

# **What to Expect from California's New Hands-Free Law**

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## Summary

As of July 1, 2008, California drivers must use hands-free technology when using a mobile phone while driving, and drivers under 18 may not use a mobile phone at all while driving.

This study finds that California's new hands-free law should save several hundred lives a year, based on the experience of the three states (and Washington, D.C.) where similar laws are already in effect. The results show that mobile phone ownership is associated with higher traffic fatality rates in bad weather and on wet roads and that hands-free laws reduce traffic fatalities during bad weather, on wet roads, and in rush-hour traffic.

It is challenging to measure the effect of mobile phones and of hands-free laws on traffic collisions. Collisions can have many causes: If a tired driver rear-ends another car at night in the rain while talking on a mobile phone, who is to say whether the mobile phone, the darkness, the wet road, or the driver's fatigue contributed most – or even at all – to the collision? To overcome the challenges of linking specific collisions to mobile phone usage, other studies have used various approaches, relying on administrative records, surveys, driving-simulation laboratories, and specially-outfitted vehicles. These studies found that hands-free devices offer no reduction in driver inattention or crash risk relative to hand-held mobile devices *when drivers are using a phone*.

In this study, we use a different approach. We look at traffic fatalities, mobile phone ownership, and hands-free laws across states to estimate how fatalities changed in states after a hands-free law went into effect, compared to states without hands-free laws. Our analysis cannot determine why, exactly, hands-free laws reduce fatalities in adverse conditions. Hands-free use might be less distracting than hand-held use, contrary to other studies, or hands-free laws might discourage overall phone use while driving, even if hands-free use is no safer. But even without understanding why hands-free laws seem to work, our findings suggest that California should expect a reduction of 300 fatalities annually during adverse driving conditions.

These findings suggest that California should concentrate its enforcement efforts during adverse driving conditions. However, enforcement is more difficult during such conditions, due to both competing demands on traffic officers and to the increased risks involved in pulling drivers over. Thus, education and public awareness about mobile phone use and hands-free technology should supplement enforcement of the law. Furthermore, with relatively modest penalties for using hand-held phones and no prohibition against dialing and texting, even strict enforcement of the law might not discourage drivers from using their mobile phones in distracting ways. Thus, public education about the law – and about the distraction and danger of using a mobile phone in the first place – should be an important component in implementing the hands-free law and could help achieve changes in behavior that enforcement alone might not bring about.



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# Introduction

After years of debate in the state legislature, California passed a law in September 2006 requiring drivers to use hands-free technology when talking on mobile phones. The law takes effect July 1, 2008, making California the fourth state (plus the District of Columbia) with a comprehensive hands-free law. A related law, taking effect on the same day, forbids drivers younger than 18 from using mobile phones at all while driving.

Supporters of the law expect that requiring hands-free technology will save lives. These technologies – which include corded earpieces, Bluetooth headsets, and voice-activated systems integrated into car stereos – allow drivers to keep both hands on the wheel and eliminate the physical distraction of holding a phone. Some skeptics, however, emphasize that the mental distraction, not the physical distraction, causes driving while talking on the phone to be dangerous – and that hands-free technology does little to reduce the mental distraction. Other skeptics point out that mobile phones are just one of many distractions drivers deal with.

Most previous research on mobile phones and traffic safety has found that talking on the phone while driving is indeed distracting and raises the risk of collisions, although estimates of the effect range considerably, with one prominent study finding no statistically significant effect. Previous studies have found that hands-free and hand-held phones involve similar levels of distraction and risk, bringing into question the value of hands-free laws. However, these studies relied on retrospective surveys of drivers, driving simulators, and specially-outfitted cars to observe driving behaviors – all of which have merits but present challenges when analyzing the effect of hands-free laws.

This study, in contrast, looks at aggregate fatality data across states from 1997-2005 to assess how fatality rates changed relative to (1) changes in mobile phone ownership and (2) the enforcement of hands-free laws. Analyzing the effect of actual policy changes captures all of the behavioral adaptations that drivers might make in response to the law, whereas previous studies drew conclusions about hands-free technology based on self-reported or voluntary use of hands-free technologies. The experience of hands-free laws elsewhere in the nation is instructive for California and suggests that the new hands-free law will indeed save lives.



# Mobile Phones and Traffic Safety

## Policy Background

Starting July 1, 2008, California drivers must use hands-free technology when using a mobile phone while driving. California is the fourth state (plus Washington, D.C.), and the first outside the Northeast, to require hands-free technology. New York has had a similar law in effect since November 2001, followed by New Jersey and the District of Columbia in July 2004 and Connecticut in October 2005. Outside the United States, however, drivers have long been forbidden from holding mobile phones while driving. Japan became the first large country to ban hand-held mobile phone use while driving (1999); and as of 2006, every G7 country except the United States had banned hand-held mobile phone use while driving, with penalties ranging from fines to exclusion from insurance coverage.

The purpose of hands-free laws is to reduce the distraction of using mobile phones and ultimately to reduce traffic collisions, injuries, and fatalities. Nationally, motor vehicle accidents rank as the 8<sup>th</sup> most common cause of death, and they are the leading cause of death among people ages 5-34.

Numerous laws are in place to reduce traffic collisions and injuries, such as seat-belt requirements, speed limits, restrictions on young drivers, minimum drinking ages, and drunk-driving laws. But the increase in mobile phone ownership over the past decade has focused attention on whether mobile phone use contributes to driver distraction and ultimately traffic collisions. Household mobile phone ownership in the United States has risen from 38% in 1997 to 76% in 2005. National studies show that 5.4% of drivers observed during daylight hours are holding a mobile phone, and another 0.6% are using a hands-free device (NHTSA, 2007).<sup>1</sup> Among drivers who own mobile phones, 73% say they talk on the phone while driving at least some of the time (Harris, 2006).

California enacted its law in September 2006, when Governor Schwarzenegger signed the legislation proposed by Senator Joe Simitian (SB 1613, 2006), who first introduced a hands-free bill in the Assembly in 2001. Supporters received an unexpected boost from Governor Schwarzenegger when the bill was in committee, who said that mobile phones endangered both drivers using them and others on the road and said that his own daughter “would be taking the bus” if he caught her using her cell phone while driving.<sup>2</sup>

Supporters of the bill, which by the time of passage included several law enforcement associations, the insurance industry, phone service provider Verizon Wireless, and phone manufacturer Palm, argued that mobile phone use increases collision risk for two reasons: the physical distraction of manipulating and holding the phone, and the mental distraction of conducting a conversation by phone. The intent of the hands-free legislation was to reduce the physical distraction and make drivers more able to respond with both hands on the wheel in high-

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<sup>1</sup> NHTSA data about mobile phone use do not report state-level data over time, so they are not helpful in assessing how hands-free laws affect mobile phone use.

<sup>2</sup> “Schwarzenegger Calls for Banning Hand-Held Cellphone Use While Driving,” *Los Angeles Times*, July 13, 2006.

risk driving situations, even though hands-free phone use would still be a mental distraction. The one named opponent, phone service provider Sprint Nextel, argued that phone use is one – and not the most prevalent – of numerous activities that distract drivers, and a hands-free law would unfairly penalize drivers who are driving responsibly while holding a phone.<sup>3</sup>

With California's law taking effect in July 2008, there remains uncertainty about whether the hands-free requirement will improve traffic safety, as proponents argue. Existing studies of mobile phones and traffic safety have found that using hands-free technology is no safer than using hand-held phones while driving. It is also possible, as the former administrator of the National Highway Traffic Safety Administration said, that hands-free laws "give hands-free phones a free pass as being safe" and could encourage drivers to use their phones more, thus raising the risk of collisions.<sup>4</sup> In this paper, we weigh the likely effects of California's new law.

## The Challenge of Measuring the Effect

It is challenging to measure the effect of mobile phones on traffic collisions. Collisions can have many causes. If a tired driver rear-ends another car at night in the rain while talking on a mobile phone, who is to say whether the phone, the darkness, the wet road, or the driver's fatigue contributed most – or even at all – to the collision? Would the collision have happened if the driver had not been on the phone? And if the driver hangs up after rear-ending the other car and tosses the phone onto the passenger seat, who would know that the driver was talking on the phone – and how could anyone establish whether talking on the phone contributed to the collision? These are the types of difficulties that make it hard to establish whether phone use while driving is dangerous, either in specific cases or on average.

California has long collected data on mobile phone use and its role as a distraction in traffic collisions, yet the data illustrate how difficult it is to draw conclusions about how much – if at all – mobile phones contribute to collision risk. Since 2002, California traffic enforcement agencies have been required to collect information on whether drivers involved in a collision were using mobile phones and whether using a phone appeared to be an inattention factor that contributed to the collision.<sup>5</sup> In every year since 2002, mobile phone use has been cited as a factor in between 7 and 15 traffic fatalities, as well as in hundreds of injury and property-damage collisions. Mobile phone use is the most frequently cited inattention factor contributing to collisions, ahead of other distractions such as the "radio or CD player," "eating," and "children." In 2006, mobile phone use data were available for 75% of people involved in collisions: In cases when these data were available, 3% of those involved in collisions were reported to be using a mobile phone. However, the 2006 California data identify a specific inattention factor in only 1% of collisions. This illustrates how difficult it is for law enforcement officials to identify distractions, since distracted driving presumably contributes to collisions in more than only 1% of cases. Thus, although California usually records whether drivers in collisions were using mobile phones, only in very rare cases could mobile phone use or any other inattention factor be judged to have contributed to the collision.

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<sup>3</sup> Senate Floor Analysis, SB 1613, August 30, 2006.

<sup>4</sup> NHTSA administrator Jeffrey Runge, as quoted in "Warning Call: As Industry Pushes Headsets In Cars, U.S. Agency Sees Danger," *Wall Street Journal*, July 19, 2004.

<sup>5</sup> The California Highway Patrol has been collecting this information since 2001.

Studies have used a variety of approaches to overcome these challenges of linking specific collisions to mobile phone use. One approach is to use a sample of collision data from administrative records; a second is to survey people about their mobile phone use and collision history; a third is to observe driver behavior in a driving-simulation laboratory or in a vehicle outfitted to record driver behaviors and potential distractions. The results from several well-known studies are all over the map: Some find no effect from mobile phone use on collisions, and others find very large effects.

In an analysis of actual collision data, Redelmeier and Tibshirani (1997) compare mobile phone call logs for drivers in nonserious collisions just before the event with a comparable time in the past. They estimate the likelihood of a collision to be 4.3 times higher when using a phone. In other studies, Hahn and Priege (2006, 2007) survey drivers about their collision history and their use of mobile phones while driving, asking them to recall two years' worth of collisions and frequency of phone use. They find that people who tend to talk more on the phone while driving tend to have more collisions because they are, by nature, riskier drivers, even when they are not talking on the phone. They conclude that there is no statistically significant effect of mobile phone use on collisions, even if heavier users have more collisions. They argue that Redelmeier and Tibshirani's findings are based only on drivers who have had collisions and cannot be extrapolated to the general population. However, their own method relies on recall and identifies the effect of mobile phone use on collisions based on differences in the recalled levels of phone use over time, and it is unclear how serious a problem measurement error might be. Further, their data were collected online, and online samples often misrepresent the general population because respondents tend to be more comfortable with and adept at using technology, which is especially problematic in surveys about how technology affects behaviors.

Two recent, high-profile studies have observed driver behavior and have found that mobile phones create significant distractions that result in driving less safely. Strayer, Drews, and Crouch (2006) find that the distraction from mobile phone use makes drivers more collision-prone than having a blood-alcohol concentration of .08%, based on a driving simulator, and they estimate the collision risk to be 5.4 times higher when using a phone relative to not using a phone.<sup>6</sup> In the second study, the National Highway Traffic Safety Administration (NHTSA, 2006) outfitted 100 cars with sensors and data collection hardware to test the effect of numerous possible distractions on crashes and near-crashes. Drivers were 2.8 times more likely to have a collision while dialing a phone, and 1.3 times more likely to have a collision while talking on the phone, compared to having no distractions. This study considered driving conditions and found that performing secondary tasks (including using a mobile phone) while driving increased collision risk in dry road conditions only, not in wet road conditions.<sup>7</sup>

These studies, therefore, disagree about how much, if at all, mobile phone use increases the risk of crashes. Furthermore, only the NHTSA study considered the role of driving

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<sup>6</sup> They derive this estimate from the combined results of three similar studies. Blood alcohol concentration legal limits are set by states, but states lose some federal highway funds if they set the BAC limit above .08% for adults or above .02% for drivers younger than 21. Thus, all states have set a .08% limit for adults and a .02% or lower limit for drivers younger than age 21.

<sup>7</sup> In a conversation with me, the study's principal investigator, Sheila Klauer, emphasized that there were relatively few observations in wet road conditions and warned against concluding that performing secondary tasks does not affect collision risk on wet roads.

conditions, and there were insufficient data on driving conditions for the study to draw definitive conclusions.

## **The Effect of Mobile Phones on Fatalities**

Looking at aggregate traffic data and mobile phone use is another way to assess the effect of mobile phones on traffic fatalities. The advantage of aggregate data is that they include all traffic incidents, rather than a small or possibly biased sample, reflect real driving conditions, and do not depend on drivers accurately recalling past behaviors.

Comparing changes in aggregate traffic fatality rates across states with different rates of mobile phone adoption can suggest whether mobile phone use affects driving safety. In recent years, mobile phone use has been increasing at different rates for different groups of people. As with most technologies, mobile phones were popular first with younger and more affluent individuals and were adopted later by those who were older and less affluent. Because states vary in their demographics, mobile phone adoption has grown faster and is higher in some states than in others. States vary considerably in both their levels and trends in fatalities and mobile phone ownership. In 2005, for instance, traffic fatalities per billion vehicle miles traveled (VMT) ranged from 22.6 in Montana to 8.0 in Massachusetts; fatalities per billion VMT were 13.2 in California and 14.5 in the nation. Mobile phone ownership in 2005 was highest in Georgia (84%) and Connecticut (83%) and lowest in West Virginia (53%), with California at 77%, slightly ahead of the U.S. average of 76%. Holding constant other factors that might affect fatalities, such as weather and general economic conditions, regression analysis can reveal whether mobile phone ownership – as well as hands-free laws – is associated with higher or lower traffic fatalities.<sup>8</sup>

This analysis uses data from two sources: NHTSA's Fatality Analysis Reporting System (FARS) and Forrester Research. FARS has reported traffic fatality data comprehensively and consistently across all states for many years. The fatality data cover deaths of drivers, passengers, and others, including pedestrians, involved in traffic collisions. FARS includes data on the time of collision, weather conditions, road conditions, and numerous other variables, making it possible to calculate, for instance, the number of fatalities on wet roads between the hours of 5 p.m. and 6 p.m. in Los Angeles County in 2005. Although there are data in FARS about whether drivers involved in a collision were using mobile phones or were distracted for other reasons, those data are included only for a handful of states and only in selected years, so they cannot be used for a comprehensive analysis of how mobile phone use affects traffic fatalities.

FARS only includes collisions that result in fatalities, and there is no data source for non-fatal collisions measured consistently across states and over time.<sup>9</sup> Although fatal collisions

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<sup>8</sup> Using regression analysis to determine whether states with different policy frameworks have different fatality rates is a standard approach in studying traffic safety. The analysis relies on state fixed-effects and weather controls in order to account for diversity in driving conditions and behaviors among states. For more details on the methodology and for references to studies using a similar approach, see Kolko (2007).

<sup>9</sup> The NHTSA's initiative to coordinate nonfatal crash data, the State Data System (SDS), included 29 states as of 2004, up from 17 states in 1999. Each state reports nonfatal crash data using its own data definitions and reporting standards, whereas the FARS system for fatalities is consistent across states, includes all states, and covers many years. See <http://www-nrd.nhtsa.dot.gov/departments/nrd-30/nca/sds.html>.

constitute a small percentage of total collisions, they bear a much larger share of media and policy attention.<sup>10</sup>

Data on mobile phone ownership come from Forrester Research, a technology research and consulting firm. Each year Forrester conducts its Technographics benchmark survey of 60,000-100,000 households about their technology adoption and behaviors.<sup>11</sup> Starting in 1997, Forrester's Technographics survey asked about mobile phone ownership in the household. Annual state-level mobile phone ownership is tabulated from this question and is combined with annual state-level traffic fatality data from the FARS. Unfortunately, Forrester does not ask mobile phone owners how much they drive or whether they use their mobile phones while driving, so there is no way to estimate the share of drivers who own mobile phones or use them while driving. Mobile phone ownership, therefore, is a proxy for mobile phone use while driving.<sup>12</sup>

The results of this statistical analysis show that mobile phone ownership is associated with higher traffic fatality rates, but the relationship is statistically significant only under certain driving conditions (Table 1). A ten percentage-point increase in mobile phone ownership – for instance, if ownership rises from 60 to 70 percent of households, or from 75 to 85 percent of households – raises the number of traffic fatalities (per mile driven) by 2.1 percent. This relationship between mobile phone ownership and overall traffic fatalities, though positive, is not statistically significant. The magnitude of this effect is equivalent to a 3.5-fold increase in fatality risk when using a mobile phone compared to not using a mobile phone, which is in the middle of the range of previous studies using different methods.<sup>13</sup> The effect of mobile phone ownership on traffic fatalities in bad weather (which account for 7 percent of all fatalities) or on wet roads (which account for 10 percent of all fatalities) is positive, statistically significant, and large. A ten percentage-point increase in mobile phone ownership raises the number of traffic fatalities (per mile driven) in bad weather by 11.5 percent and fatalities on wet roads by 7.5 percent. Mobile phone ownership is also associated with a large increase in fatalities in rush-hour conditions, but it is not statistically significant. Therefore, the distraction of mobile phone usage aggravates the challenge of driving under difficult conditions while having no statistically significant effect during optimal driving conditions.

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<sup>10</sup> In 2004, there were 38,000 fatal crashes, 1.9 million injury crashes, and 4.3 million noninjury crashes (property damage only) nationally. Fatal crashes therefore account for about 2% of crashes in which there is bodily harm, and 0.6% of all crashes (NHTSA, 2005).

<sup>11</sup> Forrester's Technographics surveys are conducted by mail; the samples are selected from national market research panels to be representative of U.S. households demographically and are weighted to correct for differences in response rates. Forrester has used TNS/NFO's market research panel since 2001 and used NPD's panel in earlier years. Forrester collects data in the 48 contiguous states and the District of Columbia, but not in Alaska or Hawaii. Only adults 18 years and older are surveyed, and the survey is conducted in English only.

<sup>12</sup> This method assumes that if ownership and use aren't perfectly correlated, the portion of use that is not captured by the ownership measure is uncorrelated with other factors that could affect traffic fatalities.

<sup>13</sup> Kolko (2007) describes how the 2.1% in overall fatalities from a ten percentage-point increase in mobile phone ownership is equivalent to a 3.5-fold increase in risk, which can then be compared to the key findings of previous studies.

**Table 1**  
**The Effect of Mobile Phone Ownership on Traffic Fatalities\***

	Percentage of all fatalities in California (2005)	Estimated effect on fatalities of 10 percentage point increase in mobile phone ownership
All fatalities	100	2.1
Fatalities in bad weather	7	11.5**
Fatalities in wet road conditions	10	7.5**
Fatalities in rush hour	23	4.9

\* Fatality categories are not mutually exclusive. For example, many fatalities in bad weather occur on wet roads. However, some bad weather – like fog or blowing sand – does not result in wet roads, and wet road conditions can be the result of earlier bad weather, even if the current weather is good.

\*\* Only the estimates for fatalities in bad weather and fatalities in wet road conditions are statistically significant at the 5% level.

# The Evidence on Hands-Free Laws

## Research on the Effect of Hands-Free Laws

While previous research is far from consensus on the effect of mobile phones on traffic safety, these studies consistently agree that the risks to safety are similar for hands-free and hand-held mobile phone use. However, none of these studies examined the effects of hands-free laws; instead, they all study the effect of voluntary use of hands-free devices.

Redelmeier and Tibshirani (1997) find no significant difference between the increased collision risk when using hands-free and hand-held units. Hahn and Prieger (2006, 2007) find that hands-free device users are more careful drivers than drivers who use hand-held cell phones when driving (although cell phone users overall are riskier drivers than people who do not use phones while driving), and after controlling for these selection effects find no significant reduction in collisions from hands-free devices relative to hand-held devices, conditional on minutes of mobile phone usage. Strayer, Drews, and Crouch (2006) find no significant differences in the impairments introduced by hand-held and hands-free devices.

However, it does not follow from these studies' findings that hands-free laws have no effect on traffic safety. These studies have found that hands-free devices offer no reduction in driver inattention or crash risk relative to hand-held mobile devices *when drivers are using a phone*. But drivers choose whether and when to use a mobile phone, and it is possible that a hands-free law could change drivers' likelihood of using a phone while driving. On the one hand, a hands-free law might make drivers less likely to talk while driving if hands-free technology is cumbersome or of lower-quality than hand-held technology or if the hands-free law serves as an educational warning about the danger of talking on the phone while driving; in these ways, a hands-free law could increase safety by reducing use. On the other hand, a hands-free law could lead drivers to believe that hands-free devices are safer than hand-helds and therefore raise drivers' likelihood of using a phone while driving; in this way, a hands-free law might reduce safety. It is also possible that hands-free technology actually does reduce the physical distraction of using a phone while driving, as the proponents of California's law argue, and that earlier studies, which were not looking specifically at hands-free laws, failed to detect this effect. The effect of a hands-free law on traffic safety has thus not been addressed by previous research but can be assessed using aggregate fatality data.

## The Effect of Hands-Free Laws on Fatalities

To test the effect of hands-free laws, our analysis now looks at how fatalities have changed in the few states with hands-free laws relative to the rest of the nation. Although laws requiring drivers to use hands-free devices when using phones are the norm in more affluent countries, within the United States, only New York, New Jersey, the District of Columbia, and Connecticut have state-wide hands-free laws in effect prior to California's law taking effect in July 2008. Some cities in other states (for example, Chicago) allow only hands-free devices while talking on the phone and driving. In many states, some types of drivers – such as school-bus drivers – are required to use hands-free devices. On the other hand, eight states forbid their municipalities from restricting mobile phone use while driving.

Only New York had a hands-free law in effect during a significant period covered by our study (Table 2). New York's law took effect in November 2001, so the period under study (1997-2005) includes four years and two months when New York's law was in effect. New Jersey's and the District of Columbia's laws took effect in July 2004, and Connecticut's in October 2005. Thus, evidence of the longer-term effects of hands-free laws on fatalities is based on data from New York, while the short-term effect of hands-free laws is based on the experiences of New Jersey, the District of Columbia, and Connecticut.<sup>14</sup>

**Table 2**  
**States with Hands-Free Laws Passed or In Effect**

State	Law passed	Law in effect	Months in 1997-2005 with law in effect
New York	June 2001	November 2001	50
New Jersey	January 2004	July 2004	18
District of Columbia	January 2004	July 2004	18
Connecticut	July 2005	October 2005	3
California	September 2006	July 2008	0
Washington	May 2007	July 2008	0

To assess whether hands-free laws have affected traffic fatalities, we use the same approach as we did in assessing whether mobile phone ownership affects fatalities. Using regression analysis, we measure traffic fatalities against mobile phone ownership, several control variables, and whether the state has a hands-free law in effect. The regression results indicate whether traffic fatalities changed in states with laws in effect, either at the time the law started being enforced or at some time thereafter.

The analysis looks at the effect of hands-free laws at six intervals after the law went into effect. The first of the six periods covers the first six months after the law went into effect, and all four states contribute to this estimate. The next two periods, which cover months 7-12 and 13-18, include the experiences of New York, New Jersey, and the District of Columbia; and the last three periods, covering months 19-24, 25-36, and 37+, include only New York.<sup>15</sup>

Hands-free laws reduce traffic fatalities over all six periods for overall fatalities and for fatalities in bad weather, on wet roads, and in rush-hour (Table 3). For instance, hands-free laws result in a drop in traffic fatalities on wet roads by 38% in the first six months after the law takes effect. However, the results are not consistently statistically significant, partly because the evidence on hands-free laws comes from a small number of states over a short period of time. The coefficients are significant at the 5% level for bad-weather fatalities in two of the six time periods, for rush-hour fatalities in four of the six time periods, and for wet-road fatalities in five of the six time periods. The effect of hands-free laws on overall fatalities, although negative, is

<sup>14</sup> Among cities with hands-free laws, only Chicago includes a substantial share of the state's population. Chicago's law took effect in July 2005.

<sup>15</sup> Because all four hands-free laws took effect midyear, the hands-free law analysis uses monthly rather than annual data. Kolko (2007) describes the adjustments used to perform and test this analysis.

not statistically significant for any time interval. Coefficients on all three types of fatalities are statistically significant in months 1-6 (when all four states contribute to the analysis) and in months 37-50 (when only New York contributes to the analysis). Although the effects appear largest in months 37-50, the differences between the time periods (with a couple of exceptions) are not statistically significant. Hands-free laws, therefore, reduce fatalities in bad weather and on wet roads – the conditions under which mobile phone ownership raises fatalities in the first place. Hands-free laws reduce rush-hour fatalities, too, even though the effect of mobile phone ownership on rush-hour fatalities is not statistically significant.<sup>16</sup>

**Table 3**  
**The Effect of Hands-Free Laws on Traffic Fatalities**

	Number of months after law took effect					
	1-6	7-12	13-18	19-24	25-36	37-50
	Percent change in traffic fatalities					
All fatalities	-17	-12	-9	-16	-12	-21
Fatalities in bad weather	-52*	-38	-22	-30	-44	-63*
Fatalities on wet roads	-38*	-38*	-18	-30*	-39*	-64*
Fatalities in rush hour	-17*	-9*	-11*	-8	-11	-18*
States contributing to results	NY, NJ, DC, CT	NY, NJ, DC	NY, NJ, DC	NY	NY	NY

\* Statistically significant at 5% level.

The analysis is limited, of course, by the fact that only New York has had a law in effect for longer than 18 months of the period under study and is therefore the only state contributing to the declines in fatalities under adverse conditions in months 19-50. Although the analysis includes control variables that rule out many explanations other than the hands-free law for the decline in fatalities in New York, that state’s experience will not necessarily be replicated by other states with hands-free laws.

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<sup>16</sup> How can hands-free laws have a significant effect on rush-hour fatalities if mobile phone ownership does not have a statistically significant effect on rush-hour fatalities in the first place? This is possible because of the time-period under study. In 1997, when the analysis period begins, mobile phone ownership was already at 38% in the nation, so the observed relationship between mobile phone ownership and traffic fatalities during the period 1997-2005 comes from the later adopters of mobile phones. Because mobile phone ownership data by state are not available prior to 1997, the effect of mobile phone adoption on traffic fatalities among the earlier owners cannot be included in the analysis. However, the effect of hands-free laws captures the effect for all mobile phone owners because the law applies to everyone. If the relationship between mobile phone use and traffic fatalities is different for early mobile phone adopters and later mobile phone adopters, that could explain why the increase in mobile phone ownership starting in 1997 did not affect rush-hour fatalities but hands-free laws do.

Why do hands-free laws appear to reduce some types of fatalities when other research has consistently found that hands-free devices are no safer than hand-held phones? Previous studies found a similar level of distraction among drivers using both types of devices, *conditional on being on the phone*. In practice, however, drivers decide whether and when to use mobile phones. The question, then, is how hands-free laws might change drivers' likelihood of using mobile phones when driving, regardless of whether the device is hand-held or hands-free.

It may be that drivers in states with hands-free laws are shifting their talking minutes to when they are not driving, or to those times when driving while talking on the phone is less likely to contribute to a fatal collision, or reducing their overall phone use. Why might hands-free laws reduce use under some driving conditions? It could be that drivers find hands-free technology more cumbersome to use if making a call requires handling two devices (the headset or earpiece and the phone) rather than one, or drivers might find a decrease in sound quality from a bad headset or undependable Bluetooth wireless connection. Yet another explanation why hands-free laws might reduce mobile phone use is that the law in itself serves as an educational warning about the danger of talking on the phone while driving, thus discouraging use or at least encouraging more discretion in deciding when to talk on the phone. Finally, it is also possible that hands-free technologies do reduce the physical distraction of using a phone, and earlier studies failed to detect this effect. If, for instance, drivers in states with hands-free laws invest in different hands-free technologies than drivers elsewhere who voluntarily use hands-free devices (for example, voice-activated systems integrated into the car stereo versus an in-ear headset), then the behavioral changes due to hands-free technology might actually be different when required by law than in voluntary circumstances.

Unfortunately, no available data can assess any of these speculations, but a recent Harris Poll tries to address these open questions. Among respondents in states with hands-free laws, 61% use a mobile phone while driving all or some of the time, compared with 73% of respondents overall. Respondents in states with hands-free laws are more likely to think that using a mobile phone while driving is dangerous than respondents overall, 64% vs. 56%. However, these results cannot be used to assess the effect of hands-free laws because the poll was conducted only at one point in time, rather than before-and-after hands-free laws came into effect. It is even possible that the states that passed hands-free laws were places where, before the law was passed, people were less likely to use a mobile phone while driving or more likely to think driving while using a phone is dangerous.<sup>17</sup>

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<sup>17</sup> This survey was conducted online by Harris Interactive, a polling firm, in May 2006. The sample size is 2,085. Many caveats apply. Online surveys are not generalizable to the offline population and, depending on the sampling methodology, might not be representative of the online population. Survey results were reported without sample sizes in each cell, so tests of significance for differences between groups are not possible to conduct. Finally, these results do not control for individual characteristics, and microdata from the survey were not made public for researchers to assess whether these differences in attitudes and behavior among respondents in hands-free states hold true when controlling for individual characteristics.

# The Effect of California's New Law

The evidence suggests that the effects of mobile phones and hands-free laws on traffic fatalities depend on road conditions and weather. The effect of California's new law, therefore, is likely to be a reduction in fatalities in bad weather and wet road conditions. However, it is possible that the reduction in fatalities that other states with hands-free laws have experienced will not be replicated in California. If Californians drive or use their mobile phones differently than drivers in the Northeastern United States – where all the existing statewide hands-free laws are in effect – then California could experience a different effect on fatalities. However, if the experience of other states is any guide, California should expect fatalities to decline.

This section looks in greater detail at the law's probable effects in California, assuming similar responses here as in the Northeast, and what that means for policy designed to educate the public and enforce the law.

## How Many Lives Will the Law Save?

The statistically significant effects of mobile phone use and of hands-free laws on fatalities occur for those fatalities experienced during bad weather or wet road conditions. Because California – especially its densely populated parts, where most driving takes place -- tends to have more favorable weather than the rest of the nation, a smaller share of California's fatalities happen in bad weather or on wet roads.

**Table 4**

**Percentage of Fatalities Under Adverse Driving Conditions**

	<b>California</b>	<b>U.S.</b>
Share of fatalities in bad weather	7.4	11.1
Share of fatalities on wet roads	10.1	15.7
Share of fatalities in rush hour	22.6	24.3

The increase in fatalities with mobile phone ownership and the expected decrease due to a hands-free law in California should therefore be more muted than in the nation and in the other states that have hands-free laws.

The effect on overall fatalities ranged between reductions of 9% and 21%, depending on how long the law has been in effect. While not statistically significant, these estimates represent the best guess at the reduction in overall fatalities. In 2005, there were 4,344 traffic fatalities in California, implying a reduction lives lost due to the hands-free law of between roughly 300 and 900 lives. The lack of statistical significance means that it's quite possible that the actual reduction could be very different, including possibly an increase rather than a decrease in fatalities. Because the effect on adverse-weather fatalities is statistically significant, we can say

with more confidence that there should be an annual decline in these adverse-condition fatalities of around 300.<sup>18</sup>

## How California Can Implement the Law

For the most part, the hands-free law is clear. It adds language to the California Vehicle Code stating that “a person should not drive a motor vehicle while using a wireless telephone unless that telephone is specifically designed and configured to allow hands-free listening and talking, and is used in that manner while driving.”<sup>19</sup> First-time violations are punished with a \$20 base fine, and repeat violations with a \$50 base fine, with no points added to the driver’s record.<sup>20</sup> For comparison, speeding 1-15 miles per hour over the limit and illegal U-turns each carries a \$35 base fine, and red-light violations and failure to yield to emergency vehicles each carries a \$100 base fine. It is a primary infraction, which means that enforcement officers can pull over a driver on the basis of violating the hands-free law itself (some traffic infractions are secondary, meaning that drivers can be cited only when pulled over for another, primary infraction). The law makes exceptions for using a hand-held phone for emergency purposes and for drivers of certain vehicles in certain contexts.

However, the hands-free law does not prohibit drivers from dialing a hand-held phone, nor does it prohibit texting. (Drivers younger than age 18, under a separate California law taking effect on July 1, are prohibited from talking on the phone or texting while driving with either hands-free phones or hand-held phones, except in an emergency. Unlike the hands-free law that applies to all drivers, the ban on mobile phone use among young drivers is a secondary infraction.) Although dialing takes little time relative to the length of a typical phone conversation, the distraction of dialing is far greater than the distraction of talking and listening on a phone, as measured by the increased risk of collisions (NHTSA, 2006). CHP’s fact sheet on the hands-free law says drivers are “strongly urged” not to dial and “strongly discouraged” from texting, and it reminds drivers that they can be pulled over for appearing distracted and not operating a vehicle safely, but nonetheless the law explicitly proscribes only talking on the phone, not dialing or texting, for adult drivers.<sup>21</sup>

As traffic infractions go, the hands-free law is relatively easy to enforce: Traffic enforcement officers can see whether a driver is holding a phone, and, like wearing a seat belt, a

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<sup>18</sup> In California in 2005, there were 319 traffic fatalities in bad weather, 438 traffic fatalities on wet roads, and 978 rush-hour fatalities. Combining these figures with the range of statistically significant percentage declines reported in Table 3, the hands-free law should reduce bad weather fatalities by 160-200, wet road fatalities by 130-280, and rush-hour fatalities by 90-180. However, because these categories overlap (90% of bad weather fatalities occur on wet roads, and 65% of wet-road fatalities occur in bad weather) we cannot simply add these declines together to get a total effect. A reasonable, conservative estimate is that the decline in bad weather and wet road fatalities would, together, save 200 lives, with the decline in rush-hour fatalities (most of which would not be in bad weather or on wet roads) adding another 100, to yield 300 total.

<sup>19</sup> California Vehicle Code, section 23123.

<sup>20</sup> Traffic and other offenses carry base fines plus additional penalty assessments, as specified in California’s Uniform Bail and Penalty Schedules. A \$20 base fine plus penalty assessments will result in first-time offenders paying a total fine of \$76, with second offenders paying \$190.

<sup>21</sup> CHP, “Wireless Telephone Laws FAQs,” [http://www.chp.ca.gov/pdf/media/cell\\_phone\\_faq.pdf](http://www.chp.ca.gov/pdf/media/cell_phone_faq.pdf).

driver is either abiding by the law or is not. There's not much ambiguity about holding a phone, whereas there can be ambiguity about whether a driver was following another car too closely. This relative clarity about hand-held vs. hands-free phones makes it easier for officers to cite drivers and harder for drivers to contest charges, compared with other kinds of infractions.

However, enforcement of the hands-free laws presents another challenge. Since mobile phone use increases fatalities under adverse driving conditions, it would be preferable to increase enforcement efforts during such conditions. Traffic enforcement officials cannot, of course, pull over every single driver using a hand-held phone, any more than they can stop every driver that glides through a stop sign or drives faster than the speed limit, so there is inevitably some discretion involved in traffic enforcement. Unfortunately, the conditions under which mobile use is more dangerous are the same conditions when enforcement is least likely to occur. In bad weather and wet road conditions, officers have more collisions to investigate and motorists to assist, both of which compete with enforcement for officer resources. Furthermore, it is more dangerous -- both for officers and for other drivers -- to pull over motorists in adverse driving conditions, making enforcement in these conditions even less likely.

Given the difficulties of enforcing the hands-free law under the conditions when enforcement would be most effective in reducing fatalities, public education and awareness about the law -- and about the distraction of using a mobile phone in the first place -- are all the more important. The law, however, did not explicitly include a public education component, and with the state's large projected budget deficit, any public education and awareness campaign that does happen will likely be minimal. As of early April 2008, California had posted frequently asked questions (FAQs) about the new law on multiple state websites and plans to issue a press release, but the state has no plans for a press conference or paid public service announcements.<sup>22</sup>

New York's public-awareness approach, when its law took effect in 2001, was similar to California's current plans. New York's main educational efforts were, first, online information about the new law on New York's Department of Motor Vehicles website, and, second, a 30-day grace period between when the law officially took effect and when enforcement began, during which media attention was expected to remind drivers of the new law. (Although California does not have a grace period, Californians will have had a long period between the law's passage and its enforcement -- 21 months -- compared to four months in New York.) One study criticized New York for not creating more awareness and education about its law. Although there was considerable media publicity between the time New York's law was passed and when it took effect, there was no publicized enforcement campaign by the state. As a result, compliance with the law declined from its initial level, even though New York's actual enforcement (as measured by citations) remained steady.<sup>23</sup>

Public education and awareness should focus on two issues: that mobile phone use is most dangerous under adverse driving conditions and that hands-free technology does not eliminate the distraction of mobile phone use. This latter point -- that the law should not lead drivers to assume that hands-free technology makes mobile phone use safe -- was a key concern

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<sup>22</sup> For instance, see [www.dmv.ca.gov/cellularphonelaws/](http://www.dmv.ca.gov/cellularphonelaws/) and [www.chp.ca.gov/pdf/media/cell\\_phone\\_faq.pdf](http://www.chp.ca.gov/pdf/media/cell_phone_faq.pdf).

<sup>23</sup> McCartt and Geary, 2004.

of the former NHTSA administrator, as noted above. Other research has shown that the distraction when using hands-free technology is no less than when using hand-held phones, yet fatalities do fall when a hands-free law is in effect. It is possible, as discussed above, that the effect of hands-free laws is to reduce overall mobile phone use while driving, or at least reduce use under more dangerous driving conditions. Even in the absence of aggressive enforcement of the hands-free law, making drivers more aware of the dangers of mobile phone use could by itself reduce fatalities in California.

## Conclusion

California's new hands-free law is likely to save lives, especially by reducing traffic fatalities in bad weather and on wet roads. Evidence across all states shows that mobile phone ownership increases traffic fatalities in adverse conditions, and the experience of the four areas with hands-free laws already in effect – New York, New Jersey, the District of Columbia, and Connecticut – suggests that hands-free laws reduce fatalities in bad weather, on wet roads, and in rush hour. The statistically significant results point to a reduction in California of 300 fatalities annually under adverse driving conditions.

Enforcement efforts should ideally be concentrated on times and places when and where these adverse conditions occur. However, enforcement is more difficult during such conditions, due both to competing demands on traffic officers and to the increased risks involved in pulling drivers over. Thus, education and public awareness about mobile phone use and hands-free technology should supplement enforcement of the law. Furthermore, with relatively modest penalties for using hand-held phones and no prohibition against dialing and texting, even strict enforcement of the law might not discourage drivers from using their mobile phones in distracting ways – underscoring the potential value of public education and awareness to help achieve changes in behavior that enforcement alone might not bring about

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