be expensive, while the items are individually cheap they are costly in large quantities and may end up not being used unless the campaign is closely watched.
Impediments	Getting the items into police hands and having them available at the time needed. Diversion of material to non-project use. Pedestrian offered the item may refuse, or discard item immediately after receipt. Even if kept, item may not be adopted for regular use.
Research Suggestions	Review “Walk Smart Baltimore” (Blomberg & Cleven, 2000) project.
Comments	

Label	Content
Name of Idea	Use of actuarial risk and needs assessment
Description	Assessing the risk and needs of clients—with a focus on dynamic and static risk factors and criminogenic needs—at the person and aggregate levels is foundational for all other principles of best practice. As an EBP, risk and needs must be assessed using research-based criteria to identify the likelihood of future recidivism, issues with probationary supervision, and the extent behaviors and issues that contribute to anti-social behaviors.
Intervention Point	Pre- or post-sentence
Implementers (Check all that apply by clicking on the associated box and write in any others)	<ul style="list-style-type: none"> • Law enforcement <input type="checkbox"/> • The courts <input checked="" type="checkbox"/> • The probation system <input checked="" type="checkbox"/> • Medical practitioners <input type="checkbox"/> • Social services and counseling <input type="checkbox"/> • Family/friends personal interactions <input type="checkbox"/> • Employers and the work environment <input type="checkbox"/> • The hospitality industry and alcohol sellers/servers <input type="checkbox"/> • Others
How It Works	Through the use of more effective assessment, the risk levels and needs of clients are better identified; thus, more appropriate interventions can be targeted for clients during the supervision process.
Experience/Evidence	Crime and Justice Institute (2009). <i>Implementing evidence-based policy and practice in community corrections</i> , 2nd Ed. Washington, DC: National Institute of Corrections. Available at https://s3.amazonaws.com/static.nicic.gov/Library/024107.pdf
Likely Cost	Medium
Impediments	Requires strong leadership in terms of implementing with fidelity and effectiveness
Research Suggestions	Already exists. Can do process and outcome evaluations
Comments	

Label	Content
Name of Idea	Target clients for appropriate interventions
Description	This strategy incorporates the risk/needs/responsivity principles. The risk principle suggests that supervision and treatment resources should be prioritized for higher risk clients. The needs principle suggests responses to identified criminogenic needs should be targeted. Finally, the responsivity principle suggests there should be sensitivity to individual temperament, learning style, motivation, gender, and culture when assigning interventions and programs.
Intervention Point	Post-sentence during supervision process
Implementers (Check all that apply by clicking on the associated box and write in any others)	<ul style="list-style-type: none"> • Law enforcement <input type="checkbox"/> • The courts <input checked="" type="checkbox"/> • The probation system <input checked="" type="checkbox"/> • Medical practitioners <input type="checkbox"/> • Social services and counseling <input checked="" type="checkbox"/> • Family/friends personal interactions <input type="checkbox"/> • Employers and the work environment <input type="checkbox"/> • The hospitality industry and alcohol sellers/servers <input type="checkbox"/> • Others
How It Works	Simply, the more accurate that interventions are targeted for clients, better outcomes tend to prevail.
Experience/Evidence	Crime and Justice Institute (2009). <i>Implementing evidence-based policy and practice in community corrections</i> , 2nd Ed. Washington, DC: National Institute of Corrections. Available at https://s3.amazonaws.com/static.nicic.gov/Library/024107.pdf
Likely Cost	Medium-High
Impediments	Requires strong partnerships with providers
Research Suggestions	Already exists. Can do process and outcome evaluations
Comments	

Strategies Involving Third-Party Interventions

Label	Content
Name of Idea	Training for bartenders/servers
Description	The front line of defense for someone who is drinking alcohol outside of the home, the people who serve alcohol should be aware of how much a patron consumes. They should be trained on how to have conversations with patrons about how they're getting home, especially those patrons that have over-consumed alcohol. That should apply to all forms of transportation, including pedestrians.
Intervention Point	Time of service
Implementers (Check all that apply by clicking on the associated box and write in any others)	<ul style="list-style-type: none"> • Law enforcement <input type="checkbox"/> • The courts <input type="checkbox"/> • The probation system <input type="checkbox"/> • Medical practitioners <input type="checkbox"/> • Social services and counseling <input type="checkbox"/> • Family/friends personal interactions <input type="checkbox"/> • Employers and the work environment <input type="checkbox"/> • The hospitality industry and alcohol sellers/servers <input checked="" type="checkbox"/> • Others
How It Works	In most areas, bartenders have to go through training and be certified by their alcohol licensing agency or other enforcement body. If a piece on impaired walking and pedestrian fatalities was included in their current training, they would have an increased awareness of the dangers posed not only to drivers but also to pedestrians. Expanding their training to include everyone who uses roads and sidewalks, as well as bike trails, could change the way bartenders approach alcohol consumption and customer service.
Experience/Evidence	
Likely Cost	Minimal: development of messaging about impaired pedestrians that can be added in existing training.
Impediments	Bartenders and servers would have to be willing to have these uncomfortable conversations with their patrons. Cutting people off runs counter to their business model, and it might take some convincing to encourage them to take what they learn about impaired pedestrians and use it to potentially save lives.
Research Suggestions	Look into the efficacy of bartender and server training programs
Comments	

Label	Content
Name of Idea	Extended server liability/dram shop laws
Description	Hold sellers/servers/hosts responsible (criminally and civilly) for injuries to people to whom they served alcohol.
Intervention Point	Service of alcohol
Implementers (Check all that apply by clicking on the associated box and write in any others)	<ul style="list-style-type: none"> • Law enforcement <input type="checkbox"/> • The courts <input type="checkbox"/> • The probation system <input type="checkbox"/> • Medical practitioners <input type="checkbox"/> • Social services and counseling <input type="checkbox"/> • Family/friends personal interactions <input checked="" type="checkbox"/> • Employers and the work environment <input type="checkbox"/> • The hospitality industry and alcohol sellers/servers <input checked="" type="checkbox"/> • Others: Legislatures
How It Works	Strengthen or add dram shop laws that hold commercial sellers/servers and private hosts responsible for serving someone who is subsequently killed or injured at a high BAC (TBD). Include initial and refresher training on the topic as part of the licensing process.
Experience/Evidence	Relative risk of traffic crashes and other types of injuries from accidents (e.g., falls) increases with increasing BAC. Avoiding high BACs reduces risk and should therefore reduce crashes.
Likely Cost	Moderate. Some education is needed after passage to make the law effective.
Impediments	Industry opposition; possible insurance company opposition since they will get most of the bills.
Research Suggestions	Determine whether there is any prevailing law and if it works.
Comments	A logical approach that may be difficult to sell.

Label	Content
Name of Idea	Ride service terminals in bars and restaurants
Description	Alcohol servers and sellers would get a terminal or sign on to a web site that would call a ride (e.g., Uber, Lyft) to transport a high-BAC pedestrian home (and only to home). Payment automatically added to the person's tab.
Intervention Point	Seller/server establishments
Implementers (Check all that apply by clicking on the associated box and write in any others)	<ul style="list-style-type: none"> • Law enforcement <input type="checkbox"/> • The courts <input type="checkbox"/> • The probation system <input type="checkbox"/> • Medical practitioners <input type="checkbox"/> • Social services and counseling <input type="checkbox"/> • Family/friends personal interactions <input type="checkbox"/> • Employers and the work environment <input type="checkbox"/> • The hospitality industry and alcohol sellers/servers <input checked="" type="checkbox"/> • Others: Legislators
How It Works	Law would require seller servers to use the terminal to summon a ride for an impaired person and empower the seller/server to add a negotiated (reduced) cost of the ride to the person's bill.
Experience/Evidence	Ride services are apparently effective where they have been used.
Likely Cost	Mostly front-end for terminals, publicity, and training. Thereafter, it is self-sustaining.
Impediments	Legislation/permission for charges. Worries about abuse and overcharging.
Research Suggestions	Design hypothetical system and survey its acceptability.
Comments	Many problems can be obviated if there is a public source of funds (e.g., fines if this is limited to convicted DWIs) can be found.

Strategies to Increase Awareness of the Problem

Label	Content
Name of Idea	Public awareness campaign on impaired pedestrians
Description	Increase awareness of the dangers of impaired walking through social media campaign and other low-cost outreach. Educational material (a one-page pamphlet or brochure) could be created and handed out by probation/parole, medical providers, counselors, and employers. Potential for print media and/or advertisement in bars and restaurants if funds are available.
Intervention Point	Internet, including social media and donated media; paid advertisements or educational material if there's money attached to the project for the development of such material (could place posters or brochures in bars/restaurants, doctor's offices, employee breakrooms or give to HR representatives to distribute). The overall message could also be worked into a larger media campaign about impairment.
Implementers (Check all that apply by clicking on the associated box and write in any others)	<ul style="list-style-type: none"> • Law enforcement <input type="checkbox"/> • The courts <input type="checkbox"/> • The probation system <input checked="" type="checkbox"/> • Medical practitioners <input checked="" type="checkbox"/> • Social services and counseling <input checked="" type="checkbox"/> • Family/friends personal interactions <input checked="" type="checkbox"/> • Employers and the work environment <input checked="" type="checkbox"/> • The hospitality industry and alcohol sellers/servers <input checked="" type="checkbox"/> • Others: The internet/social media
How It Works	If people don't know there's a problem, they'll never try to solve it. A public awareness campaign would use free social media to share messages and education about the dangers of impaired walking. If funds can be used, developing a slogan or graphics that are catchy would increase the likelihood that the message would be shared with a minimal investment. The same slogan could be strategically placed in bars and restaurants, achieving a wider reach.
Experience/Evidence	This strategy is employed by brands and issue-focused non-profit organizations around the globe with much success.
Likely Cost	Depends on how large the campaign needs/wants to be and what funds are available. Could be free, could be a significant investment.
Impediments	It might be hard to find the right message. It might be harder to get people to share the message once it's developed.
Research Suggestions	Develop and evaluate
Comments	

Label	Content
Name of Idea	Friends Don't Let Friends Walk Drunk
Description	Public awareness campaign
Intervention Point	<ul style="list-style-type: none"> • Where alcohol is being consumed (bars) • Public service announcements- "Reality" TV commercial, much like the don't text and drive ads that depict the impressive sudden and unexpected crash impact.
Implementers (Check all that apply by clicking on the associated box and write in any others)	<ul style="list-style-type: none"> • Law enforcement <input type="checkbox"/> • The courts <input type="checkbox"/> • The probation system <input type="checkbox"/> • Medical practitioners <input type="checkbox"/> • Social services and counseling <input type="checkbox"/> • Family/friends personal interactions <input type="checkbox"/> • Employers and the work environment <input type="checkbox"/> • The hospitality industry and alcohol sellers/servers <input checked="" type="checkbox"/> Others: NHTSA & Ad Council
How It Works	<ul style="list-style-type: none"> • Put the message on cocktail napkins, in restrooms at bars • Partner with the Ad Council to develop a reality TV commercial, much like the don't text and drive ads that depict the impressive sudden crash impact, put it on Social media
Experience/Evidence	<ul style="list-style-type: none"> • A similar program is Project Yellow Light- Distracted Driving- Stop Texts-Stop Wrecks
Likely Cost	Likely this is high dollar, however according to the Ad Council website: "Ad Council campaigns receive more than \$1 billion in donated media annually. Our non-profit organizations and Federal Government agency partners typically receive 10 times the return on their investment through donated media placements."
Impediments	Changing the perception that walking while intoxicated is a better alternative to driving while intoxicated.
Research Suggestions	Pilot a PSA program in one or two locations, such as a major metropolitan area in Florida or Texas, known to have high numbers of pedestrian fatalities.
Comments	

Label	Content
Name of Idea	“Don’t get smashed when You’re smashed” You-Tube vids
Description	Screen urban police body camera video looking for dramatic scenes of intoxicated people at risk in traffic, being interviewed by officers and at crash scenes.
Intervention Point	Before drinker walks, while sober and on-line
Implementers (Check all that apply by clicking on the associated box and write in any others)	<ul style="list-style-type: none"> • Law enforcement <input checked="" type="checkbox"/> • The courts <input type="checkbox"/> • The probation system <input type="checkbox"/> • Medical practitioners <input type="checkbox"/> • Social services and counseling <input checked="" type="checkbox"/> • Family/friends personal interactions <input checked="" type="checkbox"/> • Employers and the work environment <input checked="" type="checkbox"/> • The hospitality industry and alcohol sellers/servers <input checked="" type="checkbox"/> • Others
How It Works	Show exciting and scary video from police bodycams or other “cinema verite” sources that show the dangers of walking smashed. If the product is good, it will be seen by a lot of people and may influence their behavior.
Experience/Evidence	None known
Likely Cost	\$50,000 – based on video editing and production of \$1,000 per minute of airable video.
Impediments	Privacy considerations of identifiable people in video. Access to body cam video may be difficult.
Research Suggestions	Could be trialed in any major city with police body cam program.
Comments	This has the potential to earn a lot of media attention and a truly interesting vid can “go viral” and be seen by millions. There are many pedestrian crash videos on YouTube already, many from Russia and show drunk walking.

Label	Content
Name of Idea	“Be wary of walkers” informational piece
Description	Alert drivers of risk of intoxicated or stoned pedestrians
Intervention Point	Driver license office/PSA/older driver classes/YouTube
Implementers (Check all that apply by clicking on the associated box and write in any others)	<ul style="list-style-type: none"> • Law enforcement <input checked="" type="checkbox"/> • The courts <input type="checkbox"/> • The probation system <input type="checkbox"/> • Medical practitioners <input type="checkbox"/> • Social services and counseling <input type="checkbox"/> • Family/friends personal interactions <input type="checkbox"/> • Employers and the work environment <input type="checkbox"/> • The hospitality industry and alcohol sellers/servers <input type="checkbox"/> • Others: Licensing authority
How It Works	Almost every State has a “due care” provision in their traffic law that requires drivers to look out for and avoid hitting pedestrians, even if that person is incapable of watching out for themselves. This PSA would remind drivers of that duty and correct the error that assumes that people walking are looking out for themselves and being careful. It would highlight the danger of going too fast when people are walking near the road, remind people to focus on their driving (no distractions) and that it their responsibility to avoid hitting people.
Experience/Evidence	None known
Likely Cost	\$30,000 – one-time cost for PSA production and limited distribution.
Impediments	Pedestrian advocates may object if not handled gracefully.
Research Suggestions	Develop and evaluate
Comments	This seems like a low-risk way to address the intoxicated pedestrian crash from the non-drunk, responsible-driver side of the transaction. Even drivers who think they are being careful are frequently distracted, inattentive, speeding, or otherwise placing pedestrians at risk.

Label	Content
Name of Idea	Revise the Alcoholic Beverage Labeling Act
Description	<p>27 U.S. Code § 215 requires that containers of alcohol have the Surgeon General’s warning.</p> <p>The warning says: “(1) According to the Surgeon General, women should not drink alcoholic beverages during pregnancy because of the risk of birth defects.</p> <p>(2) Consumption of alcoholic beverages impairs your ability to drive a car or operate machinery, and may cause health problems.”</p> <p>If the act was revised, or a new requirement was included that went a little further to say something along the lines of “Consumption of alcoholic beverages impairs your cognitive function, judgement, and decision-making, and has negative effects on muscle coordination, vision, and speech,” the dangers of doing anything while impaired would be covered in the warning.</p>
Intervention Point	On bottles of alcohol and any other point where the warning is legally required (ads, etc.)
Implementers (Check all that apply by clicking on the associated box and write in any others)	<ul style="list-style-type: none"> • Law enforcement <input type="checkbox"/> • The courts <input type="checkbox"/> • The probation system <input type="checkbox"/> • Medical practitioners <input type="checkbox"/> • Social services and counseling <input type="checkbox"/> • Family/friends personal interactions <input type="checkbox"/> • Employers and the work environment <input type="checkbox"/> • The hospitality industry and alcohol sellers/servers <input type="checkbox"/> • Others Congress; the alcohol industry
How It Works	Congress would have to pass a law mandating a change in the language required on each warning label.
Experience/Evidence	It’s my understanding that there isn’t much evidence that warning labels prevent impaired driving in the US. European warning labels are more aggressive and warn about more negative effects of alcohol. Some contain broader language such as “Warning: excess consumption of alcohol endangers life and is harmful to health.” European countries changed the requirements within the last 3 to 5 years and there is likely ongoing research into the efficacy of these labels.
Likely Cost	Significant. A change like this would require possibly years of lobbying and would be countered by the alcohol industry.
Impediments	Making a change like this to their products would likely be met with resistance by the alcohol industry.

Label	Content
Research Suggestions	Does the existing warning label have an effect on people's choices or decision to drink or not drink alcohol? Would making a change like this be a deterrent or raise awareness about other modes of transportation beyond driving that can be impaired by alcohol?
Comments	

Strategies to Increase Awareness of Pedestrian and Traffic Safety in General

Label	Content
Name of Idea	“To get to the other side”
Description	Community mobilization effort designed to educate everyone in the community how to properly walk in crosswalks
Intervention Point	The program could begin as young a grade school – during a pedestrian safety event with crossing guards and patrols
Implementers (Check all that apply by clicking on the associated box and write in any others)	<ul style="list-style-type: none"> • Law enforcement <input type="checkbox"/> • The courts <input type="checkbox"/> • The probation system <input type="checkbox"/> • Medical practitioners <input checked="" type="checkbox"/> • Social services and counseling <input checked="" type="checkbox"/> • Family/friends personal interactions <input checked="" type="checkbox"/> • Employers and the work environment <input checked="" type="checkbox"/> • The hospitality industry and alcohol sellers/servers <input checked="" type="checkbox"/> • Others
How It Works	Education on simple “steps” to take to keep safe in a crosswalk
Experience/Evidence	The program can build on success of other programs- what to look for, staying alert, make eye contact, etc.
Likely Cost	Low cost
Impediments	Changing cultural perspectives sometimes take a long time
Research Suggestions	Research diverse perspectives on pedestrian safety
Comments	It would be interesting to see if pedestrian safety is taken seriously in other countries.

Label	Content
Name of Idea	Traffic speed reduction
Description	Lower speed limits and enforcement
Intervention Point	Engineering and enforcement of legislative action
Implementers (Check all that apply by clicking on the associated box and write in any others)	<ul style="list-style-type: none"> • Law enforcement <input checked="" type="checkbox"/> • The courts <input checked="" type="checkbox"/> • The probation system <input type="checkbox"/> • Medical practitioners <input type="checkbox"/> • Social services and counseling <input type="checkbox"/> • Family/friends personal interactions <input type="checkbox"/> • Employers and the work environment <input type="checkbox"/> • The hospitality industry and alcohol sellers/servers <input type="checkbox"/> • Others State and local legislatures
How It Works	High speed increases physical force in crashes and increase risk of injury and death
Experience/Evidence	https://ce.dot.gov/team/nhtsa.occiwf/204287_subsite/Shared/Documents/Production/www.nhtsa.gov/sites/nhtsa.dot.gov/files/documents/812478_countermeasures-that-work-a-highway-safety-countermeasures-guide-.pdf See Richard, Magee, Bacon-Abdelmoteleb, & Brown, 2018.
Likely Cost	Low
Impediments	
Research Suggestions	Examine impact on high-BAC pedestrian deaths
Comments	Speeding related fatalities account for roughly 1/3 of traffic deaths. See Forbes, G. J., Gardner, T., McGee, H., & Srinivasan, R. (2012, April). <i>Methods and practices for setting speed limits: An informational report</i> (Report No. FHWA-SA-12-004). Washington, DC: Federal Highway Administration. Available at https://safety.fhwa.dot.gov/speedmgt/ref_mats/fhwasa12004/

Label	Content
Name of Idea	Increase pedestrian Safety
Description	Change the environment to be safer for pedestrians
Intervention Point	
Implementers (Check all that apply by clicking on the associated box and write in any others)	<ul style="list-style-type: none"> • Law enforcement <input checked="" type="checkbox"/> • The courts <input checked="" type="checkbox"/> • The probation system <input type="checkbox"/> • Medical practitioners <input type="checkbox"/> • Social services and counseling <input type="checkbox"/> • Family/friends personal interactions <input checked="" type="checkbox"/> • Employers and the work environment <input checked="" type="checkbox"/> • The hospitality industry and alcohol sellers/servers <input type="checkbox"/> • Others
How It Works	Use state-of-the-art planning and engineering approaches to separate cars and pedestrians as well as induce safe pedestrian behavior even at an elevated BAC.
Experience/Evidence	Richard, Magee, Bacon-Abdelmoteleb, & Brown, 2018.
Likely Cost	Varies based on intervention
Impediments	Redesigning roads can be expensive
Research Suggestions	Develop detailed plans and evaluate them with experts
Comments	<p>Reduce speed and enforce speed limits</p> <p>Engineering and road design</p> <p>Education: Elementary-age child pedestrian training</p> <p>Conspicuity Enhancement</p>

Label	Content
Name of Idea	Night Pedestrian Zone
Description	<p>Identify areas where alcohol sales, package stores and bars/taverns serve a population that walks to them. These are likely urban communities and high density neighborhoods.</p> <p>After dark, adjust traffic controls to lower speed limits, turn signals to flashing yellow, minimizing stops. Place warning signs to alert drivers to pedestrian activity. This focuses on the driver, making them avoid the crash.</p>
Intervention Point	Environment – Traffic calming
Implementers (Check all that apply by clicking on the associated box and write in any others)	<ul style="list-style-type: none"> • Law enforcement <input type="checkbox"/> • The courts <input type="checkbox"/> • The probation system <input type="checkbox"/> • Medical practitioners <input type="checkbox"/> • Social services and counseling <input type="checkbox"/> • Family/friends personal interactions <input type="checkbox"/> • Employers and the work environment <input type="checkbox"/> • The hospitality industry and alcohol sellers/servers <input type="checkbox"/> • Others: Traffic engineering authority
How It Works	<p>The idea is to create a safer situation at night. Drivers would be required to transit these areas at low speed but would spend less time at a stop, a plus as stopping in some of these locations may be unsafe. Similar to a school zone, lower speeds would decrease the likelihood of a crash, lower the injury score of people who are hit, and make the community less “car impacted” as slower moving cars make less noise.</p>
Experience/Evidence	None known – concept is similar to school zones.
Likely Cost	Substantial – signage, construction, \$200,000 each site?
Impediments	Signs must avoid calling area a drunk haven. People may not like lower speeds.
Research Suggestions	Could be trialed at a single site
Comments	Getting the driver to prevent the crash is likely to be more successful than getting an intoxicated pedestrian to behave in a safer manner.

Label	Content
Name of Idea	Targeted crosswalk enforcement in alcohol service areas
Description	Some communities use Targeted Crosswalk Enforcement (decoy pedestrians) to enforce crosswalk laws. This tactic is generally used in the daytime. It may be practical to conduct these enforcement events in areas where impaired pedestrians are walking at times when they are active. The goal is to get motorists to observe the rules of the road that give pedestrians the right-of-way at crosswalks.
Intervention Point	Driver pedestrian interaction
Implementers (Check all that apply by clicking on the associated box and write in any others)	<ul style="list-style-type: none"> • Law enforcement <input checked="" type="checkbox"/> • The courts <input checked="" type="checkbox"/> • The probation system <input type="checkbox"/> • Medical practitioners <input type="checkbox"/> • Social services and counseling <input type="checkbox"/> • Family/friends personal interactions <input type="checkbox"/> • Employers and the work environment <input type="checkbox"/> • The hospitality industry and alcohol sellers/servers <input type="checkbox"/> • Others
How It Works	Targeted crosswalk enforcement uses a small number of enforcement actions supported by earned and paid media to change driver behavior. This would encourage drivers to look out for pedestrians and avoid hitting them.
Experience/Evidence	Evaluations have shown that TCE is effective.
Likely Cost	Expensive. Must be used often enough to change community awareness. Manpower intensive.
Impediments	Can anger motorists. May not be public sympathy for supporting inebriated pedestrians. TCE may be too hazardous at night in some locations.
Research Suggestions	Worth trying experimentally at a community that is used to doing conventional TCE
Comments	This is aimed at drivers who place pedestrians at risk.

Label	Content
Name of Idea	Enhanced crosswalks in areas frequented by for high-BAC pedestrians
Description	Many advanced features are available to upgrade a crosswalk with in-pavement flashers, overhead flashers, illuminated crosswalk signs, etc. These would be selectively used to improve crosswalks where impaired/inebriated pedestrians are active crossing the roadway.
Intervention Point	
Implementers (Check all that apply by clicking on the associated box and write in any others)	<ul style="list-style-type: none"> • Law enforcement <input checked="" type="checkbox"/> • The courts <input type="checkbox"/> • The probation system <input type="checkbox"/> • Medical practitioners <input type="checkbox"/> • Social services and counseling <input type="checkbox"/> • Family/friends personal interactions <input type="checkbox"/> • Employers and the work environment <input type="checkbox"/> • The hospitality industry and alcohol sellers/servers <input type="checkbox"/> • Others: Traffic Engineering
How It Works	Traffic engineers will upgrade crosswalks to make them more conspicuous to motorists. Along with other warrants, they will consider the presence of intoxicated or impaired pedestrians. In light of the impairment, it may be best to use passive detectors to identify the presence of a pedestrian and trigger active features such as flashers. Enhanced crosswalks help police with enforcement of crosswalk right-of-way laws.
Experience/Evidence	None known
Likely Cost	Very high \$150,000 at each location
Impediments	Maintenance issues, competing priorities, high cost
Research Suggestions	Implement and evaluate in test area
Comments	

Label	Content
Name of Idea	Improved street lighting in areas frequented by high-BAC pedestrians
Description	New LED luminaries decrease the cost of operating street lighting. These might be used to provide improved illumination of areas where impaired pedestrians are active, with the lighting set to illuminate the pedestrians, increasing their chances of being seen. Police can assist in identifying areas where such lights are needed.
Intervention Point	
Implementers (Check all that apply by clicking on the associated box and write in any others)	<ul style="list-style-type: none"> • Law enforcement <input type="checkbox"/> • The courts <input type="checkbox"/> • The probation system <input type="checkbox"/> • Medical practitioners <input type="checkbox"/> • Social services and counseling <input type="checkbox"/> • Family/friends personal interactions <input type="checkbox"/> • Employers and the work environment <input type="checkbox"/> • The hospitality industry and alcohol sellers/servers <input type="checkbox"/> • Others: Traffic Engineers
How It Works	Installation of LED lighting to highlight pedestrians
Experience/Evidence	None known
Likely Cost	Moderate – Modest install cost, long lived, low operational cost
Impediments	Dark skies are desirable at night, “light trespass” into homes inconvenient.
Research Suggestions	Could be trialed in an urban setting
Comments	

Label	Content
Name of Idea	“Keep Your Head on a Swivel” safety sign campaign
Description	Post “Keep Your Head on a Swivel” signs at crosswalks and at non-crosswalk locations where intoxicated people frequently cross streets. The signs warn walkers that cars may come at them from many directions.
Intervention Point	Environmental, at hazardous crossing points
Implementers (Check all that apply by clicking on the associated box and write in any others)	<ul style="list-style-type: none"> • Law enforcement <input type="checkbox"/> • The courts <input type="checkbox"/> • The probation system <input type="checkbox"/> • Medical practitioners <input type="checkbox"/> • Social services and counseling <input type="checkbox"/> • Family/friends personal interactions <input type="checkbox"/> • Employers and the work environment <input type="checkbox"/> • The hospitality industry and alcohol sellers/servers <input type="checkbox"/> • Others: Traffic engineering
How It Works	Signs give a visual and text instruction to look around to be safe
Experience/Evidence	None known
Likely Cost	\$150 per installation, sign and posting.
Impediments	Sign clutter, designing an effective message, identifying appropriate locations, not in the Manual of Uniform Traffic Control Devices. State Highway Safety Offices are not allowed to use Federal 402 money to erect signage. Signs may become stale in time and be ignored.
Research Suggestions	Develop and evaluate
Comments	This is a low cost project that would help intoxicated pedestrians and all other pedestrians.

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**National Highway
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