

The Involvement of Marijuana in California Fatal Motor Vehicle Crashes 1998 -2008

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Abstract

California data on drivers involved in passenger vehicle fatal crashes using Marijuana were analyzed to determine the impact on traffic safety and to provide information on the possible impact of an initiative, the Tax and Regulate Cannabis Initiative or “TC2010” which is on the California ballot in November 2010 to reform and partially legalize Marijuana.

A total of 1240 persons were killed in the last five years in fatal motor vehicle crashes involving Marijuana. 230 were killed in 2008. Use has increase steadily in the last ten years and is now at 5.5% in fatal passenger vehicle crashes. The use in single vehicle fatal crashes where most drivers are tested shows an involvement rate of 8.3%.

The largest increases occurred in the 5 years following the establishment of the Medical Marijuana Program in January 2004. For the five years following legalization there were 1240 fatalities in fatal crashes, compared to the 631 fatalities for the five years prior, for an increase of almost 100%. In 2008 there were 8 counties where more than 16% of the drivers in fatal crashes tested positive for Marijuana. Five of the 8 counties had rates over 20%

Based on this experience, a use rate of 16% to 20% is very likely. A rate increase to only 16%, would result in 670 fatalities, and at 20% we would have about 840 fatalities annually. The 20% level would be more than triple the present level of 230 fatalities in 2008. At these levels, Marijuana would rival alcohol at 17.9%, as the top cause of traffic fatalities.

If “TC2010” passes, tax income on Marijuana is estimated at \$1.4 billion annually compared to an estimated \$4 billion or more economic loss from Marijuana related fatal crashes.

Over 80% of the Marijuana drivers are male, with a median age of 25. In addition, about half (48%) of the drivers using Marijuana also were legally intoxicated. About 75% of the drivers that used Marijuana did not use any other drug. About 1.2 fatalities were reported for each Marijuana involved driver.

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The Involvement of Marijuana in California Fatal Motor Vehicle Crashes, 1998 -2008

Purpose of Study

The purpose of this study is to assess the trend and involvement of Marijuana and other drugs in fatal motor vehicle crashes in California. The major focus is on Marijuana since an initiative, the Tax and Regulate Cannabis Initiative “TC2010” is on the California ballot in November 2010 to reform and partially legalize Marijuana.

According to California NORML [\[1\]](#), the initiative would decriminalize Marijuana at the state level, while giving local, county, and city governments the power to legalize, tax and regulate production. Further, the initiative would make it legal for adults 21 and older to possess one ounce of Marijuana in the privacy of their homes and to cultivate up to 25 square feet of garden space for personal use. Current medical Marijuana laws would not be affected, so patients could still grow and possess as much as necessary for their medical needs. Local governments (state or county) would be able to regulate, license, and authorize commercial cultivation, sale, and transport for adults over 21. The initiative is a partial legalization measure since it would not legalize at the state level.

If this measure passes, tax income will grow and it is expected that the use of Marijuana will grow. According to the California Board of Equalization [\[2\]](#), the state might generate \$1.4 billion in taxes if Marijuana is legal and taxed. They did not comment on the impact on traffic fatalities which would result from more people using Marijuana and driving.

“TC2010” will not change the California law that prohibits Marijuana use when driving. California Vehicle Code, Section 23152, states that it is unlawful for any person who is under the influence of any alcoholic beverage or drug, or under the combined influence of any alcoholic beverage and drug, to drive a vehicle.

Background

Marijuana use in California has many advocates and detractors. The CA Department of Motor Vehicles website describes the effect of Marijuana by saying that it lessens coordination, distorts sense of distance, and causes hallucinations, panic, depression, and fear. Other sources describe the positive effects of Marijuana such as a feeling of euphoria, feeling of well-being, relaxation, and stress reduction. With these characteristics known, the use of Marijuana in California is increasing and its involvement in fatal motor vehicle crash is increasing.

The effect of Marijuana use in fatal motor vehicle crashes is not well documented. One of the first studies published in 1971 in the Journal Science [\[3\]](#), studied the effect of Marijuana and alcohol using driver simulators. The study showed a negligible effect of Marijuana on driver simulator performance. This was in sharp contrast to a statistically significant decrease in performance of the same subjects when they had a blood alcohol level of 0.10%. In a new study just published in the Journal of Psychoactive Drugs [\[4\]](#) no differences were found during the baseline driving segment or collision avoidance scenarios. This confirmed the 1971 study finding that persons under the influence could drive safely if highly motivated in simulated driving.

Despite the results found in well designed and executed research studies, Marijuana use in actual driving which results in fatal crashes has become a issue of concern in traffic safety. What is different in the actual driving environment is the often use of Marijuana in combination with alcohol and other drugs, and the complexity of the real world of driving.

Trend Data for Marijuana and Alcohol Use in Passenger Vehicle Fatal Crashes

The following charts show a ten year trend of the percentage of Marijuana and alcohol involvement for all drivers in passenger vehicle [\[5\]](#) fatal crashes where the use was known. The NHTSA Fatality Analysis Reporting System is the source of the data which collects data on all traffic fatalities. Up to three tests of drug use can be reported for each driver in a fatal crash, along with the alcohol test results. Most of the test results for drugs are from a blood test.

Since this data is for all drivers there are a high percentage of drivers that were not tested for alcohol or drugs. In 2008, only 43% of the drivers were tested, while in single vehicle fatal crashes 68% were tested and of fatally injured drivers, 96% were tested. Therefore the actual involvement is probably higher. NHTSA estimates that the overall percentage of drivers with blood alcohol concentrations (BACs) of 0.08+ is about 22% considering the crash factors where testing was unknown. In the chart below we have known use of alcohol 08+ at 17.9%. For Marijuana and other drug involvement there is no estimate available based on the characteristics of fatal crashes where drug tests were not conducted.

In Chart 1, known Marijuana use in passenger vehicle fatal crashes shows a steady upward trend in the past ten years as does alcohol 08+ drivers. Since about half of Marijuana users had a BAC of 0.08 or higher, the trend is also shown on the chart. Note that since 2004 the percentage of drivers using Marijuana and alcohol 08+ moved up about 2 percentage points. Note that California SB 420, allowing medical Marijuana dispensaries, became effective on Jan 1, 2004. This is probably the explanation for the jump in the percentage of Marijuana use in passenger vehicle fatal crashes.

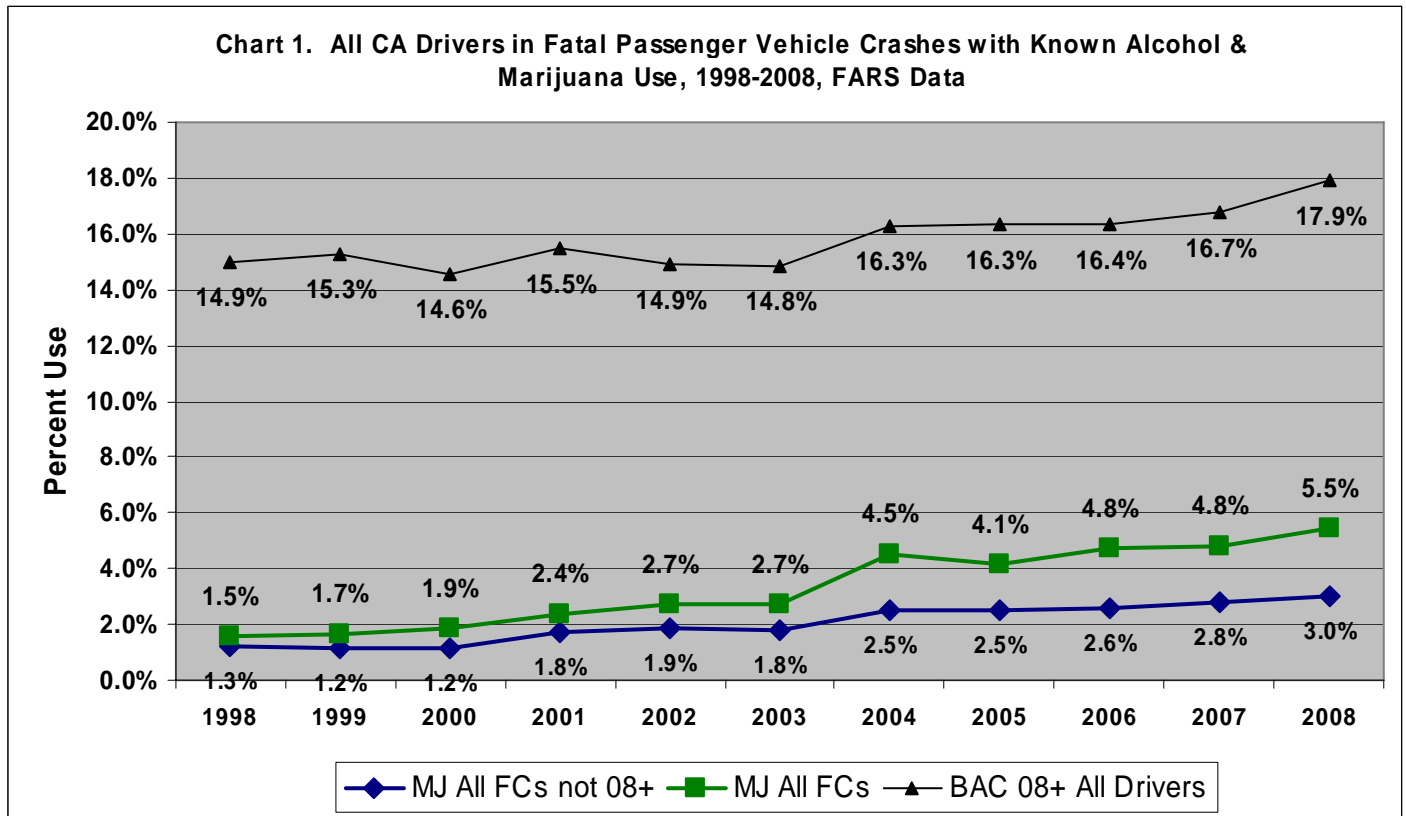


Table 1 shows the number of drivers involved in the groups in the Chart 1 above.

	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
Total Drivers	4067	3912	4288	4513	4697	4826	4636	4725	4667	4390	3638
Alcohol 08+	608	598	625	700	701	715	756	771	764	735	652
Percent	14.9%	15.3%	14.6%	15.5%	14.9%	14.8%	16.3%	16.3%	16.4%	16.7%	17.9%
Marijuana	63	65	80	108	127	130	208	195	222	211	200
Percent	1.5%	1.7%	1.9%	2.4%	2.7%	2.7%	4.5%	4.1%	4.8%	4.8%	5.5%
MJ Not 008+	51	46	50	79	88	85	117	119	122	124	110
Percent	1.3%	1.2%	1.2%	1.8%	1.9%	1.8%	2.5%	2.5%	2.6%	2.8%	3.0%

Trend Data for Marijuana and Alcohol Use in Single Passenger Vehicle Fatal Crashes

A better estimate of alcohol and Marijuana involvement in fatal crashes may be found in data for drivers in single passenger vehicles. Drug and alcohol testing is much more complete in single vehicles fatal crashes and gives a better picture of drug and alcohol involvement. In 2008, 68% of all drivers in single passenger vehicles fatal crashes were tested, and 96% of the fatal drivers. In all passenger vehicle fatal crashes the overall percent of drivers tested for drugs was only 43%.

Chart 2 below shows the trend of known alcohol and major drug groups for drivers in single passenger vehicle fatal crashes. Known alcohol 08+ is at 28.8% in 2008 compared to 8.3% for Marijuana. Drivers with stimulant were at 5.9%, narcotics at 2.6% and depressants at 1.6%. Alcohol has moved up steadily from a low of 23.5% in 1999 when the “Friends don’t let friends drive drunk” campaign ended.

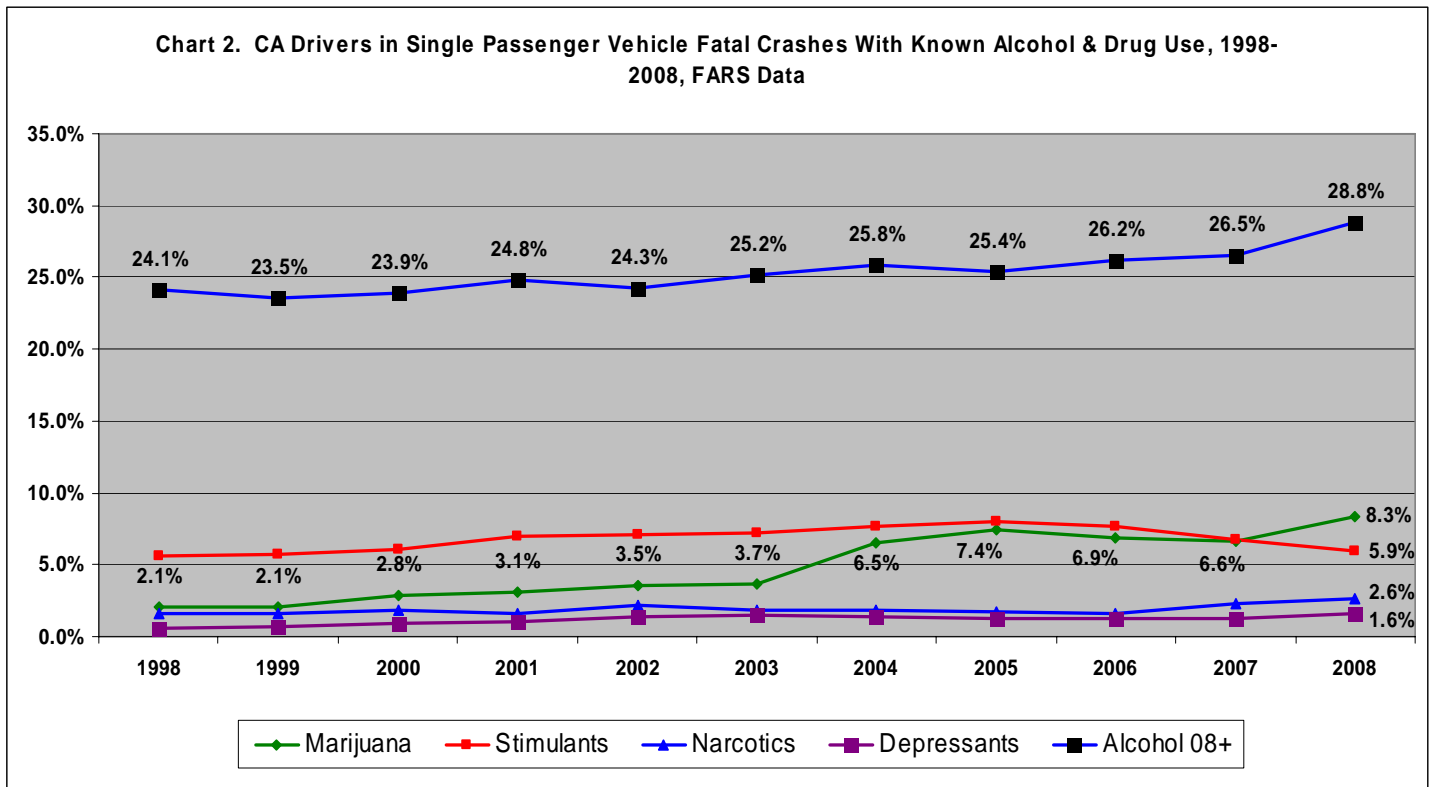


Table 2 shows the values for the groups in Chart 2.

Group	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
Total Drivers	1704	1744	1688	1860	1890	1884	1866	1927	1866	1763	1518
Alcohol08+	411	410	403	461	459	474	482	490	488	468	437
Percent	24.1%	23.5%	23.9%	24.8%	24.3%	25.2%	25.8%	25.4%	26.2%	26.5%	28.8%
Marijuana	36	36	48	58	66	69	122	143	129	117	126
Percent	2.1%	2.1%	2.8%	3.1%	3.5%	3.7%	6.5%	7.4%	6.9%	6.6%	8.3%
Stimulants	95	100	103	129	135	136	143	154	142	118	90
Percent	5.6%	5.7%	6.1%	6.9%	7.1%	7.2%	7.7%	8.0%	7.6%	6.7%	5.9%
Narcotics	27	27	31	30	40	34	34	33	30	41	40
Percent	1.6%	1.5%	1.8%	1.6%	2.1%	1.8%	1.8%	1.7%	1.6%	2.3%	2.6%
Depressants	10	12	15	19	26	29	25	25	23	22	24
Percent	0.6%	0.7%	0.9%	1.0%	1.4%	1.5%	1.3%	1.3%	1.2%	1.2%	1.6%

Fatalities as a Result of Marijuana in Fatal Crashes

More than a thousand persons were killed on California highways in the past 5 years where drivers had used Marijuana. 1036 drivers with known Marijuana use in fatal crashes were associated with 1240 fatalities. Further, the ratio of fatalities to drivers is statistically higher for Marijuana related fatal crashes than for fatal crashes for drivers at BACs of 0.08+, suggesting that the combination of Marijuana and alcohol is especially lethal since about half of the Marijuana drivers had BACs of 0.08+. About 15% of the fatal crashes resulted in 2 or more fatalities each.

Table 3. CA Drivers in Passenger Vehicle Fatal Crashes with Known Marijuana Use and Number of Persons Killed, 2004-2008, FARS Data								
Group	Number of Fatalities In Crash					Total	MJ Ratio of Fats /Drivers	08+ Ratio of Fats /Drivers
	1	2	3	4	5			
2004								
Drivers	181	23	2	2	0	208		
Fatalities	181	46	6	8	0	241	1.16	1.14
2005								
Drivers	163	23	7	1	1	195		
Fatalities	163	46	21	4	5	239	1.22	1.12
2006								
Drivers	183	28	9	1	1	222		
Fatalities	183	56	27	4	5	275	1.24	1.18
2007								
Drivers	181	21	5	3	1	211		
Fatalities	181	42	15	12	5	255	1.21	1.17
2008								
Drivers	179	16	2	2	1	200		
Fatalities	179	32	6	8	5	230	1.15	1.13
Total 2004-08								
Drivers	883	109	25	9	4	1036		
Fatalities	883	218	75	36	20	1240	1.20**	1.15

**MJ Ratio statistically higher than 08+ Alcohol (p=.0000)

California Use of Drugs and Alcohol, 2007 SAMSA Survey

The U.S. Substance Abuse & Mental Health Services Administration (SAMSA) has been surveying state use of alcohol and drugs for many years. A portion of the 2007 SAMSA survey for California is below.

The 2007 level of in the “Past Month Marijuana Use” of 6.5 % is close to the known use of Marijuana in all passenger vehicle fatal crashes of 6.6 % and in single vehicle fatal crashes of 8.3 %. Also, cocaine (a stimulant) was at 2.5 % vs. 6.7% in single vehicle fatal crashes. “Past Month Binge Alcohol Use” at 23% is similar to that of known alcohol 08+ use in fatal crashes.

Group	SAMSA Use Survey	Use in Single Vehicle FCs '07
Past Month Illicit Drug Use	9.0%	16.9%
Past Month Marijuana Use	6.5%	6.6%
Past Month Use of Illicit Drugs Other Than Marijuana	3.9%	10.3%
Past Year Cocaine Use	2.5%	6.7%
Past Month Binge Alcohol Use	23.0%	28.8%

Marijuana Driver Sex & Fatal Crash Hour, 1998, 2003, & 2008

The hour of Marijuana fatal crashes has gotten earlier since 1998. The median crash hour is now at 11pm, the same as for alcohol 08+ fatal crashes. Over 80+% of the drivers are male with 83.3% male in 2008.

Fatal Crash Hour	1998			2003			2008		
	Male	Female	Total	Male	Female	Total	Male	Female	Total
6 am to 9 am	1	1	2	2	1	3	9	3	12
9 am to Noon	2	0	2	0	0	0	3	1	4
Noon to 3 pm	5	0	5	3	1	4	6	1	7
3 pm to 6 pm	2	1	3	8	4	12	7	0	7
6 pm to 9 pm (m=11pm)	3	0	3	5	3	8	19	2	21
9 pm to Midnight	6	2	8	12	1	13	21	2	23
Midnight to 3 am	3	2	5	10	3	13	26	6	32
3 am to 6 am	6	1	7	10	2	12	11	5	16
Unknown	1	0	1	4	0		3	1	
Total	29	7	36	54	15	69	105	21	126
Percent Male	80.6%			78.3%			83.3%		

Marijuana Driver Age: 1998, 2003, & 2008

As Marijuana use becomes more mainstream, median driver age has increased. In 2008 the median age was about 25 compared to 19 in 1998. Marijuana and alcohol 08+ was highest for age 21-24 with 67.7% of the Marijuana drivers at alcohol 08+. The median age for the comparable group of drivers with known alcohol 08+ was age 30.

Table 6. CA Drivers in Single Passenger Vehicle Fatal Crashes by Age with Marijuana and Alcohol Use 1998, 2003,2008, FARS Data						
2008						
Driver Age Group	MJ	% of All Drivers	01+	% Drinking	08+	% 08+
16-20	29	23.0%	17	58.6%	12	41.4%
21-24	31	24.6%	22	71.0%	21	67.7%
25-34 (med=25.8)	34	27.0%	18	52.9%	16	47.1%
35-44	17	13.5%	8	47.0%	7	41.2%
45-54	11	8.7%	4	36.4%	4	36.4%
55-64	3	2.4%	0	0.0%	0	0.0%
65+	1	0.8%	1	100.0%	1	100.0%
Total	126	100.0%	70	56.5%	61	49.2%
2003						
Driver Age Group	MJ		01+		08+	
16-20	23	33.3%	16	69.6%	10	43.5%
21-24 (22.8)	19	27.5%	14	73.7%	11	57.9%
25-34	14	20.3%	8	57.1%	7	50.0%
35-44	7	10.1%	3	42.9%	2	28.6%
45-54	4	5.8%	1	25.0%	1	25.0%
55-64	1	1.4%	1	100.0%	1	100.0%
65-69	1	1.4%	0	0.0%	0	0.0%
Total	69	100.0%	43	62.3%	32	46.4%
1998						
Driver Age Group	MJ		01+		08+	
16-20 (19.1)	22	57.9%	3	13.6%	2	9.1%
21-24	6	15.8%	4	66.7%	2	33.3%
25-34	5	13.2%	2	40.0%	2	40.0%
35-44	2	5.3%	1	50.0%	1	50.0%
45-54	2	5.3%	1	50.0%	0	0.0%
55-64	0	0.0%	0	0.0%	0	0.0%
65+	1	2.6%	1	100.0%	1	100.0%
Total	36	100.0%	12	31.6%	8	21.1%

Use of Drugs in Combination and with Alcohol in Fatal Crashes

The following tables show the 2008 data for the major drug groups of Marijuana, narcotics, depressants, and stimulants. Alcohol 08+ and drugs was the highest with Marijuana at 48%, followed by alcohol with stimulants at 41%. Marijuana and alcohol 08+ only, with no other drug, was at 51% (48 of 94 drivers). Combination drug use was highest for depressants at 75% and narcotics at 60%, Marijuana at 25% and narcotics at 29% had the lowest combination drug use. Single drug use was highest for Marijuana at 75% followed by stimulants at 71%

Table 7. 2008 Drug Use of CA Drivers in Single Passenger Vehicle Fatal Crashes, Marijuana Type Drug (600)			
Drug Class	Total	08+	Comments
Marijuana (600)	94	48	94/126 = 75% Marijuana only
600 -100	6	2	6/126 = 5% with Narcotics
600 -300	4	1	4/126 = Depressants
600-400	18	9	18/126 =14.3% with Stimulants
600- 500	1	1	
600-300,400	1	0	
600-300,500	1	0	
600-400,500	1	0	
Total	126	61	32 /126 = 25% Combo Drugs
Percent of 600	100.00%	48.4%	48% = Alcohol 08+
Percent of Total Drivers (1,518)	8.3%		Median Age 25
100= Narcotics; 300= Depressant; 400= Stimulant; 500= Hallucinogen; 600= Marijuana			

Narcotics were used alone only 40% of the time. In combination, narcotics were most likely to be used with depressants.

Table 8. 2008 Drug Use of CA Drivers in Single Passenger Vehicle Fatal Crashes, Narcotic Type Drug (100)			
Drug Class	Total	08+	Comments
100	16	5	16/40 = 40% Narcotics only
100-300	11	2	11/40 = 28% with Depressants
100-400	6	2	6/40 = 15% with Stimulants
100-600	6	2	6/40 = 15% with Marijuana
100-200-400	1	0	
Total	40	11	24/40 = 60% Combo drugs
Percent of 100	100.0%	28%	28% = Alcohol 08+
Percent of Total Drivers (1,518)	2.6%		Median age 40
100= Narcotics; 300= Depressant; 400= Stimulant; 500= Hallucinogen; 600= Marijuana			

Depressant use was most with narcotics at 28%, Marijuana at 25 % and alcohol 08+ at 13%. Of the 6 Depressant use only drivers, none had alcohol 08+.

Table 9. 2008 Drug Use of CA Drivers in Single Passenger Vehicle Fatal Crashes, Depressant Type Drug (300)			
Drug Class	Total	08+	Comments
300	6	0	6/24 = 25% Depressant only
300-100	11	2	11/40 = 28% with Narcotics
300-500	1	0	
300-600	4	1	6/24 =25% with Marijuana
300-400,600	1	0	
300-500,600	1	0	
Total	24	3	18/24 = 75% Combo Drugs
Percent of 100	100.00%	13%	13% = Alcohol 08+
Percent of Total Drivers (1,518)	1.6%		Median age 32

100= Narcotics; **300=** Depressant; **400=** Stimulant; **500=** Hallucinogen; **600=** Marijuana

Use of stimulants alone is at 71%. In combination, it is most common with Marijuana at 21% and alcohol at 41%

Table 10. 2008 Drug Use of CA Drivers in Single Passenger Vehicle Fatal Crashes, Stimulant Type Drug (400)			
Drug Class	Total	08+	
400	64	25	64/90=71% Stimulant only
400-100	6	1	
400-300	1	0	
400-500	0	0	
400-500,600	1	0	
400-600	18	11	19/90 = 21% w Marijuana
Total	90	37	26/90 = 29% Combo Drugs
Percent of 100	100.00%	41.0%	Alcohol 08+
Percent of Total Drivers (1,518)	5.9%		Median age 32

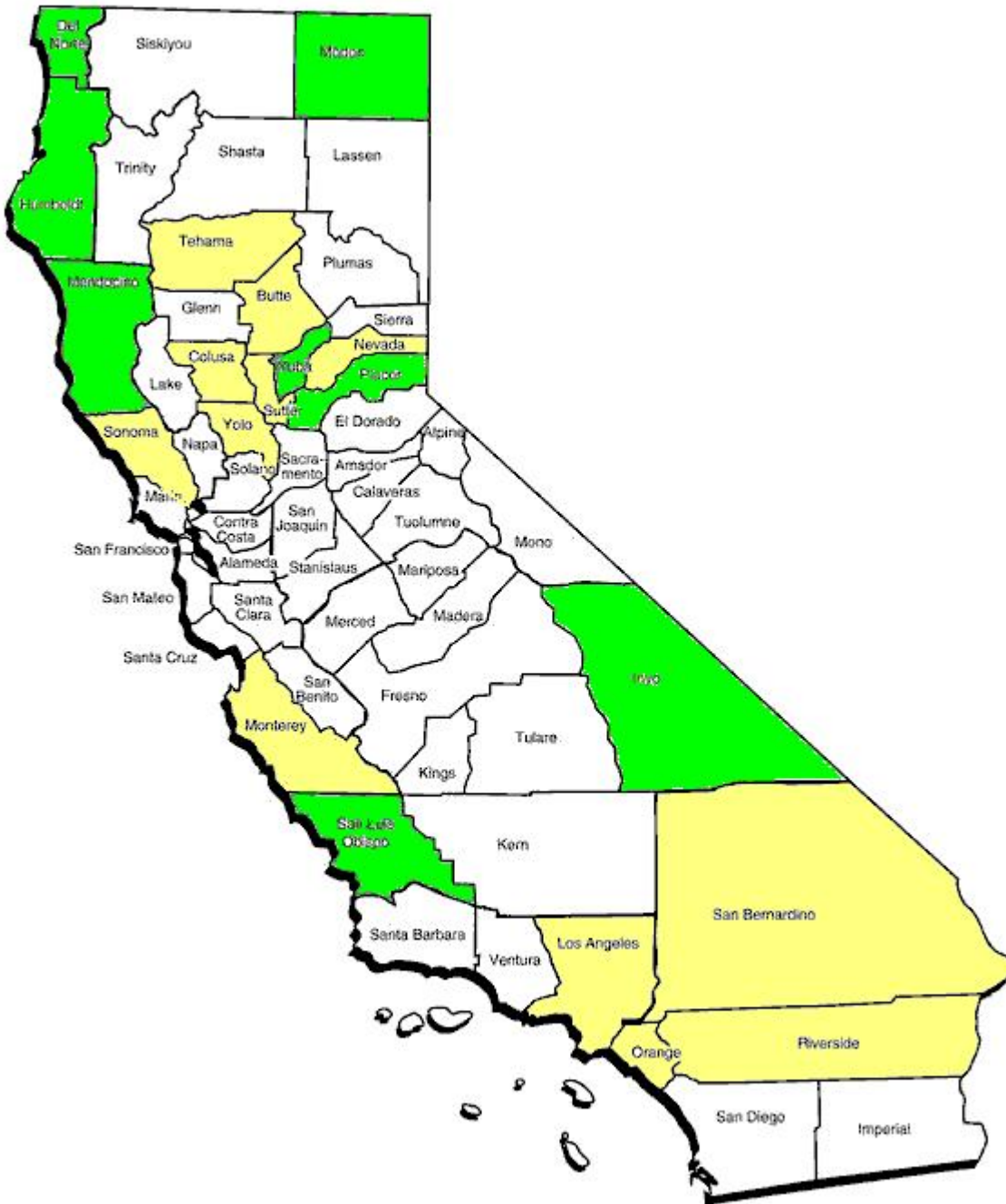
100= Narcotics; **300=** Depressant; **400=** Stimulant; **500=** Hallucinogen; **600=** Marijuana

Marijuana Use by California County, 2008

Table 11 shows known Marijuana and alcohol 08+ use of drivers by county in 2008 passenger vehicle fatal crashes. The table lists the counties with the highest percentage of use first. Note that 8 counties have use of 16% or more and of those counties, 5 have 20% or higher Marijuana use. Also, in the 8 highest counties, Marijuana use is approaching the alcohol 08+ level. The yellow shaded counties all have Marijuana use above the state average of 5.5%

County	# of Drivers	# MJ	% MJ	.08+	County	# of Drivers	# MJ	% MJ	.08+
MODOC	4	2	50.0%	0.0%	IMPERIAL	43	1	2.3%	9.3%
DEL NORTE	9	2	22.2%	22.2%	TULARE	92	2	2.2%	12.0%
YUBA	14	3	21.4%	35.7%	VENTURA	75	1	1.3%	22.7%
MENDOCINO	29	6	20.7%	31.0%	SANTA CLARA	113	1	0.9%	14.2%
SAN LUIS OBISPO	35	7	20.0%	22.9%	KERN	116	1	0.9%	9.5%
INYO	11	2	18.2%	18.2%	ALPINE	1	0	0.0%	100.0%
PLACER	23	4	17.4%	30.4%	AMADOR	5	0	0.0%	20.0%
HUMBOLDT	25	4	16.0%	24.0%	CALAVERAS	8	0	0.0%	37.5%
COLUSA	8	1	12.5%	12.5%	CONTRA COSTA	66	0	0.0%	15.2%
BUTTE	31	3	9.7%	9.7%	GLENN	9	0	0.0%	44.4%
SUTTER	21	2	9.5%	19.0%	LASSEN	12	0	0.0%	0.0%
RIVERSIDE	277	21	7.6%	23.1%	MADERA	38	0	0.0%	15.8%
NEVADA	14	1	7.1%	7.1%	MARIN	6	0	0.0%	33.3%
ORANGE	196	14	7.1%	17.3%	MARIPOSA	3	0	0.0%	0.0%
SONOMA	42	3	7.1%	23.8%	MERCED	56	0	0.0%	14.3%
SAN BERNARDINO	310	22	7.1%	18.7%	MONO	2	0	0.0%	50.0%
YOLO	29	2	6.9%	31.0%	NAPA	15	0	0.0%	33.3%
LOS ANGELES	782	53	6.8%	15.2%	PLUMAS	3	0	0.0%	0.0%
TEHAMA	15	1	6.7%	26.7%	SAN BENITO	3	0	0.0%	33.3%
MONTEREY	47	3	6.4%	27.7%	SAN FRANCISCO	34	0	0.0%	8.8%
KINGS	34	2	5.9%	14.7%	SAN JOAQUIN	92	0	0.0%	17.4%
SAN DIEGO	261	14	5.4%	20.3%	SAN MATEO	47	0	0.0%	12.8%
SANTA BARBARA	38	2	5.3%	39.5%	SANTA CRUZ	29	0	0.0%	27.6%
ALAMEDA	98	5	5.1%	8.2%	SHASTA	21	0	0.0%	9.5%
FRESNO	149	7	4.7%	22.8%	SIERRA	4	0	0.0%	0.0%
STANISLAUS	43	2	4.7%	27.9%	SISKIYOU	5	0	0.0%	60.0%
LAKE	23	1	4.3%	13.0%	SOLANO	40	0	0.0%	15.0%
SACRAMENTO	97	4	4.1%	13.4%	TRINITY	6	0	0.0%	0.0%
EL DORADO	28	1	3.6%	17.9%	TUOLUMNE	1	0	0.0%	0.0%
					Total	3,638	200	5.5%	17.9%

The green shaded counties in the map below map are the 8 counties with 16% or Marijuana use in 2008. Note that Mendocino County is the prime growing area for Marijuana. The yellow shaded counties have driver Marijuana use above the state average of 5.5%



State Marijuana Use in Fatal Crashes, 2008

Table 12 shows 2008 Marijuana and alcohol use in passenger vehicle fatal crashes by state. Twelve states (noted in italics) had laws allowing Medical Marijuana before 2008. Two additional states also have laws: Michigan in 2008 and New Jersey in 2010. Ten of the 13 states allowing Medical Marijuana have above average Marijuana use in fatal crashes. The data is presented to show how high the Marijuana involvement is at the present time in states where no state has totally legalized Marijuana. Note that 13 states have a higher Marijuana use rate in 2008 than California.

The New Hampshire and Vermont Marijuana rate is close to that for alcohol 08+ while Alaska's Marijuana rate is above their alcohol 08+ rate.

States at or above U.S. Average					States below U.S. Average				
State	Number of Drivers	Number with MJ	Percent MJ	Percent 08+	State	Number of Drivers	Number with MJ	Percent MJ	Percent 08+
N. Hampshire	149	21	14.1%	18.8%	Virginia	901	30	3.3%	15.2%
<i>Montana '04</i>	210	29	13.8%	31.0%	Georgia	1649	54	3.3%	13.5%
<i>Alaska '98</i>	70	9	12.9%	4.3%	Pennsylvania	1534	48	3.1%	17.9%
<i>Vermont '04</i>	88	9	10.2%	11.4%	Texas	3516	110	3.1%	16.0%
<i>Washington '98</i>	554	54	9.7%	22.6%	Massachusetts	365	11	3.0%	17.5%
<i>Hawaii '00</i>	104	9	8.7%	25.0%	Minnesota	486	14	2.9%	17.5%
Indiana	847	71	8.4%	16.2%	<i>Rhode Island '06</i>	70	2	2.9%	18.6%
South Carolina	938	73	7.8%	22.3%	<i>New Jersey '10</i>	644	18	2.8%	14.6%
Ohio	1257	87	6.9%	17.6%	Florida	3209	87	2.7%	15.1%
Missouri	997	69	6.9%	19.0%	Delaware	124	3	2.4%	20.2%
Wyoming	135	9	6.7%	34.1%	Tennessee	1113	25	2.2%	7.8%
<i>Nevada '00</i>	346	23	6.6%	19.7%	Wisconsin	665	13	2.0%	21.5%
South Dakota	110	7	6.4%	28.2%	Nebraska	217	3	1.4%	18.0%
<i>California '04</i>	3638	200	5.5%	17.9%	Louisiana	952	11	1.2%	17.8%
Illinois	1117	60	5.4%	20.7%	Connecticut	272	2	0.7%	16.2%
New York	1331	63	4.7%	9.1%	Iowa	429	2	0.5%	11.4%
<i>Oregon '98</i>	415	18	4.3%	21.9%	Maryland	661	3	0.5%	13.0%
Idaho	232	10	4.3%	25.0%	Oklahoma	788	3	0.4%	20.3%
<i>Michigan '08</i>	1145	49	4.3%	14.1%	Utah	272	1	0.4%	11.4%
West Virginia	366	15	4.1%	18.3%	North Carolina	1531	5	0.3%	15.9%
<i>Colorado '00</i>	551	22	4.0%	16.3%	<i>New Mexico '07</i>	342	1	0.3%	15.5%
Arkansas	602	24	4.0%	19.8%	Mississippi	850	2	0.2%	8.6%
Arizona	925	36	3.9%	14.8%	Alabama	1039	2	0.2%	14.9%
Kentucky	858	32	3.7%	12.6%	D.C.	31	0	0.0%	6.5%
Kansas	381	14	3.7%	22.0%	<i>Maine '99</i>	161	0	0.0%	19.3%
States in RED and italics have laws allowing Medical Marijuana in 2008					North Dakota	96	0	0.0%	32.3%
					Total	39283	1463	3.7%	16.4%

How high will Marijuana Fatalities go?

How high the Marijuana use will be in California if “TC2010” passes depends heavily on the availability and social acceptability of Marijuana and the implementation of the new law. In no state has Marijuana use been legalized to the extent that “TC2010” would allow, and no one has predicted that the use of Marijuana will decline.

We already have evidence of higher use at the present time in other states and in California counties. And we do have evidence that a change in availability results in increased fatalities. In California, for the five years since the Medical Marijuana Program (SB 420) was established in January 2004^[6] we had 1036 drivers (1240 fatalities) in fatal crashes, compared to the 510 drivers (631 fatalities) for the five years before. An increase of about 100%.

Information on the present Marijuana use in California counties can give us an idea of what is possible in jurisdictions where Marijuana availability and involvement in fatal crashes is already at a high level without a law change. In 2008 the known use of Marijuana in passenger vehicle fatal crashes was at 5.5% (See Table 1 on Page 2). At the same time, the top 5 counties had an involvement rate of 20% or more, and 8 counties had a rate of 16% or more (Table 13). Further, Mendocino County alone had about 18% of their drivers in fatal crashes with known Marijuana use in the last four years.

County	Number of Drivers	Number Using Marijuana	Percent Marijuana Use	Percent Alcohol .08+
MODOC	4	2	50.0%	0.0%
DEL NORTE	9	2	22.2%	22.2%
YUBA	14	3	21.4%	35.7%
MENDOCINO	29	6	20.7%	31.0%
SAN LUIS OBISPO	35	7	20.0%	22.9%
INYO	11	2	18.2%	18.2%
PLACER	23	4	17.4%	30.4%
HUMBOLDT	25	4	16.0%	24.0%

Based on this experience, a use rate of 20% is very likely. A 20% involvement rate would result in about 727 drivers in fatal crashes and 836 persons killed. This is more than triple (actually 3.6 times) the present level of 200 drivers and 230 fatalities in 2008. If the involvement increased to only 16%, the level experienced by the lowest of the top 8 counties, we would have 581 drivers involved and 669 fatalities each year.

Also note that in the 8 counties, Marijuana use is almost as high as alcohol 08+. These data suggest Marijuana involvement in fatal crashes could easily rival alcohol as the top cause of traffic fatalities since in California known alcohol 08+ is at 17.9% and 746 fatalities.

Higher Marijuana use in other states strengthens the argument that use will go higher if “TC2010” passes. Table 12 showed 13 states already have a higher Marijuana use rate in 2008 than California and 5 states with a Marijuana use rate of 11.4%, twice the level of California at 5.5%. This shows that the use and availability is already quite high elsewhere. Note that 4 of the 5 highest states are states allowing Medical Marijuana.

Conclusion: Cost of Lives Lost if “TC2010” Passes

The CA Board of Equalization ^[2] estimates that a tax income of \$1.4 billion yearly could be expected if “TC2010” passes. This tax benefit is small compared to the economic loss, if it passes.

The National Highway Traffic Safety Administration (NHTSA) estimates a value of a life lost in a traffic fatality at \$6.1 million ^[7]. If the Marijuana involvement increased to only 16% and 668 lives lost, the economic loss would be more than \$4 billion. At an involvement rate of 20% and 836 lives lost, the economic loss would be more than \$5 billion. Even at the 2008 level of 230 fatalities, the economic loss is about \$1.4 billion annually.

From a public health point of view, the passage of “TC2010” might prove to be of epidemic proportions.

References and notes:

- [1] The TaxCannabis 2010 Initiative, <http://www.canorml.org;>, 1/28/10
- [2] Analysis of AB 390, California State Board of Equalization, 7/15/09
- [3] Comparison of Marijuana and alcohol on simulated driving performance, Crancer, Dille, Delay, & Wallace, Journal Science, Volume 164 5/16/69 pp.851-854
- [4] Sex differences in the effects of Marijuana on simulated driving Performance, Anderson, Rizzo, Block, Pearlson, & O'Leary, Journal of Psychoactive Drugs, 2010 Mar; 42(1): 19-30
- [5] Passenger vehicles include multipurpose passenger vehicles or light duty trucks when that vehicle or truck is rated at not more than 6,000 pounds gross vehicle weight.’’
- [6] Senate Bill 420, effective Jan 2004, clarified the scope and application of California Proposition 215, also known as the Compassionate Use Act of 1996, and established the Medical Marijuana Program.
- [7] Value of a Statistical Life, US DOT Memorandum to Modal Administrators, 2/5/08