

# Driver Impairment Index:

An Assessment Test Developed for DUI/DUID Violators

## Development Report

Professional Online Testing Solutions, Inc.

Recent feedback from a prospective DII test user has led to development of a second version of the DII, the DII-Dr, into which a Driver Risk Scale has been incorporated. Both versions are available for use. The Driver Risk scale measures a client's level of risky driving behavior independent of substance abuse. Presence or absence of the Driver Risk Scale is the only difference between the DII and DII-Dr. California DUI evaluators can now choose between two versions of the DII based upon their DUI assessment needs and preferences.

This report summarizes the premise and development of the Driver Impairment Index (DII) assessment. Professional Online Testing Solutions, Inc., a leader in state-of-the-art testing, created this assessment exclusively for California DUI or DUID violators. For more information about the DII or to learn how to become a DII test user, please visit the Driver Impairment Index website at [www.driver-impairment-index.com](http://www.driver-impairment-index.com).



# Driver Impairment Index (DII)

## California DUI Violator Assessment

### *Driving Under the Influence in California*

According to the California Department of Motor Vehicles, in 2006, 203,866 people were arrested in the state for driving under the influence. The high volume of annual DUI arrests means that California requires accurate, concise and meaningful DUI assessment. The Driver Impairment Index (DII) was developed to augment California's current DUI system as well as provide many other useful features not seen within currently used California DUI assessments. The DII is HIPAA compliant and SBIRT compatible; adhering to the highest standards of client privacy and screening/treatment protocol.

### DII Features

The Driver Impairment Index (DII) includes a Truthfulness Scale, a unique feature built in to detect respondents' attempts to deny or minimize problems or 'fake good' while completing the DII. The DII is concise (64 items), yet reports provide a wealth of information and useful California-specific recommendations. DII reports incorporate any aggravating DUI-related circumstances (i.e. prior DUI arrests, chemical test refusal, etc.) in accordance with California's practice of imposing sentence enhancements. The DII also simultaneously screens for alcohol and drug use and abuse. Marijuana usage is especially relevant to California, prompting inclusion of marijuana-specific test items in the DII. In sum, the DII is accurate, comprehensive and designed to work smoothly with California's DUI system configuration. For more information, please visit [www.driver-impairment-index.com](http://www.driver-impairment-index.com).

### *Report Overview*

A perceived need for a concise, state-specific California DUI violators' screening test prompted Driver Impairment Index (DII) creation and design. The DII is the culmination of extensive research and development conducted solely by Professional Online Testing Solutions, Inc., a leader in state-of-the-art assessment. This report discusses the objective and unique features of the Driver Impairment Index (DII) and briefly summarizes DII research and design strategy. Test data analysis was performed on a sample of 4,171 DUI violators evaluated with an empirically established assessment previously developed by Professional Online Testing Solutions, Inc. Components of this assessment were subsequently used as a prototype for DII development.

## *DII Scales*



The DII includes three scales which measure relevant DUI violator attitudes and behavior.

- Truthfulness Scale
- Alcohol Scale
- Drugs Scale

DII Scale scores represent the degree of problem severity. The higher a particular scale score is, the more severe the violator's problems are in that area. The Truthfulness Scale is a unique feature of the DII which detects attempts to deny or minimize problems. The Alcohol Scale and Drugs Scale identify the levels of substance use and the severity of abuse. Matching of problem severity with treatment intensity is facilitated with DII report results.



### *Objective*

Our aim was to create a state-specific assessment for violators charged with driving under the influence of alcohol or drugs. Several factors were considered during the state selection process: first, we wanted the selected state to have a high volume of DUI violators. A new, automated, state-specific DUI assessment would be the most useful to a state that regularly has a large number of DUI arrestees. A high-volume state with large samples of DUI violators would also be more conducive to ongoing DII research and standardization. Second, our selected state clearly had to be one in which DUI evaluators were free to select which DUI assessments to use. Lastly, our state of choice would have a special need to test both alcohol-related and drug-related problem severity of DUI violators. Unique marijuana-related statutes and the possibility of a future increase in marijuana usage and availability within the state (i.e., the upcoming vote on Proposition 19 – the Regulate, Control and Tax Cannabis Act of 2010) made California an even more appealing location in which to introduce the DII. Once these stipulations were considered, California emerged as the clear choice for DII development focus.

### *Research and Development*

Preliminary Driver Impairment Index (DII) research consisted of familiarizing ourselves with California's DUI system configuration and statutes. Our primary information source for this was the California Department of Motor Vehicles' literature on California DUI protocol. We wanted to incorporate useful, comprehensive California-specific DUI violator information into DII reports. A main focal point was California's use of *sentence enhancements* to increase penalties for convicted DUI violators. Factors for sentence enhancement, as reported by the violator (respondent), are listed in DII reports. Another focus of our research was violators that were found to be 'driving under the influence of drugs.' We investigated California DUID protocol to ensure that meaningful information regarding DUID clients were presented in DII reports. For example, DII reports specify whether DUID violators' chemical test results were positive (drugs were present in system) or negative (no drugs were present in system).

Once the groundwork was complete, we proceeded to construct the DII itself. Many DUI tests are primarily alcohol-focused; often, evaluators must use more than one test to screen for both alcohol and drug use disorders. In addition to an Alcohol Scale, we decided to incorporate a Drugs Scale to evaluate DUI/DUID violator drug use severity and, in addition to illicit drugs, to focus on a substance that has a unique standing in California: marijuana. Marijuana-related items are incorporated within the Drugs Scale along with test items that assess problem severity of use of all drugs (licit or illicit), including marijuana, cocaine, amphetamines, barbiturates, heroin, ecstasy, etc. Added advantages of having both an alcohol use severity measure and a drug use severity measure within the same assessment are, of course, convenience, cost-effectiveness and increased time efficiency.

We also incorporated a Truthfulness Scale. The concept of a pragmatic technique for measuring truthfulness in assessment was pioneered by the developers of the Minnesota Multiphasic Personality Inventory, or MMPI. The MMPI built-in a procedure known as 'truth-correction', which has been influential in psychometrics ever since. The truth-correction methodology in the DII is similar to that used in the MMPI. Each test developed and marketed by Professional Online Testing Solutions, Inc. contains a measure of truthfulness. Our test users find this to be an important, unique and functional feature of our assessments. Every one of our tests is designed for a specific client or violator group. It would be naïve to assume that respondents are always truthful, especially when legal or court-related outcomes are at stake. For this reason, incorporating a way to empirically measure respondent truthfulness is a valuable and increasingly essential component of accurate assessment. The other DII Scales – the Alcohol Scale and Drugs Scale - are related to the Truthfulness Scale in that if the respondent shows an established pattern of untruthful responses when completing the DII, the other two DII Scales become invalid. This is done to prevent distorted or inaccurate assessment results from being used in client-related

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recommendation or decision-making processes. Clients (respondents) with invalidated tests may need to be retested at a later time.

The majority of test items in the DII Truthfulness Scale, Alcohol Scale and Drugs Scale were obtained from an empirically strong and well-established DUI violator test developed by Professional Online Testing Solutions, Inc. The scales of this test have already been validated using MMPI scales, polygraph examinations and other reports. Research, development and standardization of this test spans over 20 years. Reliability and validity studies of this assessment have been conducted on substance abuse inpatients, outpatients, college students, job applicants, defendants, diversion program attendees, probationers, inmates and counseling patients and have also been studied in court and DUI/DWI program settings, administered to over a million and a half DUI/DWI offenders. Test items selected for the DII attained very strong inter-item reliability coefficients when analysis was done on multiple samples of DUI violator test data. New items created especially for the DII were modeled after the strong items selected from our other DUI violator assessment. We are confident that the items used in the DII represent well-defined measures of truthfulness, substance use and severity of abuse. Scale reliability coefficients, as well as validity, accuracy and correlation analyses for a sample of DUI test data 4,171 DUI violators are presented in the next section.

### *DUI Assessment Test Statistics*

This section presents reliability, validity and accuracy analyses for the 4,171 DUI violators tested with an established and widely-used DUI assessment developed by Professional Online Testing Solutions, Inc. Because the strongest test items and other empirically valid test design components from this assessment were used to create the DII, these test analyses provide a good overview of statistical expectations for the DII.

### **Reliability**

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In testing, *reliability* pertains to a scale's consistency of measurement. A scale is reliable if a person gets the same score when re-tested as he/she did when first tested. Figure 1 presents the reliability coefficients for each DII Scale. Perfect reliability is 1.00. The professionally accepted standard for reliability is .75.

**Figure 1: Reliability Coefficient Alphas from a DUI Violator Assessment (N=4,171)**

<u>DII Scales</u>	<u>Coefficient Alpha*</u>
Truthfulness Scale	.89
Alcohol Scale	.92
Drugs Scale	.90

\*All alphas are significant at  $p < .001$ .

All three DII Scales attained reliability coefficient alphas of .89 or above, all significantly higher than the professionally accepted standard of .75.

### **Validity**

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*Predictive validity* refers to a test's ability to predict observable criterion behaviors. For this analysis, the prediction criterion was whether DUI violators reported themselves as having alcohol and/or drug problems. Direct self-

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admission true-or-false test items (i.e. “I have a drinking problem”) were utilized. It was predicted that the majority of self-admitted *problem drinkers* and self-admitted *problem drug users* would attain higher scores on the Alcohol and/or Drugs Scales. More specifically, a large percentage of these DUI violators were expected to have Alcohol and/or Drugs Scale scores that fell within the 70<sup>th</sup> to 100<sup>th</sup> percentile (elevated risk) range.

The results of the analysis confirmed these predictions. The majority of the DUI violators that admitted to having alcohol problems (**99.8%, or 554 out of 555**) scored in the High Risk range on the Alcohol Scale. All DUI violators that admitted to having drug problems (**98.0%, or 151 out of 154**) scored in the High Risk range on the Drugs Scale. These findings signify that the Alcohol Scale and Drugs Scale accurately recognize DUI violators that identify themselves as having substance-related problems.

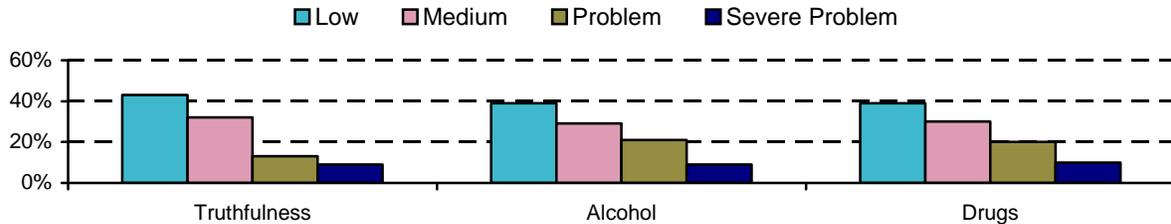
### Accuracy

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Test accuracy is determined by comparing the differences between predicted and attained risk range percentages. Small differences indicate high accuracy. The DUI violator test that we are examining and the DII both categorize DUI violators in terms of risk ranges. These ranges were established using DUI violator standardization data.

The four risk ranges (low, medium, problem and severe) and the predicted percentages for each risk range category are shown in parentheses in bold print in the top row of the table below. The percentages for each DII scale and risk range category were obtained from the DUI violators’ attained scale scores. The differences between predicted and obtained percentages for each scale’s risk range are presented within bold parentheses in the following table.

**Figure 2: DUI Violator Assessment Accuracy (N = 4,171)**



DII Scale	Low Risk (39%)	Medium Risk (30%)	Problem Risk (20%)	Severe Problem (11%)
Truthfulness Scale	40.6 (1.6)	29.7 (0.3)	21.3 (1.3)	8.4 (2.6)
Alcohol Scale	39.2 (0.8)	30.0 (0.0)	20.2 (0.2)	10.6 (0.4)
Drugs Scale	39.0 (0.0)	28.7 (1.3)	20.3 (0.3)	12.0 (1.0)

As shown in Figure 2, all (12 out of 12) risk range percentile scores are within 2.6 points of the predicted percentages. This demonstrates an accurate DUI violator assessment instrument.

### California-Specific Driver Impairment Index (DII) Report Components \_\_\_\_\_

In addition to Truthfulness Scale, Alcohol Scale and Drugs Scale scores, explanations and recommendations, DII reports incorporate other information relevant to California's statutes and DUI system.

#### *Sentence Enhancements*

Drivers convicted of DUI in California are subject to sentence enhancements (increased penalties) if certain aggravating factors exist. Some factors for sentence enhancement are: prior DUI convictions, chemical test refusal, presence of a minor (under 14) in the vehicle at time of DUI, bodily injury inflicted during DUI, injury to multiple victims, evading law enforcement at time of DUI, excessive BAC (at or above 0.15%), DUI when driver's license is suspended or revoked and DUI while on DUI probation. Sentence enhancements can lead to higher fines, longer jail or prison sentences, extended driver's license suspensions/revocations, increased mandatory DUI education/treatment requirements and more restrictive probation guidelines.

#### *Cannabis (Marijuana) in California*

Marijuana usage is more prevalent in California than in many other states. Because of California's current medical marijuana laws and possible future legalization of non-medical marijuana usage, relevant marijuana-related items were included in the DII. DII reports address medium to high level of marijuana use and/or abuse, when present. Even though marijuana is currently legally available to some California residents with a doctor's prescription, being impaired by any substance, even if legally obtained and used, while operating a vehicle can still be grounds for a DUI or DUID charge.

#### *California Blood Alcohol Content (BAC) Information*

It is unlawful for any driver in California to operate a motor vehicle with a BAC of 0.08% or above. Individuals holding a commercial California driver's license (and driving a commercial vehicle) or that are on probation for a prior DUI are subject to lower BAC limit requirements when driving - 0.04% and 0.01%, respectively. If an officer has reason to believe that a stopped driver is under the combined influence of both alcohol and drugs, the driver is required to submit to a blood or urine test at the officer's request, even if they have already submitted to a breath test. Drivers may still be charged with a DUI in California with a BAC below 0.08% if the arresting officer believes that the driver still shows signs of impairment even with a below-limit BAC. BAC at 0.15% or higher is considered 'excessive' and may lead to increased penalties upon conviction.

Under California's 'Administrative Per Se' (APS) law, drivers consent to have their breath, blood or urine tested if they are arrested for DUI (under the influence of alcohol). The California Department of Motor Vehicles (DMV) is required by APS law to suspend or revoke driving privileges for any person arrested for having a BAC over the legal limit or for refusing a chemical test. At the time of arrest, an order of suspension or revocation is served and the driver's license is confiscated by the arresting officer. To allow for due process, the DMV may issue a 30-day temporary driver's license. Any DUI-related action the DMV takes upon a driver's license is independent of any suspension or revocation penalties that may be imposed in court. Other court-imposed actions may include jail time, fines, required completion of a California-licensed DUI/DUID education/counseling or treatment program and possible Ignition Interlock Device (IID) installation.

For California juvenile drivers under the age of 21, driving with a BAC of 0.01% or higher is unlawful. Juveniles found driving with a BAC of 0.01% or higher may face immediate driver's license suspension. If a law enforcement officer has reason to suspect a stopped juvenile driver of DUI or DUID, the juvenile is required by law to submit to a Preliminary Alcohol Screening (PAS) or other chemical (breath, blood or urine) test. Refusal to complete a PAS can result in a one-year driver's license suspension. Juvenile drivers with preliminary results showing a BAC of 0.05% or higher may be asked by the law enforcement officer to submit to a second chemical

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test of their breath or blood. If the subsequent test confirms the BAC of 0.05% or above, the officer can issue an order of license suspension; the juvenile may also be placed under arrest for DUI and will be detained until they can be released to their parent/guardian or to juvenile authorities.

### *Report Individualization*

Professional Online Testing Solutions, Inc. is committed to providing meaningful assessment to our test users. To ensure this, we offer county-by-county individualization of DII reports at no cost to our California DII assessors. We will work with you to add county-specific information, recommendations, DUI program features, etc. to your DII reports.

### *Addition of Driver Risk Scale (DII-DR)*

We are committed to tailoring our assessments to meet test users' specific needs. A prospective Driver Impairment Index (DII) user recently expressed interest in adding a measure of driver risk to the DII. A Driver Risk Scale has now been integrated into a second version of the DII, called the DII-Dr. The greater number of items in the DII-Dr (74 items) means that administration time differs from the DII; DII-Dr administration time is approximately 15 minutes. Please continue to give us your comments and impressions of the DII as a current or future user.

### *Conclusion*

Statistics presented in this report demonstrate the statistical expectations of reliability, validity and accuracy of the DII. Within future DII reports, DII test data statistics and analyses involving California DUI violator BAC levels, chemical test refusals, self-reported sentence enhancements, etc. will be included, as well as correlations between prior substance-related arrests and DII Scale scores. The goal of DII development is to provide California DUI assessors with a state-specific, concise, yet comprehensive, accurate and cost-effective instrument for evaluating California DUI violators. Professional Online Testing Solutions, Inc. is committed to ongoing research and standardization of the DII, and we will continue to provide state-of-the-art assessment technology and implement requested individualization to DII reports to become an even better fit for California's DUI assessment needs.