1. Admissibility and Sufficiency of Extrapolation Evidence in DUI Prosecutions, 119 A.L.R.5th 379
Admissibility and Sufficiency of Extrapolation Evidence in DUI Prosecutions

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Summary

Extrapolation is the use of scientific evidence to relate a DUI defendant’s blood alcohol level at the time of breath or blood testing back to the time of operation of the vehicle. Many courts have considered the issue of whether the prosecution and defense may offer expert extrapolation evidence in DUI trials, and what use may be made of that evidence. While a majority of jurisdictions do not require the prosecution to extrapolate blood alcohol concentration (BAC) test results back to the time of driving to gain a DUI conviction, a majority do allow the defendant to offer extrapolation evidence to rebut the prosecution’s DUI evidence and demonstrate that their BAC was below the legal limit while driving. In Bagheri v. State, 119 S.W.3d 755, 119 A.L.R.5th 785 (Tex. Crim. App. 2003), the court decided that the erroneous admission into evidence of the state expert’s extrapolation testimony warranted reversal of the defendant’s DUI conviction where it could not be determined whether the jury convicted the defendant of impairment DUI or “per se” DUI with a BAC test result in excess of 0.10%. The court reasoned that, since the expert had testified that he had performed his extrapolations using scientifically reliable evidence, and such testimony had a powerful persuasive effect upon the jury and prejudiced its consideration of other admissible evidence. This annotation collects and discusses all of the cases that have considered the use of extrapolation evidence in DUI prosecutions.

Text

[*I] PRELIMINARY MATTERS

[*1] Introduction

[*1a] Scope

This annotation collects and discusses all of the cases that have considered the use of extrapolation evidence in DUI prosecutions. Not covered in this annotation are the cases in which the courts have considered the use of extrapolation evidence in license revocation hearings for DUI, or other types of cases, such as tort actions or homicide prosecutions where extrapolation evidence is offered. Relevant statutes are discussed herein to the extent that they are reflected in the reported cases on point. As many of these cases turn on the particular statutory phrasing, the reader should consult the appropriate statutes in the jurisdictions of interest.

A number of jurisdictions may have rules, regulations, constitutional provisions, or legislative enactments directly bearing upon this subject. These provisions are discussed herein only to the extent and in the form that they are reflected in the court opinions that fall within the scope of this annotation. The reader is consequently advised to consult the appropriate statutory or regulatory compilations to ascertain the current status of all statutes discussed herein, including those listed in the Jurisdictional Table of Cited Statutes and Cases.

Some opinions discussed in this annotation may be restricted by court rule as to publication and citation in briefs; readers are cautioned to check each case for restrictions.

[*1b] Related annotations

A.L.R. Index, Automobiles and Highway Traffic

A.L.R. Index, Blood Tests

A.L.R. Index, Breath Tests

Timothy Culhane
A.L.R. Index, Chemical Sobriety Test
A.L.R. Index, Evidence Rules
A.L.R. Index, Experiments and Tests
A.L.R. Index, Expert and Opinion Evidence
A.L.R. Index, Intoxicating Liquors

What Constitutes Driving, Operating, or Being in Control of Motor Vehicle for Purposes of Driving While Intoxicated Statute, Regulation, or Ordinance -- Being in Physical Control or Actual Physical Control -- Passengers, 94 A.L.R.6th 191

What Constitutes Driving, Operating, or Being in Control of Motor Vehicle for Purposes of Driving While Intoxicated Statute, Regulation, or Ordinance -- Being in Physical Control or Actual Physical Control -- Motorist Sleeping or Unconscious, 93 A.L.R.6th 207

What Constitutes Driving, Operating, or Being in Control of Motor Vehicle for Purposes of Driving While Intoxicated Statute, Regulation, or Ordinance -- Being in Physical Control or Actual Physical Control -- General Principles, 92 A.L.R.6th 295

Permissibility under Fourth Amendment of Investigatory Traffic Stop Based Solely on Anonymous Tip Reporting Drunk Driving, 84 A.L.R.6th 293

Validity, Construction, and Application of Statutes Prohibiting Boating While Intoxicated, Boating While Under the Influence, or the Like, 47 A.L.R.6th 107

Validity, Construction, and Application of State “Zero Tolerance” Laws Relating to Underage Drinking and Driving, 34 A.L.R.6th 623

Claim of Diabetic Reaction or Hypoglycemia as Defense in Prosecution for Driving While Under Influence of Alcohol or Drugs, 17 A.L.R.6th 757

Validity, Construction, and Application of Ignition Interlock Laws, 15 A.L.R.6th 375

Excessiveness or Inadequacy of Damage Awards Against Drunk Drivers, 14 A.L.R.6th 263

Vertical Gaze Nystagmus Test: Use in Impaired Driving Prosecution, 117 A.L.R.5th 491

Denial of Accused’s Request for Initial Contact with Attorney -- Drunk Driving Cases, 109 A.L.R.5th 611

Post-Daubert Standards for Admissibility of Scientific and Other Expert Evidence in State Courts, 90 A.L.R.5th 453

Driving while intoxicated: subsequent consent to sobriety test as affecting initial refusal, 28 A.L.R.5th 459

Horizontal gaze nystagmus test: use in impaired driving prosecution, 60 A.L.R.4th 1129

Validity, construction, and application of statutes directly proscribing driving with blood-alcohol level in excess of established percentage, 54 A.L.R.4th 149

Drunk driving: Motorist’s right to private sobriety test, 45 A.L.R.4th 11

Necessity and sufficiency of proof that tests of blood alcohol concentration were conducted in conformance with prescribed methods, 96 A.L.R.3d 745

What constitutes driving, operating, or being in control of motor vehicle for purposes of driving while intoxicated statutes, 93 A.L.R.3d 7
What amounts to violation of drunken-driving statute in officer’s “presence” or “view” so as to permit warrantless arrest, 74 A.L.R.3d 1138

Construction and application of statutes creating presumption or other inference of intoxication from specified percentages of alcohol present in system, 16 A.L.R.3d 748

Validity, construction, and application of provision for revocation or suspension of driver’s license because of conviction of traffic violation in another state, 87 A.L.R.2d 1019

Admissibility and weight of evidence based on scientific test for intoxication or presence of alcohol in system, 159 A.L.R. 209

Degree or nature of intoxication for purposes of statute or ordinance making it a criminal offense to operate an automobile while in that condition, 142 A.L.R. 555

Admissibility and weight of evidence based on scientific test for intoxication or presence of alcohol in system, 127 A.L.R. 1512

Driving automobile while intoxicated as a substantive criminal offense, 68 A.L.R. 1356

Driving automobile while intoxicated as a substantive criminal offense, 49 A.L.R. 1392

Driving automobile while intoxicated as a substantive criminal offense, 42 A.L.R. 1498

C.J.S., Motor Vehicles §§ 1403, 1407

Nichols, 2 Drinking/Driving Litigation § 23:01 (1985)

Taylor, Drunk Driving Defense, §§ 5.2, 5.2.3 (5th ed. 2000)


Gulberg, Variation in Blood Alcohol Concentration Following the Last Drink, 10 J. of Police Science & Admin. 289 (1982)


Schefter, Under the Influence of Alcohol Three Hours After Driving: The Constitutionality of the (A)(5) Amendment to Pennsylvania’s DUI Statute, 100 Dick.L.Rev. 441 (1996)

Wherry, Jr., The Rush to Convict DWI Offenders: The Unintended Unconstitutional Consequences, 19 Dayton L. Rev. 429, 449 (1994)

[*2] Summary and comment
[*2a] Generally

This annotation covers statutes and case law concerned with extrapolation of breath or blood test results back to the time of driving. The issue first arises when the prosecution attempts to introduce blood alcohol concentration test results into evidence to prove its DUI charge. The test results are obtained either by a blood alcohol content (BAC) blood test, or by a breath alcohol content (BrAC) intoxilyzer test.¹

The resulting DUI charge can either be a “per se” charge -- that the defendant’s BAC test score was in excess of the legal limit, or a non-“per se”/impairment charge -- that he defendant drove while impaired due to consumption of

¹ See Am. Jur. 2d, Automobiles and Highway Traffic § 1083.

Timothy Culhane
alcohol. The defense may then argue that the state should be required to extrapolate the BAC test results back to the time of driving through expert extrapolation testimony, or may seek to introduce his or her own expert extrapolation testimony to the effect that his or her BAC while driving was below the legal limit, and through the process of absorption in the body, rose to a level in excess of the legal limit after driving and before testing.

The threshold issue regarding extrapolation or relate back proof is often whether or not it is relevant and admissible. Some courts have found that it is relevant and admissible where the proponent’s expert is sufficiently qualified to perform extrapolations by virtue of education and experience, and had sufficient familiarity with the facts of the case to render a reliable opinion (§ 3). Other courts have ruled that the extrapolation expert’s qualifications or knowledge of the facts of the case were so limited as to make that expert’s testimony irrelevant and inadmissible (§ 4). There is authority that has decided that extrapolation evidence was admissible because of certain statutory provisions (§ 5), while others have held that relate back testimony is always inadmissible because of specific statutory provisions (§ 6).

Regarding the prosecution’s efforts to introduce blood alcohol test results, a majority of courts have decided that the prosecution is not required to relate breath test results back to the time of driving (§ 7). Courts have reached this conclusion for various reasons, including that to make such a requirement would be to place an impossible burden on the prosecution (§ 7[a]); because the statute, on its face, does not require such proof (§ 7[b]); because the test result creates prima facie evidence of guilt, (§ 7[c]); because the test results alone constitute sufficient evidence to obtain a 

DUI

conviction (§ 7[d]); because other evidence of guilt obviates the need for relate back evidence (§ 7[e]); and because the statute itself relates the BAC test results back to the time of driving (§ 7[f]).

In some jurisdictions, the prosecution is required to relate test results back to the time of driving (§ 8). The courts in those jurisdictions had made the requirement based upon particular statutory mandates (§ 8[a]), or have required the prosecution to offer expert extrapolation testimony only if it wishes to introduce the numerical result of the breath or blood test (§ 8[b]) or to take advantage of a statutory presumption of intoxication which results from a test result in excess of the statutorily provided legal limit (§ 8[c]).

Where the prosecution has offered admissible expert extrapolation testimony, some courts have found that testimony sufficient to warrant either introduction of test results or a 

DUI

conviction (§ 9[a]), while others have found it insufficient to warrant introduction of the test results or a 

DUI

conviction (§ 9[b]).

Regarding the defendant’s use of expert extrapolation evidence, a great majority of courts have held that the defendant may be allowed to offer such evidence to show a 

DUI

below the legal limit while driving (§ 10), and some have ruled that it is error to prevent the defense from utilizing an extrapolation defense (§ 11).

Regarding defense expert extrapolation evidence, some courts have found it to be sufficient to rebut the presumption of intoxication created by test results in excess of the statutory limit (§ 12[a]), while others have decided that it was not sufficient to rebut the prosecution’s case (§ 12[b]).

[*2b] Practice pointers

Counsel are advised that the first issue ordinarily encountered in 

DUI

prosecutions with regard to extrapolation evidence is often the issue of relevance or admissibility. In order for the prosecution or defense to introduce expert testimony relating the defendant’s BAC test results back to the time of driving, they must be prepared to show that their expert is qualified to extrapolate by virtue of his or her skill, experience, training or education in extrapolation and he or she is sufficiently familiar with the facts of the case and the defendant’s individual characteristics, including the amount of alcohol consumed, the time lapse between drinking and testing, the amount of food consumed, and the defendant’s height and weight, to offer a reliable opinion.

With regard to the use of admissible extrapolation evidence that may be made by the defense or prosecution, counsel are cautioned that courts in most jurisdictions base their decisions regarding the use of extrapolation evidence

\[2\] Cunningham v. McDonald, 689 A.2d 1190 (Del. 1997).


Timothy Culhane
largely upon the language of or their interpretations of applicable DUI statutory schemes. For instance, whether or not a court will allow the introduction of expert extrapolation testimony may depend upon whether the applicable DUI statute provides that BAC test results in excess of the legal limit create a prima facie evidence of guilt, or a rebuttable presumption of guilt.\(^5\)

Counsel are also cautioned to research the legislative history of DUI statutes, because some courts have found that changes in statutory language constitute legislative intent regarding the use of extrapolation evidence.\(^6\)

Counsel should also note that decisions rendered in cases which were not DUI prosecutions, but which nevertheless involved DUI issues, may constitute case law which the some courts find relevant to DUI prosecutions, and vice versa. For example, a court may find that the rationale in a DUI manslaughter decision may be relevant in a DUI prosecution in the same jurisdiction.\(^7\)

On the other hand, some courts have declared that the standard of admissibility of extrapolation evidence in criminal DUI prosecutions is separate and distinct from that utilized in a driver’s license revocation hearing based upon DUI test results.\(^8\)

Counsel should familiarize themselves with the science of extrapolation before attempting to utilize such evidence in court. Many courts have commented upon the importance of reliable expert testimony concerning the principles of rising and falling BAC levels in the blood in determining the admissibility and use of extrapolation evidence. One of these principle is the concept of absorption. One court summed up this process by stating that, as alcohol is consumed, it passes from the stomach and intestines into the blood, and from there to the brain and nervous system, impairing a person’s ability to drive.\(^9\)

The process of rising and falling BAC is commonly referred to as a blood alcohol curve, which may the be derived scientifically by plotting the amount of alcohol the body absorbs against the time it takes to do so. Courts have noted that a person’s blood alcohol concentration (BAC) rises until absorption is complete, so a BAC test taken immediately after ingestion will show a lower BAC than one taken somewhat later, even though the amount of alcohol consumption is the same.\(^10\)

The absorption issue has been held relevant to what inferences of guilt are to drawn from a BAC test result taken some time after driving, and whether the parties may make use of extrapolation evidence to prove BAC at the time of driving.\(^11\)

Another relevant factor in blood alcohol curve equation is that of elimination. Some courts have allowed experts to testify as to peak levels of absorption, and that after peak is reached, elimination of alcohol from the blood begins, and continues at a fairly constant rate of 0.15% per hour.\(^13\)

Consequently, counsel are advised to be certain prior to trial that their experts are prepared to testify regarding the factors affecting the absorption and elimination rate if they wish to offer admissible relate back testimony. In other

\(^4\) Cunningham v. McDonald, 689 A.2d 1190 (Del. 1997).
\(^6\) For example, in Knapp v. Miller, 165 Ariz. 527, 799 P.2d 868 (Ct. App. Div. 1 1990), the court found that the legislature’s deletion of the phrase, “at the time of the alleged offense,” evinced legislative intent to disallow extrapolation evidence showing BAC at the time of driving, and to make BAC at the time of testing sufficient proof of guilt of “per se” DUI.
\(^12\) Tyner v. State, 503 N.E.2d 444 (Ind. Ct. App. 2d Dist. 1987), and to be 40 to 70 minutes after consumption, in State v. Bressman, 236 Kan. 296, 689 P.2d 901 (1984).

Timothy Culhane
words, courts have found that expert extrapolation testimony is not reliable unless the expert has knowledge of various facts and individual characteristics of the defendant. Factors found to be important include the defendant’s weight, age, prior food consumption and chronic alcohol usage, the defendant’s alcohol tolerance, and/or the lapse of time between driving and testing, individual absorption and elimination rates, and the lapse of time between drinking and driving.

However, the majority of courts appear to give more consideration to four extrapolation/absorption/elimination factors, namely: (1) the presence and type of food in the stomach; (2) the person’s gender, weight, age, mental state, and drinking pattern; (3) the amount and type of beverage consumed; and (4) the time period of alcohol consumption.

Counsel should also be aware that courts which are wary of the relatively new science of extrapolation will be more likely to allow such testimony if the offering expert is able to demonstrate that he is qualified to offer it by his experience, education, training and knowledge of the scientific processes involved in absorption and elimination, but does not give too definitive of an opinion regarding his conclusions, and testifies that he is only offering an estimate based upon various variable factors.

Counsel should also be sure to eliminate the possibility of intervening alcohol consumption between driving and testing, as extrapolation has been held by some courts to be impossible where the driver has consumed alcohol after driving and before testing.

Proper precautions should also be taken which are specific to procedure in trials involving the use of expert extrapolation evidence. For example, it has been held that a party should not have mentioned extrapolation evidence in opening argument where there existed a serious question of admissibility of such evidence.

Counsel should also guard against violation of discovery rules with regard to expert extrapolation testimony. At least one court has ruled that it was error for the state to introduce expert extrapolation testimony where the prosecution failed to disclose its experts’ names to the defense prior to trial, thereby depriving the defense of its opportunity to rebut or diminish the impact of the prosecution’s expert extrapolation testimony.

Counsel should also take care not to waive objections to their opponents’ expert extrapolation testimony. It has been held that the defense waived its opportunity to rebut the accuracy of BAC test results with extrapolation testimony by failing to use existing case law in support of that defense.

It has also been held that a defendant waived the right to object to the state’s lack of expert extrapolation evidence in a jurisdiction where such proof may have been statutorily required to obtain a DUI conviction when he failed to object.

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20 In Com. v. Smith, 35 Mass. App. Ct. 655, 624 N.E.2d 604 (1993), the court ruled the prosecution’s extrapolation evidence inadmissible, but did not grant the defendant’s subsequent motion for mistrial, because the court noted that, pursuant to previous decisions, such evidence could have been admitted under other circumstances. However, in jurisdictions where relate back evidence is not admissible, or in jurisdictions where it may not be admissible in certain circumstances, a motion for mistrial could be more favorably received.
22 In Smith v. State, 2000 WL 962751 (Tex. App. Austin 2000), petition for discretionary review refused, (Oct. 4, 2000) (unpublished opinion). Fortunately for counsel, the court held that his failure to object to the BAC results did not constitute ineffective assistance of counsel, because there was ample evidence of guilt beyond the BAC test results. However, it logically follows that, where the state bases its case solely upon test results, defense counsel’s failure to raise an extrapolation argument of defense could be viewed by an appellate court as ineffective assistance of counsel.

Timothy Culhane
to the prosecution’s introduction of BAC test results in the government’s case-in-chief and stipulated that the government’s expert witness would not be required to testify.

Finally, counsel are advised that, when preparing jury instructions specific to extrapolation evidence, they should draft them with language drawing certain clear distinctions, such as those between “per se” and non-“per se” DUI statutes, and with a mind toward accurately explaining the use of presumptions or inferences of guilt that may be drawn from test results, and the effect that expert extrapolation testimony may have on those presumptions or inferences.

[*II] THRESHOLD ISSUE REGARDING RELEVANCE AND ADMISSIBILITY OF EXTRAPOLATION EVIDENCE

View that extrapolation evidence is relevant and admissible due to expert qualifications and observations.

The courts in the following cases ruled that extrapolation evidence was relevant and admissible in prosecutions for driving while intoxicated since the expert offering that testimony was qualified to give an opinion because of ample qualifications and ample opportunity to observe the defendant at the scene.

In *Smith v. City of Tuscaloosa*, 601 So. 2d 1136 (Ala. Crim. App. 1992), the court ruled that the state’s extrapolation evidence was admissible in a prosecution for driving while intoxicated. Affirming the lower court’s decision to admit an expert’s retrograde extrapolation of a defendant’s breath alcohol content test results back 15 hours to the time of driving, the court decided that the expert’s witness’s knowledge, training, and practical experience in alcohol absorption in the human body exceeded that of the average juror or witness, so he was competent to testify as an expert. His experience in daily performing retrograde extrapolations and his study of recently accepted scientific literature on the subject were matters that the court considered in reaching its decision. Any objection to the state’s expert testimony, the court added, would go to the weight rather than to the admissibility of his testimony.

A lower court’s ruling on the relevance of the state’s expert extrapolation evidence was affirmed in *State v. Root*, 193 Ariz. 442, 973 P.2d 1203 (Ct. App. Div. 1 1998), as amended, (Dec. 15, 1998) and opinion vacated on other grounds, 195 Ariz. 9, 985 P.2d 494 (1999). Noting that the DUI statute, Ariz. Rev. Stat. Ann. § 28-692(E), provided that a presumption of intoxication based on breath test results would only apply where breath tests were administered within two hours of the time of driving, the court declared that this did not mean it was mandatory to test for intoxication within two hours of driving, since the state could offer expert testimony that extrapolated the test results back to the statutorily established two hour time period. Such evidence, the court ruled, was relevant to the state’s case, since, if admitted into evidence, it would allow the court to grant a jury instruction on the issue of presumption of intoxication due to extrapolated test results.

Affirming a DUI conviction for driving with a BAC (breath alcohol content) of 0.08% or more, the court, in *State v. Vliet*, 95 Haw. 94, 19 P.3d 42 (2001), declared that a forensic toxicologist’s opinion, that the defendant’s BAC at the time of the traffic stop was 0.09%, based on retrograde calculations back from the time of the breath test, was relevant and admissible. The court reasoned that such testimony by a sufficiently qualified expert would assist the trier of fact in determining whether the defendant’s BAC was 0.08% or greater at the time of the traffic stop. Noting that Hawaii Rules of Evidence, Rule 702, provided that an expert witness qualified by knowledge, skill, training or education could testify in the form of an opinion if that opinion assisted the trier of fact and was based upon valid scientific technique, the court determined that the state’s toxicologist was a qualified expert since he had sufficiently reviewed the state’s evidence and applied a Widmark extrapolation formula which was widely accepted as reliable by the relevant scientific community.

In *People v. Bodoh*, 200 Ill. App. 3d 415, 314 Ill. Dec. 215, 558 N.E.2d 178 (1st Dist. 1990) the court affirmed the defendant’s DUI conviction, despite the fact his numerical breath test results should not have been admitted into

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23 *State v. Scussel*, 117 N.M. 241, 871 P.2d 5 (Ct. App. 1994). The court decided that defense counsel’s failure to object did not constitute ineffective assistance of counsel since there was ample evidence of guilt apart from the defendant’s test results.


25 The Widmark formula is used by experts to account for elimination of alcohol from the blood, in the case of DUI, from the time of consumption to the time of testing. In *Vliet*, the prosecution’s expert testified that, although the defendant’s BAC was 0.079% when tested, it could have been as high as 0.094% one hour earlier when he drove, assuming the average elimination rate of 0.15 per hour.

Timothy Culhane
evidence, since the state’s expert extrapolation testimony regarding total body burden of alcohol was admissible and constituted sufficient proof to warrant the conviction. Declaring that numerical breath test results were not the sole basis for finding a defendant guilty of DUI, the court concluded that the state offered sufficient expert testimony to prove intoxication, since the state’s chief toxicologist utilized the defendant’s metabolism rate and BAC test results to extrapolate the defendant’s total body burden of alcohol back to the time of driving, thereby demonstrating that the defendant had consumed nine drinks before driving. This amount of alcohol, the expert declared, was enough to support the state’s theory that the defendant drove while intoxicated. The court agreed, basing admissibility of the extrapolation evidence upon the expert’s qualifications, including his testimony regarding his previous extrapolations and the methodology he employed for extrapolation, as well as his assertion that he was only testifying as to total body burden of alcohol, and not as to specific, numerical breath alcohol concentration. The court added that, although it was error for the expert to mention numerical test results in excess of the legal limit while arriving at this conclusion, that error was harmless, since other evidence adduced at trial was sufficient to prove guilt. This evidence, the court concluded, was the number of drinks the defendant consumed prior to driving, or total body burden of alcohol, and his physical condition at the time of arrest, as testified to by the arresting officer.

Refusing to agree with a defendant’s assertion that extrapolation evidence was “junk science,” the court, in People v. Latto, 304 Ill. App. 3d 791, 237 Ill. Dec. 649, 710 N.E.2d 72 (1st Dist. 1999), affirmed an aggravated DUI conviction based upon expert extrapolation evidence. This evidence, which consisted of the state toxicologist’s estimation of defendant’s blood alcohol level at the time of driving based upon an extrapolation back from results rendered in a post-arrest blood test, was ruled admissible at trial. The court affirmed that ruling, declaring that retrograde extrapolation is a scientifically accepted method of determining blood alcohol content. The court also noted that both prosecution and defense experts agreed that it was a method by which blood alcohol level could be estimated, and that neither expert attempted to assert the process’s infallibility, with both experts testifying that retrograde extrapolation produced noting more than estimates. When offered in that manner, the court concluded, such evidence was admissible and the lower court committed no error by allowing it into evidence.

The court ruled that extrapolation evidence was relevant to prove that a driver had ingested alcohol before driving, but not to prove a specific BAC (blood alcohol content) or sufficient ingestion of alcohol to cause impairment while driving, in Tyner v. State, 503 N.E.2d 444 (Ind. Ct. App. 2d Dist. 1987). The court reasoned that extrapolation evidence, while not conclusive as to the ultimate issues of impairment or specific BAC, did bear upon the question of intoxication while driving, and thus was probative as to a material fact, namely, the temporal connection between ingestion (which it did prove) and an automobile accident. Accordingly the court affirmed the defendant’s conviction for causing injury and death for driving while intoxicated which was obtained by virtue of admission of the state’s extrapolation evidence.

Although the case of State v. Jensen, 482 N.W.2d 238 (Minn. Ct. App. 1992) concerned a prosecution for vehicular homicide while intoxicated, the court reached a decision that was relevant to DUI prosecutions, namely that testimony concerning retrograde extrapolation was admissible to prove that the defendant’s BAC was 0.10 or more at the time of driving. Noting that the police were unable to give a blood test to the defendant until 11 hours after driving, and that the test result at that time was 0.07, but that the state’s two expert witnesses extrapolated the results back to the time of driving as being between 0.181 and 0.31, the court found the extrapolation testimony admissible. The court reasoned that since the experts had access to important information such as the defendant’s height, weight, gender amount and type of food eaten, type and time of alcohol consumed, and the length of time between driving and testing, and that they had utilized the methodology of multiplying the average alcohol elimination rate by the number of hours between the incident and testing, their testimony was relevant to the issue of alcohol concentration at the time of the accident, and to show that the defendant’s BAC was above the legal 0.10 limit at that time. The court added that the principles regarding retrograde extrapolation were neither emerging nor novel, and were not scientific tests, but merely mathematical formulas, so the traditional tests for admissibility of scientific evidence, such as the one established in Frye v. U.S., 293 F. 1013, 34 A.L.R. 145 (App. D.C. 1923), did not apply to them.

Affirming the defendant’s driving while impaired conviction, the court, in State v. Catoe, 78 N.C. App. 167, 336 S.E.2d 691 (1985), writ allowed, stay allowed, 315 N.C. 186, 338 S.E.2d 107 (1985) and review denied, 316 N.C. 380, 344 S.E.2d 1 (1986), ruled that the lower court properly found the state’s expert extrapolation testimony to be admissible. The court observed that the defense had not objected to the state expert’s qualifications, and that the expert had extrapolated results of two breath tests administered to the defendant 2 hours after driving by utilizing an assumed average rate of bodily elimination of alcohol. The court reasoned that the expert simply utilized a simple

Timothy Culhane
mathematical extrapolation to attain his results, a technique which had general acceptance in the relevant scientific community, and therefore met the test of reliability of the North Carolina Rules of Evidence, Rule 702. The evidence was reliable and thus admissible, the court declared, even though there was a possibility of minor variation in individuals as to the average rate of elimination of alcohol. Such variation went to the weight, not the admissibility, of the expert testimony, the court concluded.

In Com. v. Britcher, 386 Pa. Super. 515, 563 A.2d 502 (1989), order aff’d without opinion, 527 Pa. 411, 592 A.2d 686 (1991), the court determined that the extrapolation testimony of the state’s forensic toxicologist was admissible, and affirmed the defendant’s convictions for driving under the influence with a BAC of over 0.10. The court found that the expert’s extrapolation testimony was admissible because it was supportable by reasonable inferences derivable from other evidence concerning the defendant’s drinking and the lapse of time between his driving and the taking of his blood. The expert, observed the court, merely informed the jury that, due to the average rate of absorption, the defendant’s BAC of 0.203 should be reduced by 0.02 for every beer consumed in the crucial 30 to 90 minute period before driving, and then relied upon other witness’s testimony for the number of beers consumed and when they were consumed, to reach a mathematical extrapolation result of 0.18. That the expert also gave his calculations based upon a hypothetical scenario of a specific number of beers consumed by the defendant was not grounds for objection, the court opined, since the state’s hypothetical was supported by facts in evidence and reasonable inferences that could be drawn therefrom.

**** Comment:
The Pennsylvania Supreme Court’s holding in may be distinguished from its seemingly contradictory decision in Com. v. Gonzalez, 519 Pa. 116, 546 A.2d 26 (1988), because the latter case involved extrapolation by a government expert who did not know when the suspect had had his last drink, and was forced to assume a fact not in evidence to craft his hypothetical. Consequently, the court decided, the expert’s extrapolation testimony was inadmissible. Conversely, in , the expert based his hypothetical as to when the defendant had his last drink upon the testimony of other witnesses, and the reasonable inferences that could be drawn from that testimony. Consequently, the expert’s testimony was ruled admissible.

Where an expert witness extrapolated a breath test result of 0.138 back approximately one hour to prove a blood alcohol concentration of between 0.11 to 0.16 while driving, but the expert admitted that he lacked sufficient information to render a precise breath alcohol content (BrAC) at the time of driving, the court nevertheless held the state’s expert extrapolation testimony to be sufficiently reliable and relevant to be admissible, in Hartman v. State, 2 S.W.3d 490 (Tex. App. San Antonio 1999), petition for discretionary review refused, (Feb. 9, 2000) and (overruled on other grounds by, Bagheri v. State, 87 S.W.3d 657 (Tex. App. San Antonio 2002)). The court based its decision of admissibility on three factors -- the expert’s impeccable qualifications, his extensive personal experience with the alcohol absorption and elimination process, which led to his conclusion that the standard elimination rate was.02 per hour, and the limits, which he himself placed upon his opinion. Once the lower court found the testimony relevant and of aid to the trier of fact, the court concluded, any further doubts as to the veracity of the expert’s opinion were for the trier of fact to weigh.

**** Comment:
The court in Bagheri v. State, 87 S.W.3d 657 (Tex. App. San Antonio 2002), in overruling Hartman v. State, 2 S.W.3d 490 (Tex. App. San Antonio 1999), petition for discretionary review refused, (Feb. 9, 2000), held that the sufficiency of the evidence to support the defendant’s conviction for driving while intoxicated (DWI) based on an impairment theory, rather than a per se theory, did not, alone, establish that the error in admitting a flawed retrograde extrapolation analysis of breath test results was harmless, in the case in which the jury was instructed on both an impairment theory and per se theory of DWI, where the jury instruction presented both theories in a single question, making it impossible to know which theory persuaded the jury beyond a reasonable doubt and thus, gave no assurance that the flawed evidence did not influence the jury or had only a slight effect on the jury.

In Mata v. State, 13 S.W.3d 1 (Tex. App. San Antonio 1999), petition for discretionary review granted, (Apr. 5, 2000), the court held that a state’s expert could relate the results of the defendant’s breath test back to the time he drove. Affirming the defendant’s DUI conviction, the court also ruled that the expert’s relate-back testimony was reliable because of the expert’s impeccable qualifications, his extensive personal observations of the alcohol absorption and elimination process, and the limits, which he himself placed upon his opinion.

**** Comment:

Timothy Culhane
The court in Bagheri v. State, 87 S.W.3d 657 (Tex. App. San Antonio 2002), in overruling Mata v. State, 13 S.W.3d 1 (Tex. App. San Antonio 1999), petition for discretionary review granted, (Apr. 5, 2000), held that the sufficiency of the evidence to support the defendant’s conviction for driving while intoxicated (DWI) based on an impairment theory, rather than a per se theory, did not, alone, establish that the error in admitting a flawed retrograde extrapolation analysis of breath test results was harmless, in the case in which the jury was instructed on both an impairment theory and per se theory of DWI, where the jury instruction presented both theories in a single question, making it impossible to know which theory persuaded the jury beyond a reasonable doubt and thus, gave no assurance that the flawed evidence did not influence the jury or had only a slight effect on the jury.

**** Comment:
The court in Mata v. State, 122 S.W.3d 813 (Tex. Crim. App. 2003), granted the defendant/appellant’s petition for discretionary review, vacated the court of appeal’s decision and remanded the case to that court for reconsideration of the harm analysis cited in the decision of Bagheri v. State, 119 S.W.3d 755, 119 A.L.R.5th 785 (Tex. Crim. App. 2003), § 4. Essentially, the court ruled that, where a defendant is tried on both impairment and “per se” DUI charges, it is reversible error to admit flawed retrograde extrapolation evidence since the jury would not know how to disregard that evidence as to both charges, and even though there may be sufficient additional evidence to convict on the impairment theory, since there was insufficient evidence to convict on the “per se” charge, and it could not be said with authority which evidence the jury utilized to convict on which charge, then the case must be remanded for trial without the inadmissible flawed extrapolation testimony.

Affirming the defendant’s conviction for DUI, the court, in Washburn v. State, 2002 WL 31015255 (Tex. App. San Antonio 2002), decided that the state expert’s retrograde extrapolation as to the defendant’s blood alcohol concentration (BAC) at the time of driving was sufficiently reliable for purposes of admissibility. In reaching the decision of admissibility, the court reasoned that the expert explained the science of retrograde extrapolation to the jury with sufficient clarity, acknowledged the difficulties associated with the process, and relied on presumptions regarding personal characteristics and behaviors of the defendant that the defendant’s own testimony verified. Based on these factors, the court concluded, the trial court’s decision to admit the expert’s testimony was within the zone of reasonable disagreement, and was not an abuse of discretion.

CUMULATIVE CASES
Cases:

Evidence was sufficient to support conviction for operating vehicle while intoxicated (DWI), even though defendant performed two sobriety tests at police headquarters without noticeable trouble, and defendant’s speech was then not slurred; sobriety tests at headquarters were conducted more than one hour from time of first field-sobriety tests at scene of two-car accident, defendant admitted that he was drinking prior to accident, that he was driving vehicle at time of accident, and that he was not on any medication at times that field-sobriety tests and breath test were given, and breath test showed that defendant had blood-alcohol level of twice legal limit. LSA-R.S. 14:98, subd. A(1)(b, c), 32:662, subd. A(1)(c). State v. Doucette, 899 So. 2d 159 (La. Ct. App. 3d Cir. 2005).

Expert testimony concerning defendant’s alcohol consumption and retrograde extrapolation was admissible in defendant’s trial for per se driving under the influence (DUI), as testimony was offered to prove that defendant’s blood alcohol concentration (BAC), which was found to be only .01% over legal limit after one hour delay, was not above legal limit when defendant was pulled over, rather than to prove that alcohol consumption did not impair her ability to drive. West’s A.M.C. § 63-11-30(1)(c). Evans v. State, 25 So. 3d 1054 (Miss. 2010).

Expert testimony on defendant’s alcohol consumption and retrograde extrapolation, a scientific method of making a determination of a person’s blood alcohol content (BAC) at a particular point in time, was admissible in per se driving under the influence (DUI) trial involving defendant whose BAC was not tested until approximately one hour after she was pulled over by officer; the evidence was especially relevant, given the one-hour delay before the test and the fact that defendant’s BAC was only .01% over legal limit, and the evidence was offered to prove whether defendant was at a certain BAC level at time she was stopped in her vehicle, not to show whether she was impaired at time she was driving. West’s A.M.C. § 63-11-30(1)(c). Evans v. State, 25 So. 3d 1061 (Miss. Ct. App. 2008), cert. granted, 14 So. 3d 731 (Miss. 2009) and aff’d on other grounds, 25 So. 3d 1054 (Miss. 2010).

Retrograde extrapolation evidence is relevant to a driving under the influence (DUI) charge involving a theory of either being under the influence of an intoxicating liquor or having concentration of alcohol of 0.08 or more in one’s

Timothy Culhane
blood or breath; such evidence has a tendency to make the existence of a consequential fact, i.e., the level of alcohol in a defendant’s blood at a certain point in time, more probable than it would be without the evidence. NRS 48.015, 484C.430(1). State v. Eighth Judicial Dist. Court of State ex rel. County of Clark, 127 Nev. Adv. Op. No. 84, 2011 WL 6840685 (Nev. 2011).

Doctor’s extrapolation testimony regarding defendant’s blood alcohol concentration (BAC) at the time of the crash was reliable; doctor utilized a later blood test BAC measurement to calculate the defendant’s BAC at the time of the accident, and in making this calculation, doctor considered the time elapsed, the average “social drinker” burn-off rate and the amount of alcohol in the defendant’s stomach that would not yet be absorbed, and any other unknown data or assumptions were matters which affected the weight of the evidence, but did not preclude its admissibility. State v. Lavoie, 880 A.2d 432 (N.H. 2005).

Admission, in a prosecution for driving while intoxicated (DWI), of expert testimony on retrograde extrapolation of blood alcohol concentration (BAC) is subject to the general requirements for admission of expert testimony, i.e., the expert must be qualified, the scientific evidence must assist the trier of fact, and the expert may only testify to scientific, technical, or other specialized knowledge. NMRA, Rule 11-702. State v. Silago, 2005-NMCA-100, 119 P.3d 181 (N.M. Ct. App. 2005).

Trial court did not abuse its discretion in admitting testimony of expert witness that defendant’s breath alcohol level, measured by use of retrograde extrapolation model, was likely 0.10 at time she was stopped by police, as testimony was sufficiently reliable and relevant, in that appellate court had previously recognized that retrograde extrapolation evidence was sufficiently reliable, and average alcohol elimination rate could aid fact finder in determining whether it was more or less likely defendant’s breath alcohol level exceeded statutory limit for purposes of charge of driving while impaired (DWI). West’s N.C.G.S.A. § 20-138.1; Rules of Evid., Rules 401, 403, 702, West’s N.C.G.S.A. § 8C-I. State v. Teate, 638 S.E.2d 29 (N.C. Ct. App. 2006).

Extrapolation evidence to determine a driver’s blood alcohol level at an earlier point in time, based on a blood alcohol test result at a later point in time, is generally admissible, even if the evidence is based on an average elimination rate for a general population, rather than the driver’s actual rate for eliminating alcohol from blood. State v. Taylor, 600 S.E.2d 483 (N.C. Ct. App. 2004).

Expert testimony on retrograde extrapolation was relevant to determine whether defendant, whose blood alcohol content (BAC) taken one and one-half hours after he was stopped was .64 percent, had BAC of .08 or more at time he was driving, as required to support charge for driving under influence (DUI) based on having BAC of .08 percent or higher as shown by chemical breath analysis; it was always case that BAC would be measured some time after arrest, and not at time of driving, it was common knowledge that BAC would dissipate with passage of time, and expert testimony on retrograde extrapolation, which was scientific formula based on various factors, was always method for State to prove that defendant’s BAC, while driving, was .08 percent or more by weight of alcohol in bloodstream as shown by chemical analysis of blood. West’s Or.Rev.Stat.Ann. § 813.010(1)(a), State v. Eumana-Moranchel, 352 Or. 1, 277 P.3d 549 (2012).

The testifying expert does not need to know every single personal fact about the defendant in order for retrograde extrapolation testimony to be reliable; otherwise, no valid extrapolation could ever occur without the defendant’s cooperation, since a number of facts known only to the defendant are essential to the process. Rules of Evid., Rule 702. Owens v. State, 135 S.W.3d 302 (Tex. App. Houston 14th Dist. 2004).

View that extrapolation evidence is irrelevant and inadmissible due to lack of expert qualifications and observations

The courts in the following cases ruled that extrapolation evidence was irrelevant and/or inadmissible in prosecutions for driving while intoxicated with a BAC in excess of the legal limit, i.e., a “per se” charge of DUI, since the expert offering that testimony lacked sufficient qualifications to extrapolate test results back to the time of driving, lacked sufficient opportunity to observe the defendant at the scene, and/or was unaware of other information essential to a reliable extrapolation.

In State v. Wolf, 605 N.W.2d 381 (Minn. 2000), where a defendant was charged with “per se” DUI, the court decided that the defense expert extrapolation witness’s testimony was properly excluded at trial since the expert was

Timothy Culhane
unaware of when the defendant last consumed alcoholic beverages, the amount and type of alcohol he consumed, and his height and weight at the time of arrest, and so could not render a valid opinion as to the defendants blood alcohol concentration (BAC) at the time of driving. The court began the analysis by defining the formula for retrograde extrapolation as multiplying the alcohol elimination rate by the number of hours between the incident (e.g., driving, arrest, or accident) and administration of the blood alcohol test, adding that figure to the test reading, and then subtracting any unabsorbed alcohol at the time of the incident. The court then looked to the Minnesota Rules of Evidence, Rules 403 and 702, for guidance as to the admissibility of scientific evidence, and observed that the court’s first responsibility was to determine if the defendant’s expert testimony would assist the trier of fact to understand the evidence or to determine a fact in issue. The court’s second responsibility was to scrutinize the testimony and exclude it if it proved to be irrelevant, confusing or otherwise unhelpful. Applying that standard, the court stated that because of the paucity in the record of relevant information pertaining to the defendant’s use of alcohol and his personal characteristics, i.e., the lack of a proper foundation for offering such extrapolation testimony, the court could not conclude that the lower court’s ruling against admissibility was an abuse of discretion.

Where a defendant was charged with both driving while impaired and “per se” charge but not with regard to the “per se” charge, in *Com. v. Gonzalez*, 519 Pa. 116, 546 A.2d 26 (1988), the court ruled that the state’s extrapolation evidence was admissible on the impaired charge but not with regard to the “per se” charge. Noting that the breath test was given more than three hours after the time of defendant’s vehicular accident, and that the expert was unaware of when the defendant had his last drink or whether his blood alcohol had peaked before the accident, the court declared that the state’s expert, a police corporal, could not properly extrapolate the test results back to the time of driving. This was so, the court reasoned, because the expert did not know whether the defendant’s blood alcohol peaked before the accident, and had to assume that fact, which was not in evidence, to extrapolate the test results. Since the expert had to assume this and other facts not in evidence, such as when the defendant had his last drink, in order to determine with the BAC peak occurred, then he could not opine with any certainty as to the defendant’s blood alcohol content at the time of driving. Therefore, the court decided, the expert’s testimony was irrelevant and inadmissible on the “per se” charge. However, the court concluded that the expert’s testimony that the defendant had alcohol in his system, along with other evidence adduced at trial such as the defendant’s bloodshot eyes, his smell of alcohol and stuporous conduct at the scene, were admissible to show that the defendant was driving while impaired.

In *Com. v. Loeper*, 541 Pa. 393, 663 A.2d 669 (1995), the court held that where the state had charged a defendant with “per se” DUI, or driving with a BAC in excess of 0.10%, the state’s extrapolation evidence was irrelevant to the “per se” DUI inquiry, and thus inadmissible. Where the expert, a police officer, attempted to extrapolate test results of 0.15%, taken two hours after driving, back to the time of driving, by testifying as to the defendant’s bloodshot eyes, slurred speech and smell of alcohol, the court ruled the testimony admissible, reasoning that only scientific evidence could make it more probable that an accused possessed a BAC of 0.10% or greater at the time he operated his vehicle. This was especially so, the court noted, since the test results were insufficient to warrant a conviction due to the lapse of time between driving and testing. Timely test results and scientific evidence, including extrapolation by a qualified expert, were the only kinds of evidence admissible in a “per se” DUI prosecution, the court concluded, and no abundance of impairment evidence could remedy the lack of such evidence.

Where a defendant had been convicted of driving with a blood alcohol content (BAC) in excess of 0.10%, the court, in *Mata v. State*, 46 S.W.3d 902 (Tex. Crim. App. 2001), reversed that conviction on grounds that the trial court’s decision to allow the state’s expert to extrapolate the defendant’s BAC test results of 0.15% back more than two hours to the time of driving was error. The court reasoned that the state’s expert had no knowledge of any personal characteristics of the defendant and merely based his conclusions upon the “average person” and “normal drinking patterns” rather than on actual facts or characteristics of the defendant as verified by other testimony. The court noted that the expert also gave contradictory testimony as to how many drinks it would take to increase test results from 0.10 to 0.19 in two hours, and made a mathematical error by using the wrong elimination rate while performing a hypothetical calculation. The court looked to Texas Rules of Evidence Rule 702 for guidance as to the admissibility of the expert testimony and determined that retrograde extrapolation and the scientific theories it was based on were viewed with caution by the relevant scientific community, and were only resorted to by courts in other states where the proffered testimony was sufficiently tied to the facts of the case to aid the jury in resolving a factual dispute of BAC at the time of driving. Such testimony could be reliable, the court nevertheless declared, if an expert could explain it with clarity, demonstrate an understanding of the difficulties associated with the process, apply the

Timothy Culhane
science clearly and consistently, and have knowledge of essential facts such as the length of time between driving and testing and essential individual characteristics of the defendant. Since the state’s expert failed to explain his extrapolations with clarity, was not consistent in his application of the science, and was unaware of key individual characteristics of the defendant, the court concluded, his testimony was not relevant and was inadmissible, and the lower court’s decision to admit it constituted reversible error.

**** Comment:
This case was reversed on remand, where the Texas Court of Appeals found the admission of the retrograde extrapolation to be harmless because the jury was charged on both “per se” and non-“per se” DUI charges and there was sufficient evidence to support a finding that defendant lacked the normal use of his facilities for purposes of a non-“per se” conviction, in Mata v. State, 75 S.W.2d 499 (Tex. App. San Antonio 2002). However, the Texas Criminal Appeals court granted the defendant/appellant’s petition for discretionary review, vacated the Court of Appeal’s decision and remanded the case to that court for reconsideration of the harm analysis cited in the decision of Bagheri v. State, 119 S.W.3d 755, 119 A.L.R.5th 785 (Tex. Crim. App. 2003), this section. Essentially, the court ruled that, where a defendant is tried on both impairment and “per se” DUI charges, it is reversible error to admit flawed retrograde extrapolation evidence since the jury would not know how to disregard that evidence as to both charges, and although there may be sufficient additional evidence to convict on the impairment theory, since there was insufficient evidence to convict on the “per se” charge, and it could not be said with authority which evidence the jury utilized to convict on which charge, then the case must be remanded for trial without the inadmissible flawed extrapolation testimony.

The court, in Bagheri v. State, 119 S.W.3d 755, 119 A.L.R.5th 785 (Tex. Crim. App. 2003), affirmed the lower appellate court decision of Bagheri v. State, 87 S.W.3d 657 (Tex. App. San Antonio 2002), reversing a defendant’s DUI conviction in which the prosecution’s expert extrapolated the driver’s blood alcohol content (BAC) back to the time of driving, but used flawed techniques to do so, a fact conceded by the prosecution. It was error to introduce inadmissible retrograde extrapolation testimony into evidence at trial, the court declared, leaving only the question of whether the error was harmless. The court then determined that the introduction of flawed extrapolation testimony warranted reversal, because the state’s expert testified that his extrapolations were based upon scientifically reliable and valid evidence, and his testimony was emphasized by the prosecution, and was not merely cumulative. Consequently, the court decided, it could not be said with assurance that the expert’s testimony did not have a powerfully persuasive effect upon the average juror, so reversal was required. The potential persuasiveness of the expert’s testimony was the proper ground for reversal of the trial court and affirmation of the lower appellate court, the court concluded, and not the fact that the jury’s verdict made it impossible to determine which theory the jury relied upon to convict, as the lower appellate court had stated when reversing the trial court.

CUMULATIVE CASES
Cases:

Retrograde extrapolation testimony concerning presence of alcohol in defendant’s system was unreliable, and thus, inadmissible in manslaughter and intoxication manslaughter prosecution; expert admitted that to accurately testify regarding defendant’s blood alcohol concentration at time of accident, he would need more specific information about defendant, such as defendant’s food or alcohol intake before accident or whether defendant’s bodily functions were working well, all of which would affect when defendant achieved his peak blood alcohol level. State v. Franco, 180 S.W.3d 219 (Tex. App. San Antonio 2005), reh’g overruled, (Oct. 18, 2005).

Erroneous admission of testimony by state’s expert witness, extrapolating results of defendant’s breath alcohol test back to the time he was stopped for driving while intoxicated (DWI) was harmful; evidence was elicited by and emphasized by the state, and testimony was not cumulative, as police officer’s testimony about defendant’s appearance of intoxication was subjective. Mata v. State, 143 S.W.3d 331 (Tex. App. San Antonio 2004).

[*5] View the extrapolation evidence is relevant and admissible by virtue of statutory dictates

In the following it was held that extrapolation evidence was relevant and admissible by virtue of statutory dictates.

Where a state chemist extrapolated breath test results of 0.24% back one and a half hours to the time of driving and opined that the defendant’s blood alcohol content (BAC) was probable above 0.10%, the court, in State v. Rollins,

Timothy Culhane
affirmed the "per se" DUI conviction, declaring that the hypothetical question asked of the State's expert witness met the standard of the statute governing expert hypotheticals. Noting that the chemist based his extrapolation estimation on the test results, the defendant's weight, and the time between the arrest and the breath test, all of which had already been introduced into evidence, the court concluded that the hypothetical question posed to the expert complied with the requirements of Vt. Stat. Ann. tit. 12 § 1643 (Supp. 1981), which provided that "expert hypotheticals are proper if based on the witnesses' personal observation, or on evidence introduced at trial and seen or heard by the witness, or on his technical knowledge of the subject . . ." Since the hypothetical posed to the expert was proper pursuant to the statute's requirements, the court concluded, it did not matter that the response was a mere estimate and was not given in absolute terms; the statutory requirements concerning hypothetical expert testimony were complied with, there being no statutory demand for absoluteness.

CUMULATIVE CASES

Cases:

Expert testimony relying on retrograde extrapolation analysis, which considers breath test results, defendant's statements regarding his last drink of alcohol, and elimination rates when determining blood alcohol content, was admissible in trial for driving under the influence (DUI); proving a DUI violation nearly always required circumstantial evidence, and statute did not preclude prosecutions lacking a chemical test showing blood-alcohol level of 0.08 percent or greater. West's Ann. Cal. Vehicle Code § 23152(b). People v. Warlick, 77 Cal. Rptr. 3d 564 (Cal. App. Dep't Super. Ct. 2008).

When the State does not rely on the statutory presumption of intoxication, it may use all admissible evidence including the hospital record, the testimony of the technologist performing the blood-alcohol test, and expert testimony concerning the likely effect upon an individual of a given blood-alcohol level, to prove that a defendant is guilty of vehicular homicide. LSA-R.S. 14:32.1(A)(1, 2). State v. Dickinson, 5 So. 3d 179 (La. Ct. App. 1st Cir. 2008).

In a prosecution under the statute providing that it is unlawful for a person to drive a vehicle if the person has a blood or breath alcohol concentration (BAC) of 0.08 or more "within three hours of driving" the vehicle and the BAC results from alcohol consumed before or while driving the vehicle, the state can use scientific retrograde extrapolation evidence to prove that a BAC test taken after three hours and below 0.08 shows that the defendant had an actual BAC of 0.08 or higher within three hours of driving; similarly, a defendant can use retrograde extrapolation evidence to show that a BAC test taken after three hours and above 0.08 shows that the defendant had an actual BAC of less than 0.08 within three hours of driving. West's NMSA § 66-8-102(C)(1). State v. Day, 2008-NMSC-007, 176 P.3d 1091 (N.M. 2008).

[*6] View that extrapolation evidence is irrelevant and inadmissible by virtue of statutory dictates

In the following cases it was held that extrapolation evidence was irrelevant and inadmissible because of specific statutory language as interpreted by the courts.

In People v. Emery, 812 P.2d 665 (Colo. Ct. App. 1990), the court ruled that the prosecution's extrapolation evidence relating blood test results back more than three hours to the time of an accident was unnecessary and irrelevant, since the DUI statute itself related the blood alcohol test results back to the time of the alleged offense for purposes of applying a statutory inference of intoxication which arose by virtue of a test result in excess of 0.10%. Noting that both Colo. Rev. Stat. Ann. § 42-4-1202 (2) and Colo. Rev. Stat. Ann. § 18-3-106(2) allowed a jury to infer that a defendant was under the influence of alcohol if it found that the amount of alcohol in that defendant's blood at the time of the offense or within a reasonable time thereafter was 0.10% or more, as shown by a chemical analysis of the defendant's blood, the court decided that evidence of test results given within a reasonable time of driving allowed the jury to infer intoxication, so that any further evidence, such as extrapolation evidence, was neither necessary nor relevant, and should not be introduced into evidence. However, since the court found that the introduction of such evidence was harmless error in light of other proof, the court affirmed the defendant's DUI conviction.

The court held that a blood alcohol testing statute did not permit introduction of extrapolation evidence in State v. Daniel, 132 Idaho 701, 979 P.2d 103 (1999). In reaching the decision, the court interpreted Idaho Code § 18-8004(2) to provide that any person having a BAC test result of less than 0.10 on a test requested by an officer shall not be prosecuted for DUI, and accordingly reversed the defendant's DUI conviction since his test results given two hours after

Timothy Culhane
driving were initially 0.06 and subsequently 0.03. The Idaho Legislature enacted the statute to encourage motorists to submit to BAC tests if they thought their BAC was below the legal limit, the court reasoned, and to allow the state to offer extrapolation evidence to show a higher BAC at the time of driving than was registered on the BAC test would destroy any driver’s incentive to take the test. Such a result would be clearly prohibited by the express terms of the statute, the court concluded.

The court held that a defendant could not offer extrapolation evidence in a DUI prosecution to prove that his blood alcohol content (BAC) was lower when driving than at the time of his breathalyzer test, in State v. Tischio, 107 N.J. 504, 527 A.2d 388 (1987). Noting that the applicable “per se” DUI statute, N.J. Stat. Ann. § 39:4-50(a), made it unlawful for a person to operate a motor vehicle with a blood alcohol concentration of 0.10% or more by weight of alcohol in the person’s blood, the court reasoned that statutory intent dictated that a person’s blood alcohol level at the time of the breathalyzer test constituted the essential evidence of the offense of driving under the influence, and was all the proof necessary to convict a defendant of DUI, so long as the test was given within a reasonable time after the defendant was driving. As the breathalyzer test was given to the defendant approximately one hour after he drove, with a result of 0.11, the court concluded that extrapolation evidence was not probative of the statutory offense, and hence, was inadmissible.

CUMULATIVE CASES
Cases:

Expert testimony regarding absorption and elimination rates of alcohol was irrelevant in prosecution for per se driving while intoxicated (DWI) based upon alcohol level of 0.08 percent within three hours of driving, although accuracy of blood alcohol tests was permissible line of inquiry; retrograde extrapolation was irrelevant where test results were obtained within three hours. West’s NMSA § 66-8-102(C). State v. Chavez, 2009-NMCA-089, 214 P.3d 794 (N.M. Ct. App. 2009), cert. denied, (July 15, 2009).

[*6.] 3 Reliability of extrapolation method

The following authority considered the reliability of the extrapolation method employed.

CUMULATIVE CASES
Cases:

“Retrograde extrapolation” is a scientific method of making a determination of a blood alcohol content (BAC) at a particular point in time by predicting an earlier unknown value by calculating a known later value with a series of generally used average values, and projecting that result back in time. Ludwig v. State, 122 So. 3d 1229 (Miss. Ct. App. 2013).

“Odor analysis” by which state’s expert witness made retrograde extrapolation of defendant’s blood alcohol concentration (BAC) at time of charged accident, based on police sergeant’s report of smelling alcohol on defendant’s breath more than ten hours later, was not based on sufficiently reliable method of proof and was thus inadmissible in prosecution for offenses including second-degree murder and driving while impaired (DWI); there was no evidence the witness had ever submitted odor analysis for peer review, and odor analysis lacked rigorous standards imposed by statute on chemical analyses of BAC. West’s N.C.G.S.A. § 20-139.1. State v. Davis, 702 S.E.2d 507 (N.C. Ct. App. 2010).

Underlying theory of retrograde extrapolation, which is used to determine a defendant’s blood alcohol content (BAC) sometime in the past based upon a level that has more recently been measured, is valid and reliable. Kennedy v. State, 264 S.W.3d 372 (Tex. App. Houston 1st Dist. 2008), reh’g overruled, (Oct. 8, 2008).

[*6.] 5 Application of Rule of Evidence 403

The following authority applied Rule of Evidence 403 to DUI extrapolation evidence.

CUMULATIVE CASES
Cases:

Timothy Culhane
Probative value of results of breath tests was not substantially outweighed by danger of unfair prejudice, considerations of undue delay, or other factors in trial for driving while intoxicated, even in absence of retrograde extrapolation evidence, and even though the state did not have great need for test results, given testimony of police officer and videotape of stop; tests were administered approximately one hour after defendant's arrest, test results of 0.133% and 0.130% tended to make more probable that defendant was impaired at time of driving, and test results related directly to charged offense. Rules of Evid., Rule 403. *Trillo v. State*, 165 S.W.3d 763 (Tex. App. San Antonio 2005).

State did not have to show at pretrial hearing on motion to suppress breath test results that probative value of retrograde extrapolation of results of breath test taken approximately one hour after defendant was stopped was not substantially outweighed by danger of unfair prejudice, in prosecution for driving while intoxicated (DWI). Rules of Evid., Rule 403. *Reynolds v. State*, 163 S.W.3d 808 (Tex. App. Amarillo 2005), reh’g overruled, (June 21, 2005).

**[*III]* USE OF EXTRAPOLATION EVIDENCE IN PROSECUTION’S *DUI* CASE

**[6.]** View that admissibility of extrapolation evidence is within court’s discretion

The following authority held or recognized that the use of extrapolation evidence in the prosecution’s case against a defendant of charged with driving while in intoxicated was within the sound discretion of the trial court.

**CUMULATIVE CASES**

Cases:

Expert’s proposed testimony using scientific retrograde extrapolation evidence to show that defendant’s blood alcohol concentration was between 0.08 and 0.09 mg/mL at time of motor vehicle accident was admissible in prosecution for involuntary manslaughter; expert’s testimony accounted for known and unknown facts and relied on assumptions favorable to defendant regarding when he last consumed alcohol and rate at which he eliminated it from his body. Fed.Rules Evid.Rule 702, 28 U.S.C.A. U.S. v. T sosie, 791 F. Supp. 2d 1099 (D.N.M. 2011).

Determination whether breathalyzer test was performed within reasonable time after defendant’s last operation of vehicle, as would allow admission of test results without necessity of evidence of retrograde extrapolation, which concerns changes in blood alcohol content over time, falls within the trial judge’s sound discretion in prosecution for operating motor vehicle while having blood alcohol level of.08 or more (OUI). M.G.L.A. c. 90, § 24. *Com. v. Colturi*, 448 Mass. 809, 864 N.E.2d 498 (2007).

Probative value of retrograde extrapolation of defendant’s blood-alcohol level (BAL) at the time he was driving was substantially outweighed by danger of unfair prejudice in prosecution for driving under the influence of alcohol (*DUI*) causing substantial bodily harm; extrapolation was based on single blood sample taken over two hours after accident, experts’ estimations of defendant’s BAL at time of charged offense were based primarily on factors attributed to the “average” person rather than significant personal characteristics of defendant, and the high BAL of.18 at time of test potentially invited jurors to determine defendant’s guilt based on emotion or an improper ground. NRS 48.035(1), 484C.430(1)(a, b). *State v. Eighth Judicial Dist. Court of State ex rel. County of Clark*, 127 Nev. Adv. Op. No. 84, 2011 WL 6840685 (Nev. 2011).

Trial court determination that there was sufficient indicia of reliability to admit expert testimony that a blood sample exposed to heat over 12 days might register a lower blood alcohol concentration than it would have at the time it was drawn was not an abuse of discretion, in driving while impaired (DWI) prosecution; expert was qualified as an expert in the field of retrograde extrapolation with respect to blood alcohol levels, his testimony was relevant to the issue of whether defendant was impaired while driving, expert explained the test he conducted on refrigerated and nonrefrigerated blood samples drawn from individuals who had consumed alcohol, and he explained that the results of his tests were published to the scientific community and were presented at scientific conferences. Rules of Evid., Rule 702, West’s N.C.G.S.A. § 8C-1. *State v. Corriher*, 645 S.E.2d 413 (N.C. Ct. App. 2007).

Expert testimony, extrapolating defendant’s blood alcohol content (BAC) at time of driving back from breath test showing.06 BAC an hour and thirty minutes after defendant had been stopped, was admissible to establish defendant’s BAC in prosecution on charge of driving while under the influence of intoxicants (DUII) with a.08 or more BAC; statutory requirement that offense be proven only by a chemical analysis of the breath or blood was not violated by

Timothy Culhane

[*7] View that prosecution is not required to extrapolate test results back to time of driving

[*7a] Because impossible burden would be placed upon prosecution

The following cases held that the prosecution was not required to extrapolate breath or blood test results back to the time of driving because such a requirement would saddle the prosecution with an impossible burden of proof.

Where the state’s expert witness testified that the defendant’s BAC was 0.24% one hour after driving, but was not able to extrapolate the test results back to the time of driving because of unavailable information concerning what the defendant ate and drank prior to driving, the court nevertheless affirmed the defendant’s conviction for DUI, ruling that the state was not required to offer extrapolation evidence under the circumstances, in State v. Cloverdale, 1999 WL 5517410 (Del. Super. Ct. 1999) (unpublished opinion). Noting that reliable extrapolation would be impossible unless the defendant waived his Fifth Amendment rights and provided a statement to the officer which contained an honest and accurate report of his alcohol consumption, the court declared that it would not require such testimony because of the obvious impracticalities presented by obtaining essential information from DUI defendants. In support of this reasoning, the court added that there were numerous potentials for error which impacted extrapolation accuracy under the best of circumstances, and that the majority of jurisdictions had not seen fit to make such a requirement.

In State v. Taylor, 132 N.H. 314, 566 A.2d 172 (1989), the court held that the state was not required to provide juries with evidence of a defendant’s BAC at the time of driving through extrapolation evidence. In reaching this conclusion, the court said that such a requirement would place an impossible burden on the state, because extrapolation requires information about how much the defendant drank and when, which is wholly within the defendant’s knowledge and unavailable to the state because of the defendant’s constitutional right to remain silent. The court also reasoned that, even if this information was made available to the state, determining the defendant’s precise BAC while driving would still be impossible because the rate of absorption of alcohol into the blood varies between individuals, with peak BAC being reached from 14 to 138 minutes after consumption. This variable rate is further complicated by the amount of food an individual has consumed, the court continued, which is additional evidence wholly within the knowledge of the defendant. The legislature could not have intended to place such impossible roadblocks in the way of state prosecutions of DWI, the court concluded, and affirmed the defendant’s conviction.

Where the defendant objected to the introduction of BAC test results of 0.12% one hour after driving, but was not able to extrapolate the test results back to the time of driving because of unavailable information concerning what the defendant ate and drank prior to driving, the court nevertheless affirmed the defendant’s conviction for DUI, ruling that the state was not required to offer extrapolation evidence under the circumstances, in State v. Cloverdale, 1999 WL 5517410 (Del. Super. Ct. 1999) (unpublished opinion). Noting that reliable extrapolation would be impossible unless the defendant waived his Fifth Amendment rights and provided a statement to the officer which contained an honest and accurate report of his alcohol consumption, the court declared that it would not require such testimony because of the obvious impracticalities presented by obtaining essential information from DUI defendants. In support of this reasoning, the court added that there were numerous potentials for error which impacted extrapolation accuracy under the best of circumstances, and that the majority of jurisdictions had not seen fit to make such a requirement.

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Observing that the defendant argued that the “per se” DUI statute prohibited driving while a person’s BAC was 0.10% or more, and required the prosecution to extrapolate breath tests back to the time of driving to prove its case, the court, in State v. Hatfield, 2003 WL 535930 (Tenn. Crim. App. 2003), appeal granted, (Sept. 2, 2003) (unpublished opinion), interpreted Tenn. Code Ann. § 55-10-401(a), (2) in such a manner as to conclude that extrapolation was not required. This was so, the court reasoned, because the legislature obviously did not intend to place an impossible roadblock on the road to state prosecutions for “per se” DUI, since testing could not be had while driving, and reliable extrapolation could not be had without resort to essential information which was wholly within the defendant’s knowledge and rarely available to the prosecution. Clearly, the legislature intended for properly obtained test results
to be presumptive evidence of blood alcohol concentration at the time of driving, evidence sufficient to gain a conviction under the statute.

[*7b] Because statute does not require relate back evidence on its face

In the following cases it was held that the prosecution was not required to extrapolate BAC test results back to the time of driving in order to prosecute a defendant for driving while intoxicated because the applicable DUI or DWI statute did not call for such a requirement on its face.

Affirming a defendant’s conviction for driving under the influence, the court, in State v. Barber, 42 Conn. App. 589, 681 A.2d 348 (1996), ruled that the results of a single blood chemical analysis taken while the defendant was in the hospital were admissible without a second test or any extrapolation testimony. Although the defendant argued that Conn. Gen. Stat. Ann. § 14-227a(c) required extrapolation of blood and breath test results to accurately reflect blood alcohol concentration at the time of an alleged offense, the court countered that Conn. Gen. Stat. Ann. § 14-227a(l), the statute authorizing the taking of a driver’s blood in a hospital, provided for no such requirement, and furthermore, that the general DUI statute, Conn. Gen. Stat. Ann. § 14-227a(c), had been amended to delete the extrapolation requirement in most cases. Since the court could see no requirement in the hospital statute that BAC evidence collected in a hospital should be subjected to the extrapolation prerequisites formerly contained in the former DUI statute, the court refused to usurp the authority of the legislature and create such a requirement.

Affirming a defendant’s “per se” DWI conviction based upon BAC test results of over 0.10%, the court decided that the prosecution was not required to present expert testimony extrapolating the results of the blood alcohol test back to the time of driving, in Ransford v. District of Columbia, 583 A.2d 186 (D.C. 1990). In so ruling, the court looked to D.C. Code Ann. § 40-716(b)(1), which prohibited individuals from operating vehicles when their blood contains 0.10%or more of alcohol. The court interpreted this provision to mean that the District’s Council intended for evidence of the results of blood alcohol tests, administered within a reasonable time of driving, to constitute sufficient evidence of “per se” DUI, without the need for extrapolation. Not only did the statutory scheme compel this result, the court concluded, but the practical reasons supporting the court’s ruling, such as the impossibility of obtaining sufficient information from the defendant to make a reliable extrapolation, are further indications that the District’s Council did not intend to place any other impossible roadblocks on the District’s path to prosecute DWI offenders.

In State v. Miller, 555 So. 2d 391 (Fla. Dist. Ct. App. 3d Dist. 1989), approved and remanded, 597 So. 2d 767 (Fla. 1991), the court held that the results of a defendant’s breath test taken one and one half hours after driving were admissible into evidence without extrapolation of those results back to the time of operation. Noting that the applicable DUI statute, Fla. Stat. Ann. § 316.1934(2), provided that test results administered in accordance with law “shall” be admissible, the court declared that extrapolation was not required by the statute, and that the only foundational requirement for introduction of test results was that the proper testing procedures be followed. Any other matters, such as the timing of the test, or any defense extrapolation testimony attacking the accuracy of the test, could be considered by the trier of fact after the results had been admitted into evidence, the court concluded.

The court held in State v. Kubik, 235 Neb. 612, 456 N.W.2d 487 (1990) that the state was not required to demonstrate a nexus between a test result and the defendant’s breath alcohol content (BrAC) at the precise time defendant was driving to obtain a conviction for driving while intoxicated (DWI). Affirming the defendant’s “per se” DWI conviction for having a breath test result of 0.139, the court noted that other states had held that test results were sufficient to convict for DWI without extrapolation, based on numerous theories which included the impossibility of obtaining necessary information from the defendant and that proof of test results constituted prima facie evidence of guilt. However, after examining these precedents, and the wording of Neb. Rev. Stat. Ann. § 39-669.11, which provided that tests made in conformity with established requirements shall be competent evidence in any prosecution for DWI, the court concluded that a valid breath test given within a reasonable time after a defendant’s stop was probative of a DWI violation, without the need for any extrapolation evidence. Any such additional evidence would go to the weight of the breath test results, rather than to their admissibility.

In State v. Ulrich, 17 Ohio App. 3d 182, 478 N.E.2d 812 (6th Dist. Wood County 1984), the court decided that a breath sample taken within two hours of driving would accurately reflect the driver’s breath alcohol content (BrAC) at the time of the alleged offense, and that expert testimony relating the test back to the time of the offense was

Timothy Culhane
not required. In reaching this conclusion, the court observed that Ohio Rev. Code Ann. § 4511.19(B) provided that courts could admit evidence of alcohol concentration in blood, breath or urine as shown by a chemical analysis thereof in any DUI prosecution where the sample was taken within two hours of the alleged violation. Consequently, the Ohio Assembly had made it illegal to operate a vehicle with a prescribed level of alcohol content in one’s blood. Although a previous version of this statute had provided that the test result of 0.10% or greater gave rise to a rebuttable presumption that the driver was under the influence, the court continued, the present incarnation had eliminated the term “presumption” and specifically proscribed operating a vehicle with a concentration of 0.10 grams or more by weight per 210 liters of breath. By making this amendment, the court stated, the legislature had determined that it intended that the results of an intoxilyzer test be admitted as evidence of the defendant’s BrAC at the time of driving, provided the test was administered according to statutory requirements. The gravamen of the “per se” DUI offense was operating a vehicle after ingestion of sufficient amounts of alcohol to produce test results of over 0.10%, the court declared, and no further proof was necessary to obtain a conviction on that offense.

Although the court agreed with the defendant that the critical issue was the condition of the driver at the time he was driving, it nevertheless held that the legislature intended that the state was not required to extrapolate test results back to the time of driving, in State v. Lusi, 625 A.2d 1350 (R.I. 1993). Observing that the legislature amended R.I. Gen. Laws § 31-27-2 by adding subsection (b), which provided that any person whose BAC exceeded 0.10% shall be guilty of DUI, the court decreed that by making such an amendment, the legislature clearly intended to rely on breathalyzer tests given within a reasonable time of driving as a reliable, objective, method of proof of guilt of DUI, with no need for expert extrapolation testimony.

CUMULATIVE CASES

Cases:

Presumption that motorist was at least as intoxicated at time of driving as at time of chemical testing within four hours of driving did not violate due process based on defendant’s claim that presumption lacked scientific basis, in prosecution under amended driving under influence (DUI) statute that based guilt on result of chemical test administered within four hours of driving, rather than on motorist’s blood alcohol level at time of driving; inference that motorist’s blood alcohol level was at least as high at time of driving as at time of chemical test within four hours of driving took many factors beyond alcohol elimination and absorption, including fact that many people who drink enough alcohol to become legally intoxicated do so over period of time, and not all at once right before driving. U.S.C.A. Const.Amend. 14; AS 28.35.030(a)(2). Valentine v. State, 155 P.3d 331 (Alaska Ct. App. 2007).

State was not required, in prosecution for driving while under the influence, to present expert testimony on issue of whether, or how fast, defendant’s blood alcohol level might have been expected to fall after his last drink, or to explain how to extrapolate backward in time from defendant’s breath test result to derive defendant’s blood alcohol level at time of offense. AS 28.35.033(a). Pilant v. State, 115 P.3d 579 (Alaska Ct. App. 2005).

Driving under the influence (DUI) statute, which made it a crime for persons to drive after they had consumed enough alcohol such that they would reach a 0.16% blood alcohol content (BAC) within two hours after driving, did not violate due process on ground that it created an irrefutable presumption that a driver had 0.16% BAC while driving, as having a 0.16% BAC while driving was not part of the crime, and a driver was free to contest or defend against whatever evidence the Commonwealth introduced. 75 Pa.C.S.A. § 3802(c). Com. v. Thur, 2006 PA Super 208, 906 A.2d 552 (2006).

[*7c] Because test results create prima facie evidence of guilt

It was held in the following cases that the prosecution was not required to extrapolate blood or breath test results back to the time of driving in order to convict a defendant of DUI because BAC test results constituted prima facie evidence of guilt.

In Haas v. State, 597 So. 2d 770 (Fla. 1992), the court ruled that the state was not required to extrapolate DUI breath rest results back to the time of driving, and that test results, standing alone, were circumstantial evidence of guilt. Noting that Fla. Stat. Ann. § 316.1934 (1989) provided that a person was guilty of the offense of driving under the influence with a blood alcohol level of 0.10 or higher, the court interpreted that statute as providing that test results “shall” constitute prima facie evidence that the accused had the same blood-alcohol level at the time he operated

Timothy Culhane
his vehicle. The court reasoned that the legislature contemplated that results of BAC tests would be admissible in "per se" DUI prosecutions, and that it did not intend to place upon the state the difficult and often impossible burden of extrapolation as a condition precedent to conviction under the "per se" statute.

Observing that the legislature had amended an impaired driving statutory scheme to add a "per se" DUI provision -- Ky. Rev. Stat. Ann. § 189A.0101(a), which allowed the state to prove DUI by introducing test results in excess of 0.10% blood alcohol content, the court, in Com. v. Wirth, 936 S.W.2d 78 (Ky. 1996), decided that the state should not be required to extrapolate test results back to the time of driving. The court reasoned that, by passing the new provision, the legislature intended for prima facie proof of "per se" DUI to arise from: (1) the prosecution’s introduction of BAC test results of 0.10% or more; and (2) proof that the statutes and regulations pertaining to the proper administration of tests had been complied with. The court further observed that extrapolation was often impossible due to a lack of facts peculiarly within the defendant’s knowledge; that extrapolation was no more reliable than a breath test given a reasonable time after driving; and that the statutory scheme allowed the defendant to call an expert extrapolation if he wished to do so.

Reversing the Superior Court and affirming the defendant’s DUI conviction, the court, in Com. v. Yarger, 538 Pa. 329, 648 A.2d 529 (1994), ruled that the state was not required to present expert extrapolation testimony to prove that the defendant operated his vehicle with a blood alcohol content (BAC) above the legal limit. This was so, the court announced, because the “per se” DUI statute provided that a person “shall not” drive a vehicle while the amount of alcohol by weight in his blood is 0.10% or greater. Such mandatory wording, the court reasoned, evinced legislative intent to allow the state to make a prima facie case of guilt by introducing BAC test results in excess of 0.10%, without the need for any further proof by way of extrapolation.

**** Comment:
The decision represented Pennsylvania’s departure from previous decisions such as Com. v. Modaffare, 529 Pa. 101, 601 A.2d 1233 (1992), and Com. v. Jarman, 529 Pa. 92, 601 A.2d 1229 (1992), which had required extrapolation where only a weak inference of guilt existed because of a test result not greatly exceeding 0.10 and/or because of a significant length of time between driving and testing. The court declared that it was abandoning the case-by-case analysis that it had previously required.

Declaring that in 75 Pa. Cons. Stat. Ann. § 3731(a)(4) the legislature had created an evidentiary tool that enabled the fact finder to infer intoxicated driving from test results in excess of 0.10% obtained within three hours of driving, the court ruled that the Commonwealth was not required to present expert extrapolation evidence in order to prosecute drunk drivers, in Com. v. MacPherson, 561 Pa. 571, 752 A.2d 384 (2000). The court interpreted the statute to mean that a blood test result in excess of statutory limits constituted prima facie evidence of guilt and created a permissible inference of guilt that did not shift the burden of proof to the defendant. Consequently, the court concluded, a test result of 0.14% obtained one hour after driving was sufficient evidence to affirm the defendant’s conviction for DUI, without the need for further prosecutorial proof.

Where a defendant charged with a “per se” DUI offense by virtue of a test result of 0.19% given 55 minutes after driving, the court, in Com. v. Montini, 712 A.2d 761 (Pa. Super. Ct. 1998), ruled that the state was not required to relate the test results back to the time of driving in order to prove that the defendant operated a vehicle with a blood alcohol content (BAC) of over 0.10%. The court followed established precedent of Com. v. Yarger, 538 Pa. 329, 648 A.2d 529 (1994), which had interpreted the “per se” statute as evincing legislative intent to make test results obtained within a reasonable time of driving prima facie evidence of driving under the influence, without the need for any further proof, such as expert extrapolation evidence.

It was held that the Commonwealth was not required to present relation-back expert testimony to convict a defendant of DUI under the “per se” statute, in Com. v. Weir, 1999 PA Super 210, 738 A.2d 467 (1999). The court based its ruling upon the wording of the new “per se” DUI statutory scheme, 75 Pa. Cons. Stat. Ann. § 3731(a)(4), which prohibited the operation of a vehicle with a BAC in excess of 0.10%, and which specifically allowed the prosecution to make a prima facie case of guilt by introducing validly obtained blood or breath test results in excess of the statutory limit (0.10%). Such test results constituted prima facie evidence of guilt, the court declared, so no more proof was required for the prosecution to obtain a “per se” DUI conviction.


Timothy Culhane
declared that it was not necessary for the state to relate test results back to the time of the offense. The court also ruled that relate back testimony was not required in prosecutions under the impaired driving provisions of 75 Pa. Cons. Stat. Ann. § 3731(a)(1) (1994), since no scientific evidence was required to obtain a DUI conviction under that statute, and because the statute did not limit the kind of proof that could be offered to prove impairment. The proof required to gain a conviction, the court concluded, could include BAC test results, field test results, and an officer’s testimony regarding his observations of a driver’s physical appearance and behavior at the scene.

Noting that the “per se” DUI statute, 75 Pa. Cons. Stat. Ann. § 3731(a)(4), made breath or blood test results showing a BAC of 0.10% or greater prima facie evidence of driving under the influence, the court, in Com. v. Zugay, 2000 PA Super 15, 745 A.2d 639 (2000), held that the prosecution was not required to extrapolate the defendant’s test results of 0.192 back ninety minutes to the time he drove. Such expert testimony was not required on the “per se” charge, the court concluded, since the test results were sufficient evidence of guilt without the need for any further proof.

CUMULATIVE CASES

Cases:

Extrapolation evidence was not required to support conviction for driving with a blood alcohol level of 0.08 or above, as blood alcohol level tests were taken approximately two hours after she was driving and still showed a result over twice the statutory limit such that jury could make reasonable inferences from the evidence, which included evidence that defendant had admitted to drinking and had shown signs of intoxication that improved over time, that, at the time of the accident, defendant’s blood alcohol level was similar to, if not higher than, what it was tested at two hours later. S.H.A. 625 ILCS 5/11-501(a)(1). Village of Bull Valley v. Wintepacht, 2012 IL App (2d) 101192, 968 N.E.2d 160 (Ill. App. Ct. 2d Dist. 2012).

Because test result constitutes sufficient evidence for conviction

The courts in the following cases ruled that the prosecution was not required to extrapolate breath or blood test results back to the time of driving in order to prosecute a defendant for DUI because BAC test results constituted sufficient evidence of guilt.

Affirming a DUI conviction based upon a breathalyzer result of 0.15, the court, in Terry v. City of Montgomery, 549 So. 2d 566 (Ala. Crim. App. 1989), ruled that the state was not required to relate breath test results back to the time of driving because the test results constituted evidence from which the jury could infer guilt. Such evidence was sufficient for conviction without the need for extrapolation evidence, the court concluded, and the one hour and 20 minute delay in testing went to the weight of the evidence, and not to the admissibility of the test results.

In State v. Korhn, 41 Conn. App. 874, 678 A.2d 492 (1996), the court interpreted a “per se” DUI statute, Conn. Gen. Stat. Ann. § 14-227a(c), as providing that breath test results evincing a BAC in excess of 0.10% created a rebuttable presumption of guilt of driving under the influence, and ruled that the state was not required to offer expert extrapolation evidence in order to obtain a DUI conviction. Noting that the legislature had amended this statute to delete an “analysis thereof” phrase that had previously required the state to extrapolate test results, the court declared that the legislature intended to dispense with the extrapolation requirement and to create a rebuttable presumption of guilt based solely upon BAC test results. However, the court added, the presumption was not valid where two tests were given and the results of the second test were higher than those of the first, and either measured less than 0.12%. Under such circumstances, the court reasoned, the defendant’s BAC could have been rising at the time he was tested, and been below the legal limit at the time of driving, so extrapolation would be required to prove guilt. However, since the defendant’s first test results were not 0.12% or below, the court reported, the state was not required to extrapolate, and it affirmed the defendant’s DUI conviction.

Where a substantive DUI statute, Haw. Rev. Stat. Ann. § 291-4(a)(2), had been amended to include breath test results as a basis for DUI convictions, and a procedural DUI statute, Haw. Rev. Stat. Ann. § 291-5(a), had also been amended to provide that a test results of 0.10% or more taken within three hours of the time of driving “shall” be competent evidence that the defendant was under the influence of alcohol at the time of driving, the court, in State v. Wetzel, 7 Haw. App. 532, 782 P.2d 891 (1989), decided that the legislature had intended for breath test results obtained within three hours of driving to be presumptive of guilt, and be sufficient evidence of guilt without the need for expert testimony relating test results back to the time of driving. The legislature’s amending of the two DUI statutes

Timothy Culhane
was indicative of that body’s desire to have test results create a permissible inference of guilt of “per se” DUI, and for such results to be competent evidence to obtain a conviction without the need for any further evidence, expert extrapolation testimony or otherwise, the court concluded.

Reversing the decision of an intermediary appellate court and reinstating the defendant’s DUI conviction under Mich. Comp. Laws Ann. § 257.625a(6)(a,b), the court found that the statute made blood test results admissible into evidence in prosecutions for driving while impaired due to alcohol, so prosecutors were not required to introduce expert testimony to extrapolate the test results back to the time of driving, in People v. Wagner, 460 Mich. 118, 594 N.W.2d 487 (1999). Taking its cue from the express language of the statute, which stated that test results were admissible in DUI prosecutions, the court added that since the statute did not set any limitation on the time within which tests must be administered, it would not impose any such limitation, and any testing delays would go to the weight of the evidence, and not to the admissibility of the test results.

Affirming the defendant’s DUI conviction, the court, in Wood v. Smith, 512 Pa. 641, 518 A.2d 266 (1986) ruled that breath test results of 0.13%, combined with other evidence of impairment, sufficed to warrant a guilty verdict despite the lack of expert testimony relating the results back one hour and 23 minutes to the time of driving. Noting that the “per se” DUI statute, 75 Pa. Cons. Stat. Ann. §§ 3731(a, 4), prohibited driving while having 0.10% alcohol by weight in the blood, the court reasoned that the legislature intended for a test result in excess of the legal limit to be proof that the defendant was incapable of safe driving because of an excessive consumption of alcohol.

In Com. v. Boyd, 373 Pa. Super. 298, 541 A.2d 21 (1988), it was held that a lawfully administered blood test, without additional proof by way of expert relate-back testimony, was sufficient evidence to convict for the crime of “per se” DUI as contemplated by 75 Pa. Cons. Stat. Ann. § 3731(a). Rejecting a defendant’s argument that the Commonwealth should be required to relate test results back to the time of driving, the court declared that the “per se” statute, which made driving with a blood alcohol content (BAC) of more than 0.10% a criminal offense, evinced legislative intent to require no further evidence of guilt than test results, as there was no wording in the statute which required tests within a certain time of driving or mandated corroborative evidence such as expert extrapolation evidence.

In State v. Fuqua, 1994 WL 469307 (Tenn. Crim. App. 1994) (unpublished opinion), the court ruled that since the jury could infer intoxication from the results of a BAC test administered subsequent to a DUI arrest, the state was not required to offer expert extrapolation testimony relating a test result of 0.1827% back to the time of driving in order to obtain a DUI conviction. Affirming the defendant’s conviction, the court refused to align itself with a minority of states requiring extrapolation evidence, and declared that test results in excess of the legal limit, taken a few minutes after driving, constituted sufficient evidence of DUI.

**CUMULATIVE CASES**

Cases:

Lack of extrapolation evidence goes to weight, not its admissibility, and thus, breath test showing a blood alcohol content(BAC) of .11 is some evidence of intoxication. Maxwell v. State, 253 S.W.3d 309 (Tex. App. Fort Worth 2008), petition for discretionary review filed, (June 17, 2008).

The probative value of evidence of defendant’s alcohol breath test results was not substantially outweighed by the danger of unfair prejudice, even though the results were admitted without retrograde extrapolation testimony, and thus the evidence was admissible during prosecution for driving while intoxicated (DWI); defendant provided two breath samples, both of the samples tested significantly over the legal blood-alcohol limit, the breath test results related directly to the charged offense, presentation of the evidence did not distract the jury away from the charged offense, and the State needed the evidence to prove intoxication due to evidence that defendant took field sobriety tests under poor conditions and she passed four of the field sobriety tests. Rules of Evid., Rule 403. Stewart v. State, 162 S.W.3d 269 (Tex. App. San Antonio 2005), reh’g overruled, (Mar. 8, 2005) and petition for discretionary review filed, (May 9, 2005).

Because statute itself relates test results back to the time of driving

In the following cases the courts decided that the prosecution was not required to extrapolate blood or breath test results back to the time of driving in order to prosecute a defendant for DUI because the applicable DUI statutory language related the test results back to the time of driving.

Timothy Culhane
Where a defendant was charged with **DUI** homicide and **DUI**, the court, in State v. Grenier, 2002 WL 3111771 (Del. Super. Ct. 2002) (unpublished opinion), ruled that the prosecution was not required to prove a defendant’s blood alcohol content at the time of driving by extrapolating test results in order to convict on either charge. Noting that Del. Code Ann. tit. 21, § 4177 (g) provided that BAC results taken within four hours of the time of driving ”shall” be deemed to be the actual alcohol concentration in the person’s breath at the time of driving regardless of any margin of error or tolerance factors, the court concluded that the legislature clearly intended for the BAC at time of test to be the controlling factor and for the prosecution to proceed without any need for expert testimony on retrograde extrapolation. Accordingly, the court granted the state’s motion to preclude the defendant from requiring the presence of the state forensic chemist, since that official’s testimony regarding extrapolation would be superfluous.

In State v. Statliff, 97 Idaho 523, 547 P.2d 1128 (1976), the court declared that, pursuant to the provisions of Idaho Code § 49-1102(b), the state was not required to extrapolate blood alcohol test results back to the time of vehicle operation, because the statute provided that a presumption of guilt arose from the introduction of test results. The statutory presumption related the test results back to the time of driving, the court ruled, thereby obviating the need for the prosecution to put on expert extrapolation evidence. A contrary result would defeat statutory intent, the court added, since extrapolation would be based solely upon information known only to the defendant. Nevertheless, the court concluded, once the prosecution availed itself of the statutory presumption, both parties were free to offer such extrapolation evidence as they saw fit.

Results of blood alcohol tests were held admissible under Idaho Code § 49-1102, without supplementary extrapolation evidence relating test results back to the time of driving, in State v. Knoll, 110 Idaho 678, 718 P.2d 589 (Ct. App. 1986). Reviewing a statute which had since been repealed but was relevant to **DUI** charges filed prior to repeal, the court noted that the former ”per se” **DUI** statute had made it unlawful to drive with alcohol of 0.10% by weight in one’s blood, breath, or urine, established that proof of test results were presumptive of guilt, provided the test was administered properly. Accordingly, the court concluded, the statute itself related the test results back to the time of driving, and any time lapse between driving and testing went to the weight of the evidence, not its admissibility.

Under the plain language of the ”per se” **DUI** statute, blood alcohol tests were deemed to relate their results back to the time of driving, in People v. Campbell, 236 Mich. App. 490, 601 N.W.2d 114 (1999). Observing that Mich. Comp. Laws Ann. § 257.625a provided that blood alcohol tests were admissible in intoxicated driving prosecutions so long as the proper foundational requirements for the tests were laid by the prosecution, the court ruled that the statute itself related the test results back to the time of driving, thereby obviating the need for extrapolation evidence. This was a fair result, the court concluded, since extrapolation would require the state to go forward without information wholly within the defendant’s knowledge, and which it could not obtain by virtue of the defendant’s constitutional right to remain silent.

CUMULATIVE CASES

Cases:

The admission of defendant’s alcohol breath tests results without retrograde extrapolation testimony did not cause jury confusion and they assisted the jury in understanding the evidence, during prosecution for driving while intoxicated (DWI); the breath test results directly related to the charged offense. Stewart v. State, 162 S.W.3d 269 (Tex. App. San Antonio 2005), reh’g overruled, (Mar. 8, 2005) and petition for discretionary review filed, (May 9, 2005).

[*7f] Because other evidence of guilt obviates need for relating back BAC test results

In the following cases it was held that the prosecution was not required to extrapolate BAC test results back to the time of driving in order to prosecute a defendant for **DUI** because other evidence of guilt obviated the need to offer test results.

Affirming the defendant’s **DUI** conviction, the court decided that a breathalyzer test result alone, without the necessity for expert extrapolation testimony, established a prima facie case under the ”per se” **DUI** statute, in Erickson v. Municipality of Anchorage, 662 P.2d 963 (Alaska Ct. App. 1983). Rejecting the defendant’s contention that expert evidence was necessary to relate a person’s BAC test results back to the time of driving, the court declared that, by utilizing the language ”as determined by a chemical test within four hours of his arrest” in the ”per se” **DUI** statute, the legislature intended that BAC test results obtained within four hours of driving be taken as the driver’s

Timothy Culhane
blood alcohol level while driving. Furthermore, the court noted, other evidence of intoxication, such as an admission of drinking and inability to perform roadside field sobriety tests, were further indicators of intoxication at the time of driving, and thus obviated the need to relate test results back to the time of driving. In so ruling, the court declined to adopt the minority rule which held expert testimony necessary to establish a nexus between BAC at the time a breath or blood test was administered and the BAC level at the time a defendant operated a vehicle.

In *Com. v. Kasunic*, 423 Pa. Super. 112, 620 A.2d 525 (1993), it was held that a BAC result of 0.21% obtained from a test administered 50 minutes after the defendant drove was sufficient to convict a defendant of driving with a blood alcohol level of 0.10% or more, and that the prosecution was not required to extrapolate the test results back to the time of driving in order to obtain a conviction under the "per se" statute, 75 Pa. Cons. Stat. Ann. § 3731(a)(4). This was so, the court declared, because the defendant’s BAC was twice the legal limit, and he was found lying on the roadway smelling of alcohol, appearing to the officer to be intoxicated. These facts were sufficient to prove the defendant drove while intoxicated, the court concluded, despite the lack of expert extrapolation testimony relating the BAC test results back to the time of driving.

The court, in *Com. v. Curran*, 700 A.2d 1333, 1997 WL 598066 (Pa. Super. Ct. 1997), ruled that the prosecution was not required to offer expert extrapolation testimony to obtain a conviction under 75 Pa. Cons. Stat. Ann. § 3731(a)(1), the impaired driving statute, because other evidence of guilt made the inference of guilt strong. In addition to the fact that the defendant’s BAC results of 0.24 were over twice the legal limit only one hour and 55 minutes after driving, the court noted, the officer observed that the defendant’s eyes were bloodshot and glassy, his breath smelled of alcohol, and his speech was slurred immediately after driving. Such evidence, the court declared, was sufficient to warrant a finding of guilt under the impaired driving statute, obviating the need for the prosecution to relate the test results back to the time of driving.

Where a defendant was charged with driving under the influence of alcohol and also under the "per se" charge of driving with a BAC in excess of 0.10%, the court, in *Com. v. Montini*, 712 A.2d 761 (Pa. Super. Ct. 1998), decided that the state should not be required to extrapolate breath test results of 0.19 back to the time of driving in order to obtain a conviction under the impairment charge contained in 75 Pa. Cons. Stat. Ann. § 3731(a)(1). The court reasoned that, since the prosecution had offered sufficient evidence of guilt in addition to the breath test results, including the defendant’s erratic driving and his failure to adequately perform four field sobriety tests, then it had offered sufficient proof of intoxication without the need for expert extrapolation evidence.

Observing that the prosecution offered sufficient evidence to convict the defendant of driving under the influence of alcohol to a degree of being incapable of safe driving, the court, in *Com. v. Zugay*, 2000 PA Super 15, 745 A.2d 639 (2000), ruled that neither evidence of breath test results nor expert extrapolation testimony was required to convict the defendant of non-"per se" impaired driving DUI. The court reasoned that, as the prosecution was free to offer various kinds of evidence, including outward symptoms of intoxication such as slurred speech, bloodshot eyes and odor of alcohol, to gain a conviction under the impairment statute, 75 Pa. Cons. Stat. Ann. § 3731(a)(1), when the prosecution offered such proof, it had made its case, and breath test results were not essential proof requirements. Because breath test results were not essential to a finding of guilt, the court continued, then neither was expert extrapolation testimony relating those results back to the time of driving.

Noting that the defendant’s DUI conviction was supported by evidence that he appeared intoxicated and failed several roadside field sobriety tests, the court ruled that extrapolation testimony was superfluous under the circumstances and affirmed the conviction. in *Daricek v. State*, 875 S.W.2d 770 (Tex. App. Austin 1994), petition for discretionary review refused, (Sept. 21, 1994). The "per se" DUI statute prohibited driving with a blood alcohol concentration of 0.10 or more, the court declared, so evidence of a defendant’s failure to pass field sobriety tests immediately after driving made it more probable that the failed BAC test administered an hour after driving accurately reflected the driver’s condition while driving. The BAC results and the officer’s observations of the defendant’s demeanor immediately after driving were sufficient to warrant a conviction under both the "per se" and impaired driving statutes, the court concluded, without the need for any further proof by way of relate back testimony.

Retrograde extrapolation of breath test results is not required to admit intoxilyzer test results into evidence if other evidence proves beyond a reasonable doubt that a defendant drove while intoxicated, the court decided, in *Price v. State*, 59 S.W.3d 297 (Tex. App. Fort Worth 2001), petition for discretionary review refused, (May 8, 2002). The state offered sufficient evidence to convict the defendant of DUI without retrograde extrapolation, the court declared, where

Timothy Culhane
the officer testified that the defendant drove his car into a guardrail, had glassy, red eyes, smelled of alcohol, was unsteady on his feet, and failed four roadside field sobriety tests. Such evidence was sufficient for a conviction under the **DUI** statute, *Tex. Penal Code Ann. § 49.01(2)*, the court concluded, and affirmed the defendant’s conviction.

In *State v. Mechler*, 123 S.W.3d 449 (Tex. App. Houston 14th Dist. 2003), reh’g overruled, (Nov. 25, 2003) and petition for discretionary review filed, (Jan. 14, 2004), the court ruled that retrograde extrapolation of intoxilizer tests was not required to admit those tests results into evidence if other evidence proved beyond a reasonable doubt that a person was intoxicated while driving. Where the defendant performed the intoxilizer test one and a half hours after driving with BrAC results of 0.165 and 0.166, well over the limit of 0.08 as provided by *Tex. Penal Code Ann. § 49.04(a)*, and where he exhibited numerous signs of intoxication prior to taking the tests, the court noted, the test results should have been admitted without extrapolation testimony. Accordingly, it reversed the trial court’s decision to deny admission of the test results.

**CUMULATIVE CASES**

**Cases:**

Blood sample evidence showing motorist’s blood alcohol concentration (BAC) several hours after the fatal automobile accident was relevant, in prosecution for involuntary manslaughter, to corroborate other evidence tending to show that motorist was under the influence of alcohol at time of accident, including officer’s testimony that accident resulted from speeding and alcohol consumption, and motorist’s admission that she was drunk at the time. *Fed.Rules Evid.Rule 401, 28 U.S.C.A. U.S. v. Spotted Bear*, 160 Fed. Appx. 650 (9th Cir. 2005).

Evidence was sufficient to support conviction for per se driving while intoxicated (DWI), which was based in part on 0.08 breath alcohol concentration (BAC) result from one hour and six minutes after defendant’s arrest, even though the state did not present scientific retrograde extrapolation evidence, and defendant’s expert testified that defendant was still in absorption phase while driving; expert’s testimony about elimination and metabolization stages, along with timing of defendant’s admitted drinking and behavioral evidence that defendant failed field-sobriety tests and had other indicia of intoxication, allowed a conclusion that defendant’s BAC at time of driving was 0.08 or higher. *NMSA 1978, § 66-8-102(C) (2003)*. *State v. Day*, 2008-NMSC-007, 176 P.3d 1091 (N.M. 2008).

[*8] View that prosecution is required to extrapolate test results back to time of driving

[*8a] Statutory requirement

The courts in the following cases ruled that a **DUI** statutory scheme required the prosecution to extrapolate blood or breath test results back to the time of driving in order to obtain a conviction for **DUI** or DWI.

Reversing a “per se” **DUI** conviction for lack of extrapolation evidence, the court, in *U.S. v. Wight*, 884 F. Supp. 400 (D. Colo. 1995), ruled that such evidence was required to obtain a conviction under the "per se" statute, 36 C.F.R. § 4.23(a)(2), which prohibited operating a vehicle while having an alcohol concentration of 0.10 grams or more of alcohol per 210 liters of breath. The statute criminalized having a BAC in excess of 0.10 while driving, the court reasoned, so test results, which only proved BAC at the time of testing, constituted insufficient evidence to prove the driver’s BAC while driving. Consequently, the court declared, test results of 0.151 obtained 2 hours after driving did not prove intoxication beyond a reasonable doubt, since test results could be affected by so many factors, including the type of machine used, the weight, sex and physical condition of the driver, any medication taken, the amount of food in the driver’s stomach, and the length of delay between driving and testing.

Reversing a **DUI** conviction, the court, in *State v. Claybrook*, 193 Ariz. 588, 975 P.2d 1101 (Ct. App. Div. 1 1998), ruled that the evidence was insufficient to support the conviction where the state had failed to extrapolate breath test results in excess of 0.10 back to the time of driving. Noting that Ariz. Rev. Stat. Ann. § 28-692(A)(2) provided that it was unlawful for anyone to operate a vehicle with an alcohol concentration of 0.10 or more within two hours of driving, the court reasoned that since the test was offered more than two hours after the defendant drove, and the state did not relate the test results back to within the statutorily mandated two hour period, then the state’s evidence was insufficient to gain a **DUI** conviction, requiring the conviction’s reversal.

In *State v. Geisler*, 22 Conn. App. 142, 576 A.2d 1283 (1990), cert. granted, judgment vacated on other grounds, 498 U.S. 1019, 111 S. Ct. 663, 112 L. Ed. 2d 657 (1991), the court reversed a **DUI** conviction because of the state’s

Timothy Culhane
failure to extrapolate the defendant’s test results back to the time of driving, as required by the applicable DUI statute. Agreeing with the defendant’s argument that the state failed to meet its burden of proof by not calling expert testimony to relate the test results in excess of 0.10 back to the time of the offense, the court declared that the legislature had amended the statute, Conn. Gen. Stat. Ann. § 14-227(a), to add a "per se" provision of BAC in excess of 0.10, with the intention of requiring the prosecution to prove that the analysis of the test results accurately reflect the defendant’s BAC at the time of the offense. Since the test was administered over one hour after the defendant drove, the state was required to extrapolate the test results of 0.269 back to the time of operation in order to comply with the statutory analysis requirement; its failure to do so, the court, declared, warranted reversal of the DUI conviction.

Where the "per se" DUI statute, Ind. Code Ann. § 9-30-5-1, required that breath or blood tests be administered within three hours of driving for the state to take advantage of the statutory presumption of intoxication based on a BAC in excess of 0.10%, the court ruled that test results of 0.104% obtained 2 hours after driving were insufficient to establish guilt where the prosecution failed to offer expert testimony to relate the test results back to the time of driving, in Allman v. State, 728 N.E.2d 230 (Ind. Ct. App. 2000). Noting that it was commonly understood that a drinker’s blood alcohol level varied over time as the processes of absorption and oxidation ran their course, the court declared that test results barely in excess of the legal limit were insufficient proof of DUI to allow the jury to conclude beyond a reasonable doubt that the driver’s BAC was higher at the time of driving than it was when she was tested. Since the state failed to offer any expert relate back testimony to remove that doubt, the court reversed the defendant’s "per se" DUI conviction.

Despite affirmiting a DUI conviction obtained pursuant to a non-per se statutory scheme, Ind. Code Ann. § 9-11-2-2, the court, in Smith v. State, 502 N.E.2d 122 (Ind. Ct. App. 2d Dist. 1986), nevertheless reiterated its long-held view that extrapolation evidence was required in order to successfully prosecute a DUI "per se" charge. While ruling that non-extrapolated BAC results, along with other evidence of intoxication, could sustain a non-per se impairment DUI charge, the court reaffirmed Indiana’s long-standing rule that relate back testimony was required to show that a defendant was intoxicated while driving, since the "per se" statute, Ind. Code Ann. § 9-11-2-1, criminalized operating a vehicle with a BAC of 0.10% or more.

Holding that blood or breath tests, administered over two hours beyond the time of driving, which yielded results marginally in excess of the legal limit of 0.08, must be corroborated with expert extrapolation testimony, the court, in State v. Baldwin, 130 N.M. 705, 2001-NMCA-063, 30 P.3d 394 (Ct. App. 2001) reversed a DWI conviction because the state failed to offer such testimony. The state must prove a nexus between a BAC test result in excess of 0.08 and the time a driver operated his vehicle, the court ruled, because the DWI statute, N.M. Stat. Ann. § 66-8-102(C), requires proof of excessive BAC at the time of driving. Evidence of a breath test result, the court continued, without extrapolation or other proof establishing the required nexus, is insufficient evidence as a matter of law to sustain a guilty verdict for a "per se" DWI offense. Further noting that the DWI statute did not create any statutory inference that a 0.08 BAC within three hours of driving was prima facie evidence of guilt, the court declared that suppression was required to avoid allowing the state to base a criminal verdict on conjecture which ignores the state’s burden of proof beyond a reasonable doubt and undermines the most basic principles of fairness.

In People v. LaPlante, 81 Misc. 2d 34, 365 N.Y.S.2d 392 (J. Ct. 1975), the court declared that it may be possible for a duly qualified expert to relate test results in excess of the legal limit back to the time of driving, but that without such evidence, the prosecution’s "per se" case must fail. Noting that N.Y. Veh. & Traf. Law § 1195, subd. 2 did not make drinking, drinking and driving, or even driving while impaired a crime, but only prohibited driving with a BAC in excess of 0.10%, the court maintained that test results administered subsequent to driving were not sufficient to obtain a guilty verdict pursuant to that statute.

Observing that the applicable "per se" DUI statute, Ohio Rev. Code Ann. § 4511.19(A)(3), did not provide that a BAC test result of 0.10 or more constituted prima facie guilt of DUI, but rather contemplated the introduction of "other competent evidence" besides a BAC test result in order to obtain a DUI conviction, the court found the defendant not guilty of DUI for the lack of such evidence, in State v. Murphy, 7 Ohio Misc. 2d 1, 453 N.E.2d 1304 (Mun. Ct. 1983). Although the breath test was administered 26 minutes after driving with a result of 0.119, the court opined, the state neither offered proof of excessive BAC at the time of driving by way of relate back testimony, nor did it offer any other proof of impairment while driving which was necessary to meet it burden of proof beyond a reasonable doubt. Consequently, the court had no choice but to find the defendant innocent, since the defendant’s BAC may have been lower than 0.010 at the time he was driving, as admitted by the state’s forensic pathologist.

Timothy Culhane
Acknowledging that the applicable per se DUI statute, 75 Pa. Cons. Stat. § 3731(a)(4), prohibited driving a vehicle "while" one’s blood alcohol content was 0.10 or greater, the court, in Com. v. Modaffare, 529 Pa. 101, 601 A.2d 1233 (1992), ruled that in cases where test results not taken within a short time of driving indicated a BAC not greatly in excess of 0.10, the prosecution must offer extrapolation testimony relating the results back to the time of driving in order to obtain a DUI conviction. This requirement was necessary, the court maintained, to insure that a driver was not convicted of having a BAC of 0.10 or more when that driver’s BAC may have been below the legal limit while driving, but was rising when the test was administered several hours later. Since the test in this case was given almost two hours after driving, with a result of 0.108, and the state’s expert admitted that it was possible that the defendant’s BAC was lower at the time of driving, the court determined that the state had not proven guilt of DUI beyond a reasonable doubt, and reversed the defendant’s conviction.

Observing that the state had offered no relate back testimony to support a BAC test result of 0.157% rendered 46 minutes after driving, and that the lower court had instructed the jury that the state was not required to produce relate-back evidence for prosecutions brought pursuant to the "per se" DUI statute, 75 Pa. Cons. Stat. § 3731(a)(4), the court decided that the proper remedy was to grant the defendant’s motion in arrest of judgment, in Com. v. Shade, 545 Pa. 347, 681 A.2d 710 (1996). The court ruled that the conviction was insufficient as a matter of law, and the jury was permitted base its verdict on an erroneous instruction which relieved the state of its burden of proving a material element of the offense, i.e., a BAC in excess of 0.10% at the time of driving.

Vacating a DUI conviction obtained pursuant to a "per se".10% statute, 75 Pa. Cons. Stat. § 3731(a)(4), the court, in Com. v. Osborne, 414 Pa. Super. 124, 606 A.2d 529 (1992), decided that the conviction could not stand because the state trooper administered a blood alcohol (BAC) test 50 minutes after the defendant drove, with the result of 0.148%, and the state offered no relate back testimony. The court reasoned that, the near-one-hour delay in testing, a significant factor weakening the inference of guilt, combined with the defendant’s testimony that she drank a beer 55 minutes before driving, called for relate-back testimony, since the defendant’s BAC could still have been rising at the time the test was given.

In Com. v. Proctor, 425 Pa. Super. 527, 625 A.2d 1221 (1993), although the court affirmed the defendant’s conviction for driving while impaired due to proof of physical impairment and evidence of alcohol consumption, it reversed his conviction for "per se" DUI under 75 Pa. Cons. Stat. § 3731(a)(4), even with a test result of 0.179% for exceeding the 0.10% legal limit, because the BAC test was administered one hour after driving, creating a weak inference of guilt, and the state offered no relate back testimony to prove the defendant’s BAC "while driving", as required by the "per se" statute. A one-hour delay was significant, the court declared, and was sufficient to deny the prosecution a presumption of intoxication while driving otherwise afforded by a test result in excess of 0.10%.

In Com. v. Stith, 434 Pa. Super. 501, 644 A.2d 193 (1994), it was held that relate back testimony was required to prove that the DUI offense occurred "while driving" in a prosecution pursuant to the "per se" DUI statute, 75 Pa. Cons. Stat. § 3731(a)(4). Noting that a BAC test was administered 35 to 40 minutes after the defendant drove with a result of 0.12%, the court declared that the test results, rendered so distantly from driving, did not by themselves give rise to a strong inference of guilt, and such an inference was necessary to support a conviction under that statute. However, since the state’s expert testified unequivocally that the defendant’s BAC was decreasing at the time of testing, the court affirmed the defendant’s conviction, opining that there was sufficient proof of guilt even without the otherwise required extrapolation evidence.

In State v. Ludwig, 434 N.W.2d 594 (S.D. 1989), where a driver failed field sobriety tests and had the appearance of intoxication, and a BAC test had been administered to him one hour and 15 minutes after driving with a result of 0.209%, it was held that expert extrapolation testimony was nevertheless required to obtain a conviction for "per se" 0.10% DUI, and the prosecution’s failure to offer such testimony required reversal of the conviction. The test results, by themselves, were insufficient to establish the driver’s BAC at the time of driving, the court declared, because the relevant "per se" statute, S.D. Codified Laws § 32-23-1, provided that a person "may not drive any vehicle while there is 0.10 percent of more of alcohol in his blood . . . ." Test results, the court noted, only showed a BAC at the time the driver’s blood was drawn, not what it was at the time he was driving. Expert extrapolation testimony was required, the court concluded, the relate the test results back to the time of driving.

Observing that the DUI statute prohibited driving while having a blood alcohol content (BAC) in excess of 0.10%, the court, in McCafferty v. State, 748 S.W.2d 489 (Tex. App. Houston 1st Dist. 1988), decided that the state’s proof was

Timothy Culhane
insufficient to warrant a **DUI** conviction where it did not include expert extrapolation testimony relating the test results back two hours and 15 minutes to the time of driving. Where the state’s expert merely introduced BAC test results of 0.18%, but offered no testimony as to absorption and metabolization rates of intoxication, and in no way connected the breath test results to the driver’s condition while driving two hours and 15 minutes later, the state failed to show that the defendant was intoxicated while driving, the court determined, and reversed the “per se” **DUI** conviction.

Introduction of the defendant’s BAC results of 0.160, obtained eighty minutes after she drove, without also offering expert extrapolation testimony explaining absorption or elimination of alcohol at the time of the test, was reversible error, the court declared in *Stewart v. State*, 103 S.W.3d 483 (Tex. App. San Antonio 2003), petition for discretionary review granted, (July 2, 2003). The court reasoned that the state’s proof, evidence of test results, was irrelevant without extrapolation testimony, since there was no proof of BAC at the time of driving, and her BAC could have been either rising or falling at the time of testing, leaving it no more probable that she was intoxicated while driving than not. Accordingly, the court concluded, it could not be said that the erroneous admission of the test results had no effect on the jury, so the erroneous admission was not harmless, and requiring reversal of the defendant’s “per se” **DUI** conviction.

**CUMULATIVE CASES**

Cases:

If blood sample is drawn more than two hours after arrest for driving under the influence (**DUI**), an expert must use retroactive extrapolation to determine the blood alcohol content. A.R.S. § 28-1381(A)(2). *State v. Stanley*, 172 P.3d 848 (Ariz. Ct. App. Div. 1 2007).

A numerical blood alcohol content (BAC) test result is relevant to a prosecution for driving under the influence as opposed to a per se violation only if a proper foundation is laid to assure the validity of the test result, including evidence extrapolating the result back to the time of the alleged offense. I.C. § 18-8004(1)(a). *State v. Robinett*, 106 P.3d 436 (Idaho 2005).

In a prosecution for driving while intoxicated (DWI), when the delay between defendant’s driving and the testing of defendant’s blood alcohol content (BAC) is significant, the state must prove a nexus between defendant’s BAC score and the time of driving through evidence corroborating the inference that defendant’s BAC at the time of driving was at the statutory level of 0.08 or above. UJI 14-4503. *State v. Hughey*, 2005-NMCA-114, 119 P.3d 188 (N.M. Ct. App. 2005), cert. granted, 2005-NMCERT-008 (N.M. 2005).

When the delay between driving and blood alcohol concentration (BAC) testing is significant, the State must prove a nexus between the defendant’s BAC score and the time of driving through evidence corroborating the inference that the defendant’s BAC at the time of driving was at the statutory level of 0.08 or above, in the prosecution for per se driving while intoxicated (DWI). *State v. Silago*, 2005-NMCA-100, 119 P.3d 181 (N.M. Ct. App. 2005).

[*8b*] Required only to prove numerical percentage of test result

In the following cases, it was held that relate back testimony was required solely for the prosecution to introduce the numerical results of the BAC test into evidence.

In *Desmond v. Superior Court of Maricopa County*, 161 Ariz. 522, 779 P.2d 1261, 1989 WL 31800 (1989), where a defendant had been convicted of non- “per se” **DUI**, the court held that his BAC result of 0.138 should not have been introduced into evidence without being related back forty-five minutes to the time he drove, and accordingly, reversed the defendant’s conviction. Observing that the impaired driving statute, Ariz. Rev. Stat. Ann. § 28-692(A), prohibited driving while impaired due to alcohol intoxication, the court held that although BAC results obtained within a reasonable time of driving were admissible without relate back evidence to show the presence of alcohol in the driver’s blood, the numerical results of BAC tests could not be admitted without expert extrapolation testimony, and that a jury instruction must be given which states that the evidence is admitted for the limited purpose of showing that at the time of test, the defendant had alcohol in his blood. The instruction must further state, the court added, that such evidence of alcohol consumption, without more, may not be used for the purpose of showing that the defendant was under the influence of alcohol or had a specific percentage of alcohol in his blood at any time.

Timothy Culhane
In *State v. Stamm*, 616 N.E.2d 377 (Ind. Ct. App. 2d Dist. 1993), the court reiterated the Indiana rule of law that the results of a breath test could be used to determine the numerical BAC of a defendant at the time of driving in a "per se" DUI prosecution if the state introduced extrapolation testimony relating the result back to the time of driving. When accompanied by relate back testimony, the court concluded, test results were also admissible to show the defendant had some alcohol in his system in a prosecution under the non-per se driving while intoxicated statute.

Reversing a non-"per se" DUI conviction for lack of relate back testimony, the court declared that the BAC results of 0.13% obtained one hour and 10 minutes after driving, admitted without supporting expert extrapolation testimony, constituted unfairly prejudicial evidence, since the applicable statute required proof of intoxication at the time of driving, in *State v. Dumont*, 146 Vt. 252, 499 A.2d 787 (1985). Since Vt. Stat. Ann. tit. 23, § 1201(a)(2) prohibited operating a vehicle while under the influence, the court reasoned, expert testimony concerning blood alcohol content must be limited to demonstrating that the driver had consumed intoxicating liquor, and the numerical results obtained could only be admitted into evidence when supported by expert extrapolation testimony relating the test results back to the time of driving. The court differentiated the rules concerning the two types of DUI prosecutions, declaring that BAC test results were not at all admissible in "per se" DUI prosecutions without relate back testimony, while they were admissible in non-per se prosecutions without relate back testimony, but only to show alcohol consumption, and not to prove a specific numerical BAC percentage.

The court decided that a numerical blood test result was not admissible in a non-"per se" DUI prosecution without further evidence relating the test result back to the time of operation, in *State v. McQuillen*, 147 Vt. 386, 518 A.2d 25 (1989). The court began by differentiating the applicable impairment DUI statute from the "per se" DUI statute, in that the latter criminalized driving with a blood alcohol content (BAC) in excess of 0.10%, while the former made driving while intoxicated a crime without reference to BAC test results. Evidence of BAC results must be treated with care in non-"per se" prosecutions, the court declared, to avoid possible misapplication of technical evidence by the jury, namely, making the improper suggestion that BAC test results obtained after driving accurately demonstrated BAC at the time of driving. Absent relate back testimony, the court ruled, numerical results of BAC testing is inadmissible in DUI prosecutions pursuant to either statute, and are only admissible in non-per se prosecutions to show that the defendant consumed an unspecified amount of intoxicating liquor prior to driving. Although the defendant’s test results were obtained a mere 30 minutes after driving, the court could not find such a short lapse to be de minimis, so the prosecution was required to offer relate back testimony to introduce numerical test results in its non-"per se" driving while intoxicated prosecution. Since the defendant’s numerical results were introduced at trial sans expert extrapolation testimony, reversal of his non-"per se" DUI conviction was required, the court concluded.

**CUMULATIVE CASES**

Cases:

Evidence of alcohol in defendant’s system four hours after accident was relevant and admissible in prosecution for vehicular homicide committed while driving while intoxicated (DWI), even though evidence of defendant’s specific blood-alcohol level at that time was excluded due to lack of relation-back evidence and jury’s common knowledge that such specific blood-alcohol level was over legal limit, where such evidence, taken together with lack of any evidence that defendant drank alcohol after accident, tended to establish that there had been alcohol in his system at time of accident. State v. Montoya, 2005-NMCA-078, 114 P.3d 393 (N.M. Ct. App. 2005), cert. denied, (June 6, 2005).

[*8c] Required only for prosecution to make use of presumption of intoxication

In the following cases the courts decided that expert extrapolation evidence was required for the prosecution to make use of the presumption of intoxication afforded by a BAC test result in excess of the proscribed limit.

The court, in *Desmond v. Superior Court of Maricopa County*, 161 Ariz. 522, 779 P.2d 1261, 1989 WL 31800 (1989), held that, in order to make use of the statutory presumption of intoxication afforded by a BAC result in excess of 0.10%, the prosecution must relate the breath test results back to the time of driving via expert testimony. Where a defendant had been convicted of driving under the influence, the court held that his BAC result of 0.138 should not have been introduced into evidence without being related back 45 minutes to the time he drove, and accordingly, reversed the defendant’s conviction on grounds that the jury may have been confused into believing that the test results created a presumption of guilt, when no such presumption existed without relate back testimony. Observing that the non-"per se" DUI statute, Ariz. Rev. Stat. Ann. § 28-692(A) prohibited being impaired and under

Timothy Culhane
the influence of intoxicating beverages while driving, the court concluded that a test result obtained after driving was insufficient by itself to sustain a conviction under the statute, and reversed the defendant’s conviction.

The state’s failure to offer expert testimony to relate breath test results back to the time of driving did not require reversal of the defendant’s DUI conviction, the court concluded, since relate back evidence was only required if the state sought to utilize the statutory presumption of intoxication created by Ariz. Rev. Stat. Ann. § 28-692(E)(3), ruled the court in State ex rel. McDougall v. Riddles, 169 Ariz. 117, 817 P.2d 62 (Ct. App. Div. 1 1991). Where the state only offered expert testimony as to the number of drinks a defendant had in his system, and the testimony was based upon a BAC reading obtained within a short time after arrest, and the state did not seek to take advantage of the presumption of intoxication, then the expert testimony should not have been excluded, the court declared. The absence of state sponsored relation back evidence affected only the weight of evidence, but not its admissibility, since evidence of alcohol consumption was relevant to the issue of intoxication, the court concluded.

In State v. Stamm, 616 N.E.2d 377 (Ind. Ct. App. 2d Dist. 1993), the court ruled that the only effect of not administering a DUI blood test within the three hours of the defendant’s driving, as required by Ind. Code Ann. § 9-30-6-2, was to deprive the state of making use of the rebuttable presumption of intoxication provided in Ind. Code Ann. § 9-30-6-15. The delay was relevant only with regard to the presumption, the court declared, not to the admissibility of the chemical test results.

Where the lower court had instructed the jury that it could presume intoxication from test results in excess of the legal limit, it was held in State v. McDonald, 421 N.W.2d 492 (S.D. 1988) that the instruction was error because the state failed to extrapolate the BAC test results back to the time of driving. Noting that the non-“per se” DUI statute, S.D. Codified Laws § 32-23-1(2), proscribed driving under the influence of an alcoholic beverage, and that the “per se” DUI statute, S.D. Codified Laws § 32-23-1(1) prohibited driving with a blood alcohol content of 0.10% or more, the court concluded that the state could not take advantage of the statutory presumption of intoxication granted by S.D. Codified Laws § 32-23-7 in prosecutions pursuant to either statute without offering extrapolation testimony. In prosecutions under the “per se” statute, the court concluded, evidence of BAC test results were inadmissible without extrapolation, but they were admissible in non-“per se” prosecutions, although the state could not make use of the presumption of intoxication without offering extrapolation testimony.

The court ruled that, although the state must present expert testimony relating BAC test results back to the time the defendant drove in order to make use of the presumption of intoxication afforded by the applicable DUI statute, it need not offer such evidence in order to introduce the test results for the sole purpose of proving that the defendant consumed alcohol before driving, in State v. Bradley, 578 P.2d 1267 (Utah 1978). It would be error to instruct the jury regarding any statutory presumptions of intoxication, the court ruled, in the absence of any expert testimony relating the breathalyzer test results back to the time of operation, especially where, as in this case, the test result of 0.06% was below the legal limit of 0.08%, and the only way the state could prove a result in excess of 0.08% was via extrapolation. Since the state did not offer any such expert testimony, the court decided, it would be error to instruct the jury that a presumption of intoxication attended the 0.06% test result. However, the court determined, the state did offer sufficient expert testimony to make use of the presumption and to justify the instruction when its expert testified related the average human alcohol burn-off rate to the defendant in such a manner as to warrant the jury’s conclusion that his BAC at the time of driving was in excess of the 0.08% limit which justified the statutory presumption provided for in Utah Code Ann. § 41-6-44.

The court reversed the defendant’s “per se” DUI conviction because the state offered no expert testimony relating the blood alcohol test results back to the time of operation, and the court instructed that jury that the test results created an inference of guilt, in State v. Dacey, 138 Vt. 491, 418 A.2d 856 (1980). Examining the applicable evidentiary statute, Vt. Stat. Ann. tit. 23, § 1204(3), the court determined that it provided for a legal inference of guilt when test results revealed the presence of 0.10% of alcohol in a person’s blood at the time of operating a vehicle. Focusing upon the “at the time of operation” language, the court reasoned that the inference could properly be properly raised only when the state offered expert testimony relating BAC test results back to the time of operation. As the prosecution did not relate the defendant’s test results of 0.23% back an hour and 15 minutes to the time he drove, the court concluded, reversal was required since the jury was erroneously instructed that it could infer guilt from the evidence presented, which included test results obtained after driving.

In State v. Carter, 142 Vt. 588, 458 A.2d 1112 (1983), the court held that, although the state was required to offer expert extrapolation testimony in order to take advantage of the presumption of intoxication afforded by the existence

Timothy Culhane
of test results in excess of the statutory limit, it was not required to relate BAC test results back to the time of driving in order to prove that the driver had consumed some unspecified amount of alcohol. The court rejected the defendant’s assertion that the admission of BAC test results of 0.21% was error since the state failed to relate the test results back to the time of driving, declaring that BAC test results were as relevant to the issue of DUI as an officer’s personal observations of the defendant, since test results established that the defendant had consumed some alcohol, thereby corroborating the officer’s testimony that the defendant appeared intoxicated. Accordingly, the court affirmed the defendant’s non-“per se” DUI conviction.

CUMULATIVE CASES
Cases:

Under Virginia’s driving while intoxicated (DWI) statute, test results revealing a threshold blood-alcohol concentration do not conclusively establish either that this threshold concentration was present at time motorist drove, or that motorist was in fact under influence of alcohol at time; rather, such results create only a rebuttable presumption of those facts. West’s V.C.A. § 18.2-266. U.S. v. Thomas, 367 F.3d 194 (4th Cir. 2004) (applying Virginia law).

[*9] Sufficiency of prosecution’s extrapolation evidence
[*9a] Held sufficient

In the following cases, it was held that the prosecution’s extrapolation evidence was sufficient to convict a defendant of DUI.

In Com. v. Stith, 434 Pa. Super. 501, 644 A.2d 193 (1994), where the state’s expert testified unequivocally that the defendant’s BAC was decreasing at the time of testing, the court affirmed the defendant’s conviction for “per se” 0.10% DUI under 75 Pa. Cons. Stat. § 3731(a)(4). Expert extrapolation testimony was required, the court had ruled, because the relatively low BAC test score, 0.12%, and 35 to 40 minute lapse between driving and testing, did not give rise to a strong inference of guilt. The state’s expert, a toxicologist, adequately related the test results back to the time of driving, the court noted, since he testified that it was unlikely that the driver could have absorbed enough alcohol from six drinks to get a 0.12%BAC result after a 35 to 40 minute lapse unless he was at least 0.14% while driving, or unless he “chug-a-lugged” the drinks, another great unlikelihood. That the expert did not know the precise time when the driver consumed his last drink was irrelevant, the court concluded, since the expert declared unequivocally that such information was unnecessary under the circumstances, and supported his assertion with reasonable mathematical formulae.

In Bhakta v. State, 124 S.W.3d 738 (Tex. App. Houston 1st Dist. 2003) (unpublished opinion), the court ruled that the prosecution’s expert retrograde extrapolation testimony constituted a sufficient factual basis to establish beyond a reasonable doubt that the defendant’s BAC was above the legal limit when he operated his vehicle. Noting that the defendant’s test results 25 and 28 minutes after driving were 0.149 and 0.163, respectively, the court decided that the state’s expert, a police department crime lab breath test supervisor, offered sufficient extrapolation testimony to warrant a conviction on a “per se” DUI charge when he thoroughly explained the extrapolation procedure and declared that he was familiar with enough information necessary to extrapolation, including the time of last alcohol consumption, the time of the stop, the defendant’s weight, height and gender, the time and substance of his last meal, and whether the defendant was in the elimination phase. The court added that, for extrapolation to be reliable, the expert should consider the length of time between driving and the test administration, the number of tests given and the length of time between them, the knowledge of individual characteristics such as the person’s weight and gender, tolerance for alcohol, typical drinking patterns, amount of alcohol consumed that day or night, the type of alcoholic beverage, the duration time of drinking, and amount of food consumption before, during or after drinking. Not every single personal fact about the defendant must be know to the expert for extrapolation to be sufficiently reliable, the court concluded, but only sufficient facts to determine what the driver’s probable breath test score was at the time of driving.

In State v. Bradley, 578 P.2d 1267 (Utah 1978), where extrapolation evidence was required in order for the state to make use of the statutory presumption of intoxication provided for in Utah Code Ann. § 41-6-44 and to warrant the granting of an instruction referring to the presumption, the court ruled that the prosecution had offered sufficient extrapolation testimony to justify the granting of such an instruction. By offering an expert who related the average human alcohol burn-off rate to the defendant in such a manner as to show that his BAC may have been in excess of the

Timothy Culhane
0.08% limit, the prosecution met its extrapolation burden, the court declared, even though the test result was 0.06% when administered four hours after driving.

**CUMULATIVE CASES**

Cases:

For purposes of determining admissibility of testimony of state’s expert in prosecution for aggravated driving while under the influence of alcohol (DUI) with respect to retrograde extrapolation calculation of defendant’s blood alcohol content (BAC), expert’s methodology was generally accepted as valid in relevant scientific community, despite existence of arguable flaws in methodology and some disagreement in scientific community as to most accurate method of performing retrograde analysis, where expert testified that several studies and scholarly publications supported his opinion that average person reaches peak BAC within two hours of their last drink, and state presented several articles in support of expert’s testimony. 17A A.R.S. Rules of Evid., Rule 702. *State ex rel. Montgomery v. Miller*, 321 P.3d 454 (Ariz. Ct. App. Div. 1 2014).

Evidence was sufficient to support convictions for driving under the influence (DUI), being habitual violator, and failure to maintain lane; truck landed in ditch, witness stated that two men had gotten out of truck and were walking down street holding each other up, officer found them, both men were intoxicated and had strong odor of alcohol, they told officer that they had been involved in accident, defendant had cuts and scratches consistent with injuries that would have resulted from being driver, defendant had red knot on his forehead that matched break in windshield on driver’s side, in video while two were alone in officer’s cruiser, defendant told passenger that he should say that he was driving because defendant would not spend another night in jail, and defendant’s blood alcohol level registered.210 approximately two hours after accident. *Becker v. State*, 633 S.E.2d 436 (Ga. Ct. App. 2006).

Testimony of expert toxicologist, based on retrograde extrapolation, that defendant’s blood alcohol content (BAC) was.20 at time of crash was reliable and therefore sufficient to show prohibited level of BAC on charge of aggravated driving with blood-alcohol level of.08 or more resulting in two deaths; toxicologist explained theory behind retrograde extrapolation and the formula used to calculate it, he testified the formula was generally accepted in field of toxicology, and he noted that he relied on police laboratory report stating that defendant’s BAC was.020 about 10 hours after crash and that expert had no reason to believe tests conducted by police were contaminated or unreliable. S.H.A. 625 ILCS 5/11-501(a)(1), (d)(1)(F). *People v. Ikerman*, 973 N.E.2d 1008 (Ill. App. Ct. 5th Dist. 2012).

Trial court did not abuse its discretion by determining that State’s impairment expert’s methodology to determine the level of hydrocodone in defendant’s system prior to the administration of her blood test was sufficient to pass the Daubert test for reliability, in prosecution for driving under the influence of hydrocodone and negligently causing death or serious injury to another; although there were no studies concerning the retrograde extrapolation of hydrocodone, a study was conducted to determine the mean peak level of hydrocodone in a person’s system, expert testified regarding the half-life of hydrocodone, and expert, using several different peak levels, testified that based on defendant’s impairment three hours after accident defendant was impaired at the time of the accident. Rules of Evid., Rule 702. *Teston v. State*, 44 So. 3d 977 (Miss. Ct. App. 2008), cert. granted, 31 So. 3d 1217 (Miss. 2010) and cert. dismissed as improvidently granted, 44 So. 3d 969 (Miss. 2010).

Evidence was sufficient to support conviction for driving with an alcohol concentration of.10 or more (DUI per se); results of breath alcohol test administered fifty-one minutes after defendant stopped driving showed that defendant’s blood alcohol content was.129, evidence showed that defendant smelled the odor of an alcoholic beverage when he was stopped officer, officer observed defendant’s eyes as bloodshot and glossy, officer observed clues indicating alcohol intoxication when defendant failed to satisfactorily perform field sobriety tests, defendant admitted to having ingested some alcohol, and a portable breath test detected the presence of alcohol in defendant’s breath. MCA 61-8-406(a) (2000). *State v. Weitzel*, 2006 MT 167, 332 Mont. 523, 140 P.3d 1062 (2006).

Trial court did not abuse its discretion in negligent homicide prosecution by permitting State’s expert to offer an opinion that defendant, at the time his blood draw was taken, had reached and passed “peak alcohol phase,” even though trial court had issued order excluding any evidence regarding retrograde extrapolation results of defendant’s blood alcohol concentration test; retrograde extrapolation was a method of estimating a person’s blood alcohol level at a specified time by using the person’s known blood alcohol content at a later time, and expert did not assign a definitive number to defendant’s blood alcohol at the time of the accident. *State v. Larson*, 2004 MT 345, 324 Mont. 310, 103 P.3d 524 (2004).

Timothy Culhane
Evidence was sufficient to support conviction of felony driving while intoxicated (DWI); officer testified at trial that he responded to call of suspicious vehicle or noise complaint and observed vehicle heading towards him without front license plate, that he followed vehicle into parking lot, whereupon he observed that vehicle also lacked rear license plate, that, upon approaching driver, he observed that driver had bloodshot and watery eyes, detected strong odor of alcohol on driver’s breath, and noticed that driver’s speech was slurred, and driver failed several field sobriety tests and refused to take breath alcohol test. McKinney’s Vehicle and Traffic Law §§ 1192(3), 1193(1)(c)(i). People v. Shank, 808 N.Y.S.2d 533 (App. Div. 4th Dep’t 2006).

Evidence was sufficient to support conviction for driving under the influence (DUI) of alcohol, high rate of alcohol; officer found defendant sitting in the driver’s seat of his vehicle, in a lane of travel on interstate, while administering his brakes at 2:00 a.m., defendant’s blood alcohol test at the hospital occurred at 3:00 a.m. and revealed that defendant had a blood alcohol content (BAC) of .143, and it was doubtful that defendant sat in his vehicle in a lane of travel for more than an hour before police arrived. 75 Pa.C.S.A. § 3802(b). Com. v. Teems, 2013 PA Super 147, 74 A.3d 142 (2013).

Evidence was sufficient to establish that defendant was incapable of safe driving due to consumption of alcohol so as to support driving under influence of alcohol (DUI) conviction; defendant drove onto grassy median, drove in wrong lane of traffic, smelled of alcohol, was unsteady on her feet, was combative, failed field sobriety tests, and refused blood alcohol test. 75 Pa.C.S.A. § 3802(a)(1). Com. v. Smith, 2006 PA Super 174, 904 A.2d 30 (2006).

Evidence was sufficient to support conviction for driving under influence (DUI); defendant drank six beers and two or three shots of liquor no more than two hours before driving, police officers observed that defendant had bloodshot eyes, slurried his speech, swayed in his stance, and smelled of alcohol, defendant’s breath-test results approximately one and one-half hours after collision were 0.130% and 0.127%, and expert testified that defendant’s blood-alcohol level at time of collision could have been as high as 0.103% given certain assumptions and that medical and scientific community believed that individuals were sufficiently impaired at level of 0.08% or higher. 75 Pa.C.S.A. § 3731(a)(1, 4) (Repealed). Com. v. Sullivan, 2004 PA Super 481, 864 A.2d 1246 (2004).

The results of defendant’s blood alcohol test were sufficient to establish that defendant’s blood alcohol content was above the legal limit at the time he was driving, for the purpose of prosecution for driving under the influence; two tests of defendant’s blood alcohol content were conducted within three hours after defendant drove his vehicle, and defendant’s blood alcohol content was above the legal limit on both tests. 75 Pa.C.S.A. § 3731(a.1) (Repealed). Com. v. Butler, 2004 PA Super 294, 856 A.2d 131 (2004).

Any error in trial court’s admission of witness’s testimony on retrograde extrapolation, which included his estimate that defendant had a blood alcohol content of 0.19 at time of incident, was harmless at trial for intoxication manslaughter; evidence of defendant’s intoxication was overwhelming, including defendant’s account of effect of his drinking on day of incident. V.T.C.A., Penal Code § 49.08; Rules of Evid., Rule 702; Rules App.Proc., Rule 44.2(b). Morris v. State, 214 S.W.3d 159 (Tex. App. Beaumont 2007).

Despite absence of retrograde extrapolation evidence, two breath test samples taken approximately 80 minutes after defendant stopped driving, which showed blood alcohol content level of .09 and .092, were probative of whether defendant consumed alcohol before operating a motor vehicle and whether he was impaired as a result of his alcohol consumption, in prosecution for driving while intoxicated (DUI). Gigliobianco v. State, 179 S.W.3d 136 (Tex. App. San Antonio 2005), reh’g overruled, (Oct. 10, 2005).

Evidence was sufficient to establish that defendant was intoxicated at time of his collision with other vehicle, thus supporting his conviction for driving while intoxicated (DUI); individual with whom defendant collided and vehicle’s owner testified that defendant stumbled, slurried his speech, and smelled strongly of alcohol after accident, and State’s expert testified that defendant was intoxicated at time of accident based on results of alcohol breath tests and “retrograde extrapolation” analysis, the process of computing back in time a person’s blood-alcohol level. V.T.C.A., Penal Code §§ 49.01(2), 49.04. Owens v. State, 135 S.W.3d 302 (Tex. App. Houston 14th Dist. 2004).

\[^{*9b}\] Held insufficient

In the following case it was held that the prosecution’s extrapolation evidence was insufficient.

Timothy Culhane
Where the only evidence of intoxication was the prosecution expert’s extrapolation of test results back 2 hours to the time of driving, it was held that the extrapolation testimony was insufficient to support a DUI conviction because the state’s expert was unaware of the amount of alcohol consumed by the defendant, in U.S. v. DuBois, 645 F.2d 642 (8th Cir. 1981). Where the prosecution’s witness, a forensic chemist, based her extrapolation testimony on an “average” of beer consumption, rather than the defendant’s actual consumption, and the prosecution offered no other proof of intoxication while driving, the court held such evidence to be insufficient to prove the defendant’s intoxication under the auspices of North Dakota “per se” DUI statute, N.D. Cent. Code § 39-20-07. Although the court declared that there may be instances where an expert could estimate previous blood alcohol levels accurately, where there existed a reasonable possibility of intervening consumption between driving and testing, an expert would have to know the time elapsed since driving, and the amount consumed in the interim. Lacking that information, the court concluded, the prosecution’s extrapolation testimony was inadmissible and insufficient to prove intoxication.

Affirming a “non-per se” impairment DUI conviction, the court, in Dye v. State, 2002 WL 10527 (Tex. App. Amarillo 2002), nevertheless decided that the state’s expert extrapolation testimony was not sufficiently reliable for admission into evidence. Noting that the state expert testified that retrograde extrapolation required information regarding the amount of alcohol consumed and its concentration in the beverage, the time period of consumption, the person’s gender, size and weight, and the amount of food in the person’s stomach, but also admitted that he lacked much of that information and could not precisely determine the defendant’s BAC while driving, the court concluded that the trial court abused its discretion in overruling the defendant’s objection to the expert’s extrapolation testimony. The court found the error harmless, however, since there was other admissible evidence of intoxication sufficient to warrant a conviction on the “non-per se” charge.

In Douthitt v. State, 127 S.W.3d 327 (Tex. App. Austin 2004), the court held that the State failed in intoxication manslaughter prosecution arising from accident involving vehicle driven by defendant to demonstrate by clear and convincing evidence the reliability of retrograde extrapolation testimony that defendant’s alcohol concentration exceeded 0.13 at time of accident, where expert witness did not state basis for assertion that alcohol concentration peaked no later than one hour after drinking stopped and did not expressly acknowledge that timing of peak concentration could be affected by a heavy meal or consumption of large amount of alcohol in brief period of time.

CUMULATIVE CASES

Cases:

Probative value of retrograde extrapolation of defendant’s blood-alcohol level (BAL) at the time he was driving was substantially outweighed by danger of unfair prejudice in prosecution for driving under the influence of alcohol (DUI) causing substantial bodily harm; extrapolation was based on single blood sample taken over two hours after accident, experts’ estimations of defendant’s BAL at time of charged offense were based primarily on factors attributed to the “average” person rather than significant personal characteristics of defendant, and the high BAL of .18 at time of test potentially invited jurors to determine defendant’s guilt based on emotion or an improper ground. West’s NRSA 48.035(1), 484C.430(1)(NVST484C.430, b). State v. Eighth Judicial Dist. Court of State ex rel. County of Clark, 267 P.3d 777, 127 Nev. Adv. Op. No. 84 (Nev. 2011).

Numerical blood alcohol content (BAC) tests were not relevant in prosecution of defendant for driving under the influence (DUI) that was based on the totality of the evidence, rather than based on a per se violation, where the results were not accompanied by any evidence that correlated the results to the time of the accident and how it would have impacted defendant’s ability to drive. I.C. § 18-8004(1)(a). State v. Robinett, 106 P.3d 436 (Idaho 2005).

Evidence that defendant, when tested at precinct, registered 1/1000th of one percentum of blood-alcohol content (BAC) above legal limit for per se intoxication was insufficient to prove beyond a reasonable doubt that his BAC was over the legal limit at time he was driving, as required in prosecution for driving while intoxicated (DWI), where test was given 1-1/2 hours after defendant drove. People v. Alija, 946 N.Y.S.2d 430 (Sup 2012).

Evidence failed to establish when defendant’s blood was drawn or breath sample was taken, when defendant last drove, and defendant’s likely blood alcohol content (BAC) at various points in evening so as to support driving under the influence (DUI) conviction. 75 Pa.C.S.A. § 3802(a)(1), (c). Com. v. Segida, 2006 Pa Super 296, 912 A.2d 841 (2006).

Unreliable retrograde extrapolation testimony by state expert with respect to defendant’s blood alcohol content (BAC) was irrelevant in prosecution for driving while intoxicated (DWI), and, even if relevant, its probative value

[*9] Sufficiency of prosecution’s extrapolation evidence

[*9c] Sufficient to raise question of fact

The following authority held that the prosecution’s extrapolation evidence was sufficient to raise a question of fact as to whether there was sufficient evidence to convict a defendant of **DUI**.

**CUMULATIVE CASES**

Cases:

Result of defendant’s blood alcohol content (BAC) test, administered four hours after defendant collided with another motorist, was not subject to exclusion, prior to trial for driving while intoxicated (DWI), pursuant to rule allowing for the exclusion of evidence if its probative value is substantially outweighed by the danger of unfair prejudice; trial judge was not in a position to gauge the probative value of defendant’s BAC test result prior to trial because a question of fact remained as to whether there was sufficient evidence to relate defendant’s BAC test result back to the time of driving. NMRA, Rule 11-403. *State v. Hughey*, 2007-NMSC-036, 163 P.3d 470 (N.M. 2007).

[*IV] USE OF EXTRapolATION EVIDENCE IN DEFENDANT’S **DUI** CASE

[*10] View that defendant may introduce extrapolation evidence to rebut BAC test results

The following cases hold that the defendant may introduce extrapolation evidence to rebut blood or breath test results and demonstrate a legal blood alcohol content at the time of driving despite having a BAC in excess of the legal limit at the time of testing.

**DISTRICT OF COLUMBIA COURT**

*Haas v. State*, 597 So. 2d 770 (Fla. 1992)
*State v. Miller*, 555 So. 2d 391 (Fla. Dist. Ct. App. 3d Dist. 1989), approved and remanded, 597 So. 2d 767 (Fla. 1991)

**IDAHO**

*Com. v. Wirth*, 936 S.W.2d 78 (Ky. 1996)
*Love v. Com.*, 55 S.W.3d 816 (Ky. 2001)
*State v. Lusi*, 625 A.2d 1350 (R.I. 1993)

Although the court declared that the state was not required to offer expert extrapolation testimony after admitting test results in excess of the legal limit, it further declared that evidence of the test results did not raise an irrebuttable

Timothy Culhane
presumption of guilt, and the defendant could rebut the presumption by offering his own extrapolation evidence to prove that his BAC was below the legal limit of 0.10% at the time he drove, in *Washington v. District of Columbia*, 538 A.2d 1151 (D.C. 1988). Although no further proof of guilt beyond admission of excessive test results was required by D.C. Code Ann. § 40-716(b)(1), the court opined, there was no reason to presume guilt solely from the test results; the jury was free to consider any competent evidence offered by the defendant, including evidence that the testing device was not functioning or that he had not consumed enough alcohol to become intoxicated while driving.

Although the court decided that the state was not required to offer extrapolation evidence to convict a driver with test results in excess of 0.10% of "per se" DUI, it also declared that the accused was at liberty to seek to demonstrate through cross-examination or the introduction of other evidence that the test results did not accurately reflect his or her blood-alcohol level at the time the vehicle was operated, in *Haas v. State*, 597 So. 2d 770 (Fla. 1992). Although test results in excess of the legal limit constitute presumptive evidence of intoxication, the court declared, defendants are free to attempt to rebut BAC test results with expert extrapolation testimony.

Holding that the state was not required to extrapolate BAC test results back to the time of driving as a foundational requisite to admissibility of the results, the court, in *State v. Stutliff*, 97 Idaho 523, 547 P.2d 1128 (1976), nevertheless ruled that defendants were free to offer extrapolation evidence on their own behalf. Although the DUI statute, Idaho Code § 49-1102(b), did not require extrapolation, the court reasoned, defendants were nevertheless free to offer any competent evidence bearing upon whether or not they were under the influence of alcoholic beverages while driving. The burden of proof of extrapolation evidence would rest on the party seeking to introduce it, the court concluded.

Noting that the legislature had omitted the presumption of intoxication language contained in a previous edition of Ky. Rev. Stat. Ann. § 189A, the court, in *Com. v. Wirth*, 936 S.W.2d 78 (Ky. 1996), ruled that, although the state was not required to relate test results in excess of the legal limit back to the time of driving, nothing prevented any defendant from producing his own extrapolation expert to show that his BAC was beneath the legal limit when he drove his vehicle. The court opined that, although extrapolation based only upon the lapse of time between driving and testing was no more reliable than the results of a breath test administered a reasonable time after driving, *Ky. Rev. Stat. Ann. § 189A.103(7)* permitted tested drivers to obtain additional tests administered by persons of their choosing, so nothing prohibited DUI defendants from offering expert extrapolation testimony in their defense.

Observing that 75 Pa. Cons. Stat. Ann. § 3731(a.1) created a permissible inference of guilt upon proof of BAC test results in excess of 0.10%, the court nevertheless decided that such an inference did not shift the burden of proof of DUI from the Commonwealth to the defendant, so the defendant could introduce competent evidence, including expert extrapolation evidence, to rebut the inference and overcome the Commonwealth’s prima facie case, in *Com. v. MacPherson*, 561 Pa. 571, 752 A.2d 384 (2000).

The court answered a certified question as to whether a DUI defendant could offer competent evidence in rebuttal of an inference of guilt created by the state’s introduction of BAC test results by holding that the defendant could introduce expert extrapolation evidence to prove that his blood alcohol content was lower while driving than was demonstrated in a subsequent breath test, in *State v. Lusi*, 625 A.2d 1350 (R.I. 1993). Noting that *R.I. Gen. Laws § 31-27-2* provided for an inference of guilt of DUI upon admission of test results in excess of 0.10%, the court nevertheless decided that a defendant could offer extrapolation evidence to rebut that inference. If a defendant successfully rebutted the inference with expert testimony, and the state otherwise failed to establish guilt beyond a reasonable doubt, then the defendant would be entitled to an acquittal on the DUI charge, the court decided.

In *Forte v. State*, 707 S.W.2d 89 (Tex. Crim. App. 1986) the court found that the “per se” DUI statute which prohibited driving a vehicle while having an alcohol concentration of 0.10% or more, did not create an irrebuttable presumption of guilt, but merely made a BAC test result of 0.10% or more an element of the offense, so defendants were free to offer expert extrapolation evidence in rebuttal of proof of the necessary elements of the crime. The court’s rationale was that another element of DUI was 0.10%BAC at the time of driving, so the defendant should be allowed to argue that his BAC increased from the time of driving to the time of testing. In no way, the court concluded, did the statute encourage a jury to ignore such defensive evidence on the issue of intoxication in favor of any presumption, whether mandatory or permissive, and nor did the statutory language suggest that the jury ignore such evidence and presume intoxication simply because of the admission of a chemical test result.

CUMULATIVE CASES

Timothy Culhane
Cases:

Forensic chemist’s testimony concerning retrograde extrapolation, estimating blood alcohol level of defendant charged with intoxicated assault at time of incident based upon his blood alcohol level two hours later, was unreliable and clearly inadmissible, where chemist did not explain science of retrograde extrapolation to jury with any clarity, referred only to its general principles, and did not state what elimination rate he used or demonstrate understanding of difficulties associated with retrograde extrapolation, there was only one test of defendant’s blood-alcohol content, two hours after alleged offense, and chemist did not testify to any personal characteristic of defendant. Blumenstetter v. State, 135 S.W.3d 234 (Tex. App. Texarkana 2004).

[*11] View that it is error to prevent defendant from utilizing extrapolation evidence to rebut BAC test results

In the following cases, it was held that the lower court erred in refusing to allow the defendant to offer evidence relating his BAC test results back to the time of driving in a DUI prosecution.

In State v. Allen, 212 N.J. Super. 276, 514 A.2d 879 (Law Div. 1986) (disapproved of by, State v. Tischio, 107 N.J. 504, 527 A.2d 388 (1987)), the court reversed a “per se” DUI conviction because the lower court had refused to allow the defendant to offer expert extrapolation testimony to prove that his BAC was below the legal limit while driving. Noting that N.J. Stat. Ann. § 39:4-50 provided that it was unlawful to operate a vehicle while under the influence or with a blood alcohol level of 0.10% or more, the court declared that the focus of the “per se” aspect of the statute was upon the driver’s BAC at the time of driving, and thus, the defendant was entitled to offer expert relate back testimony to refute the breathalyzer results and demonstrate his actual BAC while driving. Breath alcohol (BrAC) results in excess of 0.10% created a presumption that the defendant was intoxicated while driving, the court concluded, which could be rebutted by the defendant’s expert extrapolation testimony.

**** Comment:
The court in State v. Tischio, 107 N.J. 504, 527 A.2d 388 (1987), appeal dismissed, 484 U.S. 1038, 108 S. Ct. 768, 98 L. Ed. 2d 855, 1988 WL 5473 (1988), in disapproving State v. Allen, 212 N.J. Super. 276, 514 A.2d 879 (Law Div. 1986) (disapproved of by, State v. Tischio, 107 N.J. 504, 527 A.2d 388 (1987)), held that a defendant may be convicted for driving under the influence when the breathalyzer test that is administered within a reasonable time after the defendant was actually driving his vehicle reveals a blood-alcohol level of at least 0.10%.

Reversing a “per se” DUI conviction, the court in People v. Mertz, 68 N.Y.2d 136, 506 N.Y.S.2d 290, 497 N.E.2d 657 (1986), decided that the trial court erred when it refused to allow the defendant to make a jury argument that related his breathalyzer test results of 0.15 and 0.16 back two hours to the time of driving to show that his BAC while driving was not in excess of 0.10%. The court began by noting that N.Y. Veh. & Traf. Law § 1192, subd.2 prohibited operating a vehicle with a BAC of 0.10% or more, and that the defendant offered expert extrapolation testimony (through a professor of physiology) regarding alcohol absorption rates and food consumption which yielded an opinion that there was no way to predict from two BrAC readings of 15 and 16 whether the defendant’s BAC was greater than 0.10 two hours earlier. The court then decided that the lower court erred when it refused to allow the defendant’s attorney to argue in closing that it was fair to infer from the fact of the defendant’s rising BAC two hours after driving that his BAC was significantly lower while driving. That ruling was erroneous, the court maintained, because the statute made BAC at the time of driving a crime, and created a presumption of intoxication which could be rebutted by expert extrapolation testimony that the defendant’s BAC was below the legal limit while driving, and, that defense counsel could then argue his extrapolation defense theory to the jury. Relying on a 0.10 BAC reading two hours after driving as sufficient on its own to prove guilt, the court continued, would be to ignore scientifically accepted fact that the defendant’s BAC may have been rising and thus was lower while driving than during testing. A 0.10 BAC creates a prima facie case, the court continued, which, together with physical evidence of impairment, may be sufficient to sustain a guilty verdict. But that evidence may be rebutted by the defense with expert extrapolation testimony, and the courts may not foreclose a defendant’s opportunity to do so by limiting summation or by improper instruction of the jury.

The court held to be reversible error not to instruct the jury on the defendant’s extrapolation defense theory where the state’s expert testified on cross examination that the defendant’s BAC could have been anywhere between 0.08 and 0.147 while driving, in State v. Drown, 148 Vt. 311, 532 A.2d 575 (1987). The court found as fact that: (1) the defendant testified that he had consumed the last two of his four drinks between five and 15 minutes before driving;

Timothy Culhane
(2) the state’s chemist testified that the defendant’s 0.14 BAC test results were obtained 20 minutes after driving; (3) it takes 15 to 30 minutes to absorb a drink into one’s system; and (4) that it was possible that her last two drinks had not been absorbed while she was driving and her driving BAC could actually have been as low as 0.08. In a trial on those facts, the court reasoned, brought pursuant to the “per se” DUI statute, that the applicable presumption of excessive BAC while driving, so defendants should be allowed to offer expert extrapolation testimony to rebut the presumption and demonstrate that their BAC was below the legal limit while driving. Blood alcohol concentration, as measured by a chemical test, the court concluded, is, according to accepted scientific knowledge, a function of numerous factors, including the amount and type of food consumed, an individual’s size, weight, age, stomach and liver condition, individual absorption and elimination rates, and the length of time between drinking and testing, so test results will not always accurately reflect a defendant’s BAC while driving. Accordingly, defendants must be allowed to offer expert testimony to address the key issue in any “per se” DUI prosecution, namely, the defendant’s BAC at the time of driving.

Reversing a “per se” DUI conviction, the court, in Davis v. Com., 8 Va. App. 291, 381 S.E.2d 11 (1989), declared that the lower court erred when it refused to allow the defendant to offer expert extrapolation testimony to show that his BAC while driving was below the legal limit. The court reasoned that since Va. Code Ann. § 18.2-266(i) prohibited driving with a BAC of 0.10% or more, breath test results in excess of that limit only created a rebuttable presumption of excessive BAC while driving, so defendants should be allowed to offer expert extrapolation testimony to rebut the presumption and demonstrate that their BAC was below the legal limit while driving. Blood alcohol concentration, as measured by a chemical test, the court concluded, is, according to accepted scientific knowledge, a function of numerous factors, including the amount and type of food consumed, an individual’s size, weight, age, stomach and liver condition, individual absorption and elimination rates, and the length of time between drinking and testing, so test results will not always accurately reflect a defendant’s BAC while driving. Accordingly, defendants must be allowed to offer expert testimony to address the key issue in any “per se” DUI prosecution, namely, the defendant’s BAC at the time of driving.

In the following cases, it was held that the defendant’s extrapolation evidence was sufficient to rebut the prosecution’s BAC test results.

Affirming a lower court’s setting aside of the jury’s guilty verdict on a “per se” DUI charge, the court, in State v. Cannon, 192 Ariz. 236, 963 P.2d 315 (Ct. App. Div. 1 1998), declared that the defendant’s extrapolation-related evidence sufficed as credible evidence of innocence supporting his affirmative defense instruction to the jury. The court noted that the defendant’s expert criminalist testified that, considering the time of the breath test, the time of driving, and the test results, the defendant’s BAC may have been below the legal limit of 0.10% at the time of driving. This testimony was sufficient to warrant an acquittal, the court decided, because Ariz. Rev. Stat. Ann. § 28-692(B) provided that an affirmative defense to DUI arises when a defendant offers credible evidence that his BAC was below 0.10% while he was driving. After a defendant offers such proof, the court concluded, the state must prove beyond a reasonable doubt that the defendant’s BAC was 0.10% at the time of driving to gain a conviction on the “per se” charge, and it’s failure to do so in the instant case justified the lower court’s setting aside of the jury’s verdict.

Although the state is not required to offer extrapolation evidence to obtain a DUI conviction, where a defendant offers competent extrapolation evidence rebutting the inference of intoxication created by a BrAC test result in excess of the legal limit, that defendant is entitled to an acquittal if the prosecution cannot meet its burden with other proof, the court ruled, in State v. Lusi, 625 A.2d 1350 (R.I. 1993). This is so, the court reasoned, because the applicable DUI statute, R.I. Gen. Laws § 31-27-2, requires a finding of proof of a BAC of 0.10% or more at the time of driving to support a conviction under the “per se” statute. Consequently, a test result in excess of 0.10% merely creates a permissive, rebuttable presumption of guilt while driving, but that presumption may be rebutted by competent evidence of actual BAC while driving. The court concluded that, since the defendant offered expert extrapolation evidence that showed that his BAC was below the legal limit while driving, this proof rebutted the presumption. Since the prosecution presented no other evidence of guilt, the court had no choice but to reverse the defendant’s conviction.

CUMULATIVE CASES

26 The court explained that neither side offered standard extrapolation evidence because their witnesses were unaware of the time the defendant drank during the 50 minutes prior to driving. However, both experts’ testimony as to the general science regarding BACs rising after driving may have sufficed as proper retrograde extrapolation in other jurisdictions, as was the case in Com. v. Modaffare, 529 Pa. 101, 601 A.2d 1233 (1992).

Timothy Culhane
Cases:

Evidence was sufficient to support conviction for driving under influence (DUI), first offense; defendant had been driving a motor vehicle when he was detained at a roadblock, law enforcement officer testified that field-sobriety test was given on basis of smell of intoxicating beverage on defendant’s breath, and defendant had breath-alcohol content of 0.13%, as established by testimony of other officer, printout of completed breath test, and ticket issued to defendant. West’s A.M.C. § 63-11-30(1). Starkey v. State, 941 So. 2d 899 (Miss. Ct. App. 2006).

Evidence was sufficient to support conviction for driving under the influence (DUI), third offense; officers trained in field sobriety procedures testified that they observed defendant unsteady on his feet, with red, watery eyes, dazed stare, slurred speech, and he sensed strong odor of intoxicating beverage coming from inside vehicle, officer testified that defendant failed two field sobriety tests and refused breath test, both officers testified that defendant admitted to drinking "a couple" prior to stop, and there was evidence of two prior DUI charges within five year time period previous to arrest. West’s A.M.C. § 63-11-30(1)(a, c). Starkey v. State, 941 So. 2d 899 (Miss. Ct. App. 2006).

[*12b] Held insufficient

In the following cases, the defendant’s extrapolation evidence was found insufficient to rebut the prosecution’s proof of DUI.

Affirming the defendant’s “per se” DUI conviction, the court, in Finney v. State, 686 N.E.2d 133 (Ind. Ct. App. 1997), ruled that the language of Ind. Code Ann. § 9-30-6-15 served to relate breath test results back to the time of driving when taken within a specified time, and that the defendant’s expert extrapolation testimony did not rebut the permissive presumption of intoxication created by the statute. The defendant’s expert testified that extrapolation of test results could be calculated with availability of certain information, the court observed, but the defendant did not provide her expert with enough information to allow an accurate calculation of her BAC. Consequently, the court concluded, the defendant failed to offer sufficient evidence to rebut the statutory presumption.

In Minix v. State, 726 N.E.2d 848 (Ind. Ct. App. 2000), the court determined that proof of the defendant’s automobile accident combined with his BrAC test results in excess of the legal limit obtained within one and a half hours of driving constituted sufficient evidence of guilt, and that the defendant’s extrapolation evidence was insufficient to warrant an acquittal. The court began by noting that the applicable evidentiary statute, Ind. Code Ann. § 9-30-6-15(b) provided for a permissive presumption of intoxication while driving based upon a breath test result of 0.1% or more obtained within three hours of driving. The court then ruled that the testimony of the defendant’s expert witness to the effect that the defendant’s BAC was between 0.07 and 0.09% at the time of the accident was merely in invitation to the appellate court to reweigh the evidence that a jury had already weighed but rendered a verdict of guilt. Accordingly, the court affirmed the defendant’s "per se" DUI conviction.

In Livingston v. State, 537 N.E.2d 75 (Ind. Ct. App. 1st Dist. 1989), it was held that the prosecution’s evidence was sufficient to convict the defendant of a "per se" DUI charge, and that the defendant’s rebuttal extrapolation evidence was insufficient to rebut the presumption of guilt established by the prosecution’s introduction of intoxilizer test results in excess of the legal limit. Noting that Ind. Code Ann. § 9-11-4-15(b) provided that a BAC test result of 0.10% or more created a presumption that a defendant had a BAC in excess of 0.10% while driving, the court found that the defendant’s evidence, an officer’s admissions that the intoxilizer test was performed 29 minutes after the defendant drove and that a person’s BAC may have been rising or falling when tested, combined with a defense expert’s testimony that it was medically possible for a subject to test below 0.10% and to test over 0.10% 30 minutes later, was insufficient to overcome the statutory presumption of intoxication created by the breath test result of 0.13%. The court based its ruling on the fact that the expert testimony only established that the defendant’s BAC could have been higher or lower than the test results, and that the defendant did not ingest alcohol for a period of two hours and 20 minutes before the test. Accordingly, the jury was free to disregard this evidence and convict the defendant pursuant to the presumption that arose by virtue of the prosecution’s proof of test results in excess of the legal limit.

Affirming the defendant’s “non-per se” DUI conviction, the court, in Com. v. Weis, 416 Pa. Super. 623, 611 A.2d 1218 (1992), first reiterated its position that the state was not required to extrapolate breath test results back to the time of driving in “non-per se” DUI prosecutions under the purview of 75 Pa. Cons. Stat. Ann. § 3731(a)(4), then

Timothy Culhane
concluded that the defendant’s expert extrapolation evidence that his BAC while driving was between 0.08 and 0.09% was insufficient to warrant an acquittal. The court reasoned that, although the statutory maximum was 0.10% and the defendant’s expert testified that the BAC during driving was lower than the legal limit, the prosecution still offered sufficient proof of driving while intoxicated through a trooper’s testimony regarding skid mark evidence. Test results of 0.114% and 0.101% taken one and two hours after the accident, respectively, which demonstrated a peak BAC between the two tests, the trooper’s skid mark testimony, and the defendant’s admission that he ingested alcohol prior to driving, sufficiently established that he drove while under the influence of alcohol to a degree which rendered him incapable of safely driving, the court concluded.

In *Com. v. Freidl*, 2003 PA Super 379, 834 A.2d 638 (2003), the court found that a defendant’s expert extrapolation evidence was insufficient to warrant an acquittal and affirmed his “per se” DUI conviction. The court began its analysis by noting that 75 Pa. Cons. Stat. Ann. § 3731(a)(4) created a permissive inference that a BAC of 0.10% or more established by tests administered within three hours of driving constituted prima facie evidence of a BAC of 0.10% or more while driving, and that the defendant was free to offer relate back testimony to rebut the permissive inference. It then determined that the defendant’s expert testimony to the effect of a BAC was between 0.098 and 0.102 was insufficient to rebut the permissive inference. The court opined that the defendant’s expert’s opinion was so indefinite as to warrant the trial court’s disregarding of it, and its upholding of the statutory permissive inference.

**CUMULATIVE CASES**

Cases:

The trial court’s denial of defendant’s request for the appointment of an expert on extrapolation was not an abuse of discretion, during prosecution for driving while intoxicated (DWI); there was no proof before the trial court at the time it considered defendant’s motion that the State intended to present extrapolation opinion evidence of defendant’s blood-alcohol concentration, at trial the State offered no expert opinion of defendant’s blood-alcohol level at the time of driving based on the process of retrograde extrapolation, and defendant failed to give the trial court any basis for a conclusion that extrapolation opinion evidence would be a significant factor in his case at trial. *Mason v. State*, 341 S.W.3d 566 (Tex. App. Amarillo 2011).

**JURISDICTIONAL TABLE OF STATUTES AND CASES**

**INDEX OF TERMS**

**TABLE OF REFERENCES**

**ARTICLE OUTLINE**

**JURISDICTIONAL TABLE OF STATUTES AND CASES (Go to beginning)**

**JURISDICTIONAL TABLE OF STATUTES AND CASES**

**DISTRICT OF COLUMBIA COURT**


**UNITED STATES CODE**

*Fed.Rules Evid.Rule 401*
*Fed.Rules Evid.Rule 702*

**CODE OF FEDERAL REGULATIONS**

*36 C.F.R. § 4.23(a)(2)*

Timothy Culhane
CALIFORNIA

*Cal. Vehicle Code § 23152(b)*

COLORADO


CONNECTICUT


DELWARE

*Del. Code Ann. tit. 21, § 4177 (g)*

FLORIDA

*Fla. Stat. Ann. § 316.1934*

HAWAII


IDAHO

*Com. v. Wirth, 936 S.W.2d 78 (Ky. 1996)*
*Forre v. State, 707 S.W.2d 89 (Tex. Crim. App. 1986)*
*Idaho Code § 18-8004(2)*
*Love v. Com., 55 S.W.3d 816 (Ky. 2001)*
*State v. Lusi, 625 A.2d 1350 (R.I. 1993)*
*State v. Stuliff, 97 Idaho 523, 547 P.2d 1128 (1976)*

INDIANA

*Ind. Code Ann. § 9-30-5-1*
*Ind. Code Ann. § 9-30-6-15*
*Ind. Code Ann. § 9-30-6-15(b)*
*Ind. Code Ann. § 9-30-6-2*

KENTUCKY

Timothy Culhane

MICHIGAN

Mich. Comp. Laws Ann. § 257.625a
Mich. Comp. Laws Ann. § 257.625a(6)

NEW JERSEY


NEW MEXICO

N.M. Stat. Ann. § 66-8-102(C)

NEW YORK

N.Y. Veh. & Traf. Law § 1192
N.Y. Veh. & Traf. Law § 1195

NORTH DAKOTA

N.D. Cent. Code § 39-20-07

OHIO

Ohio Rev. Code Ann. § 4511.19(B)

OREGON


RHODE ISLAND


SOUTH DAKOTA

S.D. Codified Laws § 32-23-1
S.D. Codified Laws § 32-23-1(1)
S.D. Codified Laws § 32-23-1(2)
S.D. Codified Laws § 32-23-7

TENNESSEE

1
Tenn. Code Ann. § 55-10-401(a)

TEXAS

Tex. Penal Code Ann. § 49.01(2)
Tex. Penal Code Ann. § 49.04(a)

VERMONT

Timothy Culhane

VIRGINIA
Vt. Code Ann. § 18.2-266(i)

OTHER REFERENCES
Am. Jur. 2d, Automobiles and Highway Traffic § 1083

INDEX OF TERMS (Go to beginning)
Admissibility and relevance of extrapolation, threshold issue regarding, §§ 3-6
Admissible and relevant by virtue of statutory dictates, extrapolation evidence as, § 5
Admissible and relevant due to expert qualifications and observations, extrapolation evidence as, § 3
BAC test result as constituting sufficient evidence for conviction, § 7[e]
BAC test results as creating prima facie evidence of guilt, § 7[c]
Burden of proof, impossible, extrapolation as placing on prosecution, § 7[a]
Comment and summary, § 2
Defense of DUI charge, use of extrapolation evidence in, §§ 10-12
Expert qualifications and observations, extrapolation evidence as relevant and admissible due to, § 3
Expert qualifications and observations, lack of, extrapolation evidence as irrelevant and inadmissible due to, § 4
Impossible burden of proof, extrapolation as placing on prosecution, § 7[a]
Inadmissible and irrelevant by virtue of statutory dictates, extrapolation evidence as, § 6
Inadmissible and irrelevant due to lack of expert qualifications and observations, extrapolation evidence as, § 4
Introduction to annotation, § 1
Irrelevant and inadmissible by virtue of statutory dictates, extrapolation evidence as, § 6
Irrelevant and inadmissible due to lack of expert qualifications and observations, extrapolation evidence as, § 4
Numerical percentage of test result, proving, § 8[b]
Observations and qualifications of expert, extrapolation evidence as relevant and admissible due to, § 3
Observations and qualifications of expert, lack of, extrapolation evidence as irrelevant and inadmissible due to, § 4
Other evidence of guilt as obviating need for relating back BAC test results, § 7[f]
Practice pointers, § 2[b]
Preliminary matters, §§ 1, 2
Presumption of intoxication, extrapolation evidence as required for prosecution to make use of, § 8[c]
Prima facie evidence of guilt, test results as creating, § 7[c]
Prosecution as not required to extrapolate test results back to time of driving, § 7
Prosecution as required to extrapolate test results back to time of driving, § 8
Prosecution’s DUI case, use of extrapolation evidence in, §§ 7-9
Qualifications and observations of expert, extrapolation evidence as relevant and admissible due to, § 3
Qualifications and observations of expert, lack of, extrapolation evidence as irrelevant and inadmissible due to, § 4
Rebut BAC test results, introduction of extrapolation evidence by defendant to, § 10
Rebut BAC test results, preventing defendant from utilizing extrapolation evidence to, as error, § 11
Rebut prosecution’s BAC test results, sufficiency of extrapolation evidence to, § 12
Related annotations, § 1[b]
Relevance and admissibility of extrapolation, threshold issue regarding, §§ 3-6
Relevant and admissible by virtue of statutory dictates, extrapolation evidence as, § 5
Relevant and admissible due to expert qualifications and observations, extrapolation evidence as, § 3
Scope of annotation, § 1[a]
Statute itself as relating BAC test results back to time of driving, § 7[d]
Statute on its face as not requiring prosecution to extrapolate test results back to time of driving, § 7[b]
Statutory dictate, extrapolation evidence as irrelevant and inadmissible by virtue of, § 6
Statutory dictates, extrapolation evidence as relevant and admissible by virtue of, § 5

Timothy Culhane
Statutory requirement, prosecution’s extrapolation of test results back to time of driving as, § 8[a]
Sufficiency of defendant’s extrapolation evidence, § 12
Sufficiency of prosecution’s extrapolation evidence, § 9
Sufficient evidence for conviction, BAC test result as, § 7[e]
Summary and comment, § 2
Test result as constituting sufficient evidence for conviction, § 7[e]
Test results as creating prima facie evidence of guilt, § 7[c]
Threshold issue regarding relevance and admissibility of extrapolation, §§ 3-6
Use of extrapolation evidence in defense of DUI charge, §§ 10-12
Use of extrapolation evidence in prosecution’s DUI case, §§ 7-9

TABLE OF REFERENCES (Go to beginning)
Annotations
See the related annotations listed in § 1[b]
REFERENCES
The following references may be of related or collateral interest to the user of this annotation.

Am. Jur. 2d, Automobiles and Highway Traffic §§ 1083, 1084, 1087
Defense on Charge of Driving While Intoxicated, 19 Am. Jur. Trials 123

ARTICLE OUTLINE (Go to beginning)

I. PRELIMINARY MATTERS
§ 1 Introduction
§ 1[a] Scope
§ 1[b] Related annotations
§ 2 Summary and comment
§ 2[a] Generally
§ 2[b] Practice pointers

II. THRESHOLD ISSUE REGARDING RELEVANCE AND ADMISSIBILITY OF EXTRAPOLATION EVIDENCE
§ 3 View that extrapolation evidence is relevant and admissible due to expert qualifications and observations
§ 4 View that extrapolation evidence is irrelevant and inadmissible due to lack of expert qualifications and observations
§ 5 View the extrapolation evidence is relevant and admissible by virtue of statutory dictates
§ 6 View that extrapolation evidence is irrelevant and inadmissible by virtue of statutory dictates
§ 6.3 Reliability of extrapolation method
§ 6.5 Application of Rule of Evidence 403

III. USE OF EXTRAPOLATION EVIDENCE IN PROSECUTION’S DUI CASE
§ 6.7 View that admissibility of extrapolation evidence is within court’s discretion

Timothy Culhane
§ 7  View that prosecution is not required to extrapolate test results back to time of driving
§ 7[a]  Because impossible burden would be placed upon prosecution
§ 7[b]  Because statute does not require relate back evidence on its face
§ 7[c]  Because test results create prima facie evidence of guilt
§ 7[d]  Because test result constitutes sufficient evidence for conviction
§ 7[e]  Because statute itself relates test results back to the time of driving
§ 7[f]  Because other evidence of guilt obviates need for relating back BAC test results

§ 8  View that prosecution is required to extrapolate test results back to time of driving
§ 8[a]  Statutory requirement
§ 8[b]  Required only to prove numerical percentage of test result
§ 8[c]  Required only for prosecution to make use of presumption of intoxication

§ 9  Sufficiency of prosecution’s extrapolation evidence
§ 9[a]  Held sufficient
§ 9[b]  Held insufficient

§ 9  Sufficiency of prosecution’s extrapolation evidence
§ 9[c]  Sufficient to raise question of fact

IV. USE OF EXTRAPOLATION EVIDENCE IN DEFENDANT’S DUI CASE

§ 10  View that defendant may introduce extrapolation evidence to rebut BAC test results
§ 11  View that it is error to prevent defendant from utilizing extrapolation evidence to rebut BAC test results

§ 12  Sufficiency of defendant’s extrapolation evidence
§ 12[a]  Held sufficient
§ 12[b]  Held insufficient

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