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Memo

Date: March 2, 2012

To: Chris Murphy
Director
California Office of Traffic Safety

From: David Ragland
Director
Safe Transportation Research and Education Center (SafeTREC)
University of California, Berkeley

Subject: Descriptive analyses of traffic fatalities and injuries before and after California's law banning hand-held cell phone use while driving was implemented on July 1, 2008

As you requested, using data from the Statewide Integrated Traffic Records System (SWITRS), the collision data base for California maintained by the California Highway Patrol, we conducted a brief descriptive analysis of fatalities and injuries related to distracted driving and cell phone use during the periods before and after implementation of the July 1, 2008 law banning the use of hand-held cell phones while driving in the state.

Fatalities and injuries were summarized by six-month periods from January 2005 to December 2010. Analyses were conducted for the number of fatalities and injuries overall and for distracted driving [DD] (which includes cell phone use), cell phone use, hand-held cell phone use, and hands free cell phone use. These data are presented for the six-month intervals during this six-year period. Then, two-year periods before and after implementation of the hand-held law were compared to provide estimates of before and after collision patterns.

Percentage of Fatalities and Injuries by Six-Month Periods from January 2005 to December 2010

The percentages of fatalities and injuries due to (i) overall distracted driving, (ii) cell phone use, (iii) hand-held cell phone use, and (iv) hands-free cell phone use for the period of January 2005 to December 2010 are provided both in Tables 1 (fatalities) and 2 (injuries) and shown in Figures 1 (fatalities) and 2 (injuries). The trend shows a general increase in the percentage of fatalities and injuries associated with distracted driving during the period before July 1, 2008 and then a reduction for all four categories after implementation of the hand-held law in July 2008.

Using the *percentage* of fatalities and injuries adjusts for the fact that overall fatalities and injuries declined during this period. The law enacted is specific to hand-held cell phone use, however, trends for hands-free use appear to follow a similar pattern. Publicity surrounding the law may have drawn attention to hands-free use as well as hand-held use.

Change in Numbers of Fatalities and Injuries During the Two-Year Periods Before and After July 1, 2008

A summary of the changes in the absolute number of fatalities and injuries during the two-year period before and after implementation of the law, and the percentage change between the two periods, is shown in Tables 3 (fatalities) and 4 (injuries). These data are given for overall fatalities and injuries and for distracted driving, cell phone use, hand-held cell phone use, and hands-free cell phone use.

Comparing the two years *before* implementation of the law (July 2006-Jun 2008) with the two years *after* implementation (July 2008-June 2010) indicates a decline in all categories of fatality and injury. Overall, there was a decline of 22.1% in fatalities and 12.7% in injuries. For distracted driving (DD) there was a decline of 29.8% in fatalities and 22.0% for injuries. For hand-held cell phone use the decline was 47.0% for fatalities and 50.0% for injuries. There were similar declines for hands free cell phone use.

We calculated confidence intervals for the difference between hand-held cell phone use and non-distracted driving fatalities and injuries. The odds ratio comparing the reduction in hand-held cell phone related fatalities to the reduction in non-distracted driving fatalities was 0.68 (95% CI = 0.34-1.01); the odds ratio comparing the reduction in hand-held cell phone related injuries to the reduction in non-distracted driving injuries was 0.57 (95% CI = 0.53-0.61).

Based on our analyses, using SWITRS, comparing cell phone to non-distracted driving fatalities and injuries, the hand-held cell phone ban appeared to have saved upwards of 70-80 lives and prevent about 5,000 injuries during the two years following implementation of the law.

Discussion

There are two relevant reports that have evaluated the impact of the California hand-held cell phone law. The first, a report by the Highway Loss Data Institute (HLDI), an affiliate of the Insurance Institute for Highway Safety (IIHS), found no notable change in overall crashes in California before and after the hand-held cell phone law of July 1, 2008.[1] HLDI compared insurance claims for crash damage and did not separately identify drivers using cell phones when the crash occurred.

Another report using California collision data from the one-year period of January 1 to December 31, 2008 also found no evidence of a reduction in collisions on major California highways during the six-month periods before and after implementation of the hand-held cell phone ban in the state.

[1] Highway Loss Data Institute. December 2009. *Hand-Held Cellphone Laws and Collision Claim Frequencies* Vol 26, No. 17. Highway Loss Data Institute Bulletin.

Similar to the HLDI study, this analysis was for overall crashes and not specifically for cell phone related crashes.[2]

The lack of impact of hand-held bans on collisions in these two studies was found despite the fact that such bans appear to reduce hand-held cell phone use.[3] However, neither of these studies looked specifically at collisions involving distracted driving or cell phone use.

A later study conducted by the HLDI found no decrease in collision claims after a texting ban went in to effect in California in January 2009.[4] That study also didn't look at claims specifically related to distracted driving or texting. We did not have information on texting-related fatalities and injuries in our study and therefore we don't know the potential impact on our findings of the January 2009 ban.

It is noted that the percentage of fatalities and injuries attributed to distracted driving based on our data is lower than figures reported by NHTSA at a national level.[5] For this analysis we used definitions provided in SWITRS, which may be less inclusive than definitions used by NHTSA. We don't know what impact this would have on differences in observed distracted driving and cell phone fatalities and injuries before and after law changes.

Conclusion

The results of these descriptive analyses suggest a consistent reduction in fatalities and injuries related to hand-held cell phone use after implementation of a law banning the use of hand-held cell phones while driving in California on July 1, 2008. A similar reduction was noted for hands free cell phone fatalities and injuries. Further studies of the impact cell phone bans on traffic fatalities and injuries should focus specifically on crashes involving distracted driving and cell phone use, comparing these with crashes not involving cell phone use. A large number of laws restricting cell phone use in various ways have been implemented in different states over the past 10 years or so. We have developed a research design for (i) establishing a database of these laws and (ii) conducting a nationwide evaluation of these laws using data from the Fatality Analysis Reporting System (FARS) and other sources. Such a comprehensive study is needed to guide both national- and state-level policy with respect to laws limiting use of cell phones and other electronic devices while driving.

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[2] Nicholas E. Burger, Daniel T. Kaffine, and Bo Yu. November 2011. *Did California's hand-held cell phone ban reduce accidents?* RAND Corporation.

[3] McCartt, A.T. and Geary, L.L. 2004. Longer term effects of New York State's law on drivers' handheld cell phone use. Injury Prevention 10:11-15., and McCartt, A.T. and Hellinga, L.A. 2007. Longer term effects of Washington, DC, law on drivers' hand-held cell phone use. Traffic Injury Prevention 8:199-204.

[4] Texting Laws and Collision Claim Frequencies. Highway Loss Data Institute Bulletin, Volume 27, Issue 11, 2010, 10p

[5] National Highway Traffic Safety Administration. September 2009. *An Examination of Driver Distraction as Recorded in NHTSA Databases.* DOT HS 811 216.

Table 1—Percentage of Fatalities by Distracted Driver Category

Time point	Jan-Jun 2005	Jul-Dec 2005	Jan-Jun 2006	Jul-Dec 2006	Jan-Jun 2007	Jul-Dec 2007	Jan-Jun 2008	Jul-Dec 2008	Jan-Jun 2009	Jul-Dec 2009	Jan-Jun 2010	Jul-Dec 2010
Percent DD	5.86%	4.61%	4.15%	4.64%	5.73%	4.33%	5.72%	5.07%	4.43%	4.05%	4.64%	4.60%
Phone	1.53%	1.58%	1.77%	2.12%	3.00%	2.41%	2.62%	1.76%	1.81%	1.45%	1.81%	1.71%
Hand-held	1.00%	0.95%	1.16%	0.99%	2.01%	0.89%	1.28%	0.74%	1.07%	0.82%	0.86%	0.82%
Hands-free	0.42%	0.46%	0.61%	1.17%	1.19%	1.48%	1.34%	1.08%	0.74%	0.63%	0.94%	0.89%

Figure 1—Percentage of Fatalities by Distracted Driver Category

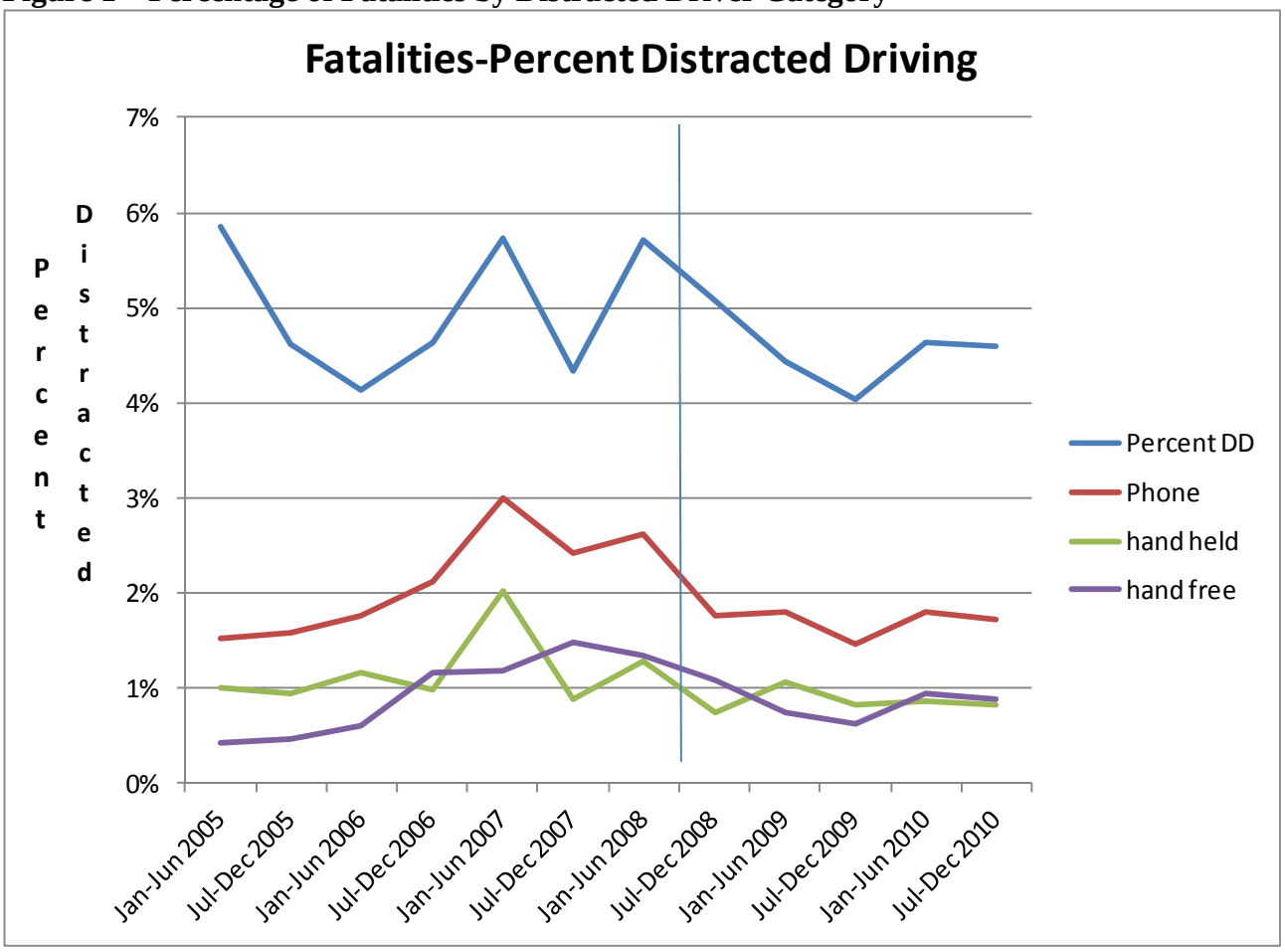

Table 2—Percentage of Injuries by Distracted Driver Category

Time point	Jan-Jun 2005	Jul-Dec 2005	Jan-Jun 2006	Jul-Dec 2006	Jan-Jun 2007	Jul-Dec 2007	Jan-Jun 2008	Jul-Dec 2008	Jan-Jun 2009	Jul-Dec 2009	Jan-Jun 2010	Jul-Dec 2010
Percent DD	9.89%	9.80%	9.83%	9.81%	9.64%	9.75%	9.66%	8.74%	8.58%	8.89%	8.52%	8.24%
Phone	2.49%	2.52%	2.72%	2.94%	3.03%	3.24%	3.28%	2.37%	2.17%	2.26%	2.14%	2.11%
Hand-held	1.21%	1.20%	1.36%	1.42%	1.44%	1.47%	1.51%	0.80%	0.84%	0.86%	0.85%	0.83%
Hands-free	0.84%	0.96%	1.10%	1.34%	1.47%	1.65%	1.70%	1.51%	1.27%	1.33%	1.25%	1.23%

Figure 2—Percentage of Injuries by Distracted Driver Category

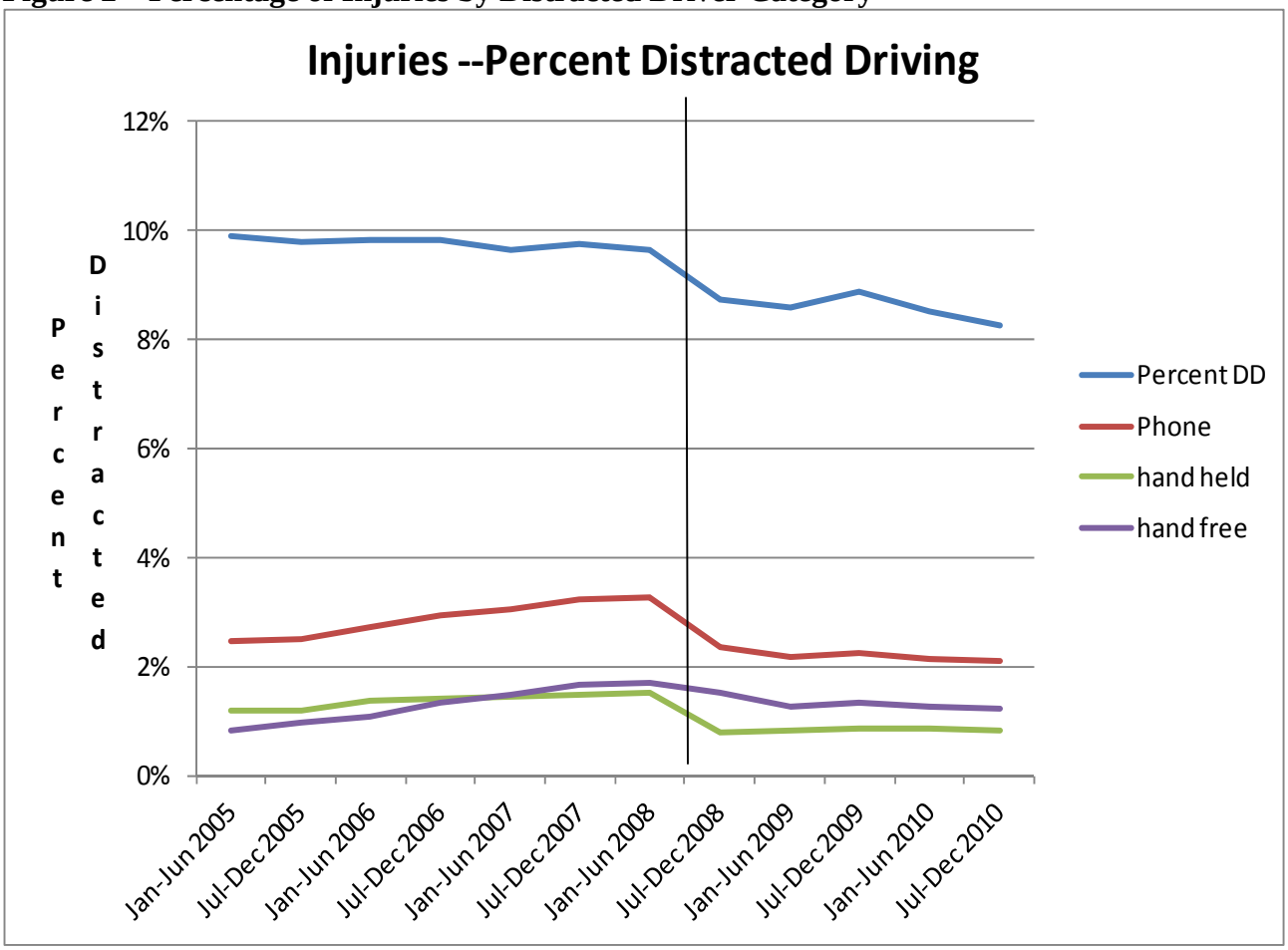

Table 3—Fatalities during the Two-Year Period before and After Implementation of the Hand-held Law (July 1, 2008)

Category	Jul 2006-Jun 2008	Jul 2008-Jun 2010	Reduction	Percentage Reduction
Overall	7,830	6,102	1,728	22.1%
Non Distracted Driving	7,434	5,824	1,610	21.7%
DD	396	278	118	29.8%
Phone	197	104	93	47.2%
Hand-Held*	100	53	47	47.0%
Hands-Free	101	52	49	48.5%

Note: The sum of "hand-held" and "hands-free" fatalities may not equal "phone" fatalities as this detail may not be provided and/or this detail may be provided for more than one driver per collision.
* The odds ratio comparing the reduction in hand-held related fatalities to the reduction in non-distracted driving fatalities was 0.68 (95% CI = 0.34-1.01)

Table 4—Injuries during the Two-Year Period before and After Implementation of the Hand-held Law (July 1, 2008)

Category	Jul 2006-Jun 2008	Jul 2008-Jun 2010	Reduction	Percentage Reduction
Overall	529,433	462,298	67,135	12.7%
Non Distracted Driving	477,973	422,148	55,825	11.7%
DD	51,460	40,150	11,310	22.0%
Phone	16,510	10,341	6,169	37.4%
Hand-Held*	7,720	3,862	3,858	50.0%
Hands-Free	8,126	6,205	1,921	23.6%

Note: The sum of "hand-held" and "hands-free" injuries may not equal the "phone" injuries as this detail may not be provided and/or this detail may be provided for more than one driver per collision.
*The odds ratio comparing the reduction in hand-held related injuries to the reduction in non-distracted driving fatalities was 0.57 (95% CI = 0.53-0.61).