

Marijuana, Other Drugs, and Alcohol Use by Drivers in Washington State

Appendices



U.S. Department of Transportation
**National Highway Traffic Safety
Administration**



*Appendix A: Oral-Fluid-Only
Results Tables*

Table 1. Percentage of THC Positive Drivers by Wave in Oral Fluid

	<i>N</i>	% THC-positive
Wave 1	878	11.6
Wave 2	629	16.4
Wave 3	806	17.1

In this table, *N*s are unweighted; percentages are weighted.
THC-positive includes results from THC and hydroxy-THC.

Table 2. Percentage of THC Positive Drive by Time of Day in Oral Fluid

	Wave 1			Wave 2			Wave 3		
	<i>N</i>	% THC-positive	% THC-positive	<i>N</i>	% THC-positive	% THC-positive	<i>N</i>	% THC-positive	% THC-positive
Daytime	250	17	6.8	163	25	15.3*	214	23	14.3
Nighttime	628	79	13.4	466	70	16.7	592	85	18.1

In this table, *N*s are unweighted; percentages are weighted.
THC-positive includes results from THC and hydroxy-THC.
*Significantly different from Wave 1 ($p < .05$).

Table 3. Percentage of Driver THC Positive by Demographic Variables in Oral Fluid

Variable	Demographic	Wave 1		Wave 2		Wave 3	
		<i>N</i>	% THC-positive	<i>N</i>	% THC-positive	<i>N</i>	% THC-positive
Gender	Male	543	12.0	383	16.4	475	20.2
	Female	333	10.9	241	16.7	324	13.2
Race	White	776	10.1	530	16.7	687	14.3
	Black or African American	59	20.0	60	13.3	58	37.1
	Asian	18	14.9	27	8.8	20	13.8
	Native American or Alaska Native	8	0.0	3	34.3	13	12.9
	Other or More than one	12	13.4	6	35.5	27	18.4
Ethnicity	Hispanic	154	12.1	110	15.2	120	7.6
	Non-Hispanic	719	11.5	512	16.8	681	19.1
Age	16 to 20	105	15.5	79	17.0	112	26.8
	21 to 34	373	12.9	275	15.3	324	18.4
	35 to 44	147	11.6	116	18.7	155	12.8
	45 to 64	210	7.9	121	16.5	178	16.0
	65 and over	39	12.8	33	17.9	31	2.3

In this table, *N*s are unweighted; percentages are weighted.
THC-positive includes results from THC and hydroxy-THC.

Table 4. Percentage of Drivers THC Positive by Drug Category and Wave in Oral Fluid
(Percentage by Column)

Drug class	Wave 1		Wave 2		Wave 3	
	<i>N</i>	%	<i>N</i>	%	<i>N</i>	%
THC-positive	96	11.6	95	16.4	108	17.1
<i>THC-positive only</i>	63	7.4	72	12.6*	78	11.2
<i>THC-positive plus any other drug</i>	33	4.2	23	3.8	30	6.0
Illegal only	19	2.2	7	1.2	2	0.2
Medications only	117	13.4	92	14.2	84	9.6
Illegal & Medications	1	0.4	1	0.2	5	0.9
Total Drug-Positive	233	27.5	195	32.0	199	27.8
Total Drug-Negative	645	72.5	434	68.0	607	72.2

In this table, *N*s are unweighted; percentages are weighted.
 THC-positive includes results from THC and hydroxy-THC.
 *Significantly different from Wave 1 ($p < .05$).

Table 5. Percentage of Drive THC Positive by Drug Category and Time of Day in Oral Fluid
(Percentages by Column)

Drug Category	Daytime		Nighttime		Total	
	<i>N</i>	%	<i>N</i>	%	<i>N</i>	%
Wave 1						
THC-positive	17	6.8	79	13.4	96	11.6
<i>THC-positive only</i>	8	4.0	55	8.7	63	7.4
<i>THC-positive plus any other drug</i>	9	2.8	24	4.7	33	4.2
Illegal only	8	2.4	11	2.2	19	2.2
Medications only	35	11.8	82	14.0	117	13.4
Illegal and medications	0	0.0	1	0.5	1	0.4
Total drug-positive	60	21.0	173	30.1	233	27.5
Total drug-negative	190	79.0	455	69.9	645	72.5
Wave 2						
THC-positive	25	15.3*	70	16.7	95	16.4
<i>THC-positive only</i>	20	12.0	52	12.8	72	12.6*
<i>THC-positive plus any other drug</i>	5	3.3	18	3.9	23	3.8
Illegal only	1	0.6	6	1.5	7	1.2
Medications only	19	11.9	73	15.1	92	14.2
Illegal and medications	0	0.0	1	0.2	1	0.2
Total drug-positive	45	27.8	150	33.5	195	32.0
Total drug-negative	118	72.2	316	66.5	434	68.0
Wave 3						
THC-positive	23	14.3	85	18.1	108	17.1
<i>THC-positive only</i>	17	7.9	61	12.3	78	11.2
<i>THC-positive plus any other drug</i>	6	6.4	24	5.8	30	6.0
Illegal only	0	0.0	2	0.3	2	0.2
Medications only	29	11.0	55	9.1	84	9.6
Illegal and medications	0	0.0	5	1.3	5	0.9
Total drug-positive	52	25.3	147	28.7	199	27.8
Total drug-negative	162	74.7	445	71.3	607	72.2

In this table, *N*s are unweighted; percentages are weighted.

Column percentages may not total to 100% due to rounding.

THC-positive includes results from THC and hydroxy-THC.

*Significantly different from Wave 1 ($p < .05$).

Table 6. Percentage of Drivers THC Positive by Drug Category and Gender and Age in Oral Fluid (Percentage by Column)

Drug category	Gender		Age (years)				
	% Male	% Female	% 16–20	% 21–34	% 35–44	% 45–64	% 65+
Wave 1	N = 543	N = 333	N = 105	N = 373	N = 147	N = 210	N = 39
THC-positive	12.0	10.9	15.5	12.9	11.6	7.9	12.8
<i>THC-positive only</i>	6.9	8.3	10.9	8.8	7.3	4.1	7.5
<i>THC-positive plus any other drug</i>	5.0	2.6	4.7	4.1	4.3	3.8	5.3
Illegal only	1.9	2.8	1.3	0.8	3.5	4.4	0.0
Medications only	11.9	16.0	2.9	15.9	14.5	13.2	14.7
Illegal and medications	0.0	1.1	0.0	0.0	0.0	1.4	0.0
Total drug-positive	25.8	30.8	19.7	29.6	29.6	26.9	27.5
Total drug-negative	74.2	69.2	80.3	70.4	70.4	73.1	72.5
Wave 2	N = 383	N = 241	N = 79	N = 275	N = 116	N = 121	N = 33
THC-positive	16.4	16.7	17.0	15.3	18.7	16.5	17.9
<i>THC-positive only</i>	11.8	14.3	11.5	12.0	14.0	12.6	17.9
<i>THC-positive plus any other drug</i>	4.6	2.5	5.5	3.3	4.8	3.9	0.0
Illegal only	0.4	2.6	0.9	1.9	1.5	0.0	0.0
Medications only	12.9	16.0	12.9	14.5	14.2	13.1	15.6
Illegal and medications	0.3	0.0	0.0	0.4	0.0	0.0	0.0
Total drug-positive	30.0	35.3	30.8	32.0	34.4	29.6	33.5
Total drug-negative	70.1	64.7	69.3	68.0	65.6	70.4	66.5
Wave 3	N = 475	N = 324	N = 112	N = 324	N = 155	N = 178	N = 31
THC-positive	13.2	20.2	26.8	18.4	12.8	16.0	2.3
<i>THC-positive only</i>	8.7	13.1	25.2	11.5	7.5	7.0	2.3
<i>THC-positive plus any other drug</i>	4.5	7.1	1.5	6.9	5.3	9.0	0.0
Illegal only	0.5	0.0	0.0	0.2	0.6	0.0	0.0
Medications only	10.5	8.6	3.3	7.2	12.4	13.5	15.9
Illegal and medications	0.0	1.6	0.0	0.4	1.9	1.9	0.0
Total drug-positive	24.1	30.4	30.1	26.1	27.7	31.4	18.2
Total drug-negative	75.9	69.6	69.9	73.9	72.3	68.6	81.8

In this table, *N*s are unweighted; percentages are weighted.

Column percentages may not total to 100% due to rounding.

Because of missing records on the demographic values, totals (*N*) do not match those in other tables.

THC-positive includes results from THC and hydroxy-THC.

Table 7. Percentage of Drivers THC Positive by Drug Category and Race and Ethnicity in Oral Fluid (Percentage by Column)

Drug category	Race					Ethnicity	
	% White	% Black/ African American	% Asian	% Native American/ Alaskan	% Other/ More than one	% Hispanic	% Non- Hispanic
Wave 1	N = 776	N = 59	N = 18	N = 8	N = 12	N = 154	N = 719
THC-positive	10.1	20.0	14.9	0.0	13.4	12.1	11.5
<i>THC-positive only</i>	6.4	10.9	10.5	0.0	13.4	9.2	7.1
<i>THC-positive plus any other drug</i>	3.7	9.1	4.4	0.0	0.0	2.9	4.4
Illegal only	2.4	0.9	0.0	0.0	0.0	3.0	2.1
Medications only	13.7	16.1	0.0	0.0	18.7	8.8	14.3
Illegal and medications	0.5	0.0	0.0	0.0	0.0	2.5	0.0
Total drug-positive	26.6	37.0	14.9	0.0	32.1	26.3	27.9
Total drug-negative	73.4	63.0	85.1	100.0	67.9	73.7	72.1
Wave 2	N = 530	N = 60	N = 27	N = 3	N = 6	N = 110	N = 512
THC-positive	16.7	13.3	8.8	34.3	50.0	15.2	16.8
<i>THC-positive only</i>	12.6	12.0	8.8	0.0	50.0	11.8	12.9
<i>THC-positive plus any other drug</i>	4.1	1.4	0.0	34.3	0.0	3.4	3.9
Illegal only	0.8	3.1	3.5	0.0	0.0	1.6	1.2
Medications only	15.5	10.5	2.8	0.0	0.0	5.7	15.8
Illegal and medications	0.2	0.0	0.0	0.0	0.0	0.0	0.2
Total drug-positive	33.2	26.9	15.1	34.3	50.0	22.5	34.0
Total drug-negative	66.8	73.1	84.9	65.7	50.0	77.5	66.0
Wave 3	N = 687	N = 58	N = 20	N = 13	N = 27	N = 120	N = 681
THC-positive	14.3	37.1	13.8	12.9	18.4	7.6	19.1
<i>THC-positive only</i>	8.7	25.7	13.8	6.4	18.4	6.9	12.1
<i>THC-positive plus any other drug</i>	5.6	11.4	0.0	6.4	0.0	0.8	7.0
Illegal only	0.2	0.0	0.0	0.0	0.0	0.0	0.2
Medications only	10.8	4.9	0.0	0.0	9.6	7.4	9.8
Illegal and medications	0.7	2.8	0.0	0.0	0.0	3.5	0.5
Total drug-positive	26.1	44.8	13.8	12.9	28.0	18.5	29.6
Total drug-negative	73.9	55.2	86.2	87.1	72.0	81.5	70.4

In this table, *N*s are unweighted; percentages are weighted.

Column percentages may not total to 100% due to rounding.

THC-positive includes results from THC and hydroxy-THC.

Because of missing records on the demographic values, totals (*N*) do not match those in other tables.

Table 8. Percentage of Drivers THC Positive by Drug Class Prevalence and Wave in Oral Fluid (Percentage by Column)

Drug class	Wave 1		Wave 2		Wave 3	
	<i>N</i>	%	<i>N</i>	%	<i>N</i>	%
THC-positive	96	11.6	95	16.4	108	17.1
<i>THC-positive only</i>	63	7.4	72	12.6*	78	11.2
<i>THC-positive plus any other drug</i>	33	4.2	23	3.8	30	6.0
Antidepressants only	5	0.6	10	1.4	4	0.3
Narcotic analgesics only	45	4.5	34	5.4	23	2.9
Sedatives only	7	0.9	4	0.7	7	0.8
Stimulants only	44	5.8	39	6.0	10	1.2
Other only	21	1.9	2	0.3	8	0.8
More than one class	15	2.2	11	1.8	39	4.7
Total drug-positive	233	27.5	195	32.0	199	27.8
Total drug-negative	645	72.5	434	68.0	607	72.2

In this table, *N*s are unweighted; percentages are weighted.
Column percentages may not total to 100% due to rounding.
THC-positive includes results from THC and hydroxy-THC.
*Significantly different from Wave 1 ($p < .05$).

Table 9. Percentage of Drivers THC Positive by Drug Class Prevalence and Time of Day in Oral Fluid (Percentages by Column)

Drug Class	Daytime		Nighttime		Total	
	N	%	N	%	N	%
Wave 1						
THC-positive	17	6.8	79	13.4	96	11.6
<i>THC-positive only</i>	8	4.0	55	8.7	63	7.4
<i>THC-positive plus any other drug</i>	9	2.8	24	4.7	33	4.2
Antidepressants only	1	0.2	4	0.8	5	0.6
Narcotic analgesics only	19	6.9	26	3.6	45	4.5
Sedatives only	2	0.7	5	1.0	7	0.9
Stimulants only	8	2.3	36	7.1	44	5.8
Other only	13	4.1	8	1.0	21	1.9
More than one class	0	0.0	15	3.1	15	2.2
Total drug-positive	60	21.0	173	30.1	233	27.5
Total drug-negative	190	79.0	455	69.9	645	72.5
Wave 2						
THC-positive	25	15.3*	70	16.7	95	16.4
<i>THC-positive only</i>	20	12.0	52	12.8	72	12.6*
<i>THC-positive plus any other drug</i>	5	3.3	18	3.9	23	3.8
Antidepressants only	2	0.9	8	1.6	10	1.4
Narcotic analgesics only	7	4.0	27	5.9	34	5.4
Sedatives only	1	0.6	3	0.8	4	0.7
Stimulants only	5	3.2	34	7.0	39	6.0
Other only	1	0.6	1	0.1	2	0.3
More than one class	4	3.2	7	1.4	11	1.8
Total drug-positive	45	27.8	150	33.5	195	32.0
Total drug-negative	118	72.2	316	66.5	434	68.0
Wave 3						
THC-positive	23	14.3	85	18.1	108	17.1
<i>THC-positive only</i>	17	7.9	61	12.3	78	11.2
<i>THC-positive plus any other drug</i>	6	6.4	24	5.8	30	6.0
Antidepressants only	3	1.0	1	0.1	4	0.3
Narcotic analgesics only	9	3.8	14	2.6	23	2.9
Sedatives only	2	0.7	5	0.9	7	0.8
Stimulants only	0	0.0	10	1.6	10	1.2
Other only	6	2.4	2	0.2	8	0.8
More than one class	9	3.2	30	5.2	39	4.7
Total drug-positive	52	25.3	147	28.7	199	27.8
Total drug-negative	162	74.7	445	71.3	607	72.2

In this table, Ns are unweighted; percentages are weighted.

Column percentages may not total to 100% due to rounding.

THC-positive includes results from THC and hydroxy-THC.

*Significantly different from Wave 1 ($p < .05$).

Table 10. Percentage of THC Positive Drivers by Drug Class and Gender and Age in Oral Fluid (Percentages by Column)

Drug class	Gender		Age (years)				
	% Male	% Female	% 16–20	% 21–34	% 35–44	% 45–64	% 65+
Wave 1	<i>N</i> = 543	<i>N</i> = 333	<i>N</i> = 105	<i>N</i> = 373	<i>N</i> = 147	<i>N</i> = 210	<i>N</i> = 39
THC-positive	12.0	10.9	15.5	12.9	11.6	7.9	12.8
<i>THC-positive only</i>	6.9	8.3	10.9	8.8	7.3	4.1	7.5
<i>THC-positive plus any other drug</i>	5.0	2.6	4.7	4.1	4.3	3.8	5.3
Antidepressants only	0.8	0.3	0.0	1.1	0.0	0.5	1.3
Narcotic analgesics only	2.7	7.9	1.6	2.9	4.0	6.9	13.4
Sedatives only	1.2	0.3	0.5	2.0	0.0	0.2	0.0
Stimulants only	5.7	5.9	0.6	5.9	10.7	5.6	0.0
Other only	1.5	2.8	0.6	1.7	3.3	2.3	0.0
More than one class	2.0	2.7	0.8	3.0	0.0	3.6	0.0
Total drug-positive	25.8	30.8	19.7	29.6	29.6	26.9	27.5
Total drug-negative	74.2	69.2	80.3	70.4	70.4	73.1	72.5
Wave 2	<i>N</i> = 383	<i>N</i> = 241	<i>N</i> = 79	<i>N</i> = 275	<i>N</i> = 116	<i>N</i> = 121	<i>N</i> = 33
THC-positive	16.4	16.7	17.0	15.3	18.7	16.5	17.9
<i>THC-positive only</i>	11.8	14.3	11.5	12.0	14.0	12.6	17.9
<i>THC-positive plus any other drug</i>	4.6	2.5	5.5	3.3	4.8	3.9	0.0
Antidepressants only	1.3	1.7	1.4	1.8	0.0	1.6	2.3
Narcotic analgesics only	4.9	6.4	6.7	5.9	3.9	3.3	13.4
Sedatives only	0.8	0.7	0.0	0.9	1.8	0.0	0.0
Stimulants only	3.9	9.1	4.7	5.4	9.2	5.8	0.0
Other only	0.4	0.0	0.9	0.4	0.0	0.0	0.0
More than one class	2.3	0.7	0.0	2.3	0.7	2.5	0.0
Total drug-positive	30.0	35.3	30.8	32.0	34.4	29.7	33.5
Total drug-negative	70.1	64.7	69.3	68.0	65.6	70.4	66.5
Wave 3	<i>N</i> = 475	<i>N</i> = 324	<i>N</i> = 112	<i>N</i> = 324	<i>N</i> = 155	<i>N</i> = 178	<i>N</i> = 31
THC-positive	20.2	13.2	26.8	18.4	12.8	16.0	2.3
<i>THC-positive only</i>	13.1	8.7	25.2	11.5	7.5	7.0	2.3
<i>THC-positive plus any other drug</i>	7.1	4.5	1.5	6.9	5.3	9.0	0.0
Antidepressants only	0.1	0.7	0.0	0.5	0.0	0.7	0.0
Narcotic analgesics only	3.2	2.2	2.7	1.9	3.4	4.8	0.0
Sedatives only	0.9	0.8	0.0	0.0	0.8	1.5	9.7
Stimulants only	0.8	1.8	0.0	1.5	1.7	1.2	0.0
Other only	0.3	1.5	0.0	0.4	0.0	1.7	6.2
More than one class	4.9	3.9	0.7	3.5	9.0	5.5	0.0
Total drug-positive	30.4	24.1	30.1	26.1	27.7	31.4	18.2
Total drug-negative	69.6	75.9	69.9	73.9	72.3	68.6	81.8

In this table, *N*s are unweighted; percentages are weighted.

Column percentages may not total to 100% due to rounding.

THC-positive includes results from THC and hydroxy-THC.

Table 11. Percentage of THC Positive Drivers by Drug Class and Race and Ethnicity in Oral Fluid (Percentages by Column)

Drug class	Race					Ethnicity	
	% White	% Black/ African American	% Asian	% Native American/ Alaskan	% Other/ More than one	% Hispanic	% Non- Hispanic
Wave 1	<i>N</i> = 776	<i>N</i> = 59	<i>N</i> = 18	<i>N</i> = 8	<i>N</i> = 12	<i>N</i> = 154	<i>N</i> = 719
THC-positive	10.1	20.0	14.9	0.0	13.4	12.1	11.5
<i>THC-positive only</i>	6.4	10.9	10.5	0.0	13.4	9.2	7.1
<i>THC-positive plus any other drug</i>	3.7	9.1	4.4	0.0	0.0	2.9	4.4
Antidepressants only	0.8	0.0	0.0	0.0	0.0	0.0	0.8
Narcotic analgesics only	4.3	8.5	0.0	0.0	0.0	1.7	5.1
Sedatives only	0.6	3.8	0.0	0.0	0.0	2.3	0.7
Stimulants only	6.1	3.8	0.0	0.0	11.4	6.8	5.6
Other only	2.2	0.9	0.0	0.0	0.0	0.4	2.2
More than one class	2.6	0.0	0.0	0.0	7.3	3.1	2.1
Total drug-positive	26.6	37.0	14.9	0.0	32.1	26.3	27.9
Total drug-negative	73.4	63.0	85.1	100.0	67.9	73.7	72.1
Wave 2	<i>N</i> = 530	<i>N</i> = 60	<i>N</i> = 27	<i>N</i> = 3	<i>N</i> = 6	<i>N</i> = 110	<i>N</i> = 512
THC-positive	16.7	13.3	8.8	34.3	35.5	15.2	16.8
<i>THC-positive only</i>	12.6	12.0	8.8	0.0	35.5	11.8	12.9
<i>THC-positive plus any other drug</i>	4.1	1.4	0.0	34.3	0.0	3.4	3.9
Antidepressants only	1.5	1.4	0.0	0.0	0.0	3.1	1.1
Narcotic analgesics only	5.9	5.6	0.0	0.0	0.0	0.8	6.5
Sedatives only	0.6	2.0	0.0	0.0	0.0	0.0	0.9
Stimulants only	6.1	4.6	6.3	0.0	0.0	2.2	6.6
Other only	0.3	0.0	0.0	0.0	0.0	0.6	0.2
More than one class	2.1	0.0	0.0	0.0	0.0	0.6	1.9
Total drug-positive	33.2	26.9	15.1	34.3	35.5	22.5	34.0
Total drug-negative	66.8	73.1	84.9	65.7	64.5	77.5	66.0
Wave 3	<i>N</i> = 687	<i>N</i> = 58	<i>N</i> = 20	<i>N</i> = 13	<i>N</i> = 27	<i>N</i> = 120	<i>N</i> = 681
THC-positive	14.3	37.1	13.8	12.9	18.4	7.6	19.1
<i>THC-positive only</i>	8.7	25.7	13.8	6.4	18.4	6.9	12.1
<i>THC-positive plus any other drug</i>	5.6	11.4	0.0	6.4	0.0	0.8	7.0
Antidepressants only	0.4	0.0	0.0	0.0	0.0	0.7	0.3
Narcotic analgesics only	3.7	0.0	0.0	0.0	0.0	0.7	3.3
Sedatives only	0.9	0.9	0.0	0.0	0.0	0.7	0.9
Stimulants only	0.9	3.1	0.0	0.0	0.0	0.4	1.4
Other only	1.0	0.0	0.0	0.0	0.0	0.0	0.9
More than one class	4.9	3.7	0.0	0.0	9.6	8.4	3.8
Total drug-positive	26.1	44.8	13.8	12.9	27.6	18.5	29.6
Total drug-negative	73.9	55.2	86.2	87.1	72.4	81.5	70.4

In this table, *N*s are unweighted; percentages are weighted.
Column percentages may not total to 100% due to rounding.
THC-positive includes results from THC and hydroxy-THC.

Table 12: Percentage of Alcohol and Drug Positive Drivers by Wave (Percentage by Column)

	Wave 1		Wave 2		Wave 3	
	<i>N</i>	%	<i>N</i>	%	<i>N</i>	%
Alcohol-positive	46	6.1	24	3.9	28	4.4
<i>Alcohol plus THC-positive</i>	8	1.1	3	0.4	5	1.3
<i>Alcohol plus any other drug</i>	7	1.0	1	0.2	4	0.3
<i>Alcohol only</i>	31	4.0	20	3.3	19	2.8
Alcohol-negative	828	93.9	601	96.1	777	95.6
<i>THC-positive and no alcohol</i>	86	9.7	88	14.6	102	20.3
<i>Any other drug and no alcohol</i>	130	14.8	99	15.8	87	13.0
<i>No drugs and no alcohol</i>	612	69.4	414	65.7	588	62.4

In this table, *N*s are unweighted; percentages are weighted.

Column percentages may not total to 100% due to rounding.

THC-positive includes results from THC and hydroxy-THC.

Table 13. Percentage of Driver THC Positive by Alcohol Concentration Level and Wave in Oral Fluid (Percentage by Row)

	<i>N</i>	Alcohol Concentration				
		% .00	% >.00	% .001-.049	% .05-.079	% .08+
<u>Wave 1</u>						
THC-negative	780	94.1	5.9	4.1	0.8	1.0
THC-positive	94	89.7	10.3	6.6	0.8	3.0
<u>Wave 2</u>						
THC-negative	534	95.6	4.4	2.2	0.7	1.6
THC-positive	91	97.2	2.8	0.0	1.0	1.8
<u>Wave 3</u>						
THC-negative	698	95.6	4.4	2.7	0.7	0.9
THC-positive	107	95.1	4.9	1.3	3.5	0.0

In this table, *N*s are unweighted; percentages are weighted.

THC-positive includes results from THC and hydroxy-THC.

Row percentages may not total to 100% due to rounding.

The column "> .00" represents all alcohol positives (applies to the three right-most columns).

Table 14. Percentage of Drivers Positive for Alcohol by Concentration and Drug Category in Oral Fluid (Percentage by Row)

Drug category	N	Alcohol Concentration				
		% .00	% >.00	% .001-.049	% .05-.079	% .08+
Wave 1						
THC-positive	94	89.7	10.3	6.6	0.8	3.0
<i>THC-positive only</i>	63	91.9	8.1	5.0	0.0	3.2
<i>THC-positive plus any other drug</i>	31	85.5	14.5	9.7	2.2	2.6
Illegal only	117	93.1	6.9	2.5	0.0	4.4
Medications only	19	86.7	13.3	0.0	13.3	0.0
Illegal and medications	1	100.0	0.0	0.0	0.0	0.0
Total drug-positive	231	91.3	8.7	3.9	1.4	3.4
Total drug-negative	639	94.4	5.6	4.7	0.6	0.4
Wave 2						
THC-positive	95	97.3	2.7	0.0	0.9	1.8
<i>THC-positive only</i>	72	98.9	1.1	0.0	0.0	1.1
<i>THC-positive plus any other drug</i>	23	92.0	8.1	0.0	4.0	4.0
Illegal only	92	100.0	0.0	0.0	0.0	0.0
Medications only	7	79.7	20.3	20.3	0.0	0.0
Illegal and medications	1	100.0	0.0	0.0	0.0	0.0
Total drug-positive	195	97.9	2.2	0.8	0.5	0.9
Total drug-negative	430	94.9	5.1	2.3	0.8	2.0
Wave 3						
THC-positive	108	95.1	4.9	1.3	3.6	0.0
<i>THC-positive only</i>	78	95.0	5.0	3.7	1.2	0.0
<i>THC-positive plus any other drug</i>	30	95.2	4.9	0.0	4.9	0.0
Illegal only	84	100.0	0.0	0.0	0.0	0.0
Medications only	2	96.4	3.6	1.0	0.9	1.7
Illegal and medications	5	100.0	0.0	0.0	0.0	0.0
Total drug-positive	199	95.7	4.3	1.1	2.6	0.6
Total drug-negative	606	95.6	4.4	2.9	0.6	0.8

In this table, *N*s are unweighted; percentages are weighted.

Row percentages may not total to 100% due to rounding.

THC-positive includes results from THC and hydroxy-THC.

The column "> .00" represents all alcohol positives (applies to the three right-most columns).

Table 15. Percentage of Drivers Positive for Alcohol by Concentration and Drug Class in Oral Fluid (Percentages by Row)

Drug class	N	Alcohol Concentration				
		% .00	% >.00	% .001-.049	% .05-.079	% .08+
Wave 1						
THC-positive	94	89.7	10.3	6.6	0.7	3.0
<i>THC-positive only</i>	63	91.9	8.1	5.0	0.0	3.2
<i>THC-positive plus any other drug</i>	31	85.5	14.5	9.7	2.2	2.6
Antidepressants only	5	100.0	0.0	0.0	0.0	0.0
Narcotic analgesics only	45	97.6	2.4	2.4	0.0	0.0
Sedatives only	7	20.1	79.9	14.7	0.0	65.2
Stimulants only	44	94.9	5.1	0.0	5.1	0.0
Other only	21	100.0	0.0	0.0	0.0	0.0
More than one class	15	96.1	3.9	3.9	0.0	0.0
Total drug-positive	231	91.3	8.7	3.9	1.4	3.4
Total drug-negative	639	94.4	5.6	4.7	0.6	0.4
Wave 2						
THC-positive	95	97.3	2.7	0.0	0.9	1.8
<i>THC-positive only</i>	72	98.9	1.1	0.0	0.0	1.1
<i>THC-positive plus any other drug</i>	23	92.0	8.1	0.0	4.0	4.0
Antidepressants only	10	100.0	0.0	0.0	0.0	0.0
Narcotic analgesics only	34	100.0	0.0	0.0	0.0	0.0
Sedatives only	4	66.3	33.7	33.7	0.0	0.0
Stimulants only	39	100.0	0.0	0.0	0.0	0.0
Other only	2	100.0	0.0	0.0	0.0	0.0
More than one class	11	100.0	0.0	0.0	0.0	0.0
Total drug-positive	195	97.9	2.2	0.8	0.5	0.9
Total drug-negative	430	94.9	5.1	2.3	0.8	2.0
Wave 3						
THC-positive	108	95.1	4.9	1.3	3.6	0.0
<i>THC-positive only</i>	78	95.0	5.0	0.0	5.0	0.0
<i>THC-positive plus any other drug</i>	30	95.2	4.9	3.7	1.2	0.0
Antidepressants only	4	100.0	0.0	0.0	0.0	0.0
Narcotic analgesics only	23	94.4	5.6	0.0	0.0	5.6
Sedatives only	7	100.0	0.0	0.0	0.0	0.0
Stimulants only	10	84.7	15.3	8.2	7.1	0.0
Other only	8	100.0	0.0	0.0	0.0	0.0
More than one class	39	100.0	0.0	0.0	0.0	0.0
Total drug-positive	199	95.7	4.3	1.1	2.5	0.6
Total drug-negative	606	95.6	4.4	2.9	0.6	0.8

In this table, Ns are unweighted; percentages are weighted.

THC-positive includes results from THC and hydroxy-THC.

Row percentages may not total to 100% due to rounding.

The column "> .00" represents all alcohol positives (applies to the three right-most columns).

Table 16. Drug Prevalence among Daytime and Nighttime Drivers (Oral Fluid Only)

Drug	Daytime <i>N</i> = 627		Nighttime <i>N</i> = 1,686	
	<i>N</i>	%	<i>N</i>	%
Cannabinoids	65	11.5	234	16.1
THC	65	11.5	233	16.1
CBD	17	2.1	69	3.3
CBN	2	0.3	6	0.5
11-OH-THC	1	0.1	0	0.0
Cocaine	8	1.4	16	1.3
Cocaine	7	1.3	12	1.1
Benzoylecgonine	5	0.4	9	0.8
Cocaethylene	1	0.2	7	0.6
Norcocaine	1	0.2	9	0.7
Opioids	42	6.6	109	8.9
Codeine	2	0.3	2	0.2
Heroin	15	2.1	23	1.6
Naltrexone	0	0.0	1	0.0
Buprenorphine	1	0.1	9	0.9
Norbuprenorphine	1	0.2	3	0.3
Fentanyl	1	0.1	0	0.0
Hydrocodone	17	2.3	28	1.9
Hydromorphone	1	0.1	1	0.0
Meperidine	0	0.0	0	0.0
Methadone	2	0.3	3	0.6
Morphine	7	1.0	35	2.1
Oxycodone	10	1.3	23	2.0
Oxymorphone	2	0.3	3	0.3
Propoxyphene	0	0.0	0	0.0
Tramadol	6	0.8	13	1.3
Amphetamines/Stimulants	40	7.3	172	11.2
MDMA	0	0.0	2	0.2
MDA	0	0.0	1	0.0
MDEA	0	0.0	0	0.0
Amphetamine	37	6.2	166	11.3
Methamphetamine	6	0.9	11	0.9
Phentermine	1	0.1	2	0.1
Methylphenidate	1	0.1	0	0.0
Narcotic Analgesics	0	0.0	1	0.0
Ketamine	0	0.0	0	0.0
PCP	0	0.0	1	0.0

Benzodiazepines	6	0.8	18	1.1
Alprazolam	3	0.4	12	0.9
Bromazepam	0	0.0	0	0.0
Chlordiazepoxide	0	0.0	1	0.1
Clonazepam	3	0.5	6	0.5
Diazepam	0	0.0	3	0.3
Nordiazepam	0	0.0	4	0.4
Lorazepam	0	0.0	1	0.0
Oxazepam	0	0.0	2	0.1
Estazolam	0	0.0	0	0.0
Flunitrazepam	0	0.0	0	0.0
Flurazepam	0	0.0	0	0.0
Midazolam	0	0.0	0	0.0
Nitrazepam	0	0.0	0	0.0
Phenazepam	0	0.0	0	0.0
Triazolam	0	0.0	0	0.0
Temazepam	1	0.1	2	0.2
Antidepressants	14	2.1	9	1.3
Amitriptyline	4	0.8	3	0.5
Nortriptyline	7	1.0	4	0.5
Fluoxetine	4	0.5	2	0.1
Imipramine	0	0.0	0	0.0
Desipramine	0	0.0	0	0.0
Amoxapine	0	0.0	0	0.0
Dothiepin	0	0.0	0	0.0
Doxepin	0	0.0	0	0.0
Desmethyldoxepin	0	0.0	0	0.0
Protriptyline	0	0.0	0	0.0
Trimipramine	0	0.0	0	0.0
Mianserine	0	0.0	0	0.0
Mirtazepine	0	0.0	0	0.0
Trazodone	0	0.0	0	0.0
Citalopram	0	0.0	2	0.2
Paroxetine	1	0.1	0	0.0
Venlafaxine	0	0.0	0	0.0
Sertraline	2	0.2	3	0.4
Barbiturates	1	0.1	3	0.4
Butalbital	1	0.1	3	0.4
Pentobarbital	0	0.0	0	0.0
Secobarbital	0	0.0	0	0.0
Phenobarbital	0	0.0	0	0.0

Muscle Relaxants	1	0.1	6	0.7
Carisoprodol	0	0.0	0	0.0
Cyclobenzaprine	1	0.1	2	0.2
Meprobamate	0	0.0	4	0.4
Sleep Aids				
Zolpidem	0	0.0	2	0.2
Cough Suppressants				
Dextromethorphan	1	0.1	9	0.7
Antihistamines	19	2.5	29	1.4
Chlorpheniramine	0	0.0	0	0.0
Diphenhydramine	19	2.5	27	1.3
Doxylamine	2	0.2	3	0.2
Antipsychotics				
Chlorpromazine	0	0.0	0	0.0
Synthetic Cannabinoids	1	0.1	1	0.0
AM-1220	0	0.0	0	0.0
AM-2201	1	0.1	0	0.0
AM-2232	0	0.0	0	0.0
CP47497	0	0.0	0	0.0
CP47497-C8	0	0.0	0	0.0
HU-210	0	0.0	0	0.0
JWH-018	1	0.1	1	0.0
JWH-022	1	0.0	1	0.0
JWH-073	0	0.0	0	0.0
JWH-200	0	0.0	0	0.0
JWH-250	0	0.0	1	0.0
XLR-11	1	0.1	0	0.0
UR-144	0	0.0	0	0.0
All Drug-positives [†]	249		700	
All Tested Drivers ^{††}	157	24.3	470	30.0

In this table, *N*s are unweighted and percentages are weighted.

[†] Indicates the total number of positive screenings regardless of how many substances were found in each driver.

^{††} Indicates number and percentage of drivers who screened positively for at least one substance.

Table 17. Drug Prevalence among Waves (Oral Fluid Only)

Drug	Wave 1 N = 878		Wave 2 N = 629		Wave 3 N = 806	
	N	%	N	%	N	%
Cannabinoids	96	11.6	95	16.4	108	17.1
THC	96	11.6	94	16.4	108	17.1
CBD	30	3.7	26	4.0	30	6.2
CBN	4	0.5	1	0.1	3	0.4
11-OH-THC	0	0.0	0	0.0	1	0.0
Cocaine	6	0.8	11	1.7	7	1.0
Cocaine	4	0.4	10	1.5	5	0.8
Benzoylecgonine	3	0.5	8	1.4	3	0.4
Cocaethylene	2	0.3	5	0.9	1	0.0
Norcocaine	1	0.1	7	1.2	2	0.4
Opioids	66	7.9	51	8.8	34	6.5
Codeine	2	0.3	0	0.0	2	0.3
Heroin	17	2.0	10	1.3	11	2.0
Naltrexone	0	0.0	0	0.0	1	
Buprenorphine	3	0.3	6	1.0	1	
Norbuprenorphine	1	0.1	3	0.6	0	0.0
Fentanyl	1	0.1	0	0.0	0	0.0
Hydrocodone	21	2.6	11	1.3	13	2.2
Hydromorphone	0	0.0	1	0.1	1	0.1
Meperidine	0	0.0	0	0.0	0	0.0
Methadone	2	0.3	2	0.4	1	0.0
Morphine	15	1.8	13	1.8	14	2.2
Oxycodone	12	1.6	9	1.1	12	2.1
Oxymorphone	0	0.0	5	0.7	0	0.0
Propoxyphene	0	0.0	0	0.0	0	0.0
Tramadol	11	1.6	5	0.8	3	0.4
Amphetamines/Stimulants	66	9.1	62	9.0	84	11.1
MDMA	1	0.0	0	0.0	1	0.0
MDA	1	0.1	0	0.0	0	0.0
MDEA	0	0.0	0	0.0	0	0.0
Amphetamine	63	8.9	59	8.9	81	11.1
Methamphetamine	7	0.9	6	0.9	4	0.5
Phentermine	1	0.1	2	0.4	0	0.0
Methylphenidate	0	0.0	1	0.1	0	0.0
Narcotic Analgesics	1	0.1	0	0.0	0	0.0
Ketamine	0	0.0	0	0.0	0	0.0
PCP	1	0.1	0	0.0	0	0.0

Benzodiazepines	8	0.9	5	0.7	11	1.8
Alprazolam	2	0.3	3	0.4	10	1.5
Bromazepam	0	0.0	0	0.0	0	0.0
Chlordiazepoxide	0	0.0	0	0.0	1	0.0
Clonazepam	4	0.4	3	0.4	2	0.3
Diazepam	2	0.2	1	0.1	0	0.0
Nordiazepam	3	0.4	1	0.1	0	0.0
Lorazepam	0	0.0	0	0.0	1	0.1
Oxazepam	2	0.2	0	0.0	0	0.0
Estazolam	0	0.0	0	0.0	0	0.0
Flunitrazepam	0	0.0	0	0.0	0	0.0
Flurazepam	0	0.0	0	0.0	0	0.0
Midazolam	0	0.0	0	0.0	0	0.0
Nitrazepam	0	0.0	0	0.0	0	0.0
Phenazepam	0	0.0	0	0.0	0	0.0
Triazolam	0	0.0	0	0.0	0	0.0
Temazepam	2	0.3	1	0.1	0	0.0
Antidepressants	3	0.3	10	1.4	10	1.8
Amitriptyline	0	0.0	3	0.4	4	0.5
Nortriptyline	0	0.0	5	0.5	6	0.6
Fluoxetine	1	0.1	3	0.3	2	0.3
Imipramine	0	0.0	0	0.0	0	0.0
Desipramine	0	0.0	0	0.0	0	0.0
Amoxapine	0	0.0	0	0.0	0	0.0
Dothiepin	0	0.0	0	0.0	0	0.0
Doxepin	0	0.0	0	0.0	0	0.0
Desmethyldoxepin	0	0.0	0	0.0	0	0.0
Protriptyline	0	0.0	0	0.0	0	0.0
Trimipramine	0	0.0	0	0.0	0	0.0
Mianserine	0	0.0	0	0.0	0	0.0
Mirtazepine	0	0.0	0	0.0	0	0.0
Trazodone	0	0.0	0	0.0	0	0.0
Citalopram	0	0.0	1	0.1	1	0.0
Paroxetine	0	0.0	0	0.0	1	0.1
Venlafaxine	0	0.0	0	0.0	0	0.0
Sertraline	2	0.1	2	0.3	1	0.0
Barbiturates	0	0.0	2	0.3	2	0.2
Butalbital	0	0.0	2	0.3	2	0.2
Pentobarbital	0	0.0	0	0.0	0	0.0
Secobarbital	0	0.0	0	0.0	0	0.0
Phenobarbital	0	0.0	0	0.0	0	0.0

Muscle Relaxants	2	0.2	3	0.4	2	0.2
Carisoprodol	0	0.0	0	0.0	0	0.0
Cyclobenzaprine	0	0.0	2	0.3	1	0.0
Meprobamate	2	0.2	1	0.1	1	0.0
Sleep Aids						
Zolpidem	1	0.1	0	0.0	1	0.0
Cough Suppressants						
Dextromethorphan	3	0.4	5	0.6	2	0.3
Antihistamines	25	2.1	12	1.4	11	1.5
Chlorpheniramine	0	0.0	0	0.0	0	0.0
Diphenhydramine	25	2.1	11	1.2	10	1.2
Doxylamine	1	0.1	2	0.3	2	0.4
Antipsychotics						
Chlorpromazine	0	0.0	0	0.0	0	0.0
Synthetic Cannabinoids	2	0.2	0	0.0	0	0.0
AM-1220	0	0.0	0	0.0	0	0.0
AM-2201	1	0.1	0	0.0	0	0.0
AM-2232	0	0.0	0	0.0	0	0.0
CP47497	0	0.0	0	0.0	0	0.0
CP47497-C8	0	0.0	0	0.0	0	0.0
HU-210	0	0.0	0	0.0	0	0.0
JWH-018	2	0.2	0	0.0	0	0.0
JWH-022	2	0.2	0	0.0	0	0.0
JWH-073	0	0.0	0	0.0	0	0.0
JWH-200	0	0.0	0	0.0	0	0.0
JWH-250	1	0.1	0	0.0	0	0.0
XLR-11	1	0.1	0	0.0	0	0.0
UR-144	0	0.0	0	0.0	0	0.0
All Drug-positives [†]	352		325		343	
All Tested Drivers ^{††}	233	27.5	195	32.0	199	27.8

In this table, *N*s are unweighted and percentages are weighted.

[†] Indicates the total number of positive screenings regardless of how many substances were found in each driver.

^{††} Indicates number and percentage of drivers who screened positively for at least one substance.

Table 18. Percentage of Drivers Positive for Synthetic Marijuana by Wave in Oral Fluid

	<i>N</i>	Positive <i>N</i>	% positive
Wave 1	878	2	0.2
Wave 2	629	0	0.0
Wave 3	806	0	0.0

In this table, *N*s are unweighted; percentages are weighted.

No comparisons were attempted on items with diminished sample sizes.

Appendix B: Blood-Only Results Tables

Table 1. Percentage of THC Positive Drivers by Wave in Blood

	<i>N</i>	% THC-positive
Wave 1	711	14.8
Wave 2	543	10.1
Wave 3	675	20.8

In this table, *N*s are unweighted; percentages are weighted.
 THC-positive includes results from THC and hydroxy-THC.

Table 2. Percentage of THC Positive Drivers by Time of Day in Blood

	Wave 1			Wave 2			Wave 3		
	<i>N</i>	% THC- positive	% THC- positive	<i>N</i>	% THC- positive	% THC- positive	<i>N</i>	% THC- positive	% THC- positive
Daytime	219	16	5.9	148	17	10.2	181	29	19.3*
Nighttime	492	88	18.8	395	43	10.0	494	88	21.2

In this table, *N*s are unweighted; percentages are weighted.
 THC-positive includes results from THC and hydroxy-THC.
 *Significantly different from Wave 1 ($p < .05$).

Table 3. Percentage of Drivers THC Positive by Demographic Variables in Blood

Variable	Demographic	Wave 1		Wave 2		Wave 3	
		<i>N</i>	% THC-positive	<i>N</i>	% THC-positive	<i>N</i>	% THC-positive
Gender	Male	438	15.2	322	10.8	395	23.3
	Female	271	14.2	216	9.1	274	17.8
Race	White	631	13.5	462	10.8	586	17.8
	Black or African American	46	22.3	47	6.9	40	51.0
	Asian	13	0.0	21	5.2	15	3.0
	Native American or Alaska Native	7	0.0	5	0.0	10	17.2
	Other or More than one	12	7.3	6	35.5	27	27.7
Ethnicity	Hispanic	125	12.5	94	6.6	104	10.0
	Non-Hispanic	585	15.2	443	10.9	566	23.2
Age	16 to 20	71	16.7	72	11.4	93	29.6
	21 to 34	312	15.3	234	9.5	276	20.5
	35 to 44	114	16.7	105	7.7	126	16.9
	45 to 64	177	13.6	96	12.7	149	22.3
	65 and over	37	7.9	33	12.3	26	9.5

In this table, *Ns* are unweighted; percentages are weighted.
THC-positive includes results from THC and hydroxy-THC.

Table 4. Percentage of Drivers THC Positive by Drug Category Prevalence and Wave in Blood (Percentage by Column)

Drug class	Wave 1		Wave 2		Wave 3	
	<i>N</i>	%	<i>N</i>	%	<i>N</i>	%
THC-positive	104	14.8	60	10.1	117	20.8
<i>THC-positive only</i>	77	10.5	43	7.3	81	13.3
<i>THC-positive plus any other drug</i>	27	4.3	17	2.8	36	7.5
Illegal only	14	2.2	9	2.1	2	0.2
Medications only	114	16.4	102	18.0	81	11.6
Illegal & Medications	1	0.2	1	0.3	4	0.9
Total Drug-Positive	233	33.6	172	30.4	204	33.4
Total Drug-Negative	478	66.4	371	69.6	471	66.6

In this table, *Ns* are unweighted; percentages are weighted.
 THC-positive includes results from THC and hydroxy-THC.

Table 5. Percentage of Drivers THC Positive by Category Prevalence and Time of Day in Blood (Percentages by Column)

Drug Category	Daytime		Nighttime		Total	
	<i>N</i>	%	<i>N</i>	%	<i>N</i>	%
Wave 1						
THC-positive	16	5.9	88	18.8	104	14.8
<i>THC-positive only</i>	8	3.4	69	13.8	77	10.5
<i>THC-positive plus any other drug</i>	8	2.5	19	5.0	27	4.3
Illegal only	3	1.0	11	2.8	14	2.2
Medications only	31	13.0	83	18.0	114	16.4
Illegal and medications	0	0.0	1	0.2	1	0.2
Total drug-positive	50	19.9	183	39.7	233	33.6
Total drug-negative	169	80.2	309	60.3	478	66.4
Wave 2						
THC-positive	17	10.2	43	10.0	60	10.1
<i>THC only</i>	13	7.7	30	7.1	43	7.3
<i>THC-positive plus any other drug</i>	4	2.4	13	2.9	17	2.8
Illegal only	3	2.2	6	2.0	9	2.1
Medications only	17	10.9	85	20.7	102	18.0
Illegal and medications	1	1.1	0	0.0	1	0.3
Total drug-positive	38	24.4	134	32.7	172	30.4
Total drug-negative	110	75.6	261	67.3	371	69.6
Wave 3						
THC-positive	29	19.3*	88	21.2	117	20.8
<i>THC-positive only</i>	22	13.3	59	13.3	81	13.3
<i>THC-positive plus any other drug</i>	7	6.1	29	8.0	36	7.5
Illegal only	0	0.0	2	0.3	2	0.2
Medications only	29	13.7	52	10.9	81	11.6
Illegal and medications	0	0.0	4	11.4	4	0.9
Total drug-positive	58	33.0	146	33.5	204	33.4
Total drug-negative	123	67.0	348	66.5	471	66.6

In this table, *N*s are unweighted; percentages are weighted.
Column percentages may not total to 100% due to rounding.
THC-positive includes results from THC and hydroxy-THC.
*Significantly different from Wave 1 ($p < .05$).

Table 6. Percentage of Drivers THC Positive by Drug Category and Gender and Age in Blood (Percentage by Column)

Drug category	Gender		Age (years)				
	% Male	% Female	% 16–20	% 21–34	% 35–44	% 45–64	% 65+
Wave 1	N = 438	N = 271	N = 71	N = 312	N = 114	N = 177	N = 37
THC-positive	14.2	15.2	16.7	15.3	16.7	13.6	7.9
THC-positive only	9.1	11.3	11.3	10.4	13.3	10.0	4.6
THC-positive and any other drug	5.1	3.8	5.4	4.9	3.4	3.6	3.3
Illegal only	2.8	1.9	0.9	0.5	3.1	5.0	0.0
Medications only	18.9	15.1	4.3	18.7	21.5	13.8	18.1
Illegal and medications	0.0	0.2	0.0	0.4	0.0	0.0	0.0
Total drug-positive	35.8	32.4	22.0	34.9	41.2	32.4	26.0
Total drug-negative	64.2	67.6	78.0	65.1	58.8	67.6	74.1
Wave 2	N = 322	N = 216	N = 72	N = 234	N = 105	N = 96	N = 33
THC-positive	9.1	10.8	11.4	9.5	7.7	12.7	12.3
THC-positive only	6.1	8.1	8.8	7.1	5.8	7.1	12.3
THC-positive and any other drug	2.9	2.7	2.7	2.4	1.9	5.6	0.0
Illegal only	1.6	2.4	1.6	3.2	0.9	1.6	0.0
Medications only	17.6	17.6	14.1	18.3	20.6	15.9	16.7
Illegal and medications	0.0	0.5	0.0	0.7	0.0	0.0	0.0
Total drug-positive	28.2	31.4	27.2	31.7	29.2	30.3	29.0
Total drug-negative	71.8	68.6	72.8	68.3	70.8	69.8	71.0
Wave 3	N = 395	N = 274	N = 93	N = 276	N = 126	N = 149	N = 26
THC-positive	23.3	17.8	29.6	20.5	16.9	22.3	9.5
THC-positive only	14.6	11.7	28.7	12.7	10.0	9.8	6.1
THC-positive and any other drug	8.6	6.1	0.9	7.8	6.9	12.5	3.4
Illegal only	0.2	0.2	1.0	0.0	0.5	0.0	0.0
Medications only	10.4	11.8	1.8	10.0	13.5	14.9	18.7
Illegal and medications	1.2	0.4	0.0	0.0	3.5	1.2	0.0
Total drug-positive	35.0	30.2	32.4	30.6	34.4	38.4	28.2
Total drug-negative	65.0	69.8	67.6	69.5	65.6	61.6	71.8

In this table, *N*s are unweighted; percentages are weighted.

Column percentages may not total to 100% due to rounding.

Because of missing records on the demographic values, totals (*N*) do not match those in other tables.

THC-positive includes results from THC and hydroxy-THC.

Table 7. Percentage of Drivers THC Positive by Drug Category and by Race and Ethnicity in Blood (Percentage by Column)

Drug category	Race					Ethnicity	
	% White	% Black/ African American	% Asian	% Native American/ Alaskan	% Other/ More than one	% Hispanic	% Non- Hispanic
Wave 1	N = 631	N = 46	N = 13	N = 7	N = 12	N = 125	N = 585
THC-positive	13.5	22.3	19.6	0.0	13.4	12.5	15.2
<i>THC-positive only</i>	10.2	12.7	19.6	0.0	13.4	9.3	10.8
<i>THC-positive and any other drug</i>	3.3	9.6	0.0	0.0	0.0	3.3	4.4
Illegal only	2.3	1.1	0.0	0.0	0.0	4.5	1.8
Medications only	17.7	12.2	0.0	0.0	18.7	15.2	16.7
Illegal and medications	0.0	1.5	0.0	0.0	0.0	0.0	0.2
Total drug-positive	33.6	37.0	19.6	0.0	32.1	32.2	33.9
Total drug-negative	66.4	63.0	80.4	100.0	67.9	67.8	66.2
Wave 2	N = 462	N = 47	N = 21	N = 5	N = 6	N = 94	N = 443
THC-positive	10.8	6.9	5.2	20.4	35.5	6.6	10.9
<i>THC-positive only</i>	7.7	5.5	5.2	20.4	35.5	6.6	7.5
<i>THC-positive and any other drug</i>	3.2	1.4	0.0	0.0	0.0	0.0	3.4
Illegal only	1.8	5.5	0.0	0.0	0.0	1.2	2.3
Medications only	18.7	13.0	16.7	14.1	0.0	3.9	20.6
Illegal and medications	0.4	0.0	0.0	0.0	0.0	0.0	0.4
Total drug-positive	31.7	25.3	21.8	34.5	35.5	11.7*	34.2
Total drug-negative	68.3	74.7	78.2	65.5	64.5	88.3*	65.8
Wave 3	N = 586	N = 40	N = 15	N = 10	N = 27	N = 104	N = 566
THC-positive	17.8	51.0	3.0	17.2	27.7	10.0	23.2
<i>THC-positive only</i>	10.4	40.6	3.0	8.6	23.5	7.0	14.7
<i>THC-positive and any other drug</i>	7.4	10.4	0.0	8.6	4.2	3.0	8.5
Illegal only	0.3	0.0	0.0	0.0	0.0	0.0	0.3
Medications only	12.3	6.7	0.0	0.0	28.8	9.5	11.2
Illegal and medications	0.7	2.8	0.0	0.0	0.0	3.0	0.5
Total drug-positive	31.1	60.5	3.0	17.2	56.5	22.5	35.2
Total drug-negative	68.9	39.5	97.0	82.8	43.5	77.5	64.8

In this table, *N*s are unweighted; percentages are weighted.

Column percentages may not total to 100% due to rounding.

Because of missing records on the demographic values, totals (*N*) do not match those in other tables.

THC-positive includes results from THC and hydroxy-THC.

*Significantly different from Wave 1 ($p < .05$).

Table 8. Percentage of Drivers THC Positive by Drug Class and Wave in Blood
(Percentage by Column)

Drug class	Wave 1		Wave 2		Wave 3	
	<i>N</i>	%	<i>N</i>	%	<i>N</i>	%
THC-positive	104	14.8	60	10.1	117	20.8
<i>THC-positive only</i>	22	2.6	15	2.5	35	13.4
<i>THC-positive plus any other drug</i>	82	12.2	45	7.6	82	7.4
Antidepressants only	18	2.5	11	1.6	18	2.5
Narcotic analgesics only	25	3.3	41	7.8*	10	1.5
Sedatives only	8	1.2	5	0.9	6	1.0
Stimulants only	50	8.0	40	7.5	19	2.5
Other only	14	1.7	5	1.0	5	0.6
More than one class	14	2.1	10	1.6	29	4.5
Total drug-positive	233	33.6	172	30.4	204	33.4
Total drug-negative	478	66.4	371	69.6	471	66.6

In this table, *N*s are unweighted; percentages are weighted.
Column percentages may not total to 100% due to rounding.
THC-positive includes results from THC and hydroxy-THC.
*Significantly different from Wave 1 ($p < .05$).

Table 9. Percentage of Drivers THC Positive by Drug Class and Time of Day in Blood
(Percentages by Column)

Drug Class	Daytime		Nighttime		Total	
	N	%	N	%	N	%
Wave 1						
THC-positive	16	5.9	88	18.8	104	14.8
<i>THC-positive only</i>	9	3.9	73	16.0	82	12.2
<i>THC-positive and any other drug</i>	7	2.0	15	2.8	22	2.6
Antidepressants only	5	2.6	13	2.5	18	2.5
Narcotic analgesics only	9	4.6	16	2.7	25	3.3
Sedatives only	1	0.5	7	1.5	8	1.2
Stimulants only	10	3.1	40	10.2	50	8.0
Other only	6	2.4	8	1.4	14	1.7
More than one class	3	0.9	11	2.7	14	2.1
Total drug-positive	50	19.9	183	39.7	233	33.6
Total drug-negative	169	80.2	309	60.3	478	66.4
Wave 2						
THC-positive	17	10.2	43	10.0	60	10.1
<i>THC-positive only</i>	13	7.7	32	7.5	45	7.6
<i>THC-positive and any other drug</i>	4	2.4	11	2.5	15	2.5
Antidepressants only	4	1.9	7	1.5	11	1.6
Narcotic analgesics only	7	5.5	34	8.7	41	7.8*
Sedatives only	0	0.0	5	1.2	5	0.9
Stimulants only	6	4.6	34	8.6	40	7.5
Other only	2	1.1	3	0.9	5	1.0
More than one class	2	1.2	8	1.8	10	1.6
Total drug-positive	38	24.4	134	32.7	172	30.4
Total drug-negative	110	75.6	261	67.3	371	69.6
Wave 3						
THC-positive	29	19.3*	88	21.2	117	20.8
<i>THC-positive only</i>	22	13.3	60	13.4	82	13.4
<i>THC-positive and any other drug</i>	7	6.1	28	7.8	35	7.4
Antidepressants only	10	4.3	8	2.0	18	2.5
Narcotic analgesics only	1	0.4	9	1.9	10	1.5
Sedatives only	2	0.9	4	1.0	6	1.0
Stimulants only	5	2.3	14	2.5	19	2.5
Other only	4	2.2	1	0.1	5	0.6
More than one class	7	3.6	22	4.8	29	4.5
Total drug-positive	58	33.1	146	33.6	204	33.4
Total drug-negative	123	67.0	348	66.5	471	66.6

In this table, Ns are unweighted; percentages are weighted.
 Column percentages may not total to 100% due to rounding.
 THC-positive includes results from THC and hydroxy-THC.
 *Significantly different from Wave 1 ($p < .05$).

Table 10. Percentage of Drivers THC Positive by Drug Class and Gender and Age in Blood
(Percentages by Column)

Drug class	Gender		Age (years)				
	% Male	% Female	% 16–20	% 21–34	% 35–44	% 45–64	% 65+
Wave 1	<i>N</i> = 438	<i>N</i> = 271	<i>N</i> = 71	<i>N</i> = 312	<i>N</i> = 114	<i>N</i> = 177	<i>N</i> = 37
THC-positive	15.2	14.2	16.7	15.3	16.7	13.6	7.9
<i>THC-positive only</i>	13.5	9.7	16.7	11.8	16.1	10.6	4.6
<i>THC-positive and any other drug</i>	1.6	4.5	0.0	3.5	0.6	3.1	3.3
Antidepressants only	2.5	2.5	1.2	2.7	1.2	3.1	4.1
Narcotic analgesics only	2.0	5.7	1.4	1.4	1.7	5.6	13.9
Sedatives only	1.6	0.4	0.7	2.5	0.0	0.3	0.0
Stimulants only	8.4	7.4	0.9	7.7	17.4	6.8	0.0
Other only	0.9	3.3	0.0	1.3	1.9	3.0	0.0
More than one class	1.9	2.5	1.2	4.0	2.3	0.0	0.0
Total drug-positive	32.4	35.8	22.0	34.9	41.3	32.4	26.0
Total drug-negative	67.6	64.2	78.0	65.1	58.8	67.6	74.1
Wave 2	<i>N</i> = 322	<i>N</i> = 216	<i>N</i> = 72	<i>N</i> = 234	<i>N</i> = 105	<i>N</i> = 96	<i>N</i> = 33
THC-positive	10.8	9.1	11.4	9.5	7.7	12.7	12.3
<i>THC-positive only</i>	8.7	6.1	8.8	7.5	6.4	7.1	12.3
<i>THC-positive and any other drug</i>	2.2	2.9	2.7	2.0	1.3	5.6	0.0
Antidepressants only	1.8	1.4	0.0	2.0	2.2	1.7	0.0
Narcotic analgesics only	8.1	7.0	10.0	8.5	5.1	4.9	16.7
Sedatives only	1.3	0.3	0.0	0.2	2.9	1.2	0.0
Stimulants only	6.4	9.0	4.1	8.6	8.9	7.1	0.0
Other only	1.1	0.8	1.6	1.1	0.9	0.7	0.0
More than one class	1.9	0.8	0.0	1.8	1.4	2.1	0.0
Total drug-positive	31.4	28.2	27.2	31.7	29.2	30.3	29.0
Total drug-negative	68.6	71.8	72.8	68.3	70.8	69.8	71.0
Wave 3	<i>N</i> = 395	<i>N</i> = 274	<i>N</i> = 93	<i>N</i> = 276	<i>N</i> = 126	<i>N</i> = 149	<i>N</i> = 26
THC-positive	17.8	23.3	29.6	20.5	16.9	22.3	9.5
<i>THC-positive only</i>	11.7	14.8	28.7	12.7	10.7	9.8	6.1
<i>THC-positive and any other drug</i>	6.1	8.4	0.9	7.8	6.2	12.5	3.4
Antidepressants only	4.0	1.6	1.1	3.5	2.2	2.7	0.0
Narcotic analgesics only	1.4	1.7	0.0	1.8	3.5	1.0	0.0
Sedatives only	0.9	1.1	0.0	0.4	1.3	1.0	11.3
Stimulants only	0.8	2.9	1.8	1.7	2.4	3.0	0.0
Other only	1.3	0.2	0.0	0.4	0.5	1.1	3.4
More than one class	4.1	4.3	0.0	2.4	7.6	7.4	4.0
Total drug-positive	30.3	35.0	32.5	30.6	34.4	38.4	28.2
Total drug-negative	69.8	65.0	67.6	69.5	65.6	61.6	71.8

In this table, Ns are unweighted; percentages are weighted.
Column percentages may not total to 100% due to rounding.
THC-positive includes results from THC and hydroxy-THC.

Table 11. Percentage of THC Positive Drivers by Drug Class and Race and Ethnicity in Blood
(Percentages by Column)

Drug class	Race					Ethnicity	
	% White	% Black/ African American	% Asian	% Native American/ Alaskan	% Other/ More than one	% Hispanic	% Non- Hispanic
<u>Wave 1</u>	<u>N = 631</u>	<u>N = 46</u>	<u>N = 13</u>	<u>N = 7</u>	<u>N = 12</u>	<u>N = 125</u>	<u>N = 585</u>
THC-positive	13.5	22.3	19.6	0.0	13.4	12.5	15.2
<i>THC-positive only</i>	11.1	22.3	19.6	0.0	13.4	10.4	12.5
<i>THC-positive and any other drug</i>	2.5	0.0	0.0	0.0	0.0	2.2	2.7
Antidepressants only	2.9	0.6	0.0	0.0	0.0	3.9	2.3
Narcotic analgesics only	3.5	3.4	0.0	0.0	0.0	1.0	3.7
Sedatives only	0.8	4.6	0.0	0.0	0.0	2.9	0.9
Stimulants only	8.9	3.6	0.0	0.0	11.4	9.9	7.7
Other only	1.7	1.1	0.0	0.0	0.0	0.6	1.9
More than one class	2.2	1.5	0.0	0.0	7.3	1.4	2.2
Total drug-positive	33.6	37.0	19.6	0.0	32.1	32.2	33.9
Total drug-negative	66.4	63.0	80.4	100.0	67.9	67.8	66.2
<u>Wave 2</u>	<u>N = 462</u>	<u>N = 47</u>	<u>N = 21</u>	<u>N = 5</u>	<u>N = 6</u>	<u>N = 94</u>	<u>N = 443</u>
THC-positive	10.8	6.9	5.2	20.4	35.5	6.6	10.9
<i>THC-positive only</i>	8.0	5.5	5.2	20.4	35.5	6.6	7.9
<i>THC-positive and any other drug</i>	2.8	1.4	0.0	0.0	0.0	0.0	3.0
Antidepressants only	1.8	0.0	0.0	14.1	0.0	1.5	1.7
Narcotic analgesics only	8.4	5.7	6.7	0.0	0.0	1.0	9.3
Sedatives only	0.7	0.9	3.8	0.0	0.0	0.0	1.1
Stimulants only	7.5	9.2	3.6	0.0	0.0	0.7	8.7
Other only	0.8	2.6	0.0	0.0	0.0	1.2	0.9
More than one class	1.6	0.0	2.6	0.0	0.0	0.7	1.6
Total drug-positive	31.7	25.3	21.8	34.5	35.5	11.7	34.2
Total drug-negative	68.3	74.7	78.2	65.5	64.5	88.3	65.8
<u>Wave 3</u>	<u>N = 586</u>	<u>N = 40</u>	<u>N = 15</u>	<u>N = 10</u>	<u>N = 27</u>	<u>N = 104</u>	<u>N = 566</u>
THC-positive	17.8	51.0	3.0	17.2	27.7	10.0	23.2
<i>THC-positive only</i>	10.4	40.6	3.0	8.6	23.5	7.8	14.7
<i>THC-positive and any other drug</i>	7.4	10.4	0.0	8.6	4.2	2.2	8.5
Antidepressants only	2.9	1.6	0.0	0.0	0.0	2.2	2.7
Narcotic analgesics only	1.9	0.0	0.0	0.0	0.0	0.8	1.7
Sedatives only	1.2	0.0	0.0	0.0	0.0	1.7	0.9
Stimulants only	2.4	0.8	0.0	0.0	14.4	2.1	2.1
Other only	0.7	0.0	0.0	0.0	0.0	0.0	0.7
More than one class	4.2	7.1	0.0	0.0	14.4	5.8	4.0
Total drug-positive	31.1	60.5	3.0	17.2	56.5	22.5	35.2
Total drug-negative	68.9	39.5	97.0	82.8	43.5	77.5	64.8

In this table, Ns are unweighted; percentages are weighted.
Column percentages may not total to 100% due to rounding.
THC-positive includes results from THC and hydroxy-THC.

Table 12: Percentage of Alcohol and Drug Positive Drivers by Wave in Blood
(Percentage by Column)

	Wave 1		Wave 2		Wave 3	
	N	%	N	%	N	%
Alcohol-positive	40	6.1	20	3.9	22	3.9
Alcohol plus THC	6	0.9	1	0.2	8	1.5
Alcohol plus any other drug	11	1.7	8	1.6	1	0.3
Alcohol only	23	3.5	11	2.1	13	2.1
Alcohol-negative	671	93.9	523	96.1	651	96.0
THC and no alcohol	98	13.5	57	9.6	105	20.6
Any other drug and no alcohol	118	16.7	104	20.2	86	15.1
No drugs and no alcohol	453	63.7	362	66.3	460	60.3

In this table, Ns are unweighted; percentages are weighted.
Column percentages may not total to 100% due to rounding.
THC-positive includes results from THC and hydroxy-THC.

Table 13. Percentage of Drivers THC Positive by Alcohol Concentration Level and Wave in Blood (Percentage by Row)

THC	N	Alcohol Concentration				
		% .00	% >.00	% .001-.049	% .05-.079	% .08+
<u>Wave 1</u>						
THC-negative	605	93.0	7.0	4.6	1.0	1.4
THC-positive	104	92.3	7.7	6.0	0.7	1.0
<u>Wave 2</u>						
THC-negative	485	95.6	4.4	1.9	1.0	1.6
THC-positive	58	98.2	1.8	0.0	0.0	1.8
<u>Wave 3</u>						
THC-negative	560	97.0	3.0	2.0	0.5	0.5
THC-positive	113	92.7	7.3	1.1	5.0	1.2

In this table, Ns are unweighted; percentages are weighted.
Row percentages may not total to 100% due to rounding.
THC-positive includes results from THC and hydroxy-THC.
The column "> .00" represents all alcohol positives (applies to the three right-most columns).

Table 14. Percentage of Drivers Positive for Alcohol by Concentration and Drug Category in Blood (Percentage by Row)

Drug Category	N	Alcohol Concentration				
		% .00	% >.00	% .001-.049	% .05-.079	% .08+
Wave 1						
THC-positive	104	92.2	7.8	6.0	0.8	1.0
<i>THC-positive only</i>	77	94.5	5.6	4.1	0.0	1.4
<i>THC-positive and any other drug</i>	27	86.7	13.3	10.8	2.5	0.0
Illegal only	14	72.1	27.9	11.7	16.2	0.0
Medications only	114	89.8	10.2	5.2	0.0	5.0
Illegal and medications	1	100.0	0.0	0.0	0.0	0.0
Total drug-positive	233	89.8	10.2	5.9	1.4	2.9
Total drug-negative	478	94.5	5.5	4.3	0.7	0.5
Wave 2						
THC-positive	60	98.2	1.8	0.0	0.0	1.8
<i>THC-positive only</i>	43	100.0	0.0	0.0	0.0	0.0
<i>THC-positive and any other drug</i>	17	93.6	6.4	0.0	0.0	6.4
Illegal only	9	85.9	14.1	14.1	0.0	0.0
Medications only	102	93.0	7.0	3.1	1.1	2.8
Illegal and medications	1	100.0	0.0	0.0	0.0	0.0
Total drug-positive	172	94.3	5.7	2.8	0.7	2.2
Total drug-negative	371	96.5	3.5	1.2	0.9	1.3
Wave 3						
THC-positive	117	92.7	7.3	1.1	5.0	1.2
<i>THC-positive only</i>	81	91.3	8.8	0.7	7.0	1.0
<i>THC-positive and any other drug</i>	36	95.3	4.7	1.8	1.5	1.4
Illegal only	2	100.0	0.0	0.0	0.0	0.0
Medications only	81	99.2	0.8	0.0	0.0	0.8
Illegal and medications	4	100.0	0.0	0.0	0.0	0.0
Total drug-positive	204	95.2	4.8	0.7	3.1	1.0
Total drug-negative	469	96.5	3.5	2.4	0.6	0.5

In this table, *N*s are unweighted; percentages are weighted.

Row percentages may not total to 100% due to rounding.

THC-positive includes results from THC and hydroxy-THC.

The column "> .00" represents all alcohol positives (applies to the three right-most columns).

Table 15. Percentage of Drivers Positive for Alcohol by Concentration and Drug Class in Blood (Percentages by Row)

Drug class	N	Alcohol Concentration				
		% .00	% >.00	% .001-.049	% .05-.079	% .08+
Wave 1						
THC-positive	104	92.2	7.8	6.0	0.8	1.0
<i>THC-positive only</i>	82	91.4	8.6	7.3	0.0	1.2
<i>THC-positive and any other drug</i>	22	95.9	4.1	0.0	4.1	0.0
Antidepressants only	18	100.0	0.0	0.0	0.0	0.0
Narcotic analgesics only	25	97.4	2.6	2.6	0.0	0.0
Sedatives only	8	24.9	75.2	13.8	0.0	61.3
Stimulants only	50	86.7	13.3	7.5	4.5	1.3
Other only	14	91.1	8.9	8.9	0.0	0.0
More than one class	14	95.0	5.0	5.0	0.0	0.0
Total drug-positive	233	89.8	10.2	6.0	1.3	2.9
Total drug-negative	478	94.5	5.5	4.3	0.7	0.5
Wave 2						
THC-positive	60	98.2	1.8	0.0	0.0	1.8
<i>THC-positive only</i>	45	100.0	0.0	0.0	0.0	0.0
<i>THC-positive and any other drug</i>	15	92.8	7.2	0.0	0.0	7.2
Antidepressants only	11	100.0	0.0	0.0	0.0	0.0
Narcotic analgesics only	41	90.3	9.7	5.6	0.0	4.1
Sedatives only	5	100.0	0.0	0.0	0.0	0.0
Stimulants only	40	93.3	6.7	1.6	2.7	2.4
Other only	5	70.1	29.9	29.9	0.0	0.0
More than one class	10	100.0	0.0	0.0	0.0	0.0
Total drug-positive	172	94.3	5.7	2.8	0.7	2.2
Total drug-negative	371	96.5	3.5	1.2	0.9	1.3
Wave 3						
THC-positive	117	92.7	7.3	1.1	5.0	1.2
<i>THC-positive only</i>	82	90.5	9.5	0.7	7.8	1.0
<i>THC-positive and any other drug</i>	35	96.8	3.2	1.8	0.0	1.4
Antidepressants only	18	100.0	0.0	0.0	0.0	0.0
Narcotic analgesics only	10	100.0	0.0	0.0	0.0	0.0
Sedatives only	6	100.0	0.0	0.0	0.0	0.0
Stimulants only	19	100.0	0.0	0.0	0.0	0.0
Other only	5	100.0	0.0	0.0	0.0	0.0
More than one class	29	97.9	2.1	0.0	0.0	2.1
Total drug-positive	204	95.2	4.8	0.7	3.1	1.0
Total drug-negative	469	96.5	3.5	2.4	0.6	0.5

In this table, Ns are unweighted; percentages are weighted.

Row percentages may not total to 100% due to rounding.

THC-positive includes results from THC and hydroxy-THC.

The column ">.00" represents all alcohol positives (applies to the three right-most columns).

Table 16. Drug Prevalence among Daytime and Nighttime Drivers (Blood Only)

Drug	Daytime <i>N</i> = 548		Nighttime <i>N</i> = 1,381	
	<i>N</i>	%	<i>N</i>	%
Cannabinoids	62	14.2	219	19.8
THC	62	14.2	219	19.8
CBD	6	0.9	13	1.2
CBN	0	0.0	1	0.2
11-OH-THC	32	5.2	103	11.1
Cocaine	4	0.7	17	1.4
Cocaine	1	0.2	11	1.0
Benzoylecgonine	3	0.5	10	0.9
Cocaethylene	0	0.0	5	0.4
Norcocaine	0	0.0	0	0.0
Opioids	23	2.7	82	10.2
Codeine	2	0.5	2	0.2
Heroin	1	0.2	4	0.3
Naltrexone	0	0.0	0	0.0
Buprenorphine	0	0.0	6	0.5
Norbuprenorphine	1	0.1	5	0.5
Fentanyl	1	0.2	0	0.0
Hydrocodone	6	0.8	13	0.9
Hydromorphone	2	0.4	0	0.0
Meperidine	0	0.0	0	0.0
Methadone	2	0.3	3	0.2
Morphine	6	0.9	32	2.0
Oxycodone	10	1.2	23	1.6
Oxymorphone	0	0.0	0	0.0
Propoxyphene	0	0.0	0	0.0
Tramadol	5	0.6	8	0.5
Amphetamines/Stimulants	21	2.6	115	12.2
MDMA	0	0.0	1	0.0
MDA	0	0.0	1	0.1
MDEA	0	0.0	0	0.0
Amphetamine	17	2.0	112	12.2
Methamphetamine	4	0.6	6	0.4
Phentermine	1	0.1	2	0.1
Methylphenidate	1	0.1	0	0.0
Narcotic Analgesics	0	0.0	1	0.0
Ketamine	0	0.0	0	0.0
PCP	0	0.0	1	0.0

Benzodiazepines	6	0.7	31	1.9
Alprazolam	4	0.5	2	0.1
Bromazepam	0	0.0	0	0.0
Chlordiazepoxide	0	0.0	2	0.1
Clonazepam	0	0.0	8	0.7
Diazepam	1	0.1	9	0.8
Nordiazepam	1	0.1	13	1.0
Lorazepam	0	0.0	2	0.2
Oxazepam	0	0.0	6	0.5
Estazolam	0	0.0	0	0.0
Flunitrazepam	0	0.0	0	0.0
Flurazepam	0	0.0	0	0.0
Midazolam	0	0.0	0	0.0
Nitrazepam	0	0.0	0	0.0
Phenazepam	0	0.0	0	0.0
Triazolam	0	0.0	0	0.0
Temazepam	0	0.0	8	0.5
Antidepressants	16	2.1	23	1.9
Amitriptyline	5	0.5	3	0.3
Nortriptyline	6	0.7	7	0.8
Fluoxetine	1	0.1	18	1.5
Imipramine	0	0.0	0	0.0
Desipramine	0	0.0	0	0.0
Amoxapine	0	0.0	0	0.0
Dothiepin	0	0.0	0	0.0
Doxepin	0	0.0	0	0.0
Desmethyldoxepin	0	0.0	0	0.0
Protriptyline	0	0.0	0	0.0
Trimipramine	0	0.0	0	0.0
Mianserine	0	0.0	0	0.0
Mirtazepine	0	0.0	0	0.0
Trazodone	1	0.2	3	0.3
Citalopram	2	0.4	4	0.6
Paroxetine	1	0.2	0	0.0
Venlafaxine	0	0.0	2	0.0
Sertraline	9	1.4	16	1.3
Barbiturates	2	0.4	6	0.7
Butalbital	2	0.4	4	0.4
Pentobarbital	0	0.0	0	0.0
Secobarbital	0	0.0	0	0.0
Phenobarbital	0	0.0	2	0.3

Muscle Relaxants	7	0.9	6	0.7
Carisoprodol	0	0.0	0	0.0
Cyclobenzaprine	7	0.9	4	0.4
Meprobamate	0	0.0	2	0.2
Sleep Aids				
Zolpidem	1	0.2	2	0.3
Cough Suppressants				
Dextromethorphan	2	0.3	0	0.0
Antihistamines	10	1.4	13	0.9
Chlorpheniramine	0	0.0	0	0.0
Diphenhydramine	10	1.4	12	0.9
Doxylamine	0	0.0	1	0.1
Antipsychotics				
Chlorpromazine	0	0.0	0	0.0
Synthetic Cannabinoids	0	0.0	0	0.0
AM-1220	0	0.0	0	0.0
AM-2201	0	0.0	0	0.0
AM-2232	0	0.0	0	0.0
CP47497	0	0.0	0	0.0
CP47497-C8	0	0.0	0	0.0
HU-210	0	0.0	0	0.0
JWH-018	0	0.0	0	0.0
JWH-022	0	0.0	0	0.0
JWH-073	0	0.0	0	0.0
JWH-200	0	0.0	0	0.0
JWH-250	0	0.0	0	0.0
XLR-11	0	0.0	0	0.0
UR-144	0	0.0	0	0.0
All Drug-positives [†]	213		709	
All Tested Drivers ^{††}	146	28.5	463	37.5

In this table, *N*s are unweighted and percentages are weighted.

[†] Indicates the total number of positive screenings regardless of how many substances were found in each driver.

^{††} Indicates number and percentage of drivers who screened positively for at least one substance.

Table 17. Drug Prevalence among Waves (Blood Only)

Drug	Wave 1 N = 711		Wave 2 N = 543		Wave 3 N = 675	
	N	%	N	%	N	%
Cannabinoids	104	14.8	60	10.1	117	20.8
THC	104	14.8	60	10.1	117	20.8
CBD	16	2.1	0	0.0	3	0.6
CBN	1	0.0	0	0.0	0	0.0
11-OH-THC	71	10.6	17	4.0	47	7.1
Cocaine	7	0.9	9	1.0	5	0.8
Cocaine	4	0.4	5	0.6	3	0.3
Benzoylecgonine	6	0.7	5	0.6	2	0.3
Cocaethylene	1	0.0	3	0.3	1	0.1
Norcocaine	0	0.0	0	0.0	0	0.0
Opioids	47	5.8	22	4.0	36	5.2
Codeine	3	0.2	1	0.1	0	0.0
Heroin	2	0.2	0	0.0	3	0.3
Naltrexone	0	0.0	0	0.0	0	0.0
Buprenorphine	4	0.4	2	0.3	0	0.0
Norbuprenorphine	3	0.2	2	0.2	1	0.2
Fentanyl	1	0.0	0	0.0	0	0.0
Hydrocodone	11	1.6	1	0.1	7	1.1
Hydromorphone	1	0.0	0	0.0	1	0.1
Meperidine	0	0.0	0	0.0	0	0.0
Methadone	2	0.2	2	0.3	1	0.1
Morphine	10	1.5	10	1.7	18	2.3
Oxycodone	11	1.2	6	0.7	16	2.0
Oxymorphone	0	0.0	0	0.0	0	0.0
Propoxyphene	0	0.0	0	0.0	0	0.0
Tramadol	9	1.3	2	0.2	2	0.3
Amphetamines/Stimulants	44	6.7	37	7.1	55	8.9
MDMA	1	0.0	0	0.0	0	0.0
MDA	1	0.0	0	0.0	0	0.0
MDEA	0	0.0	0	0.0	0	0.0
Amphetamine	41	6.5	35	6.9	53	8.9
Methamphetamine	3	0.2	2	0.3	5	0.5
Phentermine	1	0.0	2	0.2	0	0.0
Methylphenidate	0	0.0	1	0.1	0	0.0
Street Drugs	1	0.0	0	0.0	0	0.0
Ketamine	0	0.0	0	0.0	0	0.0
PCP	1	0.0	0	0.0	0	0.0

Benzodiazepines	11	1.6	7	0.8	19	2.6
Alprazolam	1	0.0	2	0.2	3	0.4
Bromazepam	0	0.0	0	0.0	0	0.0
Chlordiazepoxide	1	0.0	0	0.0	1	0.2
Clonazepam	5	0.5	0	0.0	3	0.5
Diazepam	6	0.8	1	0.1	3	0.3
Nordiazepam	6	0.7	4	0.4	4	0.5
Lorazepam	1	0.0	0	0.0	1	0.2
Oxazepam	5	0.5	1	0.1	0	0.0
Estazolam	0	0.0	0	0.0	0	0.0
Flunitrazepam	0	0.0	0	0.0	0	0.0
Flurazepam	0	0.0	0	0.0	0	0.0
Midazolam	0	0.0	0	0.0	0	0.0
Nitrazepam	0	0.0	0	0.0	0	0.0
Phenazepam	0	0.0	0	0.0	0	0.0
Triazolam	0	0.0	0	0.0	0	0.0
Temazepam	5	0.5	2	0.2	1	0.2
Antidepressants	15	1.8	8	0.9	16	2.8
Amitriptyline	2	0.2	1	0.1	5	0.6
Nortriptyline	3	0.2	3	0.3	7	1.0
Fluoxetine	4	0.4	6	0.7	9	1.4
Imipramine	0	0.0	0	0.0	0	0.0
Desipramine	0	0.0	0	0.0	0	0.0
Amoxapine	0	0.0	0	0.0	0	0.0
Dothiepin	0	0.0	0	0.0	0	0.0
Doxepin	0	0.0	0	0.0	0	0.0
Desmethyldoxepin	0	0.0	0	0.0	0	0.0
Protriptyline	0	0.0	0	0.0	0	0.0
Trimipramine	0	0.0	0	0.0	0	0.0
Mianserine	0	0.0	0	0.0	0	0.0
Mirtazepine	0	0.0	0	0.0	0	0.0
Trazodone	0	0.0	2	0.2	2	0.3
Citalopram	3	0.2	1	0.1	2	0.2
Paroxetine	0	0.0	0	0.0	1	0.2
Venlafaxine	1	0.0	0	0.0	1	0.1
Sertraline	11	1.6	5	0.6	9	1.4
Barbiturates	0	0.0	3	0.4	5	0.8
Butalbital	0	0.0	2	0.3	4	0.5
Pentobarbital	0	0.0	0	0.0	0	0.0
Secobarbital	0	0.0	0	0.0	0	0.0
Phenobarbital	0	0.0	1	0.1	1	0.2

Muscle Relaxants	6	0.6	2	0.2	5	0.7
Carisoprodol	0	0.0	0	0.0	0	0.0
Cyclobenzaprine	5	0.5	1	0.1	5	0.7
Meprobamate	1	0.0	1	0.1	0	0.0
Sleep Aids						
Zolpidem	1	0.0	0	0.0	2	0.2
Cough Suppressants						
Dextromethorphan	0	0.0	1	0.1	1	0.1
Antihistamines	13	1.2	5	0.5	5	0.5
Chlorpheniramine	0	0.0	0	0.0	0	0.0
Diphenhydramine	13	1.2	4	0.4	5	0.5
Doxylamine	0	0.0	1	0.1	0	0.0
Antipsychotics						
Chlorpromazine	0	0.0	0	0.0	0	0.0
Synthetic Cannabinoids	0	0.0	0	0.0	0	0.0
AM-1220	0	0.0	0	0.0	0	0.0
AM-2201	0	0.0	0	0.0	0	0.0
AM-2232	0	0.0	0	0.0	0	0.0
CP47497	0	0.0	0	0.0	0	0.0
CP47497-C8	0	0.0	0	0.0	0	0.0
HU-210	0	0.0	0	0.0	0	0.0
JWH-018	0	0.0	0	0.0	0	0.0
JWH-022	0	0.0	0	0.0	0	0.0
JWH-073	0	0.0	0	0.0	0	0.0
JWH-200	0	0.0	0	0.0	0	0.0
JWH-250	0	0.0	0	0.0	0	0.0
XLR-11	0	0.0	0	0.0	0	0.0
UR-144	0	0.0	0	0.0	0	0.0
All Drug-positives [†]	381		194		347	
All Tested Drivers ^{††}	233	33.6	172	30.4	204	33.4

In this table, *N*s are unweighted and percentages are weighted.

[†] Indicates the total number of positive screenings regardless of how many substances were found in each driver.

^{††} Indicates number and percentage of drivers who screened positively for at least one substance.

Table 18. Percentage of Drivers Positive for Synthetic Marijuana by Wave in Blood

Region	<i>N</i>	Positive <i>N</i>	% positive
Wave 1	711	0	0.0
Wave 2	543	0	0.0
Wave 3	675	0	0.0

In this table, *N*s are unweighted; percentages are weighted.

No comparisons were attempted on items with diminished sample sizes.

Appendix C: Surveys
Funded by
Insurance Institute for Highway Safety

DIN: __/____/___/___

NRS Questions - Verbal

1. The average driver drives about 15,000 miles a year. Would you say you drive:

- More than average
- Average
- Less than Average
- Did not answer

2 About what percent of your total driving takes place at day (daytime) / night (night time)?

- 0-20%
- 21-40%
- 41-60%
- 61-80%
- 81- 100%
- Did not answer

Activate PAS while DRIVER is talking

3. Where are you coming from?

- Own home
- Someone else's home
- Work
- Restaurant/eating place
- Bar, tavern, club
- School/church
- Sport or rec facility/park
- Store or gas station
- Hotel/motel
- Other
- Did not answer

4. Where are you going to?

- Own home
- Someone else's home
- Work
- Restaurant/eating place
- Bar, tavern, club
- School/church
- Sport or rec facility/park
- Store or gas station
- Hotel/motel
- Other
- Did not answer

5 About how many miles is it between those two places?

- 0-5
- 6-10
- 11-20
- More than 20
- Did not answer

6. How many total miles will you have driven by the end of today?

- 0-5
- 6-10
- 11-20
- More than 20
- Did not answer

Record PAS Reading:

- Green 1 (00)
- Green 2
- Green 3
- Yellow 1
- Yellow 2
- Yellow 3
- Not Used

- Yellow 4 – Call a manager
- Red 1 – Call a manager
- Red 2- Call a manager
- Red 3 – Call a manager

Assess intoxication Level

- Level 1- No signs of alcohol or drug use
- Level 2: Signs of use but no intoxication
- Level 3: Signs of use & INTOXICATED. Signal Supervisor "I need some cards over here"

Now I have a few questions about your use of alcohol, such as beer, wine, or liquor:

7. In the past year, how often have you had a drink containing alcohol?

- None in the past year
- Monthly or less **Skip to Q 9**
- 2-4 times/ month **Skip to Q 9**
- 2-3 times/ week **Skip to Q 9**
- 4 or more times/ week **Skip to Q 9**
- Did not answer

8. Do you ever drink alcoholic beverages or are you a total abstainer?

- Yes, sometimes/ occasionally
- No, total abstainer **Skip to Q. 17**
- Did not answer

9. In general would you describe yourself as:

- A very light drinker
- A fairly light drinker
- A moderate drinker
- A fairly heavy drinker
- A very heavy drinker
- Did not answer

10. About how many alcoholic beverages do you consume in an average week?

- 0
- 1-2
- 3-4
- 5-7
- 8-14
- More than 14
- Did not answer

11. Have you had anything to drink today?

- Yes
- No **Skip to Q. 14**
- Did not answer **Skip to Q. 14**

12. How long ago did you finish your last drink? ____Hours ____Minutes Did not answer

13. Was your last drink beer, wine, liquor, or other?

- Beer
- Wine
- Liquor
- Other (Malt / Wine coolers, etc.,)
- Did not answer

14. In the past year, how often did you have five (male) / four (female) or more drinks in a two hour period?

- Beyond a year/ Never
- Less than monthly
- Monthly
- Weekly
- Daily/almost daily
- Did not answer

15. In the past 12 months, did you ever drive after drinking enough that you might be considered to be *legally* under the influence of alcohol?

- Yes--> **How many times did that happen?** ____ times
- No
- Did not answer

16. About how old were you when you first started drinking, not counting small tastes or sips of alcohol?

Age _____

- Never had alcohol
- Did not answer

17. Are you (or were you) the designated driver today/ tonight? That is someone who was responsible for safely getting people home after they were drinking alcohol?

- Yes--> **As a designated driver did you**
 - Limit your drinking
 - Drink less than the people you were driving
 - Didn't change drinking behavior
 - Not drink at all
 - Did not answer
- No
- Did not answer

Demographic Data

Now I have a few background questions for statistical purposes:

18. What is your age? _____ Years Did not answer

19. How old were you when you obtained your license? _____ Years

- Not licensed
- Did not answer

20. What is your zip code? _____ Did not answer

21. How far have you gone in school?

- None - 8th grade
- 9th - 11th grade
- High school graduate
- Some college – no degree
- Associate's degree
- Bachelor's degree
- Master's degree
- Professional degree
- Doctoral degree
- Did not answer

22. Are you currently a student?

- No
- High School
- College/ Grad or Law School
- Other/ Technical or Trade Program
- Did not answer

23. Are you currently employed, unemployed, retired, on disability, a homemaker, or other?

- Employed Full-time
- Employed Part-time
- Unemployed

(23A.) How long have you been unemployed?

_____ Months _____ Years Did not answer

- Homemaker
- On Disability
- Retired
- Other _____
- Did not answer

24. Do you consider yourself to be Hispanic or Latino?

- Yes
- No
- Don't know
- Did not answer

25. To which racial group would you say you belong?

- White
- Black or African American
- Asian
- Native American or Alaska Native
- Native Hawaiian or other Pacific Islander
- More than one
- Other
- Unknown
- Did not answer

26. What range would you say includes your annual household income

- \$0-\$25,000
- \$25,001-\$50,000
- \$50,001-\$75,000
- \$75,001- \$100,000
- \$100,001 or More
- Did not answer

Now I would like to get an anonymous sample of your breath. I am not able to look at the results of your breath sample as they are masked on the device and downloaded at a later date. This will take just a few seconds. Again, this is voluntary.

Consent to PBT

- Yes
- No

PBT sample #: ____

PBT refusal sample #: ____

PBT Time: ____:____

PBT refusal Time: ____:____

ID: __/____/___/___

The following questions ask about your use of medications and/or drugs. Please indicate the last time you used that particular medication/drug. This is for research purposes only. **All your responses are completely anonymous.**

	Past 24 Hours	Past 2 Days	Past Month	Over a Month	Beyond a year/ Never
1. Cough medicines (like Robitussin, Vicks 44, etc.)	<input type="checkbox"/>				
2. Other over-the-counter medicines	<input type="checkbox"/>				
3. Tobacco (like cigarettes, cigars, chewing tobacco)	<input type="checkbox"/>				
4. Marijuana (like pot, hash, weed)	<input type="checkbox"/>				
5. Cocaine (like crack or coke)	<input type="checkbox"/>				
6. Heroin	<input type="checkbox"/>				
7. LSD (acid)	<input type="checkbox"/>				
8. Ecstasy (like "E", MDMA, "X")	<input type="checkbox"/>				
9. Methamphetamine (like speed, crank, crystal meth)	<input type="checkbox"/>				
10. GHB (like Liquid Ecstasy, Liquid G)	<input type="checkbox"/>				
11. PCP (like Angel Dust)	<input type="checkbox"/>				
12. Rohypnol (Roofies)	<input type="checkbox"/>				
13. Ketamine (Special K)	<input type="checkbox"/>				

Prescription Drug Questionnaire						ID: _ / _ / _ / _ / _							
The following is a list of medications/drugs people may use. Please indicate the last time you used that particular medication/drug. This is for research purposes only. All your responses are completely anonymous .						A	B	C	D	E	F	G	H
						Was this drug prescribed for your use?	Did you take more of this drug than prescribed?	Did a health care provider or pharmacy staff warn you that this drug might affect your driving?	Was there a label on the packaging warning you that this drug might affect your driving?	How likely do you think it is that taking this drug as prescribed could affect a person's ability to drive safely ?	How likely do you think it is that taking this drug as prescribed could cause a person to crash ?	How likely do you think it is that a person taking this drug as prescribed could be arrested for impaired driving?	How likely do you think it is that a person taking this drug as prescribed could be convicted of impaired driving?
	Past 24 Hours	Past 2 Days	Past Month	Over a Month	Beyond a year/ Never					1- Very likely 2- Somewhat likely 3- Somewhat unlikely 4- Very unlikely	1- Very likely 2- Somewhat likely 3- Somewhat unlikely 4- Very unlikely	1- Very likely 2- Somewhat likely 3- Somewhat unlikely 4- Very unlikely	1- Very likely 2- Somewhat likely 3- Somewhat unlikely 4- Very unlikely
1. Morphine or codeine (like Tylenol with codeine)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> Go to #2	<input type="checkbox"/> Go to #2	<input type="checkbox"/> Yes <input type="checkbox"/> No- Go to #2	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Don't know	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Don't know	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Don't know				
2. Methadone or buprenorphine (like Subutex, Suboxone)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> Go to #3	<input type="checkbox"/> Go to #3	<input type="checkbox"/> Yes <input type="checkbox"/> No- Go to #3	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Don't know	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Don't know	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Don't know				
3. Other prescription pain medications (like Oxycontin/ oxycodone, Percocet, Opana/Oxymorphone, Vicodin/hydrocodone)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> Go to #4	<input type="checkbox"/> Go to #4	<input type="checkbox"/> Yes <input type="checkbox"/> No- Go to #4	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Don't know	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Don't know	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Don't know				
4. ADHD medications (like Ritalin, Aderall, Concerta)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> Go to #5	<input type="checkbox"/> Go to #5	<input type="checkbox"/> Yes <input type="checkbox"/> No- Go to #5	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Don't know	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Don't know	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Don't know				
5. Other amphetamines (like Benzedrine, Dexedrine)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> Go to #6	<input type="checkbox"/> Go to #6	<input type="checkbox"/> Yes <input type="checkbox"/> No- Go to #6	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Don't know	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Don't know	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Don't know				
6. Prescription dietary / appetite suppressant (like Tenuate, phentermine)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> Go to #7	<input type="checkbox"/> Go to #7	<input type="checkbox"/> Yes <input type="checkbox"/> No- Go to #7	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Don't know	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Don't know	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Don't know				

Appendix C: Prescription Drug Questionnaire (RxDQ) (Self-Administered)

Prescription Drug Questionnaire						A	B	C	D	E	F	G	H
						Was this drug prescribed for your use?	Did you take more of this drug than prescribed?	Did a health care provider or pharmacy staff warn you that this drug might affect your driving?	Was there a label on the packaging warning you that this drug might affect your driving?	How likely do you think it is that taking this drug as prescribed could affect a person's ability to drive safely ?	How likely do you think it is that taking this drug as prescribed could cause a person to crash ?	How likely do you think it is that a person taking this drug as prescribed could be arrested for impaired driving?	How likely do you think it is that a person taking this drug as prescribed could be convicted of impaired driving?
	Past 24 Hours	Past 2 Days	Past Month	Over a Month	Beyond a year/ Never					1- Very likely 2- Somewhat likely 3- Somewhat unlikely 4- Very unlikely	1- Very likely 2- Somewhat likely 3- Somewhat unlikely 4- Very unlikely	1- Very likely 2- Somewhat likely 3- Somewhat unlikely 4- Very unlikely	1- Very likely 2- Somewhat likely 3- Somewhat unlikely 4- Very unlikely
7. Sleep aids (like Ambien, Lunesta)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> Go to #8	<input type="checkbox"/> Go to #8	<input type="checkbox"/> Yes <input type="checkbox"/> No- Go to #8	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Don't know	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Don't know	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Don't know				
8. Muscle relaxants (like Soma, Flexiril)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> Go to #9	<input type="checkbox"/> Go to #9	<input type="checkbox"/> Yes <input type="checkbox"/> No- Go to #9	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Don't know	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Don't know	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Don't know				
9. Antidepressants (like Prozac, Zoloft, Wellbutrin, Lexapro, Effexor)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> Go to #10	<input type="checkbox"/> Go to #10	<input type="checkbox"/> Yes <input type="checkbox"/> No- Go to #10	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Don't know	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Don't know	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Don't know				
10. Benzodiazepines (like Xanax/alprazolam, Valium/diazepam, Ativan/lorazepam)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> Go to #11	<input type="checkbox"/> Go to #11	<input type="checkbox"/> Yes <input type="checkbox"/> No- Go to #11	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Don't know	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Don't know	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Don't know				
11. Barbiturates (Phenobarbital)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> Go to #12	<input type="checkbox"/> Go to #12	<input type="checkbox"/> Yes <input type="checkbox"/> No- Go to #12	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Don't know	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Don't know	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Don't know				
12. Medicinal marijuana/cannabis	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> Go to #13	<input type="checkbox"/> Go to #13	<input type="checkbox"/> Yes <input type="checkbox"/> No- Go to #13	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Don't know	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Don't know	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Don't know				
13. Sativex or Marinol (dronabinol)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> Done	<input type="checkbox"/> Done	<input type="checkbox"/> Yes <input type="checkbox"/> No- Done	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Don't know	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Don't know	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Don't know				
14. Of the prescription medications you reported using, have you ever taken any with alcohol? <input type="checkbox"/> Yes <input type="checkbox"/> No													

DIN: __/___/___/___

Here is a list of questions concerning information about your use of drugs, excluding alcohol and tobacco, during the past 12 months. When the words "drug use" are used, they mean the use of **illegal drugs, prescribed or over-the-counter medications in excess of the directions, and any non-medical use of drugs.**

Again, these questions refer to the **past 12 months.**

Question	Yes	No
1 Have you used drugs other than those required for medical reasons?	<input type="checkbox"/>	<input type="checkbox"/>
2 Are you always able to stop using drugs when you want to? (If never use drugs, answer "Yes")	<input type="checkbox"/>	<input type="checkbox"/>
3 Have you had "blackouts" or "flashbacks" as a result of drug use?	<input type="checkbox"/>	<input type="checkbox"/>
4 Do you ever feel bad or guilty about your drug use? (If never use drugs, choose "No")	<input type="checkbox"/>	<input type="checkbox"/>
5 Does your spouse (or parents) ever complain about your involvement with drugs?	<input type="checkbox"/>	<input type="checkbox"/>
6 Have you neglected your family because of your use of drugs?	<input type="checkbox"/>	<input type="checkbox"/>
7 Have you engaged in illegal activities in order to obtain drugs?	<input type="checkbox"/>	<input type="checkbox"/>
8 Have you ever experienced withdrawal symptoms (felt sick) when you stopped taking drugs?	<input type="checkbox"/>	<input type="checkbox"/>
9 Have you had medical problems as a result of your drug use (e.g., memory loss, hepatitis, convulsions, bleeding, etc.)?	<input type="checkbox"/>	<input type="checkbox"/>
10 Do you abuse more than one drug at a time?	<input type="checkbox"/>	<input type="checkbox"/>

Brief Marijuana Questionnaire

This survey is design to measure your experience and beliefs about marijuana. Here, we are referring to any form of marijuana consumption (smoking, edibles, etc.). Although you may never have used marijuana, we still want to hear about your beliefs about this drug. *Even if you are not sure, give your best guess.*

	What is your answer to this statement?	How do you think most other drivers would answer?
1. I have never driven after using marijuana in the past six months.	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
2. I do intend to drive after using marijuana in the next six months.	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
3. My own health and safety are important to me.	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
4. The health and safety of all road users is important to me.	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
5. Using marijuana does impair driving ability.	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
6. Driving after using marijuana is enjoyable.	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
7. Driving after using marijuana is unwise.	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
8. It is my own decision to use or not use marijuana.	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
9. I am able to refuse to use marijuana.	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
10. People who drive after using marijuana are cool.	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
11. People who drive after using marijuana are stupid.	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
12. I would be arrested if I drove after using marijuana.	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
13. People who are important to me would be disappointed if I drove after using marijuana.	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
14. I think most people who use marijuana drive after using it.	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
15. I would cause a crash if I drove after using marijuana.	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No

Thank you for participating!

*Appendix D: PAS Vr.
Passive Alcohol Sensor Device*

Passive Alcohol Sensor -- the PAS Vr.

The passive sensor is used to obtain an estimate of alcohol level for subjects, including those who choose not to participate in the study; the PAS passively detects alcohol in the air exhaled by drivers. It is important to obtain PAS readings on all drivers pulling into the interview bays, whether they later give a breath test or not, because we need to be able to relate PAS readings to breath test readings for those who fully participate to be able to better understand the values of PAS readings for those who otherwise do not participate.

Initializing

When turning on the passive alcohol sensor (PAS Vr.) for testing, you must first initialize the device using the following steps:

Note that there are two black switches on the instrument, located on opposite sides of the device. One switch is the on/off button. The other switch is to indicate whether the PAS device is on passive mode (PAS ON) or active mode (AS ON). You ALWAYS want to be in PAS ON mode.

In the middle of the PAS device is the BAC bar graph (that will light up when alcohol is detected) and a small black button located below the BAC bar graph, known as the sampling button.



Figure 1. The PAS Vr.

While facing the front of the instrument and with the sampling port on the top of the device, locate the black power switch on the left side and slide it to the "ON" position.

The red lamp located on the far left side of the BAC bar graph, on the left side of the device, will illuminate. The red light will remain on as long as the instrument is in use.

At the base of the display or on the far right side of the BAC bar graph, an orange lamp for the heater (HTR on the PAS device) will light up and intermittently cycle on and off. This orange light indicates that the heater is in use. The heater continues to run while the instrument is on in order to maintain the fuel cell at a constant temperature of 104 degrees F +/- 5 degrees.

Wait approximately 2 minutes for the instrument to heat up.

After 2 minutes have elapsed, press the small round black button located below the orange heater indicator and on the right side of the device. This is the sampling button.

A yellow light will illuminate at the top of the BAC bar graph (PMP on the PAS device) and a small green bar will appear at the base of the graph display. After approximately 5 seconds, the yellow light will disappear.

Press the round black button again to turn off the sensor and reset the device for the first test (please note that you must turn off).

Located next to the orange heater indicator, is a red light battery indicator (BAT on the PAS device). If this red light appears and begins to flash at any time, change the battery.

Passive Sampling Test

Before beginning, be certain that the black switch located on the top right side of the device is in the "PAS ON" position. If the switch is in the Active position, the green light (ACT on the PAS device) will illuminate. You NEVER want to have the device on the Active position.

Check to ensure that the intake sampling port is free of debris and not blocked by your fingers.

Place the device approximately 5 to 7 inches from the face of the respondent.

Ask the participant an open ended question that requires a 5 second or longer response.

While the participant provides an answer, press the small round sampling button located at the base of the BAC bar graph and on right side of the instrument.

One green bar will appear at the base of the BAC bar graph display and the yellow pump light will illuminate above the bar graph once the reading has been taken. This smaller green bar will always appear when the device is activated and indicates a "00" reading. A positive reading occurs when TWO green bars are present (0.01). The survey form will have a bar scale that is equivalent to the PAS light scale – when entering your PAS data onto the survey, simply match the number of bars to the corresponding box (.i.e., one green bar on the PAS = "G1" on the survey; four yellow bars on the PAS = "Y4" on the survey, and so on). Hold the instrument steady during this process.

Once the yellow light has turned off, the test has completed and you can remove the instrument from the breath stream of the participant.

If alcohol is present, the multicolor display on the bar graph display will begin to rise, from green to yellow to red. The greater the amount of alcohol present, the higher the bar graph will rise.

The instrument will reach a peak reading within 5 to 15 seconds after the yellow indicator light goes out.

Immediately record the highest illuminated numerical value on the BAC graph display. The numbers range from 0.01 to 0.12.

Press the round black sampling button again and the display will turn off while the fuel cell recovers.

Remember that you will be activating the PAS device while talking to the participant and continuing with the interview process. You will not have time to stop the interview process while you activate the PAS and wait for the results.

You will take two PAS samples during the interview process. The survey instruments will have prompts alerting you when to take the PAS samples and where to record the results. Taking the PAS sample and recording the results will be done in smooth, fluid steps combined with other interviewing steps.

Maintenance Note: the PAS uses a 9-volt battery that will need to be changed out from time to time in the field.

Appendix E: Impaired Driver Protocol

Impaired Driver Protocol

Establishing fitness to complete assessment and/or operate a motor vehicle:

To establish if a subject is fit to complete the survey, as well as safely operate a motor vehicle upon exit, a three-level rating system has been established.

1. **Level 1** indicates that there was no evidence of substance (alcohol or drugs) use.

Level 2 indicates that there is some evidence of use (e.g. the PAS registers 6 bars or less indicating a BAC of approximately less than .05 g/dL) but the respondent displays no signs of intoxicated behavior such as slurred speech or bloodshot eyes.

Level 3 is evidence of use and signs of intoxication. At Level 3, the survey manager will be signaled to take over and will decide whether the interview should proceed and whether the subject needs assistance. We will not continue the survey on obviously inebriated and severely impaired individuals. We will offer safe transportation alternatives to the next destination for individuals who show obvious signs of Level 3 impairment. A PAS reading of 7 bars or more REQUIRES an assessment by the survey manager. A BAC of .05 or higher is the standard for arranging alternative transportation.

There will be cases where the subject will show signs of impairment, but is fit to complete the survey. The criteria for participation are that subject is able to understand the informed consent and able to provide informed consent. The criteria for consent to be informed are that the subject can understand the nature of the study as explained to him or her, that he or she understands the risks and benefits of participation, and that he or she understands that participation is voluntary. Simply being intoxicated does not preclude a person from being able to comprehend these basic concepts and process this information. Only survey managers can make the determination of whether a subject is fit to proceed with the interview. As soon as a data collector identifies a subject as Level 3, call your survey manager over to make the assessment. We have established a code signal to catch the immediate attention of the survey manager: **“Can I have some cards over here?”**

To determine ability to complete the survey, the survey manager will listen as the interview continues. If it appears that the subject does not understand the questions, the survey manager will touch the shoulder of the data collector, indicating that the data collector should step aside. The survey manager will then say, *I want to make sure you understand what this study is about so before we continue, can you explain to me what you think this survey is about? Can you tell me whether participation is voluntary or not?* If subject cannot explain the study and/or did not understand that participation was voluntary, the survey will end and the Impaired Driver Protocol will be implemented. In most cases, however, the survey manager can make a determination by simply listening to the subject’s responses and then intervening with the Impaired Driver Protocol rather than asking the subject if he understands the study.

How to Identify Level 3 Respondents

To identify intoxicated subjects (Level-3), look for a clustering of the following signs and symptoms. No one sign or symptom is a direct indication of alcohol or drug intoxication but, when combined, warrant calling your survey manager over to do a more in-depth evaluation. Remember that alcohol affects each individual differently. The effect of alcohol on a person will vary according to the person’s height, weight, drinking history, mood, the time of day, amount of

food in the stomach, the mixer used, how fast the person drinks, and what and why they are drinking, etc. If a person displays a combination of the signs and symptoms of intoxication, OR has a PAS reading of 7 bars or more bars you **MUST** call over your survey manager. Also, remember that a person may not have a positive PAS reading (or their BAC is .00) but they may be showing a cluster of other signs of intoxication. Do not ignore these signs just because there is a lack of evidence of alcohol use. The driver may be showing signs of prescription or illicit drug use. Do **not** make the judgment call yourself; rely on the expertise of your survey manager to assess the subject and intervene if necessary.

Signs of Intoxication

- A positive PAS reading
- A strong scent of alcohol
- Odors (marijuana, chemicals)
- Being overly friendly
- Talking loudly, bragging, or using foul language
- Being especially annoying or arguing with others
- Inability to light a cigarette, or attempting to light more than one cigarette at the same time
- Slurred or slowed speech or difficulty speaking
- Tending to lose the train of thought
- Glassy eyes, dilated pupils, bloodshot eyes
- Inability to focus, sleepy look, and bobbing head
- Sudden or unexplained mood changes (agitation, anxiety)
- Marked lack of coordination (e.g., inability to stand or walk, unable to hold a pen)
- Confused, disoriented appearance
- Body tremors and perspiring
- Statements suggesting hallucinations

Why this matters and key points to remember

We are required by our IRB to ensure the safety of our subjects. Our goals include:

2. Identifying respondents who may be unable to provide informed consent because they are too intoxicated to understand the risks and benefits of participation and agree to be in the survey.
3. Identifying respondents who may be too impaired to operate a motor vehicle safely.

When you identify a Level 3 intoxicated person, call the survey manager over immediately to do an assessment. We have set procedures to assess and evaluate the subject, and also get them safely to their next location. If subjects ask why you are calling someone else over, simply state: "My survey manager talks to some of our participants to make sure they are able to be in the

study.” Keep your interactions with intoxicated respondents very brief. Do not laugh or make fun of them, or ask questions about their alcohol use.

PROTOCOL FOR HANDLING AN IMPAIRED DRIVER

We will offer safe transportation alternatives to the next destination for any individual who shows obvious signs of substantial impairment.

When you observe behavior, odor, and appearance that lead you to believe that a subject is moderately or heavily intoxicated and therefore a possible danger to him/herself, his/her passengers, other drivers, or pedestrians, please follow this procedure.

Notify the Survey Manager

The survey manager will assess the subject by standing behind you to observe. If the survey manager determines that the subject is unable to give informed consent, the survey manager will stop the interview and the Impaired Driving Protocol will be activated. The survey manager will step forward and introduce himself/herself as the site’s survey manager in charge. The survey manager will be equipped a PBT with unmasked BAC numbers, and will request a breath test on the subject. If the BAC is .05 and above, the survey manager will present these options to the subject:

1. LET A PASSENGER DRIVE

If a passenger in the vehicle has a valid driver’s license, the survey manager can give that person a breath test. If the BAC is .049 or below and the individual shows no signs of obvious intoxication, then the survey manager will offer to let the passenger drive the subject home. The passenger’s BAC must be recorded on the survey manager’s Site Report Form. Those passengers under age 21 must be below .02 BAC.

2. CALL A FRIEND OR RELATIVE OF THE DRIVER

The survey manager can use a cell phone to call a friend or relative of the subject and request that someone come and assist the driver (ideally, two people should come so that one can drive the subject home and the other can drive the subject’s car home). The driver’s BAC must be below .049.

If neither of the above alternatives is satisfactory, then:

3. OFFER THE DRIVER A RIDE HOME FROM TAXI or TOWING SERVICES

If the driver does not have funds, then the NRS project will pay for the ride. The subject’s vehicle can be left at the site, moved to a nearby parking area, or towed. When using a taxi or towing service, the survey manager will get pre-paid receipts. If using a taxi service, the survey manager will give the subject the car keys and the address noting where the vehicle will be located when the individual is capable of retrieving it. If a towing service is used, the subject can simply ride with the tow driver to their home.

4. OFFER WAITING OPTION

Drivers with measured BACs under .08 will be given the option of waiting at or in their vehicle until his or her BAC drops to level where it is safer from them to drive. Based on a standard rate of metabolizing alcohol of .015 g/dL per hour, the survey manager will estimate the time when the driver’s BAC will drop to below .05 (for those 21 and older), or to below .02 for people under 21. The survey manager will collect an additional breath samples at the estimated time and beyond if necessary to ascertain if the driver’s BAC yet is low enough to drive. Drivers who have

not yet reached the BAC criterion within a half-hour before the end of the survey will be encouraged to elect one of the other safe driving alternatives. If they refuse all options, the on-site police officer will repeat the options to the driver.

Drivers with a BAC sufficiently high that it will not drop below the aforementioned thresholds by the time the survey is complete, will not be offered the opportunity to wait. However, if these drivers indicate that they plan to wait (and in doing so decline the proposed transportation alternatives), the survey manager will explain that it is unlikely they will be sufficiently sober by the end of the survey, and that if their BACs are not below the threshold 30 minutes before the end of data collection, they will need to choose one of the other transportation options. If, at the end of the evening, drivers still decline a transportation alternative, the survey manager will request that the on-site police officer repeat the options to the driver. Note that drivers who are waiting will have their vehicles parked so that they always are in view of either a data collector or an on-site officer.

5. SUBJECT'S SUGGESTION TO WALK HOME

Subjects may request to walk to a safe location (home or a friend's home) but before departing on foot, this option must be approved by the survey manager and must meet these criteria: the walk is reasonably practical (short enough in distance) and the subject is capable of making it to his/her next location safely. *If a BAC is voluntarily provided with a breath tester display unit, .08 BAC will be the maximum to allow walking short distances, however obvious signs of impairment will be used to make the decision for those who do not provide a BAC.* Further, some subjects will be unsafe to walk at levels lower than .08. If the subject and passengers are not showing obvious signs of impairment (unsteadiness, stumbling, and significant slurring of words) AND are at or below .08, they can be allowed to walk home or to their next location; otherwise they cannot walk and must select another option. Female subjects should not walk alone for safety reasons. Taking a cab, even short distances, is always encouraged first by the survey manager.

6. OFFER TO PAY FOR A HOTEL

If the subject lives too far away for any of the above options, the survey manager may arrange for the subject to stay in a nearby hotel and pay for a one night stay.

7. FINAL OPTION

The officer will be asked (in order of priority) to:

- 1) Repeat the safe ride options, and if that fails;
- 2) Tell driver that they will call an on-duty officer/dispatch and warn that an apparently impaired driver has left our site and report the pertinent vehicle information, and if that fails to convince the driver to take on of the options;
- 3) The officer, if he/she feels that the person is possibly impaired, may request the driver to provide a breath test and/or conduct a field sobriety test to determine the next course of action (, let driver leave, ask driver to stay issue citation, make arrest);
- 4) Stay with driver or make driver stay at site until BAC drops to an appropriate level that the officer feels is safe; or
- 5) Provide ride home to driver and/or passengers.

It is our hope, and experience, that calling the police officer over will increase the chance of the driver taking one of the options and also obviate the possibility of a police intervention.

*Appendix F: Mark V Alcovisor Preliminary
Breath Tester*

The Preliminary Breath Tester (PBT)

Data collectors will use a preliminary breath tester (PBT; Figure 1) to assess a participant's blood alcohol concentration. PBTs are specialized devices that measure participants BAC by use of a fuel cell inside the instrument. For this study, the BAC result will not be displayed; results will be downloaded to a computer after a shift.

Mark V Testing Device

For the NRS 2013, we will be using a preliminary breath tester known as the Mark V Alcovisor. The Mark V is powered with four AAA alkaline batteries. Data collectors will have two PBTs and extra AAA batteries in their supply backpacks. The Mark V has a 2" x 1.5" display LCD with auto backlight for night use. Below the screen there are two buttons, a red one and green one. Above the screen is the portal where the disposable mouthpiece is inserted.

To turn on the Mark V, press and hold the green on/off button (located below the display screen) for 2 to 3 seconds. The display light will come on and a self-test (automatic blank test) is carried out by the microprocessor. In a few seconds, a tone will sound and the display will read "Please Blow." This indicates the device is ready to use.

To turn off the Mark V, press and hold the green on/off button for 2 to 3 seconds. Note that the Mark V will automatically shut off after a few minutes if the unit is in the READY mode and no test has been performed.

Taking the Breath Sample

After receiving consent from the participant to obtain a breath sample, follow these steps to instruct participants on how to give the breath sample and the proper method for obtaining a breath sample.



Ensure that the PBT is ready to use. The display must read “Please Blow.” The PBT sample number will be displayed below “Please Blow.”

State the following: “The result is stored inside the device and is not displayed. Please take a deep breath and blow slow and steady into the tube until I tell you to stop.” Speak with authority, without a question in your voice.

As you speak, remove the disposable mouthpiece from its wrapper, making sure not to touch the end into which the participant will be blowing. Also, pull the wrapper off within sight of the participant) and explain what you are doing.

Attach the disposable mouthpiece to the mouthpiece holder. The mouthpiece can be inserted from either side of the Mark V; HOWEVER, for our study, the mouthpiece end that the participant will blow into MUST be positioned away from the data collector. Ensure a secure fit.

Position the PBT just in front of the participant’s mouth and let the participant know when to start. While there is no way to guarantee that the participant will give a breath sample, interviewing methodology studies show that making requests in a calm, matter-of-fact, and business-like manner will most likely elicit cooperation, and that the vast majority of respondents do try to be helpful. If the participant has difficulty understanding your request, say “Like this,” and demonstrate taking a deep breath and exhaling steadily for few seconds.

The participant should continue to blow into the breath tube. A click will occur when the participant supplies a sufficient enough sample of breath. “TEST RESULT” will appear on the screen. The actual result will not appear.

To see if the sample was captured, press the green button. The next screen will show the sample case number which should have moved to the next number.

If the participant does not provide an adequate breath sample on his or her first try, “TEST AGAIN” will appear on the screen. Press the green button to re-test and ensure that “Please Blow” appears on the screen. Explain the directions again to the participant and attempt to capture the breath sample.

Once a breath sample has been taken, the participant can be thanked.

At the end of each breath sample, the data collector removes the used breath tube, places it in the trash bag, and records the PBT sample case number on the survey and Driver Information Card.

If a participant refuses to provide a breath test, wait a few seconds and the screen will change and the following boxes will appear on the screen: Refuse and Test Again. Press the red button (the one below the screen) until the red cursor is over the Refuse box. Press the green button to confirm “Refuse.” The screen will change to say “Test Result” and the word Refuse will also appear. For each participant who does not provide a breath test, the

data collector must enter Refuse. This action will be recorded and the sample number will move to the next number.

Taking a Manual Reading

If the participant does not provide an adequate breath sample on his or her second attempt, you should be prepared to take a manual reading on the third try. The term “manual” is used because the data collector determines when an adequate amount of breath has been expelled to capture a viable sample by manually pressing the appropriate button. Under normal conditions, the PBTs are designed to capture a sample automatically by measuring the duration and strength of air flow past a sensor. Some participants, especially elderly or asthmatic participants, may not be able to provide a long or strong enough sample for the PBT to capture a sample. In these cases, the data collector will need to complete the following steps to secure a manual PBT reading:

When the PBT is ready to take a sample, ask the participant to blow into the breath tube. The red cursor will highlight the “manual” box on the screen. Press down on the green button while the participant is still blowing into the breath tube. The data collector should wait as long as possible before pressing on this button, since the reliability of the BAC reading is a function of how long the participant blows into the breath tube. Deep lung air provides a better match to the person’s actual blood alcohol concentration; therefore the longer the blow the better. However, it is important that the data collector use his or her best judgment in anticipating and taking a manual reading while the participant is still blowing.

Once the green button is pressed, the PBT will react exactly as if a normal reading has been taken.

PROPER CARE NOTES: Each PBT is an expensive piece of scientific equipment and should be treated carefully.

Warning Indicators and Error Messages: If any warning sounds, lights, or messages appear while using the PBT, switch to your backup PBT (which will be in your bay bag).

Moisture (rain/damp night air) can harm the PBTs; thus, the devices need to be protected.

If a unit is dropped, it should be switched out with a different unit (a dropped PBT will be sent back to PIRE headquarters to have its calibration checked). Again, inform the survey manager before or at the end of the session.

Cigarette smoke can permanently damage the fuel cell. All subjects should be instructed to not smoke (extinguish cigarettes) or chew anything at least 2 minutes prior to collecting the breath sample.

Appendix G: Quantisal Oral Fluid Collection Device

Collecting Oral Fluid Specimens

Upon completion of the verbal survey and breath sample collection, the next step will be to obtain consent for an oral fluid specimen. If the participant agrees to provide an oral fluid sample, he or she is given the Quantisal device to put under the tongue to collect a saliva sample.

If the participant agrees to provide an oral fluid sample and complete the self-administered questionnaire, clearly instruct him or her, “Please DO NOT chew or suck the on pad and DO NOT move pad during collection. Please keep the collector under your tongue until the indicator turns completely blue. This may take a few minutes.”

Place the Quantisal package in front of the respondent and ask, “Please remove the collector from the pouch, position it under your tongue and close your mouth.”

Instruct the participant on how to complete the Self-Administered Questionnaire. Give the participant the tablet and instruct them on how to fill out the Self-Administered Questionnaire.

If the indicator has not turned blue within 5 minutes, the pad should be removed from the mouth and discarded. Another collection attempt with a new device may begin immediately but only after saliva has accumulated in the mouth. The swab should be placed in the same position.

Remove cap from transport tube once the indicator is blue.

Ask the participant to please open their mouth, lift their tongue, remove the collector from mouth and insert the collector into the transport tub. Fluid from the transport tube should never enter the participant’s mouth.

Carefully place cap over the top of the collector stem in tube. FORCEFULLY push cap downward until cap snaps flush with top of tube.

Place the chain-of-custody label on the tube, on the DIN card, and enter the CoC number into your iPad when/where requested.



Figure 2. The Quantisal Oral Fluid Collection Device

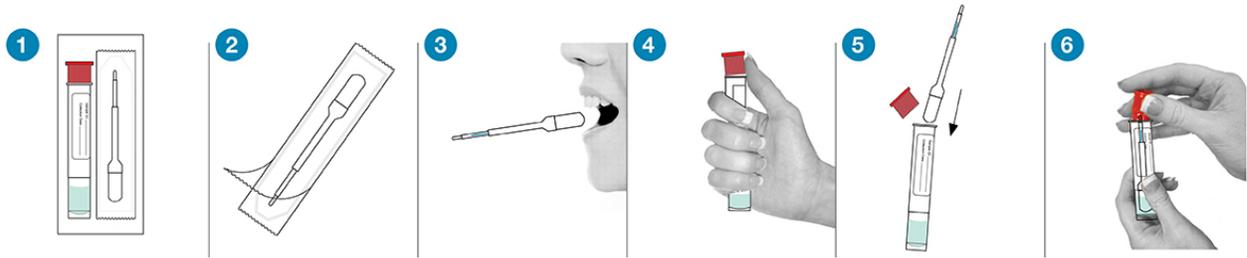


Figure 3. The Quantisal Oral Fluid Collection Device Procedure

Mix saturated collector with buffer fluid by gently shaking tube. Return the oral fluid sample to your kit for storage.

Give the respondent a \$10 incentive for their participation.

*Appendix H: THC, Hydroxy-THC, and
Carboxy-THC Results*

Table 1. Prevalence of THC, Hydroxy-THC, and Carboxy-THC by Wave (Both Oral Fluid and Blood)

	N	% positive		
		THC	Hydroxy-THC	Carboxy-THC
Wave 1	908	14.6	8.0	6.9
Wave 2	672	19.4	2.4*	10.2
Wave 3	810	21.8*	6.8	11.3

In this table, Ns are unweighted; percentages are weighted.

*Significantly different from Wave 1 ($p < .05$).

Table 2. Prevalence of THC, Hydroxy-THC, and Carboxy-THC by Wave (Oral Fluid Only)

	N	% positive		
		THC	Hydroxy-THC	Carboxy-THC
Wave 1	878	11.6	0.0	6.9
Wave 2	629	16.4	0.0	10.1
Wave 3	806	17.6	<0.1	11.2

In this table, Ns are unweighted; percentages are weighted.

Table 3. Prevalence of THC, Hydroxy-THC, and Carboxy-THC by Wave (Blood Only)

	N	% positive		
		THC	Hydroxy-THC	Carboxy-THC
Wave 1	711	14.8	10.6	5.6
Wave 2	543	10.1	4.0	7.6
Wave 3	675	21.3	6.2	10.6

In this table, Ns are unweighted; percentages are weighted.

*Appendix I: Drug Category by
Demographics Tables with
Confidence Intervals*

Table 1: Percentage of Drivers THC Positive by Drug Category and Gender and Age (Oral Fluid or Blood)(Percentages by Column)

Drug category	Gender			
	Male		Female	
	%	95% CI	%	95% CI
Wave 1	N = 563		N = 343	
THC-positive	14.8	[11.3, 19.2]	14.3	[11.0, 18.5]
<i>THC-positive only</i>	8.8	[6.0, 12.8]	8.5	[6.1, 11.8]
<i>THC-positive and any other drug</i>	6.0	[3.8, 9.2]	5.8	[3.4, 9.8]
Illegal only	2.1	[1.1, 4.0]	3.1	[1.4, 6.6]
Medications only	14.7	[11.5, 18.6]	18.6	[13.5, 24.9]
Illegal and medications	0.0	0	1.1	[0.1, 8.0]
Total drug-positive	31.6	[26.0, 37.8]	37.0	[30.5, 44.0]
Total drug-negative	68.4	[62.2, 74.1]	63.0	[56.0, 69.5]
Wave 2	N = 403		N = 264	
THC-positive	19.8	[15.1, 25.6]	19.1	[15.9, 22.8]
<i>THC-positive only</i>	12.6	[9.1, 17.2]	14.2	[11.1, 18.1]
<i>THC-positive and any other drug</i>	7.3	[4.9, 10.7]	4.9	[2.8, 8.7]
Illegal only	2.1	[1.1, 3.7]	2.1	[0.7, 5.3]
Medications only	15.0	[11.4, 19.5]	16.5	[12.2, 21.8]
Illegal and medications	0.8	[0.2, 3.1]	0.0	0
Total drug-positive	37.8	[32.3, 43.6]	37.7	[33.2, 42.3]
Total drug-negative	62.3	[5.6, 6.8]	62.3	[57.7, 66.8]
Wave 3	N = 479		N = 324	
THC-positive	24.7*	[19.8, 30.3]	17.3	[12.3, 23.9]
<i>THC-positive only</i>	14.1	[9.3, 20.8]	10.8	[6.7, 16.9]
<i>THC-positive and any other drug</i>	10.6	[6.0, 18.0]	6.5	[3.4, 12.3]
Illegal only	0.0	0	0.4	[0, 1.6]
Medications only	10.7	[7.9, 14.2]	13.0	[8.5, 19.2]
Illegal and medications	1.3	[0.2, 7.0]	0.3	[0.0, 2.2]
Total drug-positive	36.6	[32.1, 41.5]	31.0	[23.3, 39.9]
Total drug-negative	63.4	[58.5, 67.9]	69.0	[60.1, 76.7]

In this table, Ns are unweighted; percentages are weighted.

Column percentages may not total to 100 percent due to rounding.

Because of missing records on the demographic values, totals (N) do not match those in other tables.

THC-positive includes results from THC and hydroxy-THC.

*Significantly different from Wave 1 (p <.05).

Appendix I: Drug Category by Demographics Tables with Confidence Intervals

Table 2: Percentage of Drivers THC Positive by Drug Category and Age
(Oral Fluid or Blood)(Percentages by Column)

Drug category	Age (years)									
	% 16–20	95% CI	% 21–34	95% CI	% 35–44	95% CI	% 45–64	95% CI	% 65+	95% CI
Wave 1	N = 106		N = 381		N = 150		N = 228		N = 43	
THC-positive	17.3	[8.7, 31.5]	15.7	[11.1, 21.6]	15.2	[10.7, 21.1]	11.8	[6.3, 21.1]	14.0	[4.3, 37.2]
<i>THC-positive only</i>	12.7	[5.4, 27.1]	8.4	[5.5, 12.8]	9.8	[6.1, 15.3]	6.8	[3.5, 13.1]	9.2	[1.9, 34.1]
<i>THC-positive and any other drug</i>	4.6	[0.9, 20.7]	7.2	[4.0, 12.5]	5.4	[2.2, 12.5]	5.0	[2.4, 9.8]	4.9	[1.3, 16.8]
Illegal only	1.3	[0.2, 9.7]	0.9	[0.3, 2.6]	3.4	[1.1, 9.9]	4.8	[2.4, 9.4]	0.0	0
Medications only	3.6	[1.5, 8.5]	17.9	[13.0, 24.2]	18.8	[11.6, 29.2]	16.5	[11.8, 22.7]	16.0	[7.2, 31.7]
Illegal and medications	0.0	0	0.0	0	0.0	0	1.3	[0.2, 8.2]	0.0	0
Total drug-positive	22.2	[12.6, 36.2]	34.4	[26.4, 43.6]	37.4	[28.6, 47.2]	34.4	[26.1, 43.8]	30.0	[18.3, 45.0]
Total drug-negative	77.8	[63.8, 87.4]	65.5	[56.4, 73.6]	62.6	[52.8, 71.4]	65.6	[56.2, 73.9]	70.0	[55.0, 81.7]
Wave 2	N = 86		N = 288		N = 126		N = 130		N = 37	
THC-positive	19.2	[11.7, 29.9]	18.9	[14.1, 25.0]	19.6	[13.0, 28.4]	20.7	[15.1, 27.8]	21.5	[13.1, 33.2]
<i>THC-positive only</i>	14.4	[8.6, 23.3]	12.1	[8.8, 16.3]	13.1	[7.5, 22.0]	13.0	[8.4, 19.4]	21.5	[13.1, 33.2]
<i>THC-positive and any other drug</i>	4.7	[1.7, 12.8]	6.9	[3.8, 12.0]	6.5	[2.8, 14.3]	7.7	[4.5, 13.1]	0.0	0
Illegal only	2.2	[0.5, 9.3]	2.6	[1.1, 5.9]	2.1	[0.5, 8.1]	1.2	[0.3, 5.1]	0.0	0
Medications only	13.2	[6.6, 24.9]	16.4	[11.8, 22.3]	16.7	[10.8, 24.8]	14.5	[9.8, 21.0]	17.0	[5.6, 41.5]
Illegal and medications	2.2	[0.3, 16.4]	0.6	[0.0, 3.8]	0.0	0	0.0	0	0.0	0
Total drug-positive	36.8	[25.5, 49.8]	38.5	[32.9, 44.3]	38.4	[31.9, 45.3]	36.4	[30.2, 43.1]	38.5	[21.8, 58.3]
Total drug-negative	63.2	[50.2, 74.5]	61.6	[55.7, 67.1]	61.6	[54.7, 68.1]	63.6	[56.9, 69.8]	61.5	[41.7, 78.2]
Wave 3	N = 112		N = 326		N = 156		N = 178		N = 31	
THC-positive	31.2	[17.6, 48.9]	22.8	[16.8, 30.3]	19.4	[12.7, 28.5]	18.6	[9.4, 33.4]	8.2	[2.2, 26.4]
<i>THC-positive only</i>	28.2	[14.4, 47.8]	13.5	[10.3, 17.6]	7.2	[2.9, 16.7]	8.0	[4.5, 13.7]	5.2	[1.5, 16.6]
<i>THC-positive and any other drug</i>	3.0	[0.9, 9.1]	9.3	[5.3, 15.8]	12.2	[7.8, 18.6]	10.7	[3.6, 27.8]	3.0	[0.5, 15.9]
Illegal only	0.0	0	0.2	[0.0, 15.8]	0.4	[0, 2.9]	0.0	0	0.0	0
Medications only	4.0	[1.5, 10.5]	11.0	[8.3, 14.6]	11.1	[6.3, 18.8]	17.1	[10.4, 26.9]	19.3	[7.2, 42.3]
Illegal and medications	0.0	0	0.0	0	2.5	[0.7, 8.4]	1.9	[0.3, 12.3]	0.0	0
Total drug-positive	35.2	[21.9, 51.3]	34.0	[27.8, 40.7]	33.3	[26.0, 41.6]	37.6	[28.7, 47.4]	27.5	[12.9, 49.3]
Total drug-negative	64.8	[48.7, 78.1]	66.0	[59.3, 72.0]	66.7	[58.4, 74.0]	62.4	[52.6, 71.4]	72.5	[50.7, 87.1]

In this table, Ns are unweighted; percentages are weighted.

Column percentages may not total to 100 percent due to rounding.

Because of missing records on the demographic values, totals (N) do not match those in other tables.

THC-positive includes results from THC and hydroxy-THC.

Table 3. Percentage of Drivers THC Positive by Drug Category and Race (Oral Fluid or Blood) (Percentages by Column)

Drug category	Race									
	% White	95% CI	% Black/ African- American	95% CI	% Asian	95% CI	% Native American/ Alaskan	95% CI	% Other/ More than one	95% CI
Wave 1	N = 807		N = 59		N = 17		N = 8		N = 12	
THC-positive	13.7	[11.0, 16.8]	20.7	[11.6, 34.1]	15.5	[3.1, 51.0]	0.0	0	13.4	[2.9, 58.8]
<i>THC-positive only</i>	8.6	[6.5, 11.4]	9.5	[3.0, 25.7]	10.9	[1.3, 52.7]	0.0	0	13.4	[2.9, 58.8]
<i>THC-positive and any other drug</i>	5.0	[3.6, 6.9]	11.2	[4.6, 25.2]	4.6	[0.6, 28.3]	0.0	0	0.0	0
Illegal only	2.6	[1.6, 4.5]	0.9	[0.0, 7.4]	0.0	0	0.0	0	0.0	0
Medications only	16.8	[12.5, 22.2]	16.6	[8.1, 30.9]	0.0	0	0.0	0	18.8	[2.4, 78.4]
Illegal and medications	0.4	[0.0, 3.2]	0.0	0	0.0	0	0.0	0	0.0	0
Total drug-positive	33.5	[28.1, 39.4]	38.1	[27.2, 50.5]	15.5	[3.1, 51.0]	0.0	0	32.2	[11.4, 77.7]
Total drug-negative	66.5	[60.6, 78.9]	61.9	[49.6, 72.8]	84.6	[49.0, 96.9]	100.0	0	67.8	[26.3, 86.4]
Wave 2	N = 564		N = 65		N = 28		N = 5		N = 6	
THC-positive	20.2	[16.5, 24.5]	14.5	[7.7, 25.6]	12.6	[3.4, 37.2]	20.4	[4.2, 59.8]	35.5	[1.2, 61.9]
<i>THC-positive only</i>	13.0	[10.3, 16.2]	12.2	[6.4, 22.1]	12.6	[3.4, 37.2]	0.0	0	35.5	[1.2, 61.9]
<i>THC-positive and any other drug</i>	7.2	[4.9, 10.4]	2.3	[0.5, 9.6]	0.0	0	20.4	[4.2, 59.8]	0.0	0
Illegal only	1.7	[0.9, 3.2]	3.9	[1.6, 9.3]	3.4	[0.4, 23.7]	0.0	0	0.0	0
Medications only	16.7	[13.3, 20.7]	12.3	[6.6, 21.8]	12.8	[5.2, 27.9]	14.1	[1.4, 66.4]	0.0	0
Illegal and medications	0.6	[0.2, 2.5]	0.0	0	0.0	0	0.0	0	0.0	0
Total drug-positive	39.2	[35.6, 43.1]	30.7	[19.3, 44.9]	28.7	[16.1, 45.9]	34.5	[10.4, 70.4]	35.5	[1.2, 61.9]
Total drug-negative	60.8	[56.9, 64.4]	69.3	[55.1, 80.7]	71.3	[54.1, 83.9]	65.5	[29.6, 89.6]	64.5	[19.2, 91.2]
Wave 3	N = 691		N = 58		N = 20		N = 13		N = 27	
THC-positive	18.9	[14.9, 23.6]	40.8	[27.5, 55.6]	13.8	[5.7, 29.7]	12.9	[1.9, 53.2]	20.2	[4.3, 41.7]
<i>THC-positive only</i>	10.1	[8.0, 12.6]	28.2	[11.4, 54.5]	13.8	[5.7, 29.7]	6.4	[1.0, 31.5]	17.4	[4.5, 44.0]
<i>THC-positive and any other drug</i>	8.8	[5.5, 13.8]	12.5	[4.9, 28.4]	0.0	0	6.4	[1.0, 31.5]	2.8	[1.7, 61.6]
Illegal only	0.2	[0.0, 0.8]	0.0	0	0.0	0	0.0	0	0.0	0
Medications only	13.3	[10.6, 16.7]	8.1	[3.5, 17.4]	0.0	0	0.0	0	18.0	[7.2, 61.2]
Illegal and medications	0.9	[0.2, 3.6]	1.7	[0.2, 11.6]	0.0	0	0.0	0	0.0	0
Total drug-positive	33.2	[28.5, 38.3]	50.5	[36.5, 64.5]	13.8	[5.7, 29.7]	12.9	[1.9, 53.2]	38.2	[12.3, 62.5]
Total drug-negative	66.8	[61.7, 71.5]	49.5	[35.5, 63.5]	86.2	[70.4, 94.3]	87.1	[46.8, 98.1]	61.8	[48.6, 86.7]

In this table, Ns are unweighted; percentages are weighted.

Column percentages may not total to 100 percent due to rounding.

Because of missing records on the demographic values, totals (N) do not match those in other tables.

THC-positive includes results from THC and hydroxy-THC.

Table 4. Percentage of Drivers THC Positive by Drug Category and Ethnicity (Oral Fluid or Blood) (Percentages by Column)

Drug category	Ethnicity			
	% Hispanic	95% CI	% Non-Hispanic	95% CI
Wave 1	N = 160		N = 747	
THC-positive	11.9	[7.4, 18.8]	15.1	[11.8, 19.1]
<i>THC-positive only</i>	8.7	[5.5, 13.4]	8.7	[6.3, 12.0]
<i>THC-positive and any other drug</i>	3.3	[1.1, 9.2]	6.4	[4.1, 9.9]
Illegal only	3.4	[1.0, 10.1]	2.3	[1.2, 4.2]
Medications only	13.0	[8.2, 20.2]	16.6	[13.0, 21.1]
Illegal and medications	2.4	[0.2, 17.8]	0.0	0
Total drug-positive	30.7	[22.3, 40.6]	34.0	[27.8, 40.8]
Total drug-negative	69.3	[59.4, 77.7]	66.0	[59.2, 72.2]
Wave 2	N = 118		N = 547	
THC-positive	14.7	[9.1, 22.7]	20.7	[17.0, 24.9]
<i>THC-positive only</i>	12.5	[7.4, 20.4]	13.4	[10.2, 17.4]
<i>THC-positive and any other drug</i>	2.2	[0.6, 7.6]	7.3	[5.0, 10.5]
Illegal only	2.4	[0.8, 6.9]	2.0	[1.0, 3.8]
Medications only	5.2	[2.2, 11.8]	18.1	[15.0, 21.6]
Illegal and medications	1.5	[0.2, 8.3]	0.3	[0.0, 2.2]
Total drug-positive	23.7	[17.5, 31.4]	41.0	[37.4, 44.7]
Total drug-negative	76.3	[68.6, 82.5]	59.0	[55.3, 62.6]
Wave 3	N = 121		N = 683	
THC-positive	14.0	[7.7, 24.1]	23.3	[18.4, 28.9]
<i>THC-positive only</i>	8.3	[3.4, 19.1]	13.6	[9.4, 19.3]
<i>THC-positive and any other drug</i>	5.7	[2.5, 12.5]	9.6	[5.5, 16.4]
Illegal only	0.0	0	0.2	[0.0, 0.7]
Medications only	9.1	[5.8, 13.9]	12.2	[9.2, 16.0]
Illegal and medications	2.5	[0.6, 9.6]	0.7	[0.1, 3.4]
Total drug-positive	25.5	[17.4, 35.9]	36.3	[30.9, 41.9]
Total drug-negative	74.5	[64.1, 82.6]	63.7	[58.1, 69.1]

In this table, Ns are unweighted; percentages are weighted.

Column percentages may not total to 100 percent due to rounding.

Because of missing records on the demographic values, totals (N) do not match those in other tables.

THC-positive includes results from THC and hydroxy-THC.

*Appendix J: Drug Class by Demographics
Tables with Confidence Intervals*

Table 1. Percentage of Drivers THC Positive by Drug Class and Gender (Oral Fluid or Blood)
(Percentages by Column)

Drug Class	Gender			
	% Male	95% CI	% Female	95% CI
Wave 1	<i>N</i> = 563		<i>N</i> = 343	
THC-positive	14.8	[11.3, 19.2]	14.3	[11.0, 18.5]
<i>THC-positive only</i>	8.8	[6.0, 12.8]	8.5	[6.1, 11.8]
<i>THC-positive and any other drug</i>	6.0	[3.8, 9.2]	5.8	[3.4, 9.8]
Antidepressants only	1.5	[0.8, 3.0]	1.7	[0.8, 3.5]
Narcotic analgesics only	2.0	[1.0, 3.8]	5.8	[3.4, 9.7]
Sedatives only	1.3	[0.5, 3.1]	0.4	[0.0, 2.0]
Stimulants only	8.3	[6.1, 11.4]	8.6	[4.8, 15.0]
Other only	1.3	[0.7, 2.5]	3.1	[1.6, 5.9]
More than one class	2.4	[1.2, 4.8]	3.0	[1.3, 6.8]
Total drug-positive	31.6	[26.0, 37.8]	37.0	[30.5, 44.0]
Total drug-negative	68.4	[62.2, 74.1]	63.0	[56.0, 69.5]
Wave 2	<i>N</i> = 403		<i>N</i> = 264	
THC-positive	19.8	[15.1, 25.6]	19.1	[15.9, 22.8]
<i>THC-positive only</i>	12.6	[9.1, 17.2]	14.2	[11.1, 18.1]
<i>THC-positive and any other drug</i>	7.3	[4.9, 10.7]	4.9	[2.8, 8.7]
Antidepressants only	1.8	[0.8, 3.8]	1.8	[0.7, 4.4]
Narcotic analgesics only	5.7	[3.5, 9.0]	4.6	[2.4, 8.9]
Sedatives only	0.8	[0.3, 2.4]	0.8	[0.2, 3.9]
Stimulants only	5.3	[3.3, 8.4]	8.6	[5.5, 13.4]
Other only	1.1	[0.4, 3.1]	0.9	[0.3, 2.8]
More than one class	3.3	[2.1, 5.3]	1.8	[0.6, 5.0]
Total drug-positive	37.8	[32.3, 43.6]	37.7	[33.2, 42.3]
Total drug-negative	62.3	[56.4, 67.8]	62.3	[57.7, 66.8]
Wave 3	<i>N</i> = 479		<i>N</i> = 324	
THC-positive	24.7*	[19.8, 30.3]	17.3	[12.3, 23.9]
<i>THC-positive only</i>	14.1	[9.3, 20.8]	10.8	[6.8, 16.9]
<i>THC-positive and any other drug</i>	10.6	[6.0, 18.0]	6.5	[3.4, 12.3]
Antidepressants only	1.3	[0.6, 2.8]	3.1	[1.2, 7.5]
Narcotic analgesics only	2.6	[1.6, 4.3]	1.4	[0.4, 4.9]
Sedatives only	1.0	[0.3, 3.6]	1.0	[0.3, 3.1]
Stimulants only	2.8	[1.6, 4.7]	1.5	[0.4, 5.0]
Other only	0.3	[0.0, 1.1]	1.5	[0.6, 3.9]
More than one class	4.0	[2.1, 7.6]	5.1	[3.2, 8.2]
Total drug-positive	36.6	[32.1, 41.5]	31.0	[23.3, 39.9]
Total drug-negative	63.4	[58.5, 67.9]	69.0	[60.1, 76.7]

In this table, *N*s are unweighted; percentages are weighted.

Column percentages may not total to 100 percent due to rounding.

Because of missing records on the demographic values, totals (*N*) do not match those in other tables.

THC-positive includes results from THC and hydroxy-THC.

*Significantly different from Wave 1 ($p < .05$).

Table 2. Percentage of Drivers THC Positive by Drug Class and Age (Oral Fluid or Blood)
(Percentage by Column)

Drug Class	Age (years)									
	16–20		21–34		35–44		45–64		65+	
	%	95% CI	%	95% CI						
Wave 1	<i>N</i> = 106		<i>N</i> = 381		<i>N</i> = 150		<i>N</i> = 228		<i>N</i> = 43	
THC-positive	17.3	[8.7, 31.5]	15.7	[11.1, 21.6]	15.2	[10.7, 21.1]	11.8	[6.3, 21.1]	14.0	[4.3, 37.2]
<i>THC-positive only</i>	12.7	[5.4, 27.1]	8.4	[5.5, 12.8]	9.8	[6.1, 15.3]	6.8	[3.5, 13.1]	9.2	[1.9, 34.1]
<i>THC-positive and any other drug</i>	4.6	[0.9, 20.7]	7.2	[4.1, 12.5]	5.4	[2.2, 12.5]	5.0	[2.4, 9.8]	4.9	[1.3, 16.8]
Antidepressants only	0.8	[0.0, 6.1]	1.1	[0.4, 2.9]	1.0	[0.2, 4.3]	2.4	[0.9, 6.5]	3.7	[0.8, 14.9]
Narcotic analgesics only	1.6	[0.4, 6.9]	2.0	[1.0, 4.0]	2.1	[0.8, 5.3]	5.1	[2.9, 8.9]	12.3	[5.8, 24.3]
Sedatives only	0.4	[0.0, 3.5]	2.1	[0.7, 5.7]	0.0	0	0.5	[0.0, 2.1]	0.0	0
Stimulants only	0.6	[0.0, 5.0]	8.9	[5.6, 13.8]	14.2	[6.6, 27.8]	8.7	[6.1, 12.4]	0.0	0
Other only	0.6	[0.0, 5.0]	1.6	[0.8, 3.1]	3.2	[1.7, 6.2]	2.4	[1.1, 5.5]	0.0	0
More than one class	0.8	[0.0, 6.0]	3.3	[1.6, 6.5]	1.8	[0.5, 6.0]	3.5	[1.4, 8.3]	0.0	0
Total drug-positive	22.2	[12.6, 36.2]	34.5	[26.4, 43.6]	37.4	[28.6, 47.2]	34.4	[26.1, 43.8]	30.0	[18.3, 45.0]
Total drug-negative	77.8	[63.8, 87.4]	65.5	[56.4, 73.6]	62.6	[52.8, 71.4]	65.6	[56.2, 73.9]	70.0	[55.0, 81.7]
Wave 2	<i>N</i> = 86		<i>N</i> = 288		<i>N</i> = 126		<i>N</i> = 130		<i>N</i> = 37	
THC-positive	19.2	[11.7, 29.9]	18.9	[14.1, 25.0]	19.6	[13.0, 28.4]	20.7	[15.1, 27.8]	21.5	[13.1, 33.2]
<i>THC-positive only</i>	14.4	[8.6, 23.3]	12.1	[8.8, 16.3]	13.1	[7.5, 22.0]	13.0	[8.4, 19.4]	21.5	[13.1, 33.2]
<i>THC-positive and any other drug</i>	4.7	[1.7, 12.8]	6.9	[3.8, 12.0]	6.5	[2.8, 14.3]	7.7	[4.5, 13.1]	0.0	0
Antidepressants only	1.3	[0.2, 9.8]	2.5	[1.1, 5.6]	1.2	[0.3, 4.5]	0.8	[0.1, 5.9]	2.0	[0.2, 14.9]
Narcotic analgesics only	8.3	[3.7, 17.6]	5.9	[3.8, 9.0]	2.9	[1.1, 7.7]	1.8	[0.5, 5.8]	14.9	[4.3, 40.5]
Sedatives only	0.0	0	0.7	[0.2, 3.1]	1.6	[0.4, 6.4]	0.9	[0.1, 6.7]	0.0	0
Stimulants only	4.3	[1.4, 12.1]	7.2	[4.9, 10.5]	9.8	[5.2, 17.7]	5.8	[3.1, 10.8]	0.0	0
Other only	1.5	[0.2, 9.8]	0.3	[0, 2.5]	0.0	0	3.6	[1.2, 10.4]	0.0	0
More than one class	2.2	[0.3, 16.4]	2.9	[1.3, 6.3]	3.3	[1.3, 7.8]	2.9	[1.0, 7.8]	0.0	0
Total drug-positive	36.8	[25.5, 49.8]	38.5	[32.9, 44.3]	38.4	[31.9, 45.3]	36.4	[30.2, 43.1]	38.5	[21.8, 58.3]
Total drug-negative	63.2	[50.2, 74.5]	61.6	[55.7, 67.1]	61.6	[54.7, 68.1]	63.6	[56.9, 69.8]	61.6	[41.7, 78.2]
Wave 3	<i>N</i> = 112		<i>N</i> = 326		<i>N</i> = 156		<i>N</i> = 178		<i>N</i> = 31	
THC-positive	31.2	[17.6, 48.9]	22.8	[16.8, 30.3]	19.4	[12.7, 28.5]	18.6	[9.4, 33.4]	8.2	[2.2, 26.4]
<i>THC-positive only</i>	28.2	[14.4, 47.8]	13.5	[10.3, 17.6]	7.2	[2.9, 16.7]	8.0	[4.5, 13.7]	5.2	[1.5, 16.6]
<i>THC-positive and any other drug</i>	3.0	[0.9, 9.1]	9.3	[5.3, 15.8]	12.2	[7.8, 18.8]	10.7	[3.6, 27.8]	3.0	[0.5, 15.9]
Antidepressants only	0.8	[0.1, 5.6]	2.9	[1.3, 6.5]	1.2	[0.2, 5.4]	2.2	[0.9, 5.1]	0.0	0
Narcotic analgesics only	2.7	[0.7, 9.7]	2.1	[0.9, 4.9]	2.6	[0.9, 7.4]	2.5	[0.5, 11.3]	0.0	0
Sedatives only	0.0	0	0.3	[0.0, 2.2]	1.2	[0.2, 5.8]	1.5	[0.5, 4.4]	9.7	[1.2, 48.9]
Stimulants only	0.6	[0.0, 5.0]	2.5	[1.1, 5.4]	2.3	[0.8, 6.1]	3.3	[1.4, 7.4]	0.0	0
Other only	0.0	0	0.4	[0, 3.1]	0.0	0	1.7	[0.5, 5.7]	6.2	[2.2, 16.1]
More than one class	0.0	0	3.0	[1.5, 5.8]	6.8	[3.7, 12.2]	7.9	[3.7, 16.1]	3.4	[0.4, 22.7]
Total drug-positive	35.2	[21.9, 51.3]	34.0	[28.0, 40.7]	33.4	[26.0, 41.6]	37.6	[28.7, 47.4]	27.5	[12.9, 49.3]
Total drug-negative	64.8	[48.7, 78.1]	66.0	[59.3, 72.0]	66.6	[58.4, 74.0]	62.4	[52.6, 71.4]	72.5	[50.7, 87.1]

In this table, Ns are unweighted; percentages are weighted.

Column percentages may not total to 100 percent due to rounding.

Because of missing records on the demographic values, totals (N) do not match those in other tables.

THC-positive includes results from THC and hydroxy-THC.

Appendix J: Drug Class by Demographics Tables with Confidence Intervals

Table 3. Percentage of Drivers THC Positive by Drug Class and Race (Oral Fluid or Blood) (Percentages by Column)

Drug Class	Race									
	% White		% Black/African American		% Asian		% Native Alaskan		% Other/More than one	
	%	95% CI	%	95% CI	%	95% CI	%	95% CI	%	95% CI
Wave 1	N = 807		N = 59		N = 17		N = 8		N = 12	
THC-positive	13.6	[11.0, 16.9]	20.7	[11.6, 34.1]	15.5	[3.1, 51.0]	0.0	0	13.4	[2.9, 58.8]
THC-positive only	8.6	[6.5, 11.4]	9.5	[3.0, 25.7]	10.9	[1.3, 52.7]	0.0	0	13.4	[2.9, 58.8]
THC-positive and any other drug	5.0	[3.6, 6.9]	11.2	[4.6, 25.2]	4.6	[0.6, 28.3]	0.0	0	0.0	0
Antidepressants only	1.8	[1.0, 3.1]	0.5	[0.0, 4.5]	0.0	0	0.0	0	0.0	0
Narcotic analgesics only	3.0	[2.0, 4.4]	8.5	[3.8, 17.9]	0.0	0	0.0	0	0.0	0
Sedatives only	0.7	[0.3, 1.6]	3.8	[0.7, 18.3]	0.0	0	0.0	0	0.0	0
Stimulants only	9.3	[6.3, 13.7]	3.8	[0.7, 16.8]	0.0	0	0.0	0	11.4	[3.4, 72.3]
Other only	2.1	[1.2, 3.5]	0.9	[0.0, 7.4]	0.0	0	0.0	0	0.0	0
More than one class	3.0	[1.8, 5.0]	0.0	0	0.0	0	0.0	0	7.3	[1.3, 51.3]
Total drug-positive	33.5	[28.1, 39.4]	38.1	[27.2, 50.5]	15.5	[3.1, 51.0]	0.0	0	32.1	[11.4, 77.7]
Total drug-negative	66.5	[60.6, 71.9]	61.9	[49.6, 72.8]	84.6	[49.0, 96.9]	100.0	0	67.9	[26.3, 86.4]
Wave 2	N = 564		N = 65		N = 28		N = 5		N = 6	
THC-positive	20.2	[16.5, 24.5]	14.5	[7.7, 25.6]	12.6	[3.4, 37.2]	20.4	[4.2, 59.8]	35.5	[1.2, 61.9]
THC-positive only	13.0	[10.3, 16.2]	12.2	[6.4, 22.1]	12.6	[3.4, 37.2]	0.0	0	35.5	[1.2, 61.9]
THC-positive and any other drug	7.2	[4.9, 10.4]	2.3	[0.5, 9.6]	0.0	0	20.4	[4.2, 59.8]	0.0	0
Antidepressants only	1.9	[1.0, 3.6]	1.3	[0.2, 8.6]	0.0	0	14.1	[1.4, 66.4]	0.0	0
Narcotic analgesics only	5.3	[3.5, 7.9]	5.9	[2.1, 15.8]	5.1	[0.9, 25.4]	0.0	0	0.0	0
Sedatives only	0.6	[0.2, 1.8]	2.5	[0.7, 8.8]	0.0	0	0.0	0	0.0	0
Stimulants only	6.9	[5.1, 9.3]	6.6	[2.3, 17.5]	6.2	[1.2, 25.8]	0.0	0	0.0	0
Other only	1.3	[0.5, 2.7]	0.0	0	0.0	0	0.0	0	0.0	0
More than one class	3.1	[1.9, 5.0]	0.0	0	4.9	[1.0, 20.4]	0.0	0	0.0	0
Total drug-positive	39.2	[35.6, 43.1]	30.7	[19.3, 44.9]	28.7	[16.1, 45.9]	34.5	[10.4, 70.4]	35.5	[1.2, 61.9]
Total drug-negative	60.8	[56.9, 64.4]	69.3	[55.1, 80.7]	71.3	[54.1, 83.9]	65.5	[29.6, 89.6]	64.5	[19.2, 91.2]
Wave 3	N = 691		N = 58		N = 20		N = 13		N = 27	
THC-positive	18.9	[14.9, 23.6]	40.8	[27.5, 55.6]	13.8	[5.7, 29.7]	12.9	[1.9, 53.2]	20.2	[4.3, 41.7]
THC-positive only	10.1	[8.0, 12.6]	28.2	[11.4, 54.5]	13.8	[5.7, 29.7]	6.4	[1.0, 31.5]	17.4	[4.5, 44.0]
THC-positive and any other drug	8.8	[5.5, 13.8]	12.5	[4.9, 28.4]	0.0	0	6.4	[1.0, 31.5]	2.8	[1.7, 61.6]
Antidepressants only	2.3	[1.3, 4.3]	1.0	[0.1, 8.3]	0.0	0	0.0	0	0.0	0
Narcotic analgesics only	2.8	[1.7, 4.7]	0.0	0	0.0	0	0.0	0	0.0	0
Sedatives only	1.1	[0.5, 2.6]	0.8	[0.0, 8.0]	0.0	0	0.0	0	0.0	0
Stimulants only	2.2	[1.4, 3.7]	3.6	[1.0, 12.7]	0.0	0	0.0	0	9.0	[0.9, 21.4]
Other only	1.0	[0.5, 2.1]	0.0	0	0.0	0	0.0	0	0.0	0
More than one class	4.9	[3.2, 7.3]	4.3	[0.8, 20.3]	0.0	0	0.0	0	9.0	[0.7, 33.0]
Total drug-positive	33.2	[28.5, 38.3]	50.5	[36.5, 64.5]	13.8	[5.7, 29.7]	12.9	[1.9, 53]	38.2	[12.3, 62.5]
Total drug-negative	66.8	[61.7, 71.5]	49.5	[35.5, 63.5]	86.2	[70.3, 94.3]	87.1	[46.8, 98.1]	61.8	[48.6, 86.7]

In this table, Ns are unweighted; percentages are weighted.

Column percentages may not total to 100 percent due to rounding.

Because of missing records on the demographic values, totals (N) do not match those in other tables.

THC-positive includes results from THC and hydroxy-THC.

Table 4. Percentage of Drivers THC Positive by Drug Class and Ethnicity (Oral Fluid or Blood)
(Percentages by Column)

Drug Class	Ethnicity			
	% Hispanic	95% CI	% Non- Hispanic	95% CI
Wave 1	<i>N</i> = 160		<i>N</i> = 747	
THC-positive	11.9	[7.4, 18.8]	15.1	[11.9, 19.1]
<i>THC-positive only</i>	8.7	[5.5, 13.4]	8.7	[6.3, 12.0]
<i>THC-positive and any other drug</i>	3.3	[1.1, 9.2]	6.4	[4.1, 9.9]
Antidepressants only	3.0	[0.9, 9.4]	1.3	[0.6, 2.6]
Narcotic analgesics only	1.2	[0.3, 4.1]	3.8	[2.6, 5.4]
Sedatives only	2.2	[0.6, 7.6]	0.8	[0.2, 2.4]
Stimulants only	8.6	[4.6, 15.7]	8.4	[5.5, 12.5]
Other only	0.4	[0.0, 3.6]	2.2	[1.3, 3.8]
More than one class	3.4	[0.7, 15.1]	2.5	[1.4, 4.5]
Total drug-positive	30.7	[22.3, 40.6]	34.0	[27.8, 40.8]
Total drug-negative	69.3	[59.4, 77.7]	66.0	[59.2, 72.2]
Wave 2	<i>N</i> = 118		<i>N</i> = 547	
THC-positive	14.7	[9.1, 22.7]	20.7	[17.0, 24.9]
<i>THC-positive only</i>	12.5	[7.4, 20.4]	13.4	[10.2, 17.4]
<i>THC-positive and any other drug</i>	2.2	[0.6, 7.6]	7.3	[5.0, 10.5]
Antidepressants only	3.4	[1.0, 10.2]	1.5	[0.7, 3.0]
Narcotic analgesics only	1.7	[0.4, 6.9]	6.1	[4.4, 8.2]
Sedatives only	0.0	0	1.0	[0.4, 2.3]
Stimulants only	2.0	[0.6, 6.4]	7.8	[5.3, 11.3]
Other only	0.0	0	1.2	[0.5, 2.7]
More than one class	2.1	[0.6, 7.2]	2.9	[1.7, 4.8]
Total drug-positive	23.7	[17.5, 31.4]	41.0	[37.4, 44.7]
Total drug-negative	76.3	[68.6, 82.5]	59.0	[55.3, 62.6]
Wave 3	<i>N</i> = 121		<i>N</i> = 683	
THC-positive	14.0	[7.7, 24.1]	23.3	[18.4, 28.9]
<i>THC-positive only</i>	8.3	[3.4, 19.1]	13.6	[9.4, 19.3]
<i>THC-positive and any other drug</i>	5.7	[2.5, 12.5]	9.6	[5.5, 16.4]
Antidepressants only	1.8	[0.5, 6.0]	2.0	[1.1, 3.7]
Narcotic analgesics only	0.6	[0.0, 4.0]	2.6	[1.5, 4.2]
Sedatives only	0.7	[0.0, 5.6]	1.1	[0.4, 2.6]
Stimulants only	2.4	[0.8, 6.8]	2.2	[1.3, 4.0]
Other only	0.0	0	0.9	[0.4, 2.0]
More than one class	6.0	[2.1, 15.7]	4.2	[2.6, 6.6]
Total drug-positive	25.5	[17.4, 35.9]	36.3	[30.9, 41.9]
Total drug-negative	74.5	[64.1, 82.6]	63.7	[58.1, 69.1]

In this table, *N*s are unweighted; percentages are weighted.

Column percentages may not total to 100 percent due to rounding.

Because of missing records on the demographic values, totals (*N*) do not match those in other tables.

THC-positive includes results from THC and hydroxy-THC.

DOT HS 812 299A
July 2016



U.S. Department of Transportation
**National Highway Traffic Safety
Administration**

