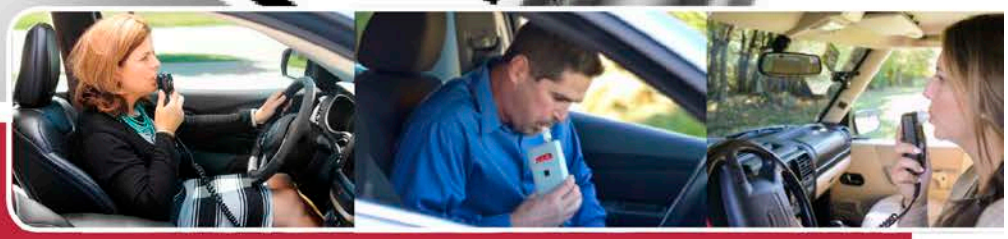

ANNUAL IGNITION INTERLOCK SURVEY 2016 & 2017: UNITED STATES

TIRF USA Inc.

TIRF

The knowledge source for safe driving

The Traffic Injury Research Foundation USA, Inc.

Traffic Injury Research Foundation USA, Inc. (TIRF USA) is an independent road safety research institute that obtained 501(c)3 non-profit status in the US in 2014. The mission of TIRF USA is to develop and share the knowledge that saves – preventing injuries and loss of life on the roads, reducing related social, health and insurance costs, and safeguarding productivity.

Corporate Office
20 F Street, 7th Floor
Washington, DC 20001
T: 202-507-6334 | F: 202-507-6101
Email: tirf@tirf.us

www.tirf.us

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ANNUAL IGNITION INTERLOCK SURVEY 2016 & 2017: UNITED STATES

Robyn D. Robertson, Ward G.M. Vanlaar and Marisela Mainegra Hing

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AIIPA
ASSOCIATION OF IGNITION INTERLOCK PROGRAM ADMINISTRATORS

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Maryland Traffic Safety Resource Prosecutor
Minnesota Department of Public Safety
Missouri Office of Prosecution Services
Missouri Department of Transportation, Traffic & Highway Safety Division
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Oklahoma Highway Safety Office
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Oregon Department of Transportation – Transportation Safety Division
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Tennessee District Attorneys General Conference, Traffic Safety Resource Prosecutor
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West Virginia Division of Motor Vehicles Interlock Department
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INTRODUCTION

The National Highway Traffic Safety Administration (NHTSA) reported 10,497 alcohol-impaired driving fatalities in 2016, which accounted for 28% of all motor vehicle traffic fatalities. This is a 1.7 percent increase from 2015, compared to an overall increase in fatalities of 5.6 percent (NHTSA 2017). Trend data show that, proportionally speaking, among all crashes, fewer crashes are attributable to alcohol-impaired driving in 2016 compared to previous years. However, when expressed in absolute numbers, there were more alcohol-impaired driving fatalities in 2016 (10,497) than in 2015 (10,320). This is the second consecutive increase in the number of lives lost since 2014, when there were 9,943 alcohol-impaired driving fatalities (see Vanlaar et al. 2017a).

The value of interlock programs as an impaired driving countermeasure is clearly evident in light of stagnating progress reducing alcohol-impaired driving fatalities. Interlocks have proven to reduce the incidence of impaired driving while the device is installed in the vehicle (Willis et al. 2004; Elder et al. 2011). Furthermore, recent evaluations studying the impact of interlocks on crashes have also demonstrated that interlock programs embedded in strong legislation can lead to a reduction in alcohol-related fatalities (Marques et al. 2010; McCartt et al. 2013; Kaufman & Wiebe, 2016; Lucas et al. 2016; Vanlaar et al. 2017b; McGinty et al. 2017; Teoh et al. 2018).

Ignition interlock programs are prevalent across the US as a result of the strong body of evidence of the effectiveness of this measure. In March 2018, according to Mothers Against Drunk Driving (MADD 2018), 30 states[1], the District of Columbia, and four counties in California[2] required all alcohol-impaired driving offenders including first offenders, to install an interlock (Figure 1). An additional 11 states required interlocks for offenders with a high blood alcohol concentration (BAC; usually 0.15 or higher) and for repeat offenders. Six states required devices only for repeat offenders. Finally, three states did not have mandatory interlock requirements but permitted their usage with judicial discretion.

Despite the prevalence of interlock programs across the country, installation rates of interlocks among eligible offenders vary considerably, and can be as low as approximately 20 percent. Given the evidence regarding interlocks, it is paramount they are utilized to the fullest by increasing participation rates, and thereby ensuring this effective road safety measure is also an efficacious one. It is therefore essential to monitor installation rates; such is the purpose of this survey.

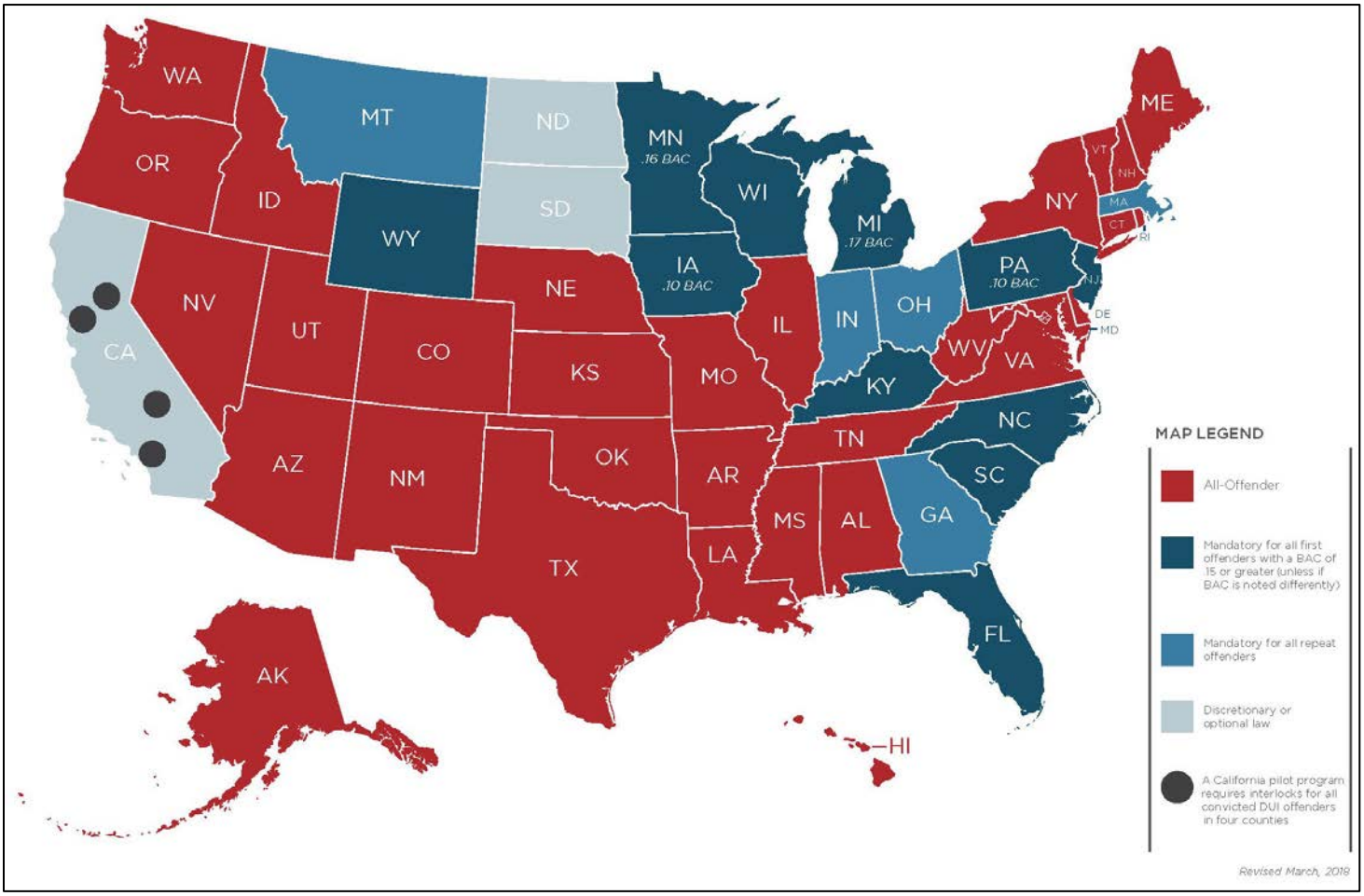
The Traffic Injury Research Foundation USA, Inc. (TIRF USA) in partnership with the Association of Ignition Interlock Program Administrators (AIIPA) and TIRF in Canada conducted a national survey on interlock installations in the US in 2017. Previous surveys collected data for installations in 2014, 2015 and part of 2016 (Casanova Powell et al. 2016, 2017). These data provide a comprehensive picture of interlock installations across the US and are a useful benchmark for state ignition

[1] Nevada all-offender law effective date is June 12, 2017, for the purpose of adopting regulations and performing preparatory administrative tasks necessary to carry out the provisions of this law; and October 1, 2018, for all other purposes.
[2] California all-offender law goes into effect on January 1, 2019.

interlock program administrators and impaired driving stakeholders to measure interlock usage and growth in interlock programs on an annual basis.

This report contains results from the annual survey of 2016 installation data from state agencies, and 2016 and 2017 data from interlock manufacturers, and compares these data to results from previous years.

Figure 1: Laws mandating alcohol ignition interlock orders (March 2018)



Source: MADD (2018). 2018 Report to the Nation. Mothers Against Drunk Driving (madd.org)

METHODS

State ignition interlock program managers, highway safety office directors, staff within departments of transportation, public safety and motor vehicles in all 50 states, and six interlock manufacturers were contacted by email in February and March 2018 to request relevant interlock data. Manufacturers were asked for 2016 and 2017 data while states were requested to provide data for 2016.

Three measures of installation were requested for 2016 and 2017. Each indicator is useful to measure growth as well as to gauge workload associated with programs. Specific definitions of these measures were provided as follows:

- Total Installs Number all (TINall): Total number of interlocks that were in a vehicle at any time between January 1st through to December 31st, including devices that may have been installed prior to January 1st but were still in the vehicle for any period of time during the year following January 1st;
- Total Installs Number (TIN): Total number of newly installed interlocks from January 1st through to December 31st;
- Active Installs Number (AIN): Total number of interlocks that were in the vehicle of an active participant on either August 31st or December 31st.

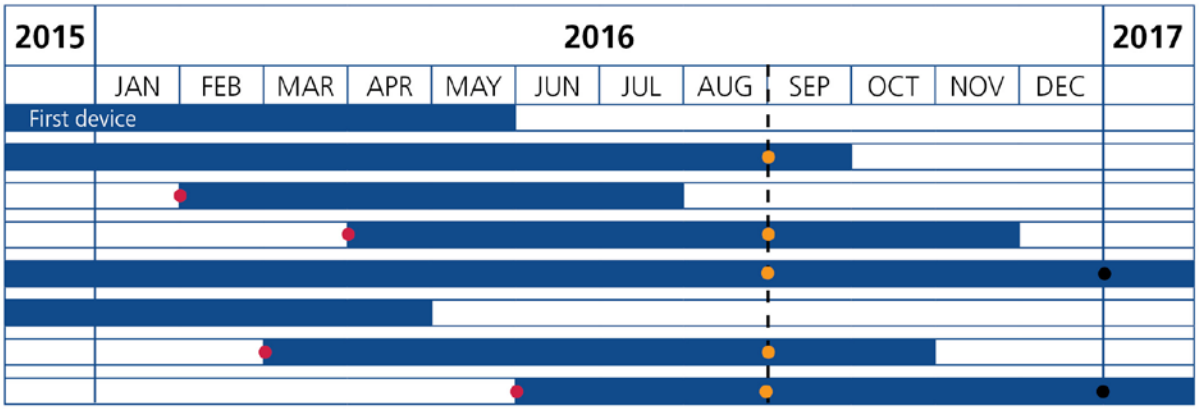
Figure 2 shows an example of eight separate interlock device installations to illustrate these definitions for the data year 2016. In this example, a measure of all installs (TINall) in 2016 is equal to 8, whereas a measure of new installs (TIN) is 4, and a measure of installs on August 31st, 2016 (AIN) is 5, and on December 31st, 2016 it is 2.

To place the interlock installation numbers in context, state administrators were also asked other questions about legislation and program features. Traffic Safety Resource Prosecutors (TSRPs) in each jurisdiction were requested to provide data about interlock legislation and the total number of driving while impaired[3] (DWI) arrests and convictions for the year 2016.

Surveygizmo online survey software (www.surveygizmo.com) was used to capture the data in combination with Microsoft Excel.

[3] The abbreviation DWI (driving while intoxicated or impaired) is used throughout this report as a convenient descriptive label, even though some states use other terms such as OUI (operating under the influence) or DUI (driving under the influence), and in some states they refer to different levels of severity of the offense. DWI is used not only to maintain consistency throughout the report but also because it is more descriptive of the offense usually associated with drunk drivers.

Figure 2: Illustration of installation measures



Time Device Installed

August 31st, 2016

TINall = 8

TIN = 4

AIN Aug 31st, 2016 = 5

AIN Dec 31st, 2016 = 2

First device was installed in 2015 and removed end May 2016

RESULTS

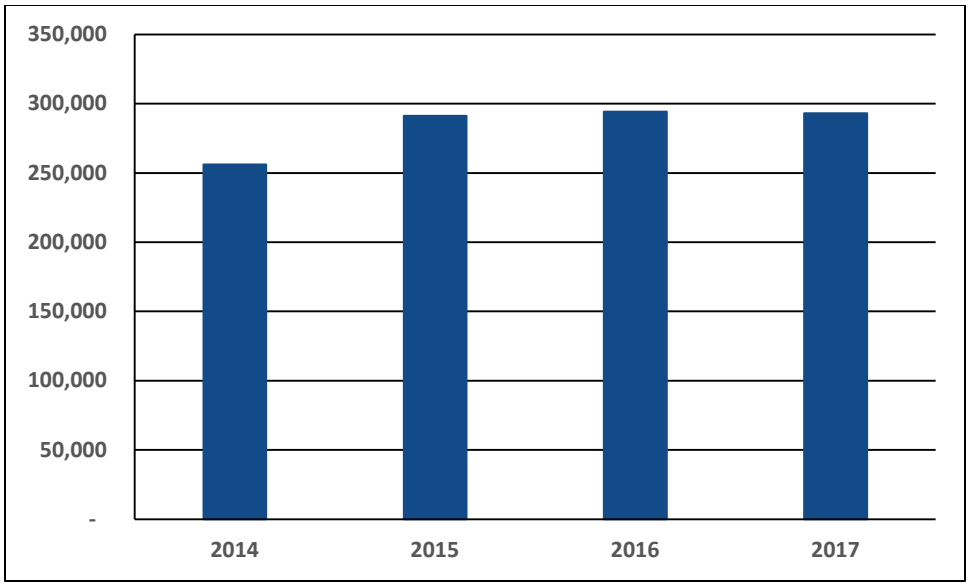
As of May 8th, 2018, data were received from six manufacturers (Alcohol Countermeasure Systems,Corp., Alcohol Detection Systems, Draeger, Intoxalock, LMG Holdings, and SmartStart, Inc.) and 37 states (only partial data was received from some states who were not able to query their data accordingly).

Results are presented in two main sections. First, interlock installation numbers are presented to measure interlock usage and growth over time. Second, to put installation numbers in perspective, installation rates of eligible participants are presented based on the best estimate available of the number of arrested or convicted DWI offenders.

Number of total and active installed interlocks

Three measures of installation for the years 2016 and 2017 were requested from manufacturers. According to the TIN data provided by manufacturers, nationally 294,340 new ignition interlock devices (IIDs) were installed in 2016 and 293,192 in 2017 (Figure 3). These numbers represent 1.1% and 0.7% increases, respectively, from the 291,189 new installations in 2015. These changes are small in comparison to the 13.7% increase in new installations from 256,150 in 2014 to 291,189 in 2015. This result may be due to the fact that many more states implemented first offender legislation from 2011 to 2014 whereas fewer states passed this legislation in 2016 and 2017.

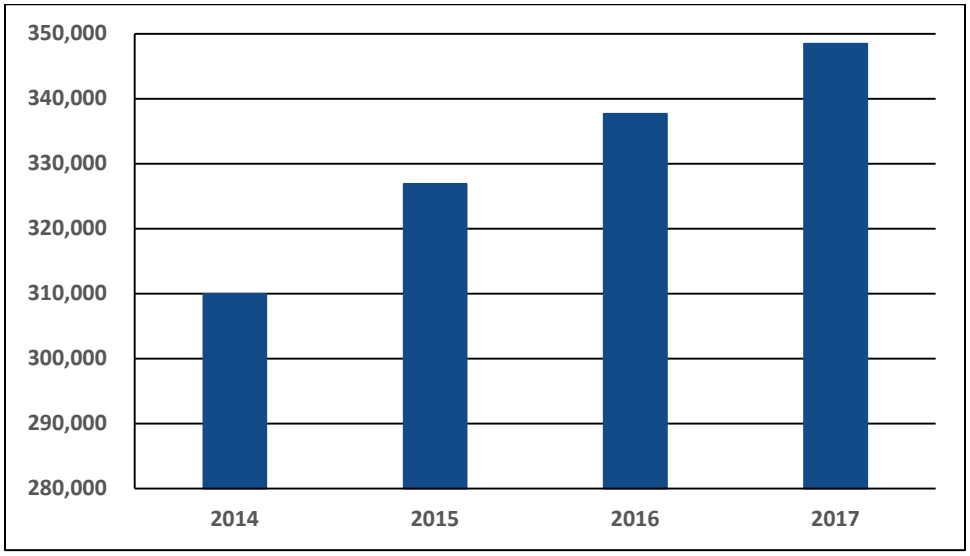
Figure 3: National total new installations of IIDs as reported by manufacturers (TIN)



An examination of the number of active IIDs installed in a vehicle on December 31st of each year revealed a significant increasing trend over the years (Figure 4, coef. =12647, p = 0.007). According to the AIN data provided by the manufacturers, nationally there were 337,657 IIDs installed on

December 31st, 2016 and 348,476 on December 31st, 2017. These numbers represent 3.3% and 6.6% increases from the 326,855 IIDs installed on December 31st, 2015.

Figure 4: National active installations of IIDs on December 31st as reported by manufacturers (AIN Dec. 31st)



In terms of all IIDs that were installed in a vehicle at any time throughout the whole year, including devices that may have been installed in previous years (TINall), there was an increase from 614,626 IIDs in vehicles in 2016 to 633,483 in 2017 (Figure 5). This represents a 3.1% increase from 2016 to 2017. A comparison of the total number of newly installed devices to the total number of all devices that were installed in a vehicle during each year showed that new installs represented 47.9% in 2016 and 46.3% in 2017. These data may provide insight into the workload associated with interlock programs and suggest that the percentage of new program participants is approximately equal to the number of pre-existing participants on an annual basis. Based on state experiences with interlock programs in the past decade, there is some evidence to indicate that new participants are associated with a higher workload for staff. Not only does the enrollment and installation process require more administration, but new participants are also more likely to experience more breath test fails as they learn how the device works (see Vanlaar et al. 2010, 2013, 2017b). Conversely, most participants who have been actively using an interlock for several months become more compliant and experience fewer breath test fails and program violations, and thus require less staff time to manage.

Figure 5: National total installations of IIDs as reported by manufacturers (TINall)

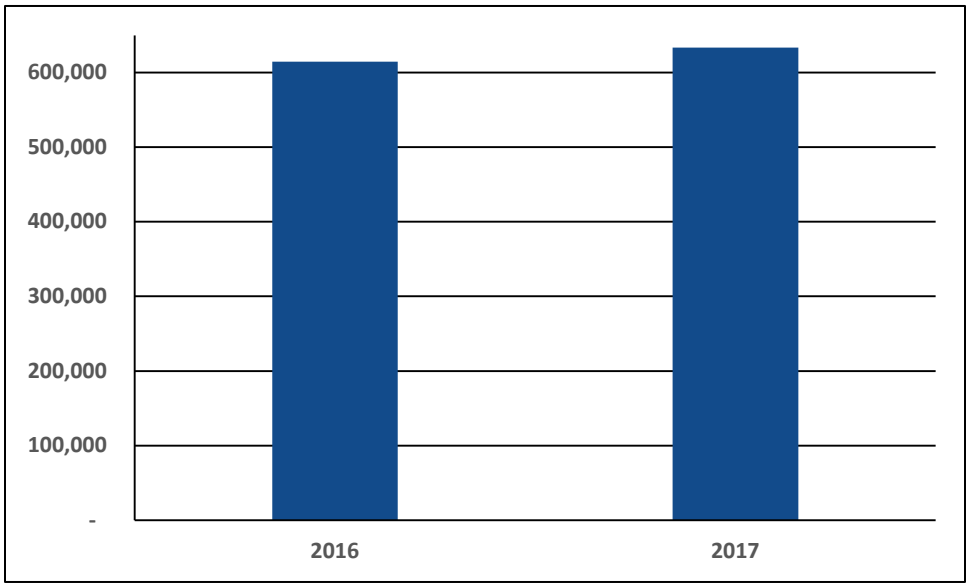


Figure 6 provides an overview for TIN and AIN indicators from 2014 to 2017. Note that the AIN for August and December are very similar each year (less than a 1% difference).

Figure 6: National total new installations and active installed IIDs as reported by manufacturers

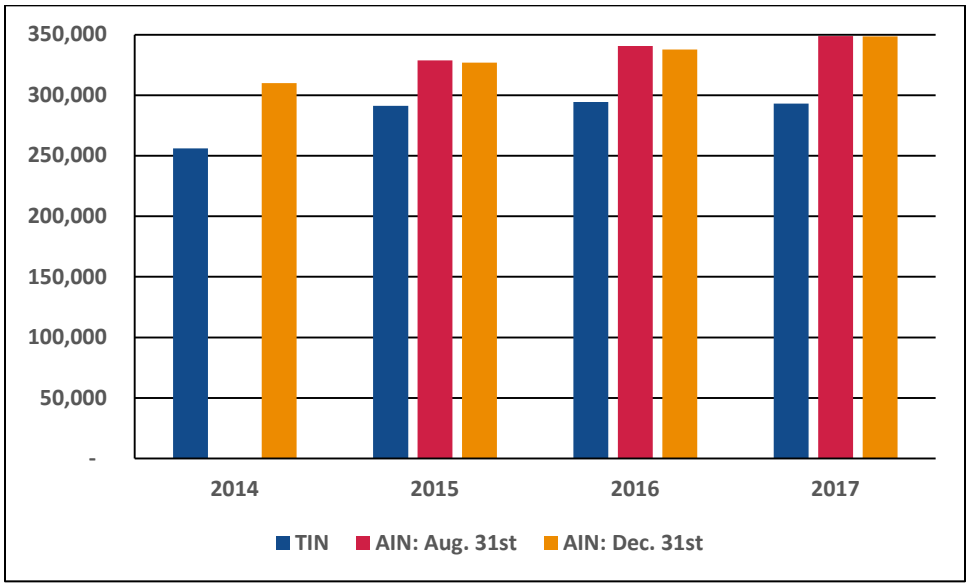


Figure 7 shows a map with the TIN values for 2017 per state. The figure shows that Texas is the state with the largest number of new installations in 2017 with 37,477 and North Dakota is the state with the smallest number of new installations in 2017 with 8 new IIDs.

Figure 7: Map of total new installations (TIN) in 2017 as reported by manufacturers

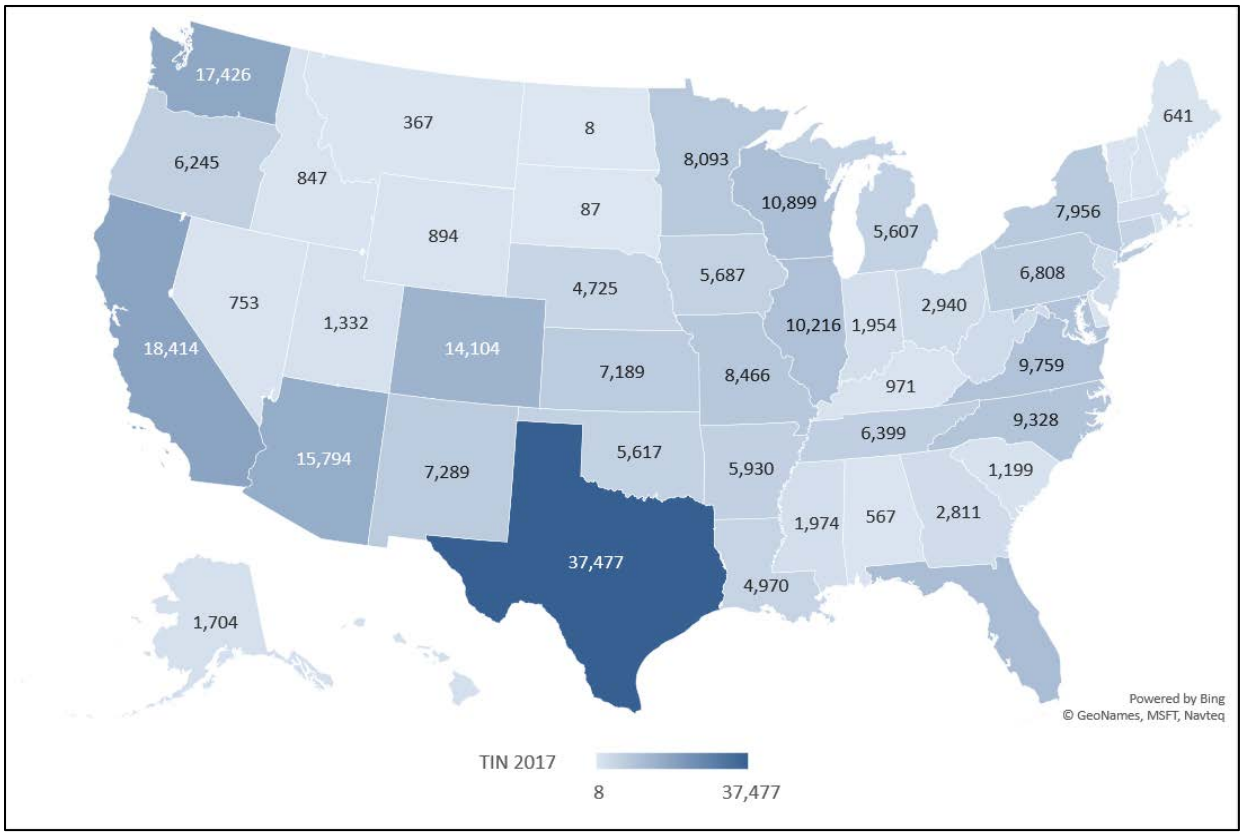


Table 1 contains three measures for the years 2016 and 2017 as reported by manufacturers per state, along with an indication of the percent change. The states that show more growth from 2016 to 2017 with respect to new installations (TIN) were Maryland (32.2% increase), South Dakota (24.3% increase), Vermont (24.0%) and Pennsylvania (21.3%). Note that the 700% change in North Dakota is not meaningful to measure growth as the absolute numbers were very low (from one TIN in 2016 to 8 in 2017). Other increases in TIN were less than 20%.

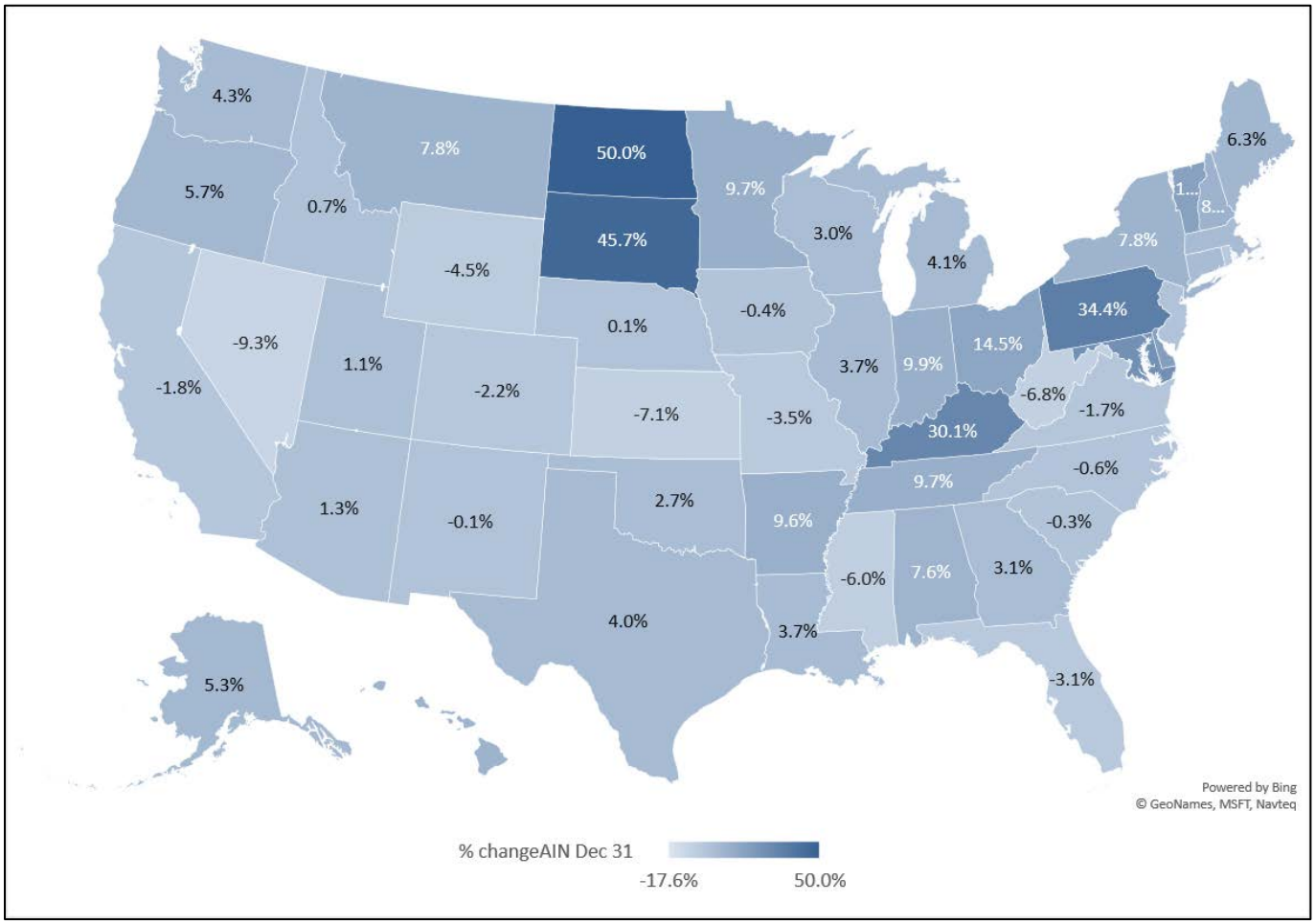
Table 1: Manufacturer reported installation data reported by state

Jurisdiction	TINall			TIN			AIN Dec. 31		
	2016	2017	% change	2016	2017	% change	2016	2017	% change
Alabama	1,071	1,359	26.9%	601	567	-5.7%	793	853	7.6%
Alaska	3,315	3,082	-7.0%	1,752	1,704	-2.7%	1,365	1,437	5.3%
Arizona	32,744	31,861	-2.7%	15,717	15,794	0.5%	16,099	16,303	1.3%
Arkansas	9,058	10,260	13.3%	5,406	5,930	9.7%	4,335	4,750	9.6%
California	36,643	35,442	-3.3%	19,147	18,414	-3.8%	17,181	16,873	-1.8%
Colorado	38,341	38,397	0.1%	13,743	14,104	2.6%	24,345	23,801	-2.2%
Connecticut	9,172	10,982	19.7%	5,261	5,246	-0.3%	5,807	6,002	3.4%
Delaware	1,216	1,252	3.0%	739	694	-6.1%	560	662	18.2%
Florida	22,341	21,956	-1.7%	12,028	11,468	-4.7%	10,591	10,258	-3.1%
Georgia	4,738	4,985	5.2%	2,797	2,811	0.5%	2,177	2,245	3.1%

Jurisdiction	TINall			TIN			AIN Dec. 31		
	2016	2017	% change	2016	2017	% change	2016	2017	% change
Hawaii	3,036	3,013	-0.8%	1,588	1,630	2.6%	1,384	1,489	7.6%
Idaho	1,769	1,836	3.8%	821	847	3.2%	995	1,002	0.7%
Illinois	18,411	18,510	0.5%	11,058	10,216	-7.6%	8,361	8,673	3.7%
Indiana	2,969	3,282	10.5%	1,923	1,954	1.6%	1,349	1,482	9.9%
Iowa	11,036	10,961	-0.7%	5,663	5,687	0.4%	5,332	5,313	-0.4%
Kansas	18,309	17,931	-2.1%	8,135	7,189	-11.6%	10,748	9,985	-7.1%
Kentucky	1,020	1,594	56.3%	886	971	9.6%	641	834	30.1%
Louisiana	9,580	9,910	3.4%	4,512	4,970	10.2%	4,974	5,160	3.7%
Maine	1,127	1,133	0.5%	626	641	2.4%	512	544	6.3%
Maryland	15,331	17,988	17.3%	7,167	9,475	32.2%	8,469	10,603	25.2%
Massachusetts	8,102	8,454	4.3%	2,820	2,801	-0.7%	5,693	5,907	3.8%
Michigan	14,623	15,904	8.8%	5,759	5,607	-2.6%	10,261	10,682	4.1%
Minnesota	18,632	19,671	5.6%	7,936	8,093	2.0%	11,645	12,779	9.7%
Mississippi	3,524	3,003	-14.8%	2,465	1,974	-19.9%	1,039	977	-6.0%
Missouri	17,210	17,031	-1.0%	8,917	8,466	-5.1%	8,606	8,303	-3.5%
Montana	661	715	8.2%	386	367	-4.9%	348	375	7.8%
Nebraska	8,623	8,937	3.6%	4,539	4,725	4.1%	4,208	4,213	0.1%
Nevada	2,030	2,053	1.1%	868	753	-13.2%	1,306	1,185	-9.3%
New Hampshire	1,752	1,990	13.6%	889	886	-0.3%	1,115	1,205	8.1%
New Jersey	8,953	8,483	-5.2%	5,623	3,168	-43.7%	3,017	3,019	0.1%
New Mexico	19,244	19,054	-1.0%	8,085	7,289	-9.8%	11,728	11,717	-0.1%
New York	15,928	15,984	0.4%	8,193	7,956	-2.9%	8,139	8,775	7.8%
North Carolina	20,934	20,849	-0.4%	9,784	9,328	-4.7%	11,584	11,509	-0.6%
North Dakota	1	8	700.0%	1	8	700.0%	2	3	50.0%
Ohio	5,040	5,495	9.0%	2,472	2,940	18.9%	2,592	2,969	14.5%
Oklahoma	13,999	15,219	8.7%	5,699	5,617	-1.4%	9,616	9,875	2.7%
Oregon	11,276	11,840	5.0%	5,669	6,245	10.2%	5,616	5,937	5.7%
Pennsylvania	10,608	12,792	20.6%	5,611	6,808	21.3%	6,054	8,135	34.4%
Rhode Island	1,685	1,797	6.6%	1,047	967	-7.6%	841	812	-3.4%
South Carolina	2,533	2,786	10.0%	1,352	1,199	-11.3%	1,588	1,583	-0.3%
South Dakota	129	131	1.6%	70	87	24.3%	46	67	45.7%
Tennessee	12,266	12,476	1.7%	6,434	6,399	-0.5%	6,112	6,702	9.7%
Texas	83,050	90,875	9.4%	36,556	37,477	2.5%	51,643	53,699	4.0%
Utah	3,334	3,288	-1.4%	1,350	1,332	-1.3%	1,951	1,972	1.1%
Vermont	1,249	1,503	20.3%	437	542	24.0%	972	1,136	16.9%
Virginia	18,729	17,754	-5.2%	10,053	9,759	-2.9%	8,216	8,078	-1.7%
Washington	35,663	36,183	1.5%	17,029	17,426	2.3%	18,802	19,603	4.3%
Washington, D.	22	28	27.3%	12	11	-8.3%	17	14	-17.6%
West Virginia	7,215	6,744	-6.5%	3,066	2,857	-6.8%	3,887	3,622	-6.8%
Wisconsin	24,281	24,579	1.2%	10,717	10,899	1.7%	13,753	14,168	3.0%
Wyoming	2,103	2,123	1.0%	931	894	-4.0%	1,242	1,186	-4.5%
Total	**614,626**	**633,483**	**3.1%**	**294,340**	**293,192**	**-0.4%**	**337,657**	**348,476**	3.2%

In terms of active IID installations on December 31st (AIN), the states with larger growth from 2016 to 2017 were South Dakota (45.7%), Pennsylvania (34.4%), Kentucky (30.1%) and Maryland (25.2%), see Figure 8. Note that the 700% and 50% change in TIN and AIN in North Dakota are not meaningful to measure growth as the absolute numbers were very small (from one TIN in 2016 to 8 in 2017, and from 2 AIN on December 31st, 2016 to 3 in 2017).

Figure 8: Map of percentage change in AIN December 31st, 2016-2017 as reported by manufacturers



Installation rate of interlocks among eligible population of offenders

An accurate way to measure the efficacy of an interlock program within a state is to estimate the percentage of offenders who actually installed an interlock among those who were eligible or required to do so.

Dependent upon legislation, the eligible population in a state for offenders who are required to install an interlock may be either those offenders arrested for DWI (if an administrative license suspension or revocation requires an interlock) or those convicted of DWI. For the latter, this may be further dependent upon what category of offense requires an interlock. Furthermore, some states may include administrative per se cases. Another caveat to consider when defining the

eligible population is that some offenders may not be deemed eligible because of other driving or non-driving violations; for example, as a result of delinquent child support payments that are unrelated to DWI.

Information was collected in an effort to better re-define the eligible population per state. This included data on the number of arrests as well as convictions. Although DWI arrest and conviction data are not ideal to define the eligible population across all states, for the above-mentioned reasons, they are currently the best available source of information to estimate installation rates.

The percentage of new interlocks installed per DWI arrest and convictions was calculated when possible among states for which both the numerator and denominator were available (i.e., TIN in states divided by the total number of DWI arrests in states, or divided by the total number of convictions in states). Figure 9 shows an increasing percentage of installations per DWI arrests and convictions over the years.

Figure 9: Percentage of IIDs installed per DWI arrests and convictions in 2014-2016

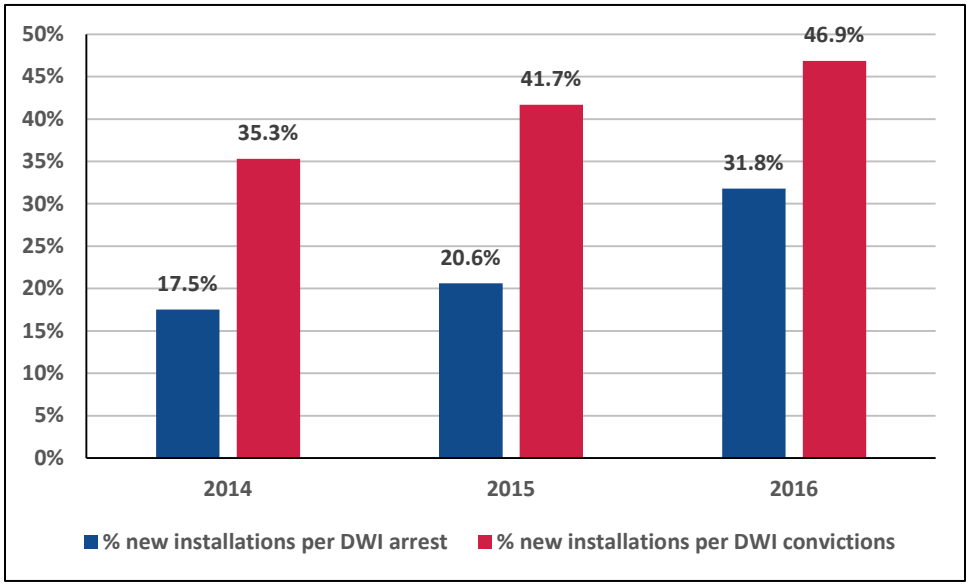


Table 2 presents impaired driving arrest and conviction data for 25 states in 2016. The percentage of convictions per arrests were calculated when possible as well as the percentage of new interlocks installed per DWI arrests and per DWI convictions.

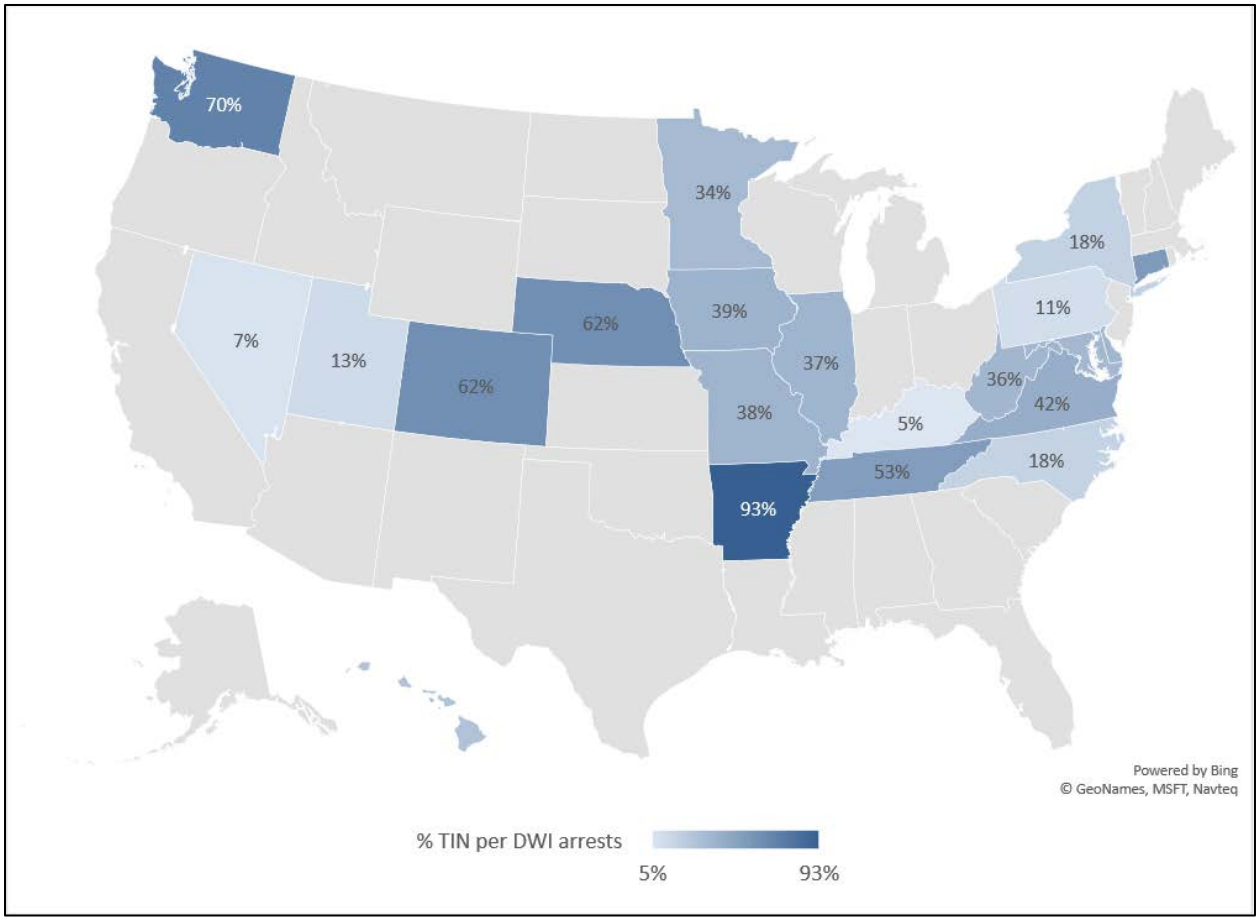
Table 2: Percentage of interlocks installed (TIN manufacturer data) per DWI arrests and convictions (states administrators data) in 2016

State	DWI arrests	DWI convictions	% convictions per DWI arrests	% TIN per DWI arrests	% TIN per DWI convictions
Arkansas	5,837	5,376	92.1%	92.6%	100.6%
Colorado	22,218	21,561	97.0%	61.9%	63.7%
Connecticut	9,659	3,123	32.3%	54.5%	168.5%
Delaware	2,061	2,220	107.7%	35.9%	33.3%
Hawaii	5,630			28.2%	

State	DWI arrests	DWI convictions	% convictions per DWI arrests	% TIN per DWI arrests	% TIN per DWI convictions
Illinois	29,528	2,701	9.1%	37.4%	409.4%
Iowa	14,721	10,286	69.9%	38.5%	55.1%
Kansas		5,278			154.1%
Kentucky	16,893	13,642	80.8%	5.2%	6.5%
Maryland	20,439	14,347	70.2%	35.1%	50.0%
Minnesota	23,392	18,524	79.2%	33.9%	42.8%
Missouri	23,658	16,186	68.4%	37.7%	55.1%
Nebraska	7,311	6,867	93.9%	62.1%	66.1%
Nevada	11,729	5,278	45.0%	7.4%	16.4%
New York	44,470	19,397	43.6%	18.4%	42.2%
North Carolina	54,603	31,920	58.5%	17.9%	30.7%
Ohio		36,301			6.8%
Pennsylvania	53,578	27,143	50.7%	10.5%	20.7%
Tennessee	12,201	8,116	66.5%	52.7%	79.3%
Utah	10,755	8,161	75.9%	12.6%	16.5%
Vermont		1,440			30.3%
Virginia	23,916	19,503	81.5%	42.0%	51.5%
Washington	24,425	25,125	102.9%	69.7%	67.8%
West Virginia	8,579	6,666	77.7%	35.7%	46.0%
Wyoming		1,735			53.7%
Totals			**63.4%**	**31.8%**	**46.9%**
Utah: Arrest data are for the fiscal year 2016 (July 1, 2015 through June 30, 2016)					

As previously mentioned, DWI arrests and convictions are not ideal to define the eligible population for an IID program in all states. As such, some of the percentages in Table 2 are larger than 100%. For example, Connecticut requires an IID for all offenders, including administrative per se cases (failure or refusal of chemical test at arrest); Illinois allows the reinstatement of driving privileges with an IID for an administrative license revocation upon a DWI arrest and prior to a DWI conviction. Figure 10 shows a map representing the percentage of new interlocks installed per DWI arrests per state in 2016.

Figure 10: Map of percentage of new interlocks installed (TIN) per DWI arrests in 2016



Program information

State administrators were also asked other questions about program features. According to their responses:

- 41.9% (13) of 31 states require compliance-based removal to exit the interlock program (Connecticut, Georgia, Illinois, Minnesota, Missouri, North Carolina, Oregon, South Carolina, Tennessee, Vermont, Virginia, Washington and West Virginia);
- between 12 and 17 of 31 states issue program extensions for different types of violations: breath tests fails (14), retest fails (12), circumvention/tampering (17), and unauthorized removal (12); and,
- 17 of 31 states require advanced technology devices such as cameras or GPS. In particular, all 17 states require camera and 5 also require GPS in addition to a camera.

CONCLUSIONS

Epidemiological data regarding alcohol-impaired driving suggest that progress in addressing the problem may be stagnating. While the proportion of alcohol-impaired driving crashes out of all crashes may have been at an all-time low in 2016, there have been two consecutive increases in the absolute number of alcohol-related fatalities on the roads since 2014. In this context of waning progress, alcohol ignition interlock programs are especially pertinent. Their value as an impaired driving countermeasure is clearly evident in light of the strong body of evidence showing that they not only reduce recidivism but that they can also lead to a reduction in alcohol-related fatalities when the use of the device is embedded in strong legislation. But for an effective measure to be efficacious, market penetration is crucial. As such, the purpose of this annual survey is to monitor installations and installation rates and to report these findings to the benefit of all stakeholders involved.

When comparing four years of installation data, it is clear that the use of IIDs across the country is growing. While the number of new installations in 2017 is slightly smaller than in 2016, all other indicators show growth (note that the result of this indicator is perhaps not surprising given that fewer states remain to pass all offender legislation given that the majority of states have already done so in the past). To illustrate, using the indicator for active installations on December 31st (AIN), there were 337,657 IIDs installed on December 31st, 2016 and 348,476 on December 31st, 2017. These numbers represent 3.3% and 6.6% increases from the 326,855 IIDs installed on December 31st, 2015. When looking at all IIDs installed (TINall), this number grew from 614,626 IIDs in 2016 to 633,483 in 2017, which represents a 3.1% increase. Finally, installation rates based on available data on arrests and convictions in states that provided these data also show an increasing trend. In 2014, 17.5% of all those arrested had an IID installed while this increased to 31.8% in 2016. Regarding convictions, in 2014, 35.3% of all those convicted installed an IID and this rose to 46.9% in 2016. It warrants mentioning that these are best estimates of installation rates for eligible populations at this time as accurate data is not available.

In conclusion, the survey data collected since 2014 demonstrate a steady growth of IIDs across the country. Nevertheless, there is much room for growth as the installation rate indicators suggest that there is likely still a large contingent of eligible offenders on the road who have not installed an interlock.

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Traffic Injury Research Foundation, USA Inc.

Corporate Office
20 F Street, 7th Floor
Washington, DC 20001

www.tirf.us
Email: tirf@tirf.us