

Tandem DUI *per se*

HB19-1146

Press package

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A legislative proposal to replace Colorado's 5 ng/ml permissible inference law with Tandem DUI *per se*

January 30, 2019

What is Tandem DUI *per se*?

- Alcohol's DUI *per se* law requires one event to prove a violation of the law:
 - BAC \geq .08.
- Tandem DUI *per se* requires two events to prove a violation of the law:
 - Evidence based on the driver's behavior that the driver was impaired, and
 - Proof of any level of a psychoactive drug in the driver's blood or oral fluid.

Key points:

- A 5 ng/ml THC law is
 - Scientifically invalid [page 4],
 - Limited to only part of the DUID problem [page 12]
 - Prosecutorially ineffective [pages 13 & 14]
 - Judicially unsound [page 15]
- Colorado's 5 ng/ml permissible inference law should be replaced with a Tandem DUI *per se* law, the only concept supported by leading DUID scientists.
- New information¹ tells us now is the time to act

¹ Bui B, Reed J. Driving Under the Influence of Alcohol and Drugs. A Report Pursuant to HB 17-1315. July 2018. Colorado Division of Criminal Justice. We have long known that a 5 ng/ml law was scientifically invalid. The DCJ report shows it is also prosecutorially ineffective and judicially unsound.

A 5 ng/ml THC level is scientifically invalid

- Like alcohol impairment, THC impairment is dose dependent. That is, the more a user consumes, the more impaired they become².
- *But because THC is fat soluble, unlike alcohol the blood level of THC tells us nothing about brain level of THC or about the level of THC impairment³.*
- Blood THC levels can be very low, or even non-detectable when brain THC levels are high⁴.
- Alcohol is the only drug for which a strong correlation has been shown between blood levels and impairment levels. Among all drugs, marijuana is not the exception. Alcohol is the exception⁵.
- A driver with a blood THC level below 5 ng/ml is as likely or even more likely to cause a crash as a driver above 5 ng/ml⁶. A driver can be just as impaired at 2 ng/ml as at 20 ng/ml⁷.
- A driver impaired due to use of a marijuana edible is highly unlikely to have a blood THC level as high as 5 ng/ml⁸.

² Verster JC, Pandi-Perumal SR, Ramaekers JG. Drugs, Driving and Traffic Safety. ISBN 978-3-7643-9922-1 [See reference 135 – Abstract p 477 and conclusion p 495]

³ Logan BK, Kacinko SL, Beirness DJ. An evaluation of data from drivers arrested for DUI in relation to per se limits for cannabis (May 2016) AAA Foundation for Traffic Safety [See reference 335 – especially pages 2 and 25]

⁴ Mura P, Kintz P, Dumestre V et al. THC can be detected in brain while absent in blood. J of Anal Tox V 29 Nov/Dec 2005, 842-843 [See reference 317]

⁵ DuPont R. Testimony before the US House Energy and Commerce Committee July 11, 2018 [See reference HHRG-115-1F17 page 18]

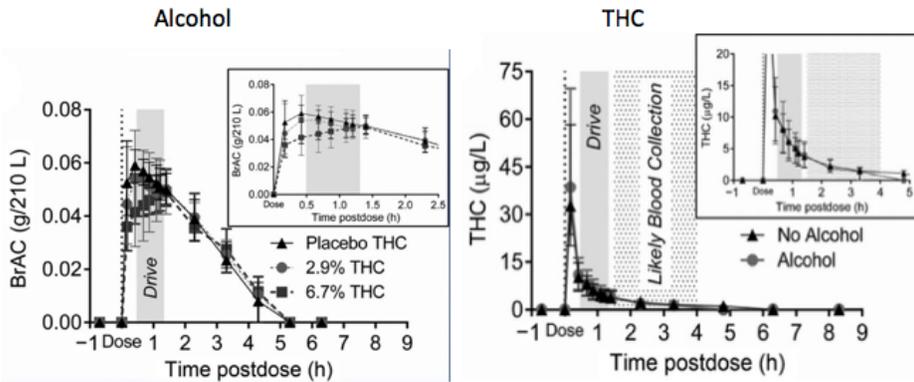
⁶ Huestis MA. Effects of cannabis with and without alcohol on driving. ACMT Seminars in Forensic Toxicology. Denver, CO, Dec 9, 2015 [See reference 300 – especially slide 15]

⁷ Declues K, Perez S, Figueroa A. A 2-year study of Δ9-tetrahydrocannabinol concentrations in drivers: examining driving and field sobriety test performance. J Forensic Sci Nov 2016 64:6

⁸ Vandry R, Herrmann ES, Mitchell JM. Pharmacokinetic profile of oral cannabis in humans: blood and oral fluid disposition and relation to pharmacodynamic outcomes. J Anal Tox 2017 41 83-99 [See reference 381 p 94]

THC blood levels reveal nothing of THC brain levels

THC does not impair blood, it impairs brains. We measure blood alcohol levels as a surrogate for what is in the brain. For alcohol, blood is an excellent surrogate. Blood is an ineffective surrogate to measure THC brain levels because THC is insoluble in blood. When THC is entrained in a bloodstream it is quickly absorbed by the brain and other fatty tissues. Compare the two redistribution/metabolism curves below.⁹



For alcohol

- Removed by metabolism
- Metabolism is linear
- Metabolism .015-.020 gm/dl-hr
- Can use retrograde extrapolation
- Measurement within 2 hr is OK

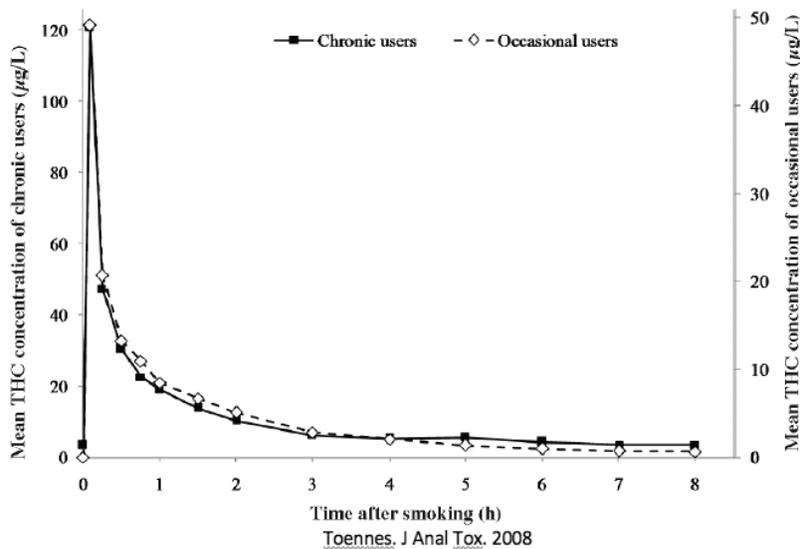
For THC

- Removed primarily from blood by redistribution
- Metabolism is first order kinetic
- Metabolic half-life is ~4.1 days
- Retrograde extrapolation is impossible
- Average 73% reduction within 25 minutes
- (Range of 6.6% to 89.5%)

Hartman. Clinical Chemistry. 2015

THC's rapid redistribution from blood to brain occurs identically for both chronic and occasional users, but there are great differences from one individual to another.¹⁰

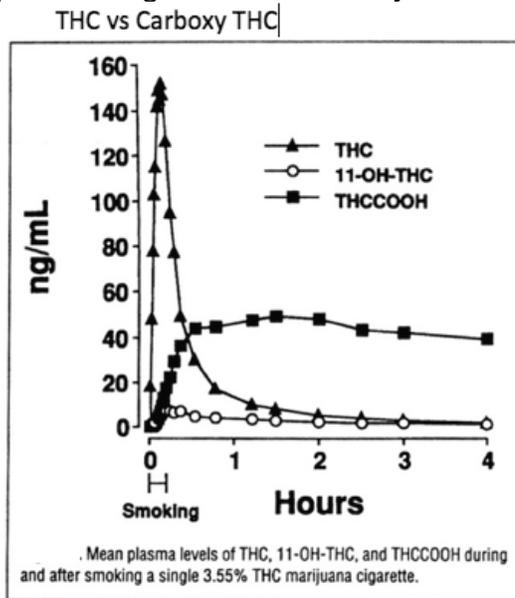
Overlay of mean THC concentrations of occasional and heavy users, normalized



⁹ Hartman RL, Brown TL, Milavetz et al. Effect of Blood Collection Time on Measured Δ^9 -Tetrahydrocannabinol Concentrations: Implications for Driving Interpretation and Drug Policy. Clinical Chemistry 62:2 367-377 (2016)

¹⁰ Toennes SW, Ramaekers JG, Theunissen EL, et al. Comparison of Cannabinoid Pharmacokinetic Properties in Occasional and Heavy Users Smoking a Marijuana or Placebo Joint. J Anal Tox Vol 32 No 7 Sept 2008 470-477

THC's primary inactive metabolite carboxy-THC (THCCOOH) behaves differently from its parent drug because carboxy-THC is water soluble.¹¹



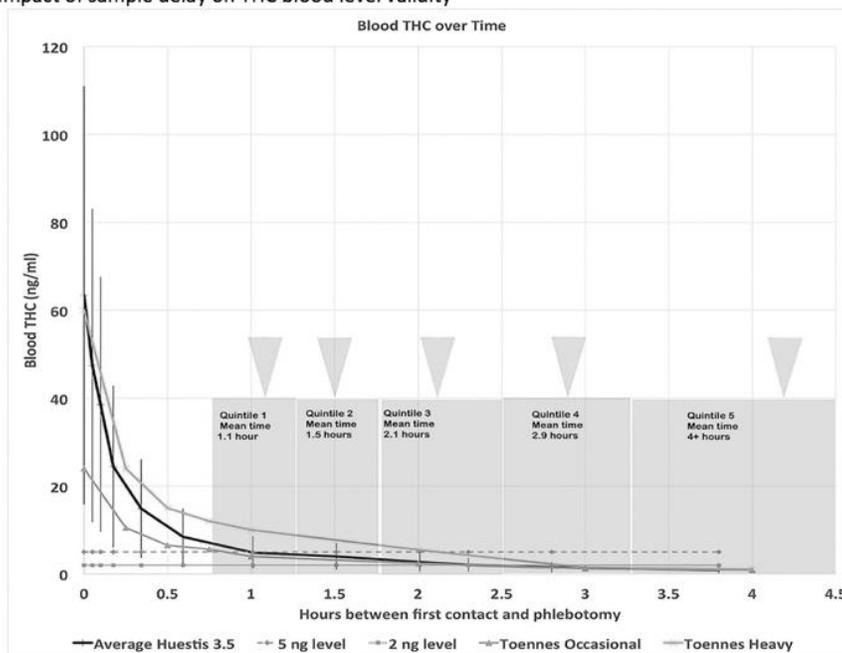
THC is not soluble in blood so it is very quickly removed from the bloodstream as it is absorbed by fatty tissues. It is gone from blood within hours in all but addicts and other heavy users.

Carboxy THC is blood-soluble so it remains in the blood for days and even weeks while the THC remaining in the body continues to be metabolized, even though THC may no longer be detectable in blood.

Huestis. J Anal Tox. 1992

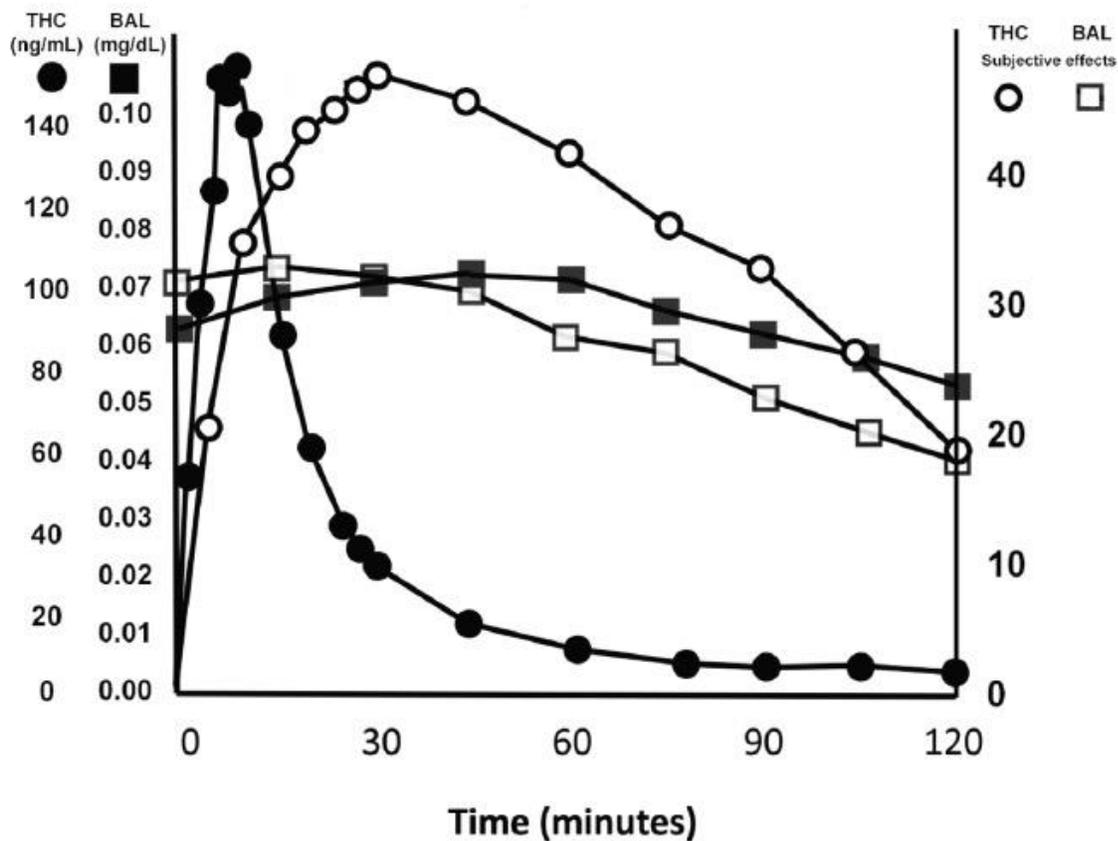
The median time between a crash and a blood draw in Colorado is 2 hours.¹² Overlaying the draw time histogram with THC's redistribution, it can be seen that the median whole blood THC level would be just over 2 ng/ml for the occasional user and slightly above 5 ng/ml for the chronic user. And that's for someone smoking marijuana at the time of a crash.

Impact of sample delay on THC blood level validity



¹¹ Huestis, MA, Henningfield JE, Cone EJ. Blood Cannabinoids. I. Absorption of THC and Formation of 11-OH-THC and THCCOOH During and After Smoking Marijuana. J Anal Tox Sept/Oct 1992 Vol 16 276-282

¹² Wood E, Brooks-Russell A, Drum P. Delays in DUI blood testing: Impact on cannabis DUI assessments. Traffic Injury Prevention 2016 Vol 17 No 2, 105-108



Because THC behaves so differently from alcohol, even if a blood sample could be taken at the time of an arrest or crash, blood THC levels would not indicate impairment levels. In the chart above¹³, the line with open boxes indicates blood alcohol levels, the line with black boxes shows subjective alcohol impairment associated with those blood alcohol levels. They match quite closely from consumption to at least two hours thereafter. The line with open circles indicates blood THC levels, the line with black circles shows subjective THC impairment associated with those levels. They diverge radically one from the other. Blood THC levels can be rapidly declining at the same time as subjective impairment levels are quickly climbing.

This demonstrates that blood THC levels do not correlate with subjective feelings of being high.

¹³ Sewell RA et al. The Effects of Cannabis Compared with Alcohol on Driving. Am J Addict. 2009

High THC levels in the brain while undetectable in blood

Mura et al. tested paired samples, blood and brain matter from twelve deceased subjects who tested positive for cannabinoids in blood. Both THC and THC's inactive metabolite carboxy-THC will cause a positive cannabinoid test result.

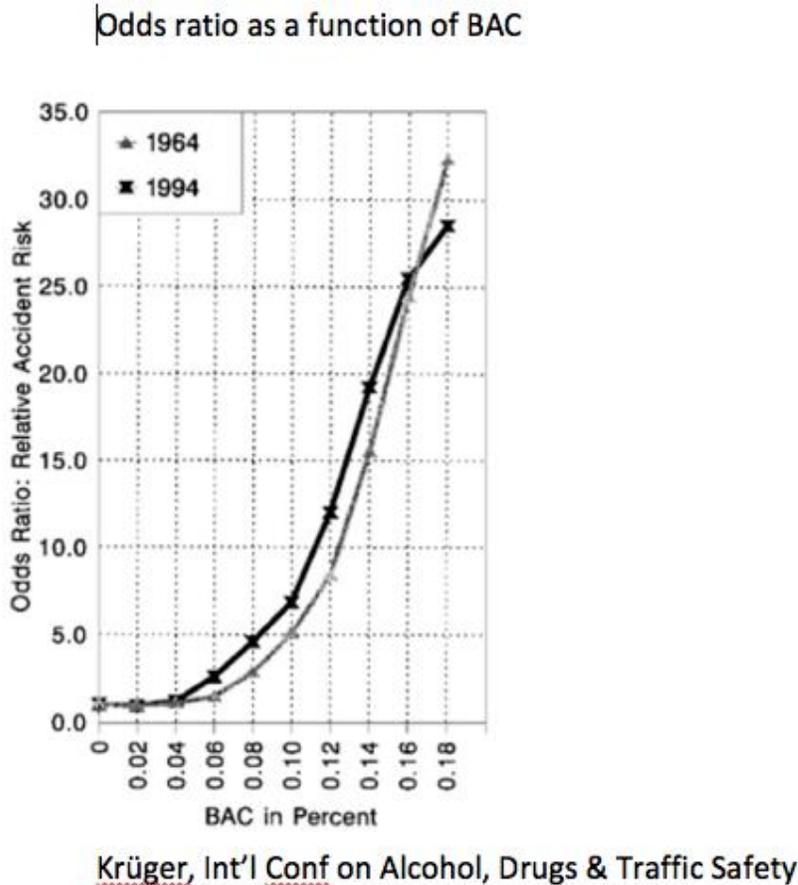
Brain THC levels were higher than blood levels in 100% of the test subjects.

Three of the twelve subjects revealed high brain levels of THC where none could be detected in their blood.¹⁴

¹⁴ Mura P, Kintz P, Dumestre V et al. THC can be detected in brain while absent in blood. J of Anal Tox V 29 Nov/Dec 2005, 842-843

Marijuana is not the outlier, alcohol is

There is a high correlation between blood alcohol levels and levels of impairment. This has been shown in laboratory experiments but most convincingly in epidemiological evidence embodied in the Borckenstein curve. See an example below:



This is the primary evidence that has led to acceptance of alcohol *per se* levels that vary from .02 to .10, depending upon the country's beliefs in individual freedom and tolerance for risk. Colorado's alcohol *per se* level is .08. Most of Europe is .05.

Even though many drugs including THC have been shown experimentally to cause driving impairment, no correlation between drug blood levels and levels of impairment have ever been verified, in part due to the reasons described above.

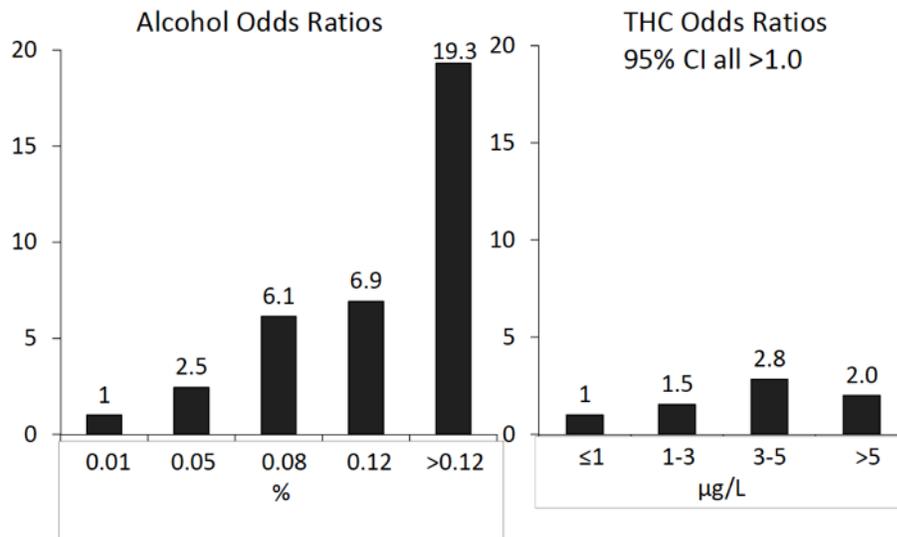
Robert L. DuPont, MD testified before the US House Energy and Commerce Committee July 11, 2018, saying that alcohol is the only drug for which a strong correlation has been shown between blood levels and impairment levels. Among all drugs, marijuana is not the exception. Alcohol is the exception.¹⁵

¹⁵ Committee archives HHRG-1F17 page 18

Drivers <5 ng THC are as dangerous as those > 5 ng

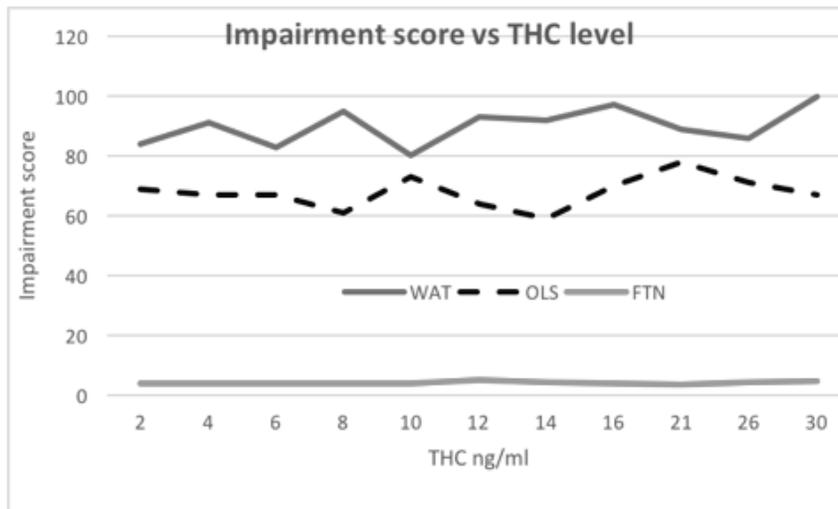
The multi country DRUID study found that a driver with a blood THC level below 5 ng/ml was as likely or even more likely to cause a crash as a driver above 5 ng/ml.¹⁶

DRUID Culpability Study (N = 7455)



Hels. DRUID Final Conference. 2011

Declues¹⁷ et al. tested nearly 5,000 drivers arrested on suspicion of driving under the influence of drugs. The vast majority were polydrug users but 363 were positive for THC *only*. They were evaluated for impairment using Walk and Turn (WAT), One Leg Stand (OLS) and Finger to Nose (FTN) tests. There were no differences in the level of impairment measured regardless of the blood levels of THC.



Declues. J Forensic Sci. 2016

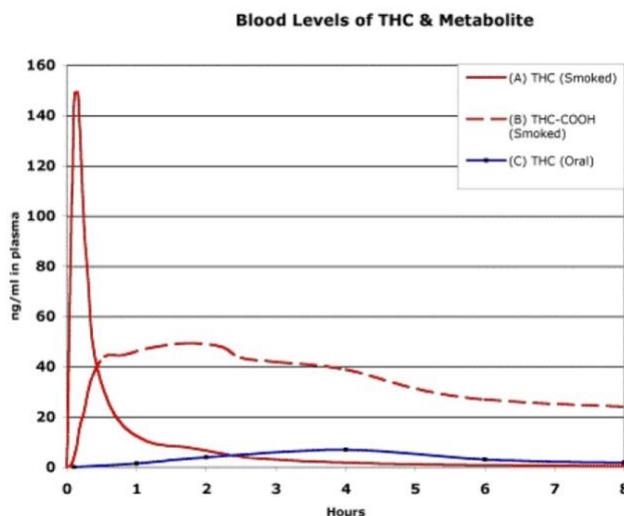
¹⁶ Hels T, Berhoft IM. Risk of serious injury and death for drivers positive for drugs. [Sound/Visual production (digital)]. DRUID Final conference, Cologne, Germany 27/09/2011

¹⁷ Declues K, Perez S, Figueroa A. A 2-year study of Δ^9 -tetrahydrocannabinol concentrations in drivers: examining driving and field sobriety test performance. J Forensic Sci Nov 2016 64:6

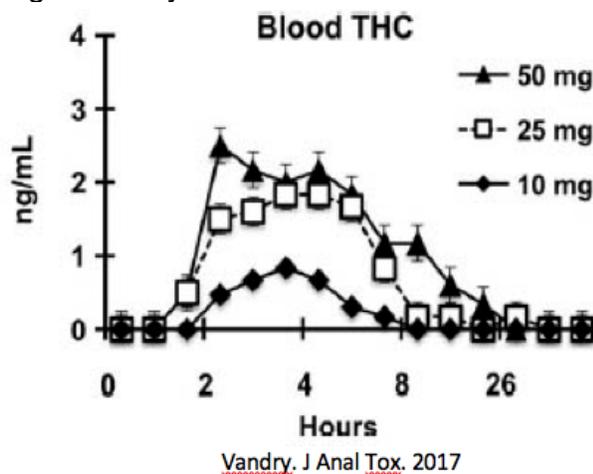
Drivers on edible marijuana will not test above 5 ng/ml

When a user smokes or vapes marijuana a large dose of THC is delivered immediately to the lungs which transfer the THC to blood circulating in the lungs. That THC is then quickly absorbed by fatty tissues and removed from the blood as described above.

When someone consumes a marijuana edible the THC must first be processed by the liver before it is gradually metered out into the bloodstream. This explains the gradual response and extended duration to a “high” from edibles compared with inhaled products. The THC released to the bloodstream is quickly absorbed by the brain but since there is no large dose of THC transferred to the blood immediately, the edible THC levels never approach the levels seen with inhaled marijuana.¹⁸



Vandry¹⁹ et al. tested 18 subjects at three doses of marijuana edibles (10, 25 and 50 mg). The standard dose is 10 mg. None of the subjects had a blood level of THC higher than 3 ng/ml at any time.



¹⁸ Grotenhermen, F., et.al.; Developing Science-Based Per Se Limits for Driving under the Influence of Cannabis (DUIC)

¹⁹ Vandry R, Herrmann ES, Mitchell JM. Pharmacokinetic profile of oral cannabis in humans: blood and oral fluid disposition and relation to pharmacodynamic outcomes. J Anal Tox 2017 41 83-99

DUID is not just about marijuana

Drug class	Positive toxicology test			Example
Alcohol	15,924			
≥ BAC .08		13,620	85.5%	
BAC .05 - .079		1,389	8.7%	
THC	2,885			
≥ 5 ng/ml		1,369	47.5%	
<5 ng/ml		1,516	52.5%	
CNS Depressants	957			Benzodiazepines
CNS Stimulants	887			Methamphetamine, cocaine
Narcotic analgesics	402			Opiates, opioids
Prescription & OTC	183			Antidepressants
Other	32			LSD, ketamine, inhalants
Single drug	14,549			
Polydrug	2,100			

- Colorado cases in 2016 tested and reported, not all adjudicated
- Few of the above were tested for both alcohol and drugs, so polydrug is underreported

- 54% of positive drug tests were for THC
- 46% of positive drug tests were for other drugs
- Less than half of cannabinoid-positive tests were ≥ 5 ng

Substance	Number of drivers		Comments
Cases tested		2,383	
1 or more intoxicant		2,340	
Single intoxicant	762		
Alcohol only	541		
THC only	135		
Other drugs only	86		Includes narcotics, depressants,
Polydrug	1,578		Categories below not mutually exclusive
Includes alcohol	1,443		73% of drinkers were polydrug users
Includes THC	1,136		89% of cannabis users were polydrug
Includes other	749		90% of other drug users were polydrug

- Colorado cases in 2016 tested for both alcohol and drugs (5, 7, 9, or 11-panel screen)
- 8.7% of total cases were tested and reported for both alcohol and drugs
- Table shows any amount of alcohol or drugs found, including $\Delta 9$ -THC

- In cases tested for both drugs and alcohol, polydrug users outnumbered all single intoxicants combined.
- 90% of drug users were polydrug users

A 5 ng/ml law is prosecutorially ineffective

- Data collected by Colorado's DCJ from DUI cases in 2016 revealed the following:

Table 1²⁰ Convictions by drug class

Drug class	Cases	Convictions
Alcohol \geq .05	14,217	93.3%
\geq BAC .08		95.3%
BAC .05 - .079		73.8%
THC \geq 1.0	2,227	82.8%
\geq 5 ng/ml		87.5%
1.0-4.9 ng/ml		76.6%
CNS Depressants	881	83.2%
CNS Stimulants	797	89.0%
Narcotic analgesics	368	83.7%
Prescription & OTC	170	74.1%
Other	30	86.7%
Single drug	14,549	90.1%
Polydrug	2,100	88.4%

- Cases in 2016 adjudicated by report date mid-2018
- Convictions include Guilty, Deferred & Deferred/Dismissed
- Convictions include convictions for DUI and DWAI
- Case numbers include single drug and polydrug, i.e. 2,227 THC cases include 1,365 polydrug users

- Conviction rate of THC cases (82.8%) were no higher, and usually lower than conviction rates of other drug classes that have no permissible inference level.

²⁰ Data from Tables 33, 34, 40 and 38 from Bui and Reed 2018

A 5 ng/ml law is prosecutorially ineffective

- The data are even more striking in cases with evidence of only one drug responsible for impairment:

Table 2²¹ Convictions by single drug impairment

Convictions by drug			Case Count
	DUI	DWAI	
Alcohol only			13,323
≥ BAC .08	92.5%	99.9%	11,857
BAC .05 - .079	23.6%	85.0%	1,189
THC only			878
≥ 5 ng/ml	59.8%	99.7%	621
1.0-4.9 ng/ml	14.1%	91.4%	241

Colorado DUI/DUID adjudicated cases in 2016

No polydrug cases included

Convictions include Guilty, Deferred, Deferred/Dismissed

DUI: substantially incapable of safe driving

DWAI: impaired to the slightest degree, less safe

- Most THC cases were convicted of DWAI, proving the following:
 - These defendants were impaired.
 - Officers identify THC impairment, even without a drug version of a breathalyzer.
 - Prosecutors convict defendants of impairment based upon evidence presented by officers.
- 59.8% of THC cases ≥ 5 ng/ml were convicted of DUI.
- 14.1% of THC cases < 5 ng/ml were convicted of DUI.
 - Officers and prosecutors are doing their job.
 - The 5 ng/ml THC law isn't. **Let's change it.**

²¹ Data from Bui email Aug 24, 2018 [See Ed Wood Data Request, tab 2]

A 5 ng/ml THC law is judicially unsound

- In DUI cases with victims, a DWAI conviction alone does not provide justice.
 - In Colorado, DUI Vehicular Homicide is a Class 3 felony. But a DWAI Vehicular Homicide is not unlawful.
 - In cases of DWAI Vehicular Homicide, a prosecutor must rely upon a lesser offense such as Reckless Vehicular Homicide or Careless driving resulting in death.

Table 3²² Vehicular Homicide/Assault-DUI Convictions

Cases	Number	Rate	Note
VH-alcohol	10	80%	
VH-THC only	2	0%	All were < 5 ng/ml
VH-single	1	0%	
VH-polydrug	7	71%	
VA-alcohol	79	75%	
VA-THC only	5	80%	All were ≥5 ng/ml
VA-single	3	67%	
VA-polydrug	50	88%	

- The two vehicular homicide cases in 2016 due to THC *only* were below 5 ng/ml and neither driver was convicted of DUI vehicular homicide.

²² Data from Tables 42 and 43 from Bui and Reed 2018

5 ng THC permissible inference alternatives

- 5 ng/ml THC *per se*
 - 5 ng/ml is not a scientifically valid limit for THC impairment.
 - Most THC-impaired drivers test below that limit.
 - Drivers impaired by THC edibles test below that limit.
 - This does not deal with non-THC causes of drugged-driving.
 - This does not deal with polydrug impairment.
 - Adoption of oral fluid testing will make blood limits irrelevant.
- The Canadian approach – 2 ng/ml and 5 ng/ml THC *per se*
 - This has most of the above-noted drawbacks.
 - Canadian journalists report that this is confusing, contentious, and likely will not survive a constitutional challenge.
- Non-zero *per se* limits for a panel of drugs
 - This cannot be realistically done for all the impairing drugs currently in use, even if the levels were to be scientifically valid.
 - Non-zero limits do not deal well with polydrug impairment.
 - These laws specify blood limits that may become irrelevant with the adoption of oral fluid testing.
- Revert to an impairment-based law without *per se* limits
 - Conviction rates are lower than with *per se* laws.
 - It's more difficult to educate the public to the dangers of impaired driving without limits.
- Zero tolerance for impairing drugs
 - Zero tolerance laws vary widely among the sixteen states that have adopted them.
 - These are difficult to pass because of three common objections:
 - “Zero tolerance” is considered to be intolerant, which it is, by definition. That is considered to be a bad thing by a tolerant society.
 - Many believe that the mere presence of a drug should not be cause for a violation.
 - The public expects that *per se* limits should define impairment, which is not the intention of zero tolerance.
- Tandem DUI *per se*

Genesis of Tandem DUI *per se*

- The concept was described by the American Automobile Association²³.

AAA is urging states to use more comprehensive enforcement measures to improve road safety. Rather than relying on arbitrary legal limits, states should use a two-component system that requires (1) a positive test for recent marijuana use, and most importantly, (2) behavioral and physiological evidence of driver impairment. This system would rely heavily on two current law-enforcement training programs: Advanced Roadside Impaired Driving Enforcement (ARIDE) and the 50-state Drug Evaluation and Classification (DEC) program. These programs train law enforcement officers around the country to more effectively recognize drug-impaired driving.

- The scientific basis was published by Logan et al²⁴.
- This is a zero tolerance law, reformulated to deal with most of the common objections to zero tolerance²⁵.
- The term was made public in 2017²⁶ :

We believe that a much better alternative to choosing an arbitrary drug *per se* level above zero is the Tandem *per se* approach, which requires a sequence of events to prove the crime of driving under the influence of drugs *per se*. Using this approach, a person would be guilty of driving under the influence of drugs *per se* if:

- The driver was arrested by an officer who had probable cause, based on the driver's demeanor, behavior and observable impairment to believe the driver was impaired; AND
- The driver had any amount of an impairing substance in their blood, oral fluid, or breath.

Tandem *per se* is consistent with AAA's recommendation to rely upon impairment observations from trained officers, corroborated by laboratory tests. Sensible evidence-based laws are needed that focus on finding and removing impaired drivers from our roads. A 5 ng/ml THC *per se* limit is neither sensible nor evidence-based.

²³ Green M. Fatal Road Crashes Involving Marijuana Double After State Legalizes Drug. AAA Public Relations press release May 10, 2016 [See reference 336]

²⁴ Logan BK, Kacinko SL, Beirness DJ. An evaluation of data from drivers arrested for DUI in relation to *per se* limits for cannabis (May 2016) AAA Foundation for Traffic Safety [See reference 335]

²⁵ See page 10 for a list of zero tolerance objections. Current zero tolerance laws require probable cause to collect a blood sample to prove a violation. So does Tandem *per se*. But since both conditions are listed adjacent to one another in the Tandem *per se* law, that link is more clear to the public. Also, Tandem *per se* probable cause requires evidence of impairment, not mere use.

²⁶ Logan BK, Talpins SK, Wood EC. Don't regulate marijuana like alcohol. Santa Fe New Mexican April 3, 2017

Twelve Drugged-Driving Lessons from Colorado

What has marijuana legalization done to Driving Under the Influence (DUI) cases in Colorado? Important answers are now emerging. July 2018, the Division of Criminal Justice (DCJ) released a 106-page report Driving Under the Influence of Drugs and Alcohol²⁷ for the year 2016. This first-of-its-kind report and its database enabled us to draw twelve important conclusions.

1 Colorado's report is the first to show causes of DUI, not just presence of drugs
Coroners routinely test fatal crash victims for presence of alcohol and drugs. That makes it easy to report the presence of impairing substances in fatal crashes, which is why we see so many reports of "marijuana-involved" fatal crashes, primarily based upon coroner reports. Reports from the Washington Traffic Safety Commission²⁸ and Rocky Mountain High Intensity Drug Trafficking Area²⁹ are recent examples of such studies which show excellent trend graphs. But since coroner's subjects are never charged with or convicted of DUI, such reports are often criticized on the grounds that mere presence of drugs does not prove impairment.

Colorado's report was created by linking forensic toxicology data with the state judicial data of DUI charges and convictions. It is the first large-scale report to show the *causes of all DUI charges*, not simply the *presence of drugs* in fatal crashes. This is a huge step forward to understanding DUI and drugged driving. Colorado's report was written pursuant to a bill that DUID Victim Voices drafted last year and guided through legislative approval.

2 We can't understand our drugged driving problem if we don't test for it.
As the DCJ report repeatedly pointed out, Colorado does a terrible job testing drivers arrested for DUI, which limits the power of the report. Of the 27,244 cases of DUI charges in 2016, only 8.7% were tested for both alcohol and drugs, and the test methods and reports were not uniform. Nevertheless, the following conclusions are evident from the 2016 data.

3 Polydrug impairment was far more common than marijuana impairment.
Of the 2,383 cases tested for both drugs and alcohol, 2,340 had at least one intoxicant. Less than one-third (32.6%) of those positive cases had a single intoxicant, either alcohol or a single drug. The balance (67.4%) were polydrug cases, where drivers were positive for multiple drugs. Only 5.8% of the 2,340 cases were positive for marijuana's THC *only*. THC means *only* delta 9-THC, not its inactive metabolite.

²⁷ http://cdpsdocs.state.co.us/ors/docs/reports/2018-DUI_HB17-1315.pdf

²⁸ http://wtsc.wa.gov/wp-content/uploads/dlm_uploads/2018/05/Marijuana-and-Alcohol-Involvement-in-Fatal-Crashes-in-WA_FINAL.pdf

²⁹ <https://rmhidta.org/files/D2DF/FINAL-Volume5UPDATE2018.pdf>

4 Marijuana accounted for a little more than half of all drug impairment

There were 2,885 THC-positive cases, and 2,246 cases positive for other drugs. By that measure, THC constituted 56.2% of the drug-impaired (non-alcohol) cases. For cases of a single drug only (excluding both polydrug and alcohol cases), THC constituted 61.1% of the cases. Clearly, drugged driving is not just about marijuana.

5 Drug users were more likely than drinkers to be polydrug users

90% of drug users and 89% of marijuana users were polydrug users. 73% of drinkers were polydrug users. The latter number is likely an exaggeration of the facts, since the number is based only on drivers tested for both drugs and alcohol. Police test drivers for drugs only if they have a good reason for drug testing. Therefore drivers *only* on alcohol were likely under-represented in the sample. A broader database would likely lower this number. For example, Washington’s study of fatal crashes found that over 70% of drug users (including marijuana users) were polydrug users, but only 39% of drinkers were polydrug users.

6 Drunk drivers were far more likely to be convicted of DUI than drugged drivers

93.3% of drivers who had a BAC above .05 were convicted, compared with 83.8% of drugged drivers. These numbers include polydrug cases, and also include convictions for both DUI as well as DWAI. Colorado has two levels of impaired driving charges: DUI (substantially incapable of safe driving) and Driving While Ability Impaired, or DWAI (impaired to the slightest degree, less capable of safe driving).

7 Marijuana-impaired drivers were less likely to be convicted than others

93.3% of drunk drivers and 84.7% of drivers testing positive for non-marijuana drugs were convicted. But only 82.8% of drivers testing greater than 1 ng/ml THC (the lowest forensic laboratory reporting limit) were convicted. This is striking since Colorado’s 5 ng/ml THC permissible inference law was intended to make THC convictions easier.

8 Stoned drivers over 5 ng/ml THC were impaired, yet only 60% were convicted of DUI

It’s important to look at the small minority of drivers who tested positive for *only* THC or alcohol. This view completely avoids any question about whether or not it was the THC that caused impairment, or alcohol or another drug in a drug “cocktail” that caused impairment. For cases of THC *only* that were *above* 5 ng/ml, 99.7% were found guilty of DWAI. They were proven to be impaired. Yet only 59.8% were convicted of DUI. The only reason that overall THC-positive drivers had a higher conviction rate (82.8%) was because of the 88.4% conviction rate for polydrug impairment, not because of Colorado’s 5 ng/ml permissible inference law.

Table 1 Convictions by single drug

Convictions by drug			Case Count
	DUI	DWAI	
Alcohol only			13,323
≥ BAC .08	92.5%	99.9%	11,857
BAC .05 - .079	23.6%	85.0%	1,189
THC only			878

≥ 5 ng/ml	59.8%	99.7%	621
1.0-4.9 ng/ml	14.1%	91.4%	241

- Colorado DUI/DUID adjudicated cases in 2016
- No polydrug cases included
- Convictions include Guilty, Deferred, Deferred/Dismissed
- DUI: substantially incapable of safe driving
- DWAI: impaired to the slightest degree, less safe

Incidentally, Table 1 also proves that police were able to accurately identify marijuana-impaired drivers even without the support of the preliminary breath testers often used for alcohol impairment. It also proves prosecutors were successful prosecuting impaired driving.

9 Stoned drivers under 5 ng/ml THC were impaired, yet only 14% were convicted of DUI
 For THC *only* drivers who test *below* 5 ng/ml, the results were even worse. 91.4% were convicted of DWAI, proving that they were impaired. Yet only 14.1% were convicted of DUI. The low DUI conviction rate would be acceptable if the drivers were not impaired, but DWAI convictions prove otherwise. In contrast, drunk drivers below alcohol's .08 gm/dl 'legal limit' had a 67% higher DUI conviction rate than stoned drivers below THC's 5 ng/ml 'legal limit,' even though drunk drivers had a lower conviction rate of DWAI than stoned drivers.

10 Victims of THC-impaired drivers under 5 ng/ml did not see justice
 Fortunately traffic injuries are rare and traffic fatalities are even more rare. In 2016, half of the twenty DUI vehicular homicides were charged with DUI caused by alcohol *only*, the other half were caused by various drugs or drug and alcohol combinations. Only two were charged with vehicular homicide due to driving under the influence of THC *only*. Both cases tested *below* 5 ng/ml and neither driver was found guilty. In contrast, five were charged with vehicular assault due to driving under the influence of THC *only*, and four were found guilty. All were *above* 5 ng/ml. The vehicular homicide and assault numbers are too small to be conclusive, but they are fully consistent with the above observations that were based on larger numbers.

Table 2 Vehicular Homicide/Assault-DUI Convictions

Cases	Number	Rate	Note
VH-alcohol only	10	80%	
VH-THC only	2	0%	All were < 5
VH-single drug	1	0%	
VH-polydrug	7	71%	
VA-alcohol only	79	75%	
VA-THC only	5	80%	All were ≥5
VA-single drug	3	67%	
VA-polydrug	50	88%	

Table 2 also proves that marijuana can kill and maim innocent victims. That is not a new observation, but it is one that some still deny.

11 It takes an hour to take a blood sample. Two hours if a victim is involved.

A major reason that Colorado's 5 ng/ml THC 'legal limit' in blood is scientifically invalid is that blood is never impaired by THC. Only the brain is impaired. Since THC is fat soluble, it is very quickly absorbed by the brain and other highly perfused fatty tissues. That is why the maximum blood level of THC drops an average of 73.5% within the first 25 minutes after beginning to smoke a joint³⁰. Within an hour, the THC level drops below 5 ng/ml for occasional users, and within two hours it drops below 5 ng/ml for chronic users³¹. And that is for cases of a driver smoking a joint *at the time of a crash or an arrest*. THC blood levels are even lower for a stoned driver who stops smoking an hour or more before driving. Colorado's 2016 data revealed that the median time between a traffic stop and blood collection was between 55 and 60 minutes, but was 114 minutes between a dispatch to an injury crash and blood collection. Times for fatal crashes were not reported. With such sample collection delays, blood testing cannot reliably measure the concentration of a drug causing impaired driving.

12 A 5 ng/ml law is prosecutorially ineffective, scientifically invalid and judicially unsound

Colorado's 5 ng/ml THC permissible inference law targets a very small proportion of the state's DUI drivers; 862 out of 27,244 in 2016. And for those, less than half were convicted of DUI according to Table 1. The law is clearly not effective in achieving prosecutions.

Observation #11 stated only one reason that THC's 'legal limit' is scientifically unsound. Another is that drivers impaired *only* by marijuana edibles reach a maximum blood THC level of under 3 ng/ml³², and that is if they take five times the normal 10 mg dose!

Observation #10 demonstrates how judicially unsound Colorado's law is. Fortunately, very few victims were killed or injured by marijuana-impaired drivers, but those who were killed or injured deserved the same chance for justice as victims of drunk driving.

³⁰ <http://clinchem.aaccjnls.org/content/62/2/367>

³¹ Wood E. Weakest in the Nation: Colorado's DUID laws are the weakest in the nation; why and how to fix that. July 2018. Figure 8 page 28

³² <https://www.ncbi.nlm.nih.gov/pubmed/28158482>

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Background research information also can be found in the book Weakest in the Nation: Colorado's DUID laws are the weakest in the nation; why and how to fix that. An executive summary follows.



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Education and promoting effective laws to reduce Driving Under the Influence of Drugs (DUID) – A scientifically - based perspective from DUID Victims.

Executive summary of Weakest in the Nation

Two facets of the Driving Under the Influence of Drugs (DUID) problem are of concern. First, DUID drivers kill and maim innocent victims. Second, DUID victims often fail to see the same kind of justice that is delivered to drunk driving victims because laws designed to deal with alcohol impairment do not work well for drug impairment.

Driving Under the Influence (DUI) is not just about alcohol, and DUID is not just about marijuana. Whereas in years past, alcohol was the only impairing substance commonly found in drivers, today's forensic laboratories report that polydrug impairment (impairment by multiple drugs) is more common than impairment by either alcohol alone or marijuana alone. Although alcohol and marijuana are the most commonly found drugs in drivers involved in fatal crashes, they are very frequently found in combination, often with narcotics, depressants, stimulants, and other drugs.

Public knowledge about drunk driving is widespread but frequently wrong. Knowledge about drugged driving is far less common and even more commonly wrong. The public in general fails to understand the DUI arrest process, the difference between DUI and DUI *per se*, and the many differences between alcohol and other drugs.

Until the last few years, driving has become increasingly safer. The average person will be involved in a fatal crash only about once every 85 lifetimes. So when drivers are warned that an activity like drinking alcohol, using drugs or texting and driving can increase the risk of a fatal crash, drivers can and do ignore such warnings. And they usually get away with it. This explains why so many messages to avoid drunk, drugged or distracted driving are ineffective.

Marijuana-impaired driving is of particular concern not just because of its inherent danger, but because of its increasing prevalence and a common but falsely-held belief that stoned driving is not dangerous. Marijuana-impaired driving is less deadly than drunk driving, just as a .22 caliber bullet is less deadly than a .45 caliber bullet. But all four can and do kill.

Blood tests or breath tests have been used successfully to assess alcohol impairment for decades. But alcohol is the *only* drug for which there is a strong correlation between impairment and blood or breath concentrations. For marijuana's impairing delta 9-tetrahydrocannabinol (THC), all recent scientific research has demonstrated that even though higher doses of THC are more impairing than lower doses, there is absolutely no correlation between levels of THC impairment and blood levels of THC.

Individuals can develop a tolerance to some of the impairing effects of drugs, including alcohol, marijuana and opioids. But tolerance to some of a drug's impairing effects does not make the individual tolerant to all impairing effects. Addicts and other heavy users of drugs can be just as impaired as novice users, just as alcoholics can be as impaired as social drinkers.

Colorado's DUID laws are considered the weakest in the nation for several reasons:

1. The 5 nanogram per milliliter permissible inference level for marijuana's THC ensures that most THC-impaired drivers who test below 5 ng/ml will *not* be convicted of DUI.
2. The 5 ng/ml permissible inference level does not guarantee that THC-impaired drivers who test above 5 ng/ml will be convicted of DUI.
3. Colorado relies upon a very stringent statutory definition of DUI that is difficult to prove in court: *the person is substantially incapable* of safe driving.
4. Colorado has a lower offense of Driving While Ability Impaired (DWAI): *affects the person to the slightest degree* similar to the statutory DUI definition of some other states. But although vehicular homicide due to DUI is a Class 3 felony, vehicular homicide due to DWAI is not even a misdemeanor. It is not unlawful.
5. Colorado tests a minority of DUI suspects and drivers involved in fatal crashes for drug presence. Therefore, the prevalence of drug impaired driving is not well understood.
6. Colorado provides a statutory presumption of innocence for drivers testing below a Blood Alcohol Concentration (BAC) of 0.05, which fails to recognize that a non-impairing dose of alcohol combined with a non-impairing dose of THC can impair a driver.

The following statutory changes are recommended to improve Colorado's DUID laws. These are offered as a menu, not as a package, since the effects of some recommendations overlap.

Transformative changes

1. Change the THC permissible inference law to a Tandem *per se* law. [See Chapter 12.]
2. Require evidentiary drug testing of any driver who tests positive for drugs on a preliminary drug test; and evidentiary drug testing of *all* drivers involved in fatal crashes.
3. Implement oral fluid testing: roadside non-quantitative preliminary oral fluid testing if the officer has reasonable grounds to believe that the driver may be impaired by drugs; evidentiary laboratory oral fluid testing as an alternative to blood testing to prove the presence of an impairing substance.

Improvements

1. Redefine DUI for drugs similar to Vermont's recent definition.
2. Establish zero tolerance for all psychotropic drugs in drivers under the age of 21.
3. Reclassify penalties and misdemeanors to criminalize vehicular homicide or assault due to DWAI; make vehicular homicide or assault due to careless driving a felony.
4. Impose the same requirements and sanctions for drug testing that currently apply to alcohol testing.
5. Eliminate the statutory presumption of innocence for a BAC below .05 if psychotropic drugs in addition to alcohol are present.
6. Enhance penalties for polydrug impairment.
7. Eliminate alcohol sanctions for drug impairment convictions.
8. Implement electronic warrants to reduce delays in taking blood samples.
9. Adopt National Safety Council forensic testing recommendations.
10. Include officer-collected evidence from the scene of arrest in statutory reports from the Division of Criminal Justice.

Weakest in the Nation is available on Amazon.com.