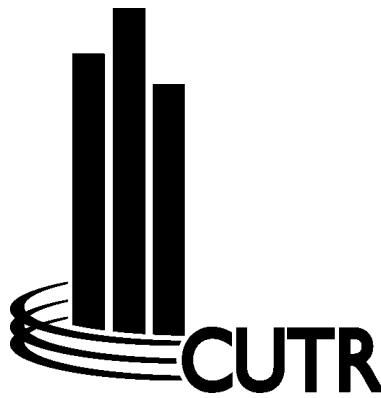


Investigation of the Use of Mobile Phones While Driving



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INVESTIGATION OF THE USE OF MOBILE PHONES WHILE DRIVING

EXECUTIVE SUMMARY

The number of mobile phone users in the U.S. has grown from 500,000 in 1985 to 63 million in 1998. This rapid growth has occurred largely without consideration of the mobile phone's suitability for usage while driving. The objective of this report is to summarize existing information on the subject of mobile phone use while driving, in order to provide a concise summary of the issues for the public, researchers, and legislators alike. The report discusses the benefits of mobile phone usage while driving, such as driver safety and time use efficiency, and negative aspects such as its potential for driver distraction resulting in accidents.

The report contains information on the demographics of mobile phone use in the U.S., focusing on user demographics and frequency of usage while driving. Although once used primarily by high income business people, user demographics are now much more similar to the demographics of the U.S. population as a whole. Findings from literature on the subject of mobile phone use and driving performance are highly variable. In general, the literature shows that the effect of mobile phone use on driving is a complex issue with several influencing factors including the type of mobile phone used, the type of conversation undertaken, and the demographics of the user. In general, it was found that mobile phone use does have an adverse affect on driving performance, but the significance of the distraction is difficult to quantify. Reports found that people that used a mobile phone while driving were anywhere from 34 percent to 300 percent more likely to have an accident.

At present, only two states include specific "check boxes" on their accident investigation forms to identify mobile phone use as a factor in crashes. This report concludes that data collection on a national scale is the first, most important step to accurately evaluating the

risk associated with mobile phone use, and therefore assessing the need for any legislative regulations on usage. Several countries have already banned mobile phone use while driving, and legislation has been proposed in nine states in the U.S. At the time of this report (April 1999), no U.S. legislation on this issue had progressed to become law. There are numerous reasons for this, including the lack of data to support any legislative action. Alternatively, laws may develop through civil court cases where mobile phone users, manufacturers, service providers, etc. are found liable for automobile accidents.

With mobile phone use likely to continue to increase in the future, the safety of driving while using a mobile phone will become a very important safety issue. Therefore, it is important to begin to collect better data on the risks associated with using a mobile phone while driving. In this manner, the need for legislation can be accurately measured, and, if legislation is needed, its extent, role, and effectiveness in saving lives can be better assessed.

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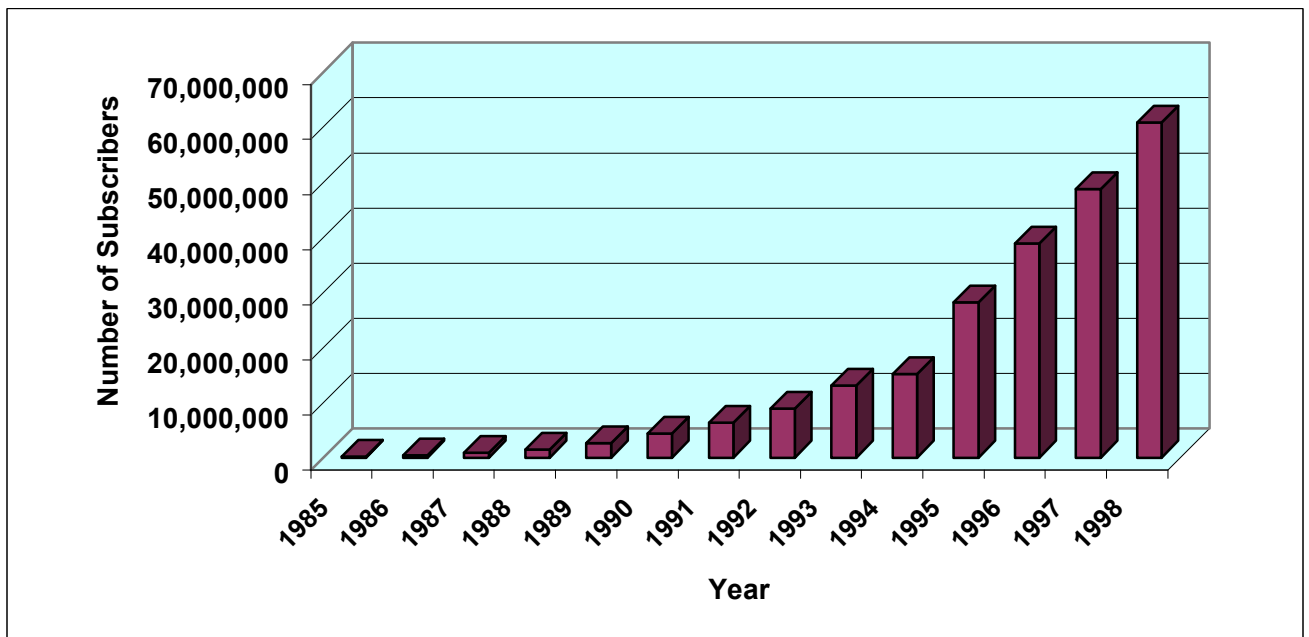
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1. Introduction

1.1 Background

In September 1998 there were 63 million subscribers to wireless phones in the U.S., while in 1985 there were less than 500,000 (see Table 1.) This explosion in usage has resulted in more people using mobile phones in a variety of different situations. One situation with obvious safety implications is the use of mobile phones while driving a vehicle. This is an issue of growing concern that has prompted the introduction of legislation in several states and has been the subject of numerous research projects and some media attention.

Table 1: Wireless Subscribership



Source: Cellular Telecommunications Industry Association

1.2 Report Content and Objectives

The objective of this report is to review the existing literature on the subject in order to provide a concise summary of the issues for the public, researchers, and legislators alike. The report analyzes the demographics of mobile phone use to obtain a full understanding of utilization patterns. A legislative review is provided that includes an analysis of attempts to legislate mobile phone use in the U.S. and also includes information from other countries where legislation prohibiting/limiting mobile phone use exists. The report then discusses how to improve safety while using a mobile phone in an effort to increase awareness of the problem and potentially save lives. Finally, the report assesses the future of in-vehicle communication technology, discussing new and emerging technologies and their integration in the broader field of intelligent transportation systems.

1.3 Definition of Mobile Phone

The term “mobile phone” has been used generically to include several forms of wireless communication. This term represents fully portable cellular and digital phones in addition to hand-held and hands-free car phones.

2. Demographics of Mobile Phone Use

2.1 Introduction

To gain a better understanding of mobile phone usage, socio-economic characteristics of mobile phone users and most common uses are examined. Data on mobile phone ownership, usage and other issues were obtained to better understand potential problems caused by widespread usage. This chapter presents existing information from surveys and polls. The four main areas of interest are demographics of mobile phone users, usage while driving, safety benefits, and emergency response issues.

2.2 Sources of Information

Several sources are referenced in this section of the report. The Gallup Organization conducted the Motorola Cellular Impact Survey in 1993, and its results are compared to a similar survey conducted in the same organization in 1991. In these surveys, telephone interviews were conducted with a nationally representative sample of 660 mobile phone users. In January 1998, Peter D Hart Research Associates conducted a nationwide telephone survey for the Cellular Telecommunications Industry Association. A representative sample of 1004 mobile phone users were surveyed. *Prevention Magazine* conducted surveys in 1994 and 1995, with approximately 1260 respondents in each survey. The magazine reported that the survey was a representative sample of national demographics. The Motor Vehicle Occupant Safety Survey was conducted by National Highway Traffic Safety Association (NHTSA) from November 1996 to January 1997. This telephone survey included 4,022 respondents randomly selected from all 50 states and the District of Columbia.

2.2 Demographics of Mobile Phone Users

Tables 2,3, and 4 consider age, income, employment, and education as demographic factors related to mobile phone use.

Table 2: Age of Mobile Phone Users

Age of Respondents	Motorola Survey		Hart Associates
	1991	1993	1998
18-24	6%	6%	31%
25-34	26%	30%	
35-44	34%	30%	27%
45-54	20%	23%	26%
55-59	6%	3%	
60 or older	4%	8%	15%
No response	3%	0%	

Source: Motorola Cellular Impact Survey, Peter D. Hart Research Associates Survey

Table 3: Income of Mobile Phone Users

Income Distribution of Respondents	1991	1993
Less than \$25,000	N/A	15%
\$25,000 - \$44,999	30%	27%
\$45,000 – \$59,999	20%	16%
\$60,000 - \$74,999	14%	7%
\$75,000 – or over	16%	28%

Source: Motorola Cellular Impact Survey

Table 4: Employment Status of Mobile Phone Users

Employment Status of Respondents	1991	1993
Full-Time	83%	78%
Part-Time	6%	5%
Homemaker	11%	4%
Self-Employed	N/A	4%
Retired	N/A	5%

Source: Motorola Cellular Impact Survey

Table 5 shows that in 1990/1991 most mobile phones were used for business purposes. The surveys in 1993/1994 showed that more phones were being purchased for personal use and by 1998 personal use was the dominant type of use. This is a trend that is expected to continue as phones become increasingly inexpensive and therefore more attractive to the general public for non-business purposes. Mobile phone providers also have increased the number of payment plans that allow users a certain number of free minutes of use per month. Peter D. Hart Research Associates compared mobile phone usage in standard demographic groupings with the national averages of the same groupings. The results of this analysis and examination of the information in the tables presented here, shows that “the expansion of wireless phone use to all segments of society has created a market that demographically resembles the U.S. population.” (Hart, 1998)

Table 5: Purpose of Mobile Phone Calls

Purpose	1990 CTIA	1991 Motorola	1993 Motorola	1994 CTIA	1997 Hart	1998 Hart
Business	60%	67%	54%	44%	25%	21%
Personal	40%	33%	46%	56%	58%	61%

Source: Cellular Telecommunications Industry Association Survey, and Peter D Hart Research Associates Survey

2.3 Mobile Phone Usage While Driving

Table 6 presents the results of the Prevention Magazine survey (1995) that asked mobile phone users how often they use their mobile phones while driving.

Approximately 60 percent of respondents indicated that they use their car phone while driving either very few times or never.

Table 6: Frequency of Mobile Phone Usage While Driving

Frequency of car phone use while driving	Percent of responses
Most trips	17%
About half	10%
Less than half	12%
Very few	46%
Never	15%

Source: Prevention Magazine Survey

Results from a similar survey by NHTSA (Goodman, 1997) are shown below in Table 7. Sixty-five percent of respondents indicated that they used their phones while driving either very few times or never which is consistent with the *Prevention Magazine Survey*. Males seem to use their phones while driving more frequently than females. The difficulties and subsequent uncertainties associated with collecting data on mobile phone usage should be considered when viewing Table 7. People may be unwilling to state that they use their mobile phones while driving which may affect the accuracy of these survey results.

Table 7: Frequency of Mobile Phone Usage While Driving

	Do you talk on the phone while driving?		
	Male	Female	Total
Most trips	16%	5%	11%
About half	10%	9%	9%
Less than half	17%	12%	15%
Very few	49%	59%	54%
Never	7%	14%	11%

Source: NHTSA Motor Vehicle Occupant Survey

2.4 Safety Benefits

One major reason for the purchase of a mobile phone is the perceived increased safety benefits, as shown in Table 8. This table, part of the Motorola Cellular Impact Survey, shows the frequency of mobile phone usage for safety purposes and the perceived importance of having a phone available for this purpose.

Table 8: Usage of Mobile Phones for Safety Reasons

Safety Benefits	1991	1993
Called for help for another's disabled vehicle	38%	40%
Called for help for own disabled vehicle	25%	39%
Called for assistance for own medical emergency	7%	13%
Called for assistance for another's medical emergency	23%	28%
Called police to warn of hazardous road conditions	24%	28%
Considered buying another cell phone for other family members as safety precaution	N/A	52%
Have purchased an additional phone for other family member as safety precaution	N/A	28%
Encourage teenagers to use phone while out at night	N/A	26%

Source: Motorola Cellular Impact Survey

This table indicates that there is a broad range of perceived safety benefits available to mobile phone users; many in the survey have used their mobile phone for several of the safety purposes. It also indicates that a large proportion have purchased and used their phones for this reason. It is probable that these benefits are a major reason for the growth in non-business usage.

2.5 Emergency Response

A perceived major benefit of carrying a mobile phone in a vehicle is the ability to call for assistance in an emergency. The number of wireless 911 and distress calls has risen steadily, in keeping with increases in mobile phone ownership. The number of annual nationwide wireless 911 and distress calls was 193,000 in 1985 and has risen to 30,500,000 in 1997 (Cellular Telecommunications Industry

Association, 1997). Emergency response service providers and law enforcement agents recognize the benefits that the improved communication links provide. If a person in an accident does not have a mobile phone to call 911, other motorists on the road see the accident and the distress call is made indirectly. The problem with mobile phones is that the emergency call centers cannot pinpoint the distress call location, as can be done with landline distress calls. This is a problem if the caller is unaware of his or her location. Technology is available to allow the location of mobile phones to be tracked, but implementation is difficult due to privacy implications. In 1996, the Federal Communications Commission (FCC) released a Notice of Proposed Rulemaking which proposed that by April 1998, “all cellular carriers must be able to relay a caller’s Automatic Number Identification (ANI) and the location of the base station or cell site to the designated Public Safety Answering Point (PSAP) for a 911 call” (Goodman, 1997). In March 1999 the FCC, were still in the process of finalizing this regulation (<http://www.fcc.gov/>, 1999). Further applications in emergency response technology are considered in Section 6 of this report.

Another problem with mobile distress calls is the sheer volume that can flood call centers in the aftermath of an accident on a busy roadway. This scenario endangers people involved in accidents elsewhere who cannot get through to the call center. The ease of calling this toll-free number on a mobile phone has resulted in people dialing 911 to ask for directions or test the operation of the phone. Some states have established Emergency Communication Centers to deal with large volumes of mobile 911 calls (Goodman, 1997).

3. Published Research

Research literature on the use of mobile phones while driving can be divided into three main categories: on-road studies, simulator studies, and epidemiological studies. Each type has contributed to understanding of the issues and notable studies from each area are summarized below.

3.1 On-Road Studies

This category covers the studies undertaken on actual roads in real world conditions and as such are of great value. Using simulators always carries the risk of not sufficiently replicating real world conditions and therefore not providing relevant results. On-road studies are based on “real world” conditions.

3.1.1 The Effects of Mobile Telephoning on Driving Performance (Brookhuis, et al., 1991)

The objective of the project was to study the effects of driving while telephoning in three different traffic conditions while following another vehicle, in order to regulate the “traffic load.” These conditions were light traffic on a quiet roadway, heavy traffic on a four-lane ring road, and in-city traffic. The study used 12 subjects, 10 male and 2 female, who drove an instrumented Volvo 245 GLD for an hour each day for three weeks and operated a mobile telephone for a short period of each trip. One half of the subjects used a hand-held phone while the other half used a hands-free phone, and subjects were asked to place and receive calls. The age of participants was evenly spaced between 23 and 65. The telephone conversation consisted of a three-minute combination of memory and addition testing. The vehicle measured lane tracking, steering wheel movements, speed, following distance, driver rear view mirror checking, and driver pulse rate.

Study Results and Findings

- Talking on a mobile phone decreased the standard deviation of lateral position or “swerving,” particularly while driving on a quiet roadway.

- Talking on the mobile phone delayed adaption to speed variation of the followed car by 600msec.
- Steering wheel standard deviation was considerably greater when using a mobile phone during city driving, particularly when placing and receiving calls on the hand-held phones.
- Mobile phone use while driving generally did not affect rear-view mirror checking.
- Drivers' mental workload increased while undertaking the telephone task; no measurable difference was detected for the alternative driving conditions of phone types.
- Success in the telephone task increased significantly over the study period, indicating a learning effect.
- No age variance in performance of the different age groups was detected.

3.1.2 Effects of Handsfree Telephone Use on Driving Behavior

(Fairclough, et al., 1991)

The study required subjects to drive an experimental vehicle in a real road environment under three different experimental conditions. The three conditions were a conversation on a car phone (hands free), a conversation with a passenger, and the control condition of no conversation. Twenty-four subjects were chosen to participate, of which none were regular car phone users. The route was a one-mile circuit of single lane roads.

Results and Study Findings

- Speaking while driving exerts a higher mental workload than driving alone and induced increased task effort and frustration.
- Time taken to complete the route was around 10 percent longer under speaking conditions.
- Heart rate was significantly higher in the car phone condition than either the passenger or control conditions. This could either have been caused by the inexperience of using a car phone or could indicate that a car phone

conversation is fundamentally more demanding than a passenger conversation. Other studies have found that these two types of conversation are different in the complete absence of “social cues” in car phone conversations, and also that the presence of a passenger increases the drivers awareness of their own driving standards.

3.2 Simulator Studies

3.2.1 Changes in Driver Behavior as a Function of Handsfree Mobile Phones

(Alm, et al., 1991)

This study assessed the effect of a hands-free telephone conversation on the driver’s reaction time, lane position, speed level, and workload during easy and hard driving conditions. Forty subjects were randomly assigned to four experimental conditions on test routes 80km long.

During the easy driving task, the telephone conversation was given the highest priority. This meant that the telephone task was completed successfully while driving performance deteriorated slightly. During the hard driving task, the driving was given highest priority and therefore driving was better than under the easy driving task but the telephone performance reduced.

Study Results and Findings

- Reaction time was significantly increased by phone use during the easy driving condition, but there was no effect when using the phone during the hard driving condition.
- Phone use increased lateral position deviation; the harder the driving task, the greater the lateral deviation.
- A higher mental workload was imposed on the driver by phone use, but the workload was unaffected by the complexity of the driving task.
- Phone use had the effect of reducing driver speed.

3.2.2 The Effect of Cellular Phone Use Upon Driver Attention

(McKnight, 1991)

The objective of this study was to assess the use of mobile phones as a possible driving distraction. There were 151 participants in the study, which used a video driving sequence containing 47 different traffic situations. Five conditions of distraction were tested: placing a mobile phone call, carrying out a simple mobile phone conversation, carrying out a complex mobile phone conversation, tuning a radio, and no distraction. Distraction was measured by comparing response occurrence and response time under the test conditions with the comparable responses with no distraction.

Study Results and Conclusions

- The three tasks involved in mobile phone use - placing calls, simple conversations and complex conversations - all increased the time required to respond to highway traffic conditions, by between 0.3 and 0.85 seconds.
- Complex conversations induced the largest reaction time increases, which were equivalent to tuning a radio.
- Placing a call and undertaking a simple conversation were found to be less distracting than tuning a radio.
- Age was found to have an influential effect on the amount of distraction incurred.
- The proportion of drivers over 50 years old who failed to respond to traffic situations while using mobile phones was two to three times larger than younger drivers, with the act of placing the call being the most difficult for older drivers.
- Prior experience with mobile phones was found to be unrelated to the degree of distraction.

3.3 Epidemiological Studies

These studies use the epidemiological method of assessing accident risk while using a phone while driving. The technique was originally designed to assess the risk of infection of a person exposed to a disease. In this case, the technique is used to assess the risk of “exposure” to an accident if using a mobile phone as opposed to the risk while not using one. A major benefit of the technique is that each study participant serves as their own control, so the effect of using the phone is directly determined. Some of the more important studies are described below.

3.3.1 Association between Cellular Telephone Calls and Motor Vehicle Collisions

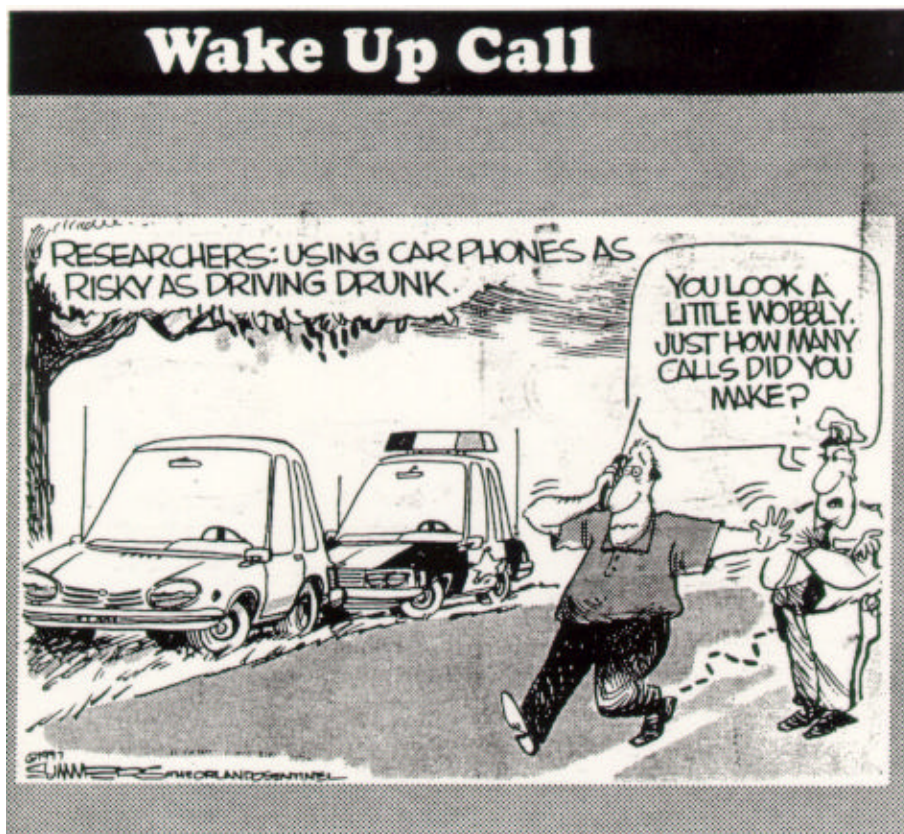
Of all the studies undertaken on this topic, this one by Redelmeier (1997) has received the most attention from both legislators and the media and has been most effective in bringing the issue into the public domain.

The study uses an epidemiological method, case crossover design, to evaluate whether using a mobile phone while driving increases the risk of a motor vehicle collision. The study participants were people who reported to the New York Collision Reporting Center between 7/1/94 and 8/31/95 and were included if they consented to participate and the collision resulted in substantial property damage. Accidents involving injury or criminal activity are not dealt with by the center. People were excluded from the study if they did not have a mobile phone or their billing records could not be located. A total of 699 subjects were eventually selected to participate in the study. Telephone records were collected and the time of accident estimated from the subject statement, police records and the billing records. If these three sources matched, the time of the accident was said to be exact. The phone activity during the collision time period was compared with the same time period of another control day to see if there was an association between phone use and accident risk. Control days used were the preceding day,

same day proceeding week, day of similar phone activity and period of most mobile phone use.

Results and Study Findings

- Average monthly bill was \$72 compared with the national average of \$51.
- Twenty-four percent of participants used their mobile phone in the 10 minutes before the crash.
- Thirty-nine percent of drivers called emergency services following the collision.
- Using a mobile phone while driving is associated with an approximately four-fold increase in risk compared with not using the phone; this is similar to the risk of driving with a blood alcohol level at the legal limit.
- Hand free phones are no safer than hand-held phones.
- Younger drivers were found to be at more risk than older drivers.
- High speed crashes are more likely than low speed crashes.



3.3.2 Cellular Phones and Fatal Traffic Collisions

(Violanti, 1998)

This case control study was conducted to determine statistical associations between traffic fatalities and the use or presence of a mobile phone. The study used data from the Oklahoma State Department of Public Safety database as the police standardized accident reports include a “check box” to indicate the presence and/or use of a mobile phone. The reports were filed between 1992 and 1995.

Study Results and Findings

- Total traffic related accidents were 233,000, of which 1,548 were fatal. Of the vehicles involved in fatal accidents, 4.2 percent had mobile phones and 7.7 percent of the fatalities with phones present were reported to be using the phone at the time of collision.
- Drivers reported to be using a phone at the time of collision had a nine-fold risk of a fatality over those without a phone.
- Drivers reported to have a phone present in their vehicle were at twice the risk for a fatality as drivers without phones.
- Drivers with phones were more likely to incur a collision due to “wandering” from their lane.
- Drivers with phones had a increased chance of striking a pedestrian.
- Drivers with phones had an increased risk of overturning their vehicle.
- Drivers using phones were at three times the risk of a fatality over alcohol/drug use.
- Results suggest that phone use is associated with driver inattentiveness to speed and lane position.
- Risk of phone involved fatalities increase with age.

3.3.3 Cellular Phones and Traffic Accidents: An Epidemiological Approach (Violanti, 1996)

The objective of this study was to examine the association between mobile phone use and traffic accident risk using epidemiological case control design and logistic regression techniques. The study divided its subjects into a case group and control group, with 100 drivers in each group. The case group consisted of New York State drivers who had a “reportable” accident (\$1,000 property damage or personal injury) in 1992-93. The control group consisted of a random sample of New York State drivers who were accident-free within the last 10 years. The epidemiological method allowed the study to focus on the presence of risk factors associated with traffic accidents.

Study Results and Findings

- An increased crash risk of 34 percent existed for those with mobile phones in their cars.
- Talking for more than fifty minutes per month resulted in a 5.58 fold increased risk of having a crash, higher than any other in car activity.
- People in the case (accident) group used their mobile phones twice as much as people in the control (no accident) group and engaged in considerably more business and intense calls.

3.4 General Studies

3.4.1 An Investigation of the Safety Implications of Wireless Communications in Vehicles (NHTSA, 1997)

This report is an extensive review of the issues surrounding mobile phone use while driving. It contains summaries and discussion into almost all of the research done on this issue up to 1997. The report objective is to assess whether mobile phone use while driving increases the crash risk and to assess the magnitude of traffic safety problem due to this behavior. The report also

discusses the future problems if current trends continue and explores ways to maximize safe usage by drivers.

Study Findings

- Using a mobile phone does increase the risk of a crash but the amount of increased risk was hard to quantify and may depend on other driver-related variables besides mobile phone usage.
- The national magnitude of the problem was found to be unquantifiable due to the absence of mobile phone use in police crash data reports.
- The report predicted that the number of crashes due to mobile phone usage would increase in the future as the number of mobile phone users increased.
- There is a large scope for improving the safety of mobile phone usage, both through driver education to increase awareness of the dangers involved and through technological advances to create ergonomically sound mobile phones.

3.5 Summary of Research Literature Findings

3.5.1 Quantifying Crash Risk

From the research studies described above, assessing and quantifying the effects of mobile phone use on driving and crash risk is a complex task. The epidemiological studies are useful as a source of quantifiable statistics on the risks associated with mobile phone use while driving. The accuracy of these predictions depends on the quality of the data and the validity of these relatively new techniques and, in this respect, the validity of using epidemiological methods can be questioned. However, in the absence of police crash reports detailing mobile phone usage, this is the only method currently available for any quantifiable crash risk analysis. These studies all find that there is a significant risk, Redelmeier (1997) states a quadrupling of the risk, while Violanti (1996) finds a 34 percent increase in risk.

3.5.2 Effect of Mobile Phone Use on Driver Behavior

Aside from quantifying crash risk, all the studies mentioned are useful in assessing how mobile phone use affects general driving behavior. Repeated findings include adverse effects on driver reaction time, mental workload vehicle lane position, all pointing towards the distracting nature of mobile phone use. In comparing mobile phone use with other in car activities, Violanti (1996) found that mobile phone use was most distracting if used for more than fifty minutes per month. In contrast, McKnight (1991) found mobile phone use to be no more dangerous than tuning a radio. Considering the physical and mental activity required by mobile phones, it appears that this activity is one of the most distracting in car activities that is possible to carry out while driving. Even if only as distracting as tuning a radio, the actual exposure to accident risk is significantly higher due to the greater lengths of time spent on the phone compared to tuning the radio.

3.5.3 Hands-Free Versus Hand-Held Mobile Phone Usage

Assuming mobile phone use is associated with increased crash risk, some types of behavior appear to be at more risk than others. Research suggests that hands-free use is less dangerous than hand-held use due to the removal of “physical distraction” while placing and receiving calls. However, research comparisons of hand-held and hands-free phones shows that there is little difference in risk during the act of conversation due to the continued presence of a mental distraction.

3.5.4 Effect of Type of Conversation on Crash Risk

Research has shown that the type of conversation is significant in determining crash risk. Violanti (1996) found that mobile phone users engaging in intense or business conversations were more likely to have a crash, while McKnight (1991) found that complex conversations were the most dangerous phone-related activity. The general finding that engaging in a simple conversation is relatively risk-free compared to engaging in an intense conversation was a finding of several studies.

A possible explanation for this is given in Alm (1990), whereby phone use and driving are parallel tasks competing for the drivers attention. If the driving task or phone task is simple, the driver can easily accommodate one or the other but not both if they are difficult.

3.5.5 Effect of Age on Crash Risk

On this issue, many of the studies exhibit conflicting findings. The epidemiological studies generally find that younger drivers are more at risk, while the on-road and simulator studies tend to find that older drivers are more susceptible to a mobile-phone-related crash. Given that the mobile phone's main effect is distraction of the driver, with resulting detrimental effects on reaction time and attention to road conditions, it would appear that older people, with their already-reduced reaction abilities, are more at risk from mobile phone use. The fact that young people appear more at risk in the epidemiological studies suggests that the crashes experienced by mobile phone users may be more due to factors other than mobile phone use.

4. Existing Crash Data

At present, there are two national crash databases that gather data on motor-vehicle collisions in the U.S., the Fatal Analysis Reporting System (FARS) and National Automotive Sampling System (NASS). Both these databases use police crash report data as a source of information. With the exception of Oklahoma and Minnesota, no state police reports include a specific “check box” for mobile phones. In most states, the only way in which mobile phone use can be coded into the databases is if they are mentioned in the narrative description of the crash, found at the end of the report (Goodman, 1997).

4.1 FARS Database

This is a census of all motor-vehicle-related fatalities that are recorded by police crash reports - approximately 40,000 deaths every year. Mobile telephone use was included as a possible driver-related factor beginning in 1994. A major problem with FARS is that data is skewed due to the way the Oklahoma data have been coded. In this state, a tick in the “mobile telephone installation” box has been taken to indicate a mobile-telephone-related crash. Further analysis of the data showed that less than 10 percent of the Oklahoma crashes were actually mobile-phone-related. Experience with the Oklahoma data has shown that even with check boxes included in the report, correct coding of mobile phone related crashes is not straightforward. The NHTSA study (Goodman, 1997) (see Section 3.4) has taken account of this anomaly in its analysis and is confident that the data from the other states are accurately coded.

Studies of the FARS data from 1994 and 1995 shows that, in most-mobile-phone related crashes, the driver of the striking vehicle was using a mobile phone and that most of these crashes involved collisions with other vehicles (Goodman, 1997). Further analysis of the causes of mobile phone related crashes has shown that the main reasons for the crashes has been driver inattention, driving too fast and running off the road. Driver inattention has a particularly strong correlation

with mobile-phone-related crashes, with a fivefold increase in likelihood over the FARS average (Goodman, 1997).

4.2 NASS Database

This database uses trained researchers to investigate a stratified random sample of all motor vehicle crashes in the U.S., around 5,000 crashes each year. The database incorporates the police crash reports with interviews of the drivers and passengers of the vehicles involved. Analysis of 1995 data showed that eight crashes out of 4,555 (0.18 percent) involved a mobile phone and that a common factor of each of these crashes was driver inattention. Applying weighting factors to the sample, the eight crashes are representative of 3,837 national mobile phone related crashes (Goodman, 1997).

4.3 Oklahoma Crash Data

As mentioned earlier in section 5.1, Oklahoma and Minnesota are unique in their collection of mobile phone specific crash data. However, in Minnesota, the check box is underutilized (see Section 4.4) so Oklahoma is the only state collecting usable data. Oklahoma started its collection of mobile-phone-related crash data in 1992. The police crash report contains check boxes for “phone installed” and “phone in use,” with officers trained to look for the presence of a mobile phone at the scene of the crash. If a mobile phone is seen to be installed in the vehicle, then the driver is asked if it was being used at the time of the crash. The first problem with this method is that a mobile phone is noted as present only if it is installed in the car. Three-quarters of all mobile phones are hand-held and would not be noted under this system. The second problem is that drivers at fault in the crash would be reluctant to state that they were using their mobile phone during this time. These problems suggest the potential for under-reporting of instances of mobile phone use. A further problem is that the type of usage is not defined, and, therefore, there is no means of assessing which of the acts of dialing, receiving a call, or talking are the most hazardous.

Bearing in mind these problems, analysis of the Oklahoma data showed that approximately 10 percent of telephones known to be in vehicles were in use at the time of the crash. Table 8 shows a comparison of the contributing causes of all Oklahoma collisions with the contributing causes of crashes involving mobile phones. A similar trend to the FARS database is observed with driver inattention far more prevalent among mobile-phone-related crashes (Goodman, 1997).

Table 9: Contributing Causes of Oklahoma Collisions, 1992-1994

	All (%)	Mobile Phone Usage (%)
Failed to yield	19	15
Followed too closely	11	13
Unsafe speed	12	6
Improper turn	11	10
Changed lanes unsafely	5	6
Stopped in traffic lane	0	1
Failed to stop	7	6
Unsafe vehicle	2	1
Left of center	2	2
Improper overtaking	0	1
Improper parking	2	0
Inattention	9	17
DUI	4	7
Other	16	15

Source: Annual Oklahoma Traffic Accident Facts Report

4.4 Minnesota Crash Data

Minnesota police crash reports have included a check box for “driver on car phone/CB/2-way radio” as a contributing crash cause since 1991 (Goodman, 1997). Since this time, the number of citations including this contributing cause has been insignificant and has often been grouped in with other “miscellaneous factors.” It is thought that the reason for this unusually low occurrence rate is that contributing cause factors are obtained from interviews with involved parties, with mobile phone use being difficult to detect (Goodman, 1997).

4.5 Japanese Crash Data

Data released from the National Police Agency of Japan gives analysis of car-phone related traffic accidents in 1997 and 1998. Table 9 shows the total number of car phone related accidents.

Table 10: Traffic Accidents While the Driver is Using a Mobile Phone

	Jan-Jun 1997	Jan-Jun 1998	% increase
Number of Accidents	1122	1248	11.2
Fatalities	11	22	50
Injuries	1624	1793	10.4

Source: National Police Agency of Japan

These accidents represent 0.34 percent of all accidents in Japan (National Police Agency of Japan, 1998). Further analysis of these data was undertaken to assess which types of use were more dangerous. Table 10 shows the results of this analysis.

Table 11: Type of Mobile Phone Activity in Progress when Crash Occurred

Calling/Operating		Receiving Calls		Talking		Others	
#	%	#	%	#	%	#	%
286	22.9	537	43	208	16.7	217	17.4

Source: Traffic Planning Department, National Police Agency of Japan

Table 10 shows that the most hazardous activity associated with mobile phone use is receiving a call. This is a rather surprising statistic, as receiving a call does not require the same driver workload as placing a call or talking on the phone. The fact that the driver cannot choose the time when a call is received perhaps introduces the element of danger into this activity.

Additional data analysis showed that, by far, the most common type of mobile-phone-related accident is a rear-end collision, accounting for 76.3 percent of all accidents. The age group most likely to have a mobile-phone-related accident is

the 16 to 24 year olds (31.8 percent), while people over 50 years old accounted for less than 10 percent of all accidents. Also, males are more likely to have a mobile-phone-related accident; 77.6 percent of the total number of crashes involved male drivers (National Police Agency of Japan, 1998).

4.6 Summary

This section has described the existing data available for mobile-phone-related crashes. In the U.S., the two national databases, FARS and NASS, make use of police crash reports as the basis of their data. The lack of a specific mobile phone use element to these crash reports indicates the probability of underreporting mobile-phone-related accidents. The difficulty in determining accurately whether a mobile phone was in use at the time of the accident means that providing a check box in crash reports does not solve the problem, which has been shown with the analysis of the Oklahoma data. Clearly, it may be very difficult to design a police crash report that provides accurate, unbiased results on mobile phone usage, but this is what would be required to obtain irrefutable knowledge of the extent of the accident risk associated with using a mobile phone while driving. The methods used in Japan, where the required data appear to be available, may need to be considered when designing a data collection system for the U.S. In summarizing the various sources of data available, it appears that most mobile-phone-related crashes occur due to drivers moving from their lane or colliding with a stopped vehicle in their lane, mainly due to inattention to the driving task. These general findings are strikingly similar to the findings of the research studies summarized in Section 4. There is a real need for concise crash data collection to assess the magnitude of the problem and to derive potential solutions. To do this, police crash reports should include a carefully-designed mobile phone use element, and investigating officers should have the necessary awareness and training to complete this element correctly.

5. Safe Use of Mobile Phones while Driving

Assuming that wireless communication technology will be increasingly available to drivers in the future, it is essential that drivers know how to use their mobile phone safely. The Cellular Telecommunications Industry Association (CTIA) has put considerable effort into getting the “safe use” message across, using its campaign “Safety: Your Most Important Call” (CTIA, 1998). The campaign’s central message is that it is a driver’s first responsibility to drive safely and includes 10 points to consider when using a mobile phone while driving. These are:

1. Get to know your phone and its features such as speed dial and redial.
2. When available, use a hands-free device.
3. Position your phone within easy reach.
4. Let the person you are speaking with know you are driving; if necessary, suspend the call in heavy traffic or hazardous weather conditions.
5. Do not take notes or look up phone numbers while driving.
6. Dial sensibly and assess the traffic situation; if possible, place calls when you are not moving or before pulling into traffic.
7. Do not engage in stressful or emotional conversations that may divert your attention from the road.
8. Use your phone to call for help.
9. Use your phone to help others in emergencies.
10. Call roadside assistance or a special non-emergency wireless number when necessary.

All of these points are good advice and increase the safety of drivers and other road users around them. They take into account the findings of several studies mentioned in Section 3 by warning against calling when already under a heavy driving workload and engaging in stressful and emotional conversations. The recommendations to use a hands-free device, place calls when not moving, and

suspending calls in heavy traffic or hazardous weather conditions are also good advice. However, it may be unrealistic to expect these to be followed by the majority of users without some method of enforcement. Also, it may be unwise to promote the notion of the hands-free device being “safe” in light of the *New England Journal of Medicine* article (Redelmeier, 1997) that states that this may not be any safer than the hand-held device.

The main problem in this field is getting the safe use message across to the people who use or plan to use their phones while driving. In New York State, legislation has been proposed requiring that a warning sticker be placed on the handset by the manufacturer, informing of the dangers involved in usage while driving (Section 7). Aside from this legislation, a government-backed national campaign involving TV or other forms of mass media advertising to promote the safe use of mobile phones while driving may prove extremely beneficial. Additional education in this field is a primary concern and can begin immediately to save lives and increase safety.

6. New Technology

6.1 Introduction

There is an almost limitless potential for new technology in the field of wireless communications. Already, mobile phones are being used to operate portable faxes, and provide e-mail, and Internet access as the phenomenon of the “mobile office” emerges. The use of these supplementary items is discussed in this chapter. The use of the mobile phone as a safety device has been well documented and has been taken one step further by the development of Automatic Crash Notification (ACN). ACN is designed to be a direct automatic link to emergency services if the vehicle is involved in a collision. Further applications of the mobile phone in Intelligent Transportation Systems are also discussed in addition to an insight into the “programmable” nature of the mobile phone. The concept of an “intelligent answerphone” is also addressed.

6.2 Incorporation of Mobile Phones in other Communication Devices

Mobile phones can be used to link many other devices to the wireless communication network. Many information transfer devices ultimately use phones to transport data. Faxes, e-mail, and the Internet all use phone lines for access. Since the wireless communication network carries out the same task as traditional phone lines, it is natural that mobile phones be used to make these supplementary devices mobile. Mobile phones incorporating these additional functions are on the market at present, but it is unclear what number are in use. The question of the safety of using these devices while driving is outside the scope of this study and is currently being assessed by the NHTSA Research Team.

6.3 Automated Collision Notification (ACN)

Research has shown that one of the main reasons for having a mobile phone in a vehicle is safety. People know that if their vehicle breaks down or they are involved in an accident, help is only a call away. The application of this concept

is taken one step further by ACN technology. This is part of a general ITS initiative called Advanced Emergency Response Services. The purpose of ACN is to automatically initiate a wireless 911 call, transmitting data on the severity of the crash, related safety information, and location of the vehicle (Donnelly, 1997). The system requires a vehicle equipped with advanced electronics, sensors and computer systems that can determine engine problems, temperature changes, the vehicle's location, and speed levels (Yuan et al., 1994)). The sensors would detect impact on the vehicle and trigger the portable phone to dial 911 and relay the relevant information from the car to the appropriate emergency personnel. The technology described already exists and is currently being tested by NHTSA. During a road trial, one driver was involved in an actual accident, and the ACN unit connected the driver directly with emergency personnel via a universal wireless port as soon as the car sensors had detected an impact. The role of wireless technology in this lifesaving area of ITS is very valuable and will increase in effectiveness as technology advances. The wider concept of Advanced Emergency Response Services involves the "end-to-end" connection of accident victim and suitable emergency service. The objective is to remove from the system the intermediary connectors between the two "ends" that slow the reaction time to the accident and therefore reduce the effectiveness of the response.

6.4 The Intelligent Answerphone

The "intelligent answerphone" is a concept introduced by A.M Parkes in "Driving Future Vehicles" (1993). The intelligent answerphone would increase the safety of using an in-vehicle communication device by only allowing the driver to converse during safe driving periods. The answerphone would receive information from vehicle sensors or visual data and evaluate the driver workload in real time. During periods of high workload, the answerphone would alert the driver to driving conditions. In extreme cases, the answerphone would cut off the conversation, informing the caller that they would be reconnected shortly and directing the call to the driver's voicemail. The technology required for such a

system is still a long way from being available to the general public and will require advances in several fields of ITS (Goodman, 1997).

7. Legislation

7.1 Introduction

As with many new technologies, there is little or no legislation in place to define the individual's use of mobile phones. A formal assessment of what actions should and should not be undertaken while using a mobile phone does not exist and, therefore, the question is left to the discretion of each individual mobile phone user. The need to legislate mobile phone use cannot be considered until there is a clear, quantifiable understanding of the relative risks involved.

Legislation on this issue has been proposed in a number of states in the U.S., but, as yet, none has progressed to become law. Additionally, in a number of other countries, laws are in place to restrict the use of mobile phones while driving. A discussion of the reasons for and impact of legislation in these countries is also included.

7.2 Legislation in the United States

To date, legislation specific to mobile phone use while driving has been proposed in nine states:

- California
- Hawaii
- Illinois
- Nebraska
- New Jersey
- New York
- Oregon
- Virginia
- Washington

The state most actively proposing legislation on this issue is New York, where a variety of related bills have been introduced by four legislators. A discussion of the legislation proposed by four of these legislators is detailed below.

7.2.1 New York Legislation

Assemblyman Felix Ortiz was the first to propose legislation in the U.S. in February 1997, after witnessing a woman crash her car into a light pole while talking on her mobile phone. When he offered assistance to her, she stated that the accident would not have occurred if she had not been using her mobile phone. Shortly after the legislation was introduced, the *New England Journal of Medicine* (Redelmeier, 1997) published the study on phone use while driving, which reinforced Ortiz's argument and further increased his media exposure.

To date, Assemblyman Ortiz has introduced four bills on this issue. Two of the bills would prohibit the use of a mobile or car phone while driving (both hand-held and hands-free), with allowable exceptions including "if the operator is in fear of their life or that a criminal act may be perpetrated against them or contacting an E911 system." (New York State Bill A05857) The third bill "requires the Department of Motor Vehicles to include information on accidents involving operator use of cellular or car phones in its annual summary of motor vehicle accidents." (New York State Bill A04587)The fourth bill requires manufacturers to affix a warning label on mobile or car phones stating that operation while driving may be dangerous.

Mr. Ortiz likens this issue to seatbelt legislation, which was derided at first by the car industry and the general public but support steadily grew until the laws were enacted.

A bill introduced by Senator Sidikman prohibits the use of hand-held phones while driving. The amended bill considers prosecution measures and exceptional usage. The offense would be classified as a secondary traffic offense, similar to

driving without a seatbelt, whereby the offense would not be reported unless the driver was pulled over for another offence. Evidence of the safety risks associated with phone use while driving was obtained from a number of sources. Research studies cited are Redelmeier (1997), Violanti (1996), and McKnight (1991). In addition to the studies, the Statement in Support of the bill contains the description of a fatal accident caused by a driver using a mobile phone. The supporting Senator's objectives are to raise public consciousness of the issues to promote discussion and to provide a platform for a study in the next session. The bill also "tests the water" for support and assesses the need for a law.

Senator Weisenberg introduced a bill requiring that a study be undertaken to assess the need for legislation restricting the use of mobile phones while driving. Evidence of the need for legislation is mainly anecdotal evidence, including letters from constituents who had a family member killed in a mobile phone related crash.

Senator Stavisky has proposed two pieces of legislation on this issue. Bill S03270 "prohibits the use of a handheld cellular telephone or cellular car telephone except in specified circumstances....," (New York State Bill S03270) and requires that manufacturers notify users of the prohibition. The second piece of legislation "requires police accident reports indicate whether cellular or digital PCS telephones were present in vehicles and whether the use of such telephones is known or suspected as a contributing factor in such accident." (New York State Bill S05795) The bills are currently under review in the Transportation Committee.

7.2.2 California Legislation

In February 1997, Senator Burton proposed legislation restricting the use of mobile phones while driving. The bill prohibited the use of hand-held phones while driving and has recently been dropped by the senator so it was never heard in policy committee.

Studies cited by the senator in support of the bill include Redelmeier (1997), Brookhuis (1991), McKnight (1991), – Alm & Hakan (1995), and Brown, et al., (1969).

7.2.3 U.S. Legislation Summary

In analysis of the various attempts at legislation in the U.S., several issues become apparent. The justification for the legislation comes mainly from the opinion of the legislator proposing the legislation, although in several cases the *New England Journal of Medicine* article (Redelmeier, 1997) is cited. There is no nationally-accredited document to prove the connection between mobile phone use and traffic accidents. Second, many of the bills focus on the restriction of hand-held mobile phones suggesting that hands-free phones are considered safer, although it may be that prohibiting hand-held phones is just a first step. Third, the fact that no bill has been close to becoming law suggests that there may be a lack of public and political support for such legislation, or that a strong mobile phone industry lobby is preventing the progress of legislation. The similarity of this issue and the seatbelt legislation of the mid-1980s, as suggested by Assemblyman Ortiz, is an interesting point. Is it just a matter of time before the support for legislation grows to the level required for implementation?

Alternatively, will such legislation come about as the result of civil court case law liability determinations? Once a civil action occurs in which a court determines that full or partial liability damages are to be assessed against a defendant due to a court finding of negligence stemming from a motor vehicle crash where cellular telephone use was determined to be a contributing factor, insurance companies (for motorists, cellular service providers, and cell phone manufacturers or importers) may be the final decision maker in forcing legislation. Despite the noted current lack of nationally-accredited documentation of a scientifically valid connection between crashes and cell phone use, an investigating officer's simple

“driver was using cell phone” notation on a traffic citation for failure to yield may be sufficient evidence to bring about such a damage award. Hence, while politicians may be reluctant to establish public policy restricting or limiting cell phone use, courts and lawyers are not averse to setting case precedent.

7.3 International Experience

A number of countries have enacted legislation to restrict the use of mobile phones while driving: Australia, Switzerland, Israel, Spain, Portugal, Italy, Brazil, Chile, Sweden and Singapore (Goodman, 1997). The United Kingdom is currently reviewing the need for specific legislation and, as such, is in a similar position to the U.S. This section reviews the legislation in place in some of these countries.

7.3.1 International Laws

The Australian state of Victoria was the first to introduce legislation, banning the use of hand-held phones while driving in 1988. This was followed by a similar ban in the state of New South Wales. Since this time, Spain, Italy, Israel, Portugal, and Brazil have introduced similar bans, usually focusing on the restriction of hand-held phones. Spain is particularly strict on enforcing this law, with Spanish police briefed to look out for illegal usage; and fines from \$80-\$800 are regularly issued. Some countries, such as France and Sweden, prefer to restrict phone usage while driving using existing, general legislation, while countries such as Germany, Austria, and the Netherlands are currently considering legislation to restrict phone use to hands-free units only (Goodman, 1997).

7.3.2 Switzerland

Switzerland is one of the countries where legislation used to restrict phone use while driving is more general: “The driver must concentrate on the road and

traffic while driving. He or she may not carry out activities while driving which negatively impact the operation of the vehicle.” (VerkehrsvegelInverordnung, 1989) However, the regulations do state that the driver “must not be distracted by radio or other audio devices.” (VerkehrsvegelInverordnung, 1989) Drivers with car phones must sign a declaration with their insurance companies that prohibit them from making a call while driving. The insurance claim following a crash is reduced if the driver is using their phone at the time of the incident (Stevens, et al., 1997). A fine of around \$80 is issued for the use of a car phone in a moving vehicle without using a hands free device (Ordnungsbussenverordnung, 1990).

7.3.3 United Kingdom

The UK does not have any legislation in place at present, but phone use while driving is mentioned in The Highway Code, a set of guidelines for road users that must be learned as part of driving test requirements. The Highway Code states, “Do not use a hand-held telephone or microphone while you are driving. Find a safe place to stop first. Do not speak into a hands free microphone if it will take your mind off the road. You must not stop on the hard shoulder of a motorway to answer or make a call, except in an emergency” (Highway Code, 1992.)

The issue of mobile phone use while driving is a current issue of political debate in the UK. Debate in the House of Commons resulted in the commissioning of a report to review the evidence currently available, completed by the Transport Research Laboratory in November 1997 (Stevens et al., 1997). This report concludes that mobile phones would be unlikely to be a significant factor in accidents if the following could be ensured:

- Phones were only used in light traffic conditions.
- Drivers did not initiate calls unless the numbers were pre-programmed.
- Only routine/casual conversations were undertaken.
- All drivers used well designed hands-free kits.

The report does not comment on the likelihood of these suggestions being adhered to. Hands-free phones are recommended due to studies showing that the distraction effect of phone use is reduced as they are made easier to use (Stevens et al., 1997). After the report was presented to the House of Commons, it was decided that a Code of Practice on the use of mobile phones in vehicles should be developed. This is currently at the consultation stage with input from mobile phone companies and motoring interests (<http://parliament.the-stationary-office.co.uk>, 1998). The report findings are also being incorporated in the revised edition of The Highway Code. The report does not see the need for specific legislation banning phone use while driving as there are already regulations in place under which dangerous phone use may be punished. This stance is supported by the Government and the Association of Chief Police Officers who cite regulation 104 of Road Vehicles Regulations 1986, which states that “police can prosecute or issue fixed penalty notices to drivers who do not exercise proper control of their vehicles. Use of a mobile phone when driving can also result in prosecution for the offense of careless and inconsiderate driving or dangerous driving.”(Proceedings of the House of Commons) This view is echoed by police in the U.S. where reckless driving is illegal in all states and careless or inattentive driving is illegal in some states; police state that these existing laws already gives them the power to regulate dangerous mobile phone usage (Goodman, 1997).

7.4 Comparison of Seatbelt Legislation and Mobile Phone Legislation

There are some similarities between legislating for mobile phone use while driving and the seatbelt legislation issue of the early 1980s. The first seatbelts were introduced in the 1950s but usage was less than 15 percent until the U.S. Department of Transportation’s 1984 rule on automatic occupant protection. This initiated a wave of legislative action in 31 states, and seatbelt use increased to around 40 percent by 1987. By 1996, seatbelt laws existed in 49 states and average seatbelt usage was 68 percent. (<http://NHTSA.DOT.GOV>, 1999).

In the late 1990s the issue has progressed to whether non-compliance should be a secondary or primary offense. In 1997, seat belt law in 36 states is specified as only secondary enforcement, meaning that the offense could only be cited if the driver is stopped for some other traffic infraction. As of January 1999, 15 states have seat belt use as a primary enforcement offense (Highwaysafety.Org, 1999). There are several parallels with legislation of mobile phone use while driving. Both cases could be defined as “potentially” harmful and are relatively subtle in their effect on the driver on a daily basis; therefore, it is difficult to project the importance of compliance. In both cases, initial public and political opinion were generally against the need for legislation; it took several years for people to realize the importance of seatbelt legislation.

The subtle nature of “non-compliance” is such that both issues could be seen as secondary offenses with a low likelihood of receiving a serious citation for non-compliance. Experience from the passage of seatbelt legislation has shown that if mobile phone legislation is implemented, it is likely to be introduced in a phased manner. This could mean that the most unsafe types of usage (if these usage types exist and can be identified) could be targeted long before any wide-ranging legislation is introduced. In the case of mobile phones, this could mean an initial restriction placed on hand-held phones only.

8. Conclusion

Mobile phone usage has increased rapidly over the last 15 years. As more people use their mobile phones while driving, there is an obvious need for extensive and accurate data on the crash risk associated with this practice. Unfortunately, only 2 of the 50 states have a data collection program in place, and the accuracy of the data is being questioned. Many studies have been conducted, and their results indicate an increased crash risk of between 34 percent and 300 percent if the driver of a vehicle is using a mobile phone. However, much larger studies using “real world” data must be performed before the true risk of mobile phone use while driving can be assessed. If there were data available on a national scale, it would be possible to evaluate the crash risk and also to determine potential solutions to alleviate or reduce the risk. Once the risks and remedies are known, it will be possible for legislators to assess the need for legislation and enforcement measures. Without this information, it is difficult to determine the best course of action.

The most obvious source of data is the police crash reporting system similar to what is currently in existence in Oklahoma and Minnesota. Experience in these two states has shown that the mobile phone use element must be carefully incorporated into the report and utilized by trained investigators in order to obtain meaningful data.

The speed at which mobile phones have become available to a large proportion of the general public has resulted in the safety of such usage left relatively unassessed. Research studies have shown that mobile phone use has an adverse effect on driving. Generally, it appears that mobile phone use causes driver inattention, which, in turn, causes reaction time increases, lane deviations, and associated impairments to driving decision making abilities. Drivers need to be made aware of these dangers and their implications so they can make their phone usage safer. People intending to use their mobile phones while driving must be

made aware of the need to avoid intense or emotional mobile phone conversations, mobile phone use during difficult driving conditions, and hand-held phones. A national campaign involving mass media could have a positive impact on lessening dangerous usage of mobile phones while driving.

Legislators in a number of states have introduced legislation prohibiting or curtailing the use of mobile phones while driving. To date, none of these measures has passed. One criticism of the legislation that is introduced is there is a lack of data to support any legislative action. Alternatively, laws may develop through civil court cases where mobile phone users, manufacturers, service providers, etc. are found liable for automobile accidents.

In addition to data collection and safety education, the role of technology will be important in reducing the crash risk associated with mobile phones. It is already unnecessary to use a hand-held phone, and improved ergonomic design is constantly making the mobile phone easier, and presumably safer, to use. The benefits of carrying a mobile phone in a vehicle are many, ranging from the ability to call for assistance when broken down, involved in a crash, or in personal danger, to the more advanced benefits such as ACN systems and other future ITS developments. If used carefully, the mobile phone will be an important and productive element of present and future in-vehicle equipment.

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Appendix A

Sample Proposed U.S. Legislation on Limiting/Banning the Use of Mobile Phones While Driving

SB 1131 Vehicles.

BILL NUMBER: SB 1131 INTRODUCES 02/28/97

INTRODUCED BY Senator Burton

FEBRUARY 28, 1997

An act to add Section 21700.3 to the Vehicle Code, relating to vehicles.

LEGISLATIVE COUNSEL'S DIGEST

SB 1131, as introduced, Burton. Vehicles.

(1) Existing law makes it a crime for a person to drive vehicles upon the highways in violation of the Vehicle Code.

This bill would prohibit a person from driving a vehicle upon any highway while operating a cellular telephone if the operation of that telephone by the driver requires the driver to hold the telephone in his or her hand. Because a violation of this prohibition would be a crime, the bill would impose a state-mandated local program by creating a new crime.

(2) The California Constitution requires the state to reimburse local agencies and school districts for certain costs mandated by the state. Statutory provisions establish procedures for making that reimbursement.

This bill would provide that no reimbursement is required by this act for a specified reason.

Vote: majority. Appropriation: no. Fiscal committee: yes. State-mandated local program: yes.

SECTION 1. Section 21700.3 is added to the Vehicle Code, to read:

21700.3. No person shall drive a vehicle upon any highway while operating a cellular telephone if the operation of that telephone by the driver requires the driver to hold the telephone in his or her hand.

SEC. 2. No reimbursement is required by this act pursuant to Section 6 of Article XIII B of the California Constitution because the only costs that may be incurred by a local agency or school district will be incurred because this act creates a new crime or infraction, eliminates a crime or infraction, or changes the penalty for a crime or infraction, within the meaning of Section 17556 of the Government Code, or changes the definition of a crime within the meaning of Section 6 of Article XIII B of the California Constitution.

Notwithstanding Section 17580 of the Government Code, unless otherwise specified, the provisions of this act shall become operative on the same date that the act takes effect pursuant to the California Constitution.

CURRENT BILL STATUS

MEASURE : S.B. No. 1131
AUTHOR(S) : Burton.
TOPIC : Vehicles.
HOUSE LOCATION : SEN

LAST HIST. ACT. DATE : 02/02/98
LAST HIST. ACTION : Returned to Secretary of Senate pursuant to Joint Rule 56.
31 DAYS IN PRINT : 03/31/97

TITLE : An act to add Section 21700.3 to the Vehicle Code, relating to vehicles.

COMPLETE BILL HISTORY

BILL NUMBER : S.B. No. 1131
AUTHOR : Burton
TOPIC : Vehicles.

BILL HISTORY

1998 Feb. 2 Returned to Secretary of Senate pursuant to Joint Rule 56.
1997
Apr. 10 Set, first hearing. Hearing canceled at the request of author.
Mar. 26 Set for hearing April 15.
Mar. 18 To Com. On TRANS.
Mar. 3 Read first time.
Mar. 1 From print. May be acted upon on or after March 31.
Feb. 28 Introduced. To Com. On RLS. for assignment. To print.

New York State Bill A05857

All available information for bill A05857, except its text, is supplied in this document. You may jump to a particular item by selecting from the menu below, or you may simply scroll down through this document. To view the bill text, select the last item from the menu below.

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Summary of Bill A05857

BILL NO A05857A

SPONSOR Ortiz

COSPNSR Clark, Dinowitz, Seminerio, Denis, Grannis

MLTSPNSR Brennan, DiNapoli, Gottfried, Greene, Hikind

Add S397-c, V & T L

Prohibits the use of a handheld cellular telephone or cellular car telephone while operating a motor vehicle except in specified circumstances where the operator is in fear of their life or that a criminal act may be perpetrated against them or contacting an E911 system; provides a two minute grace period to park vehicle on the side of the road; requires all cellular telephones sold or leased in the state to notify customers of the prohibition.

Actions on Bill A05857

BILL NO A05857A

03/04/1997referred to transportation

03/20/1997amend and recommit to transportation

03/20/1997print number 5857a

01/07/1998referred to transportation

05/05/1998held for consideration in transportation

Votes on Bill A05857

Vote record not found for bill A5857

Memo on Bill A05857

BILL NUMBER: A5857A

PURPOSE OR GENERAL IDEA OF BILL: To prevent automobile accidents caused by drivers who are distracted by the use of a cellular phone while operating a motor vehicle.

SUMMARY OF SPECIFIC PROVISIONS: This bill adds a new section 397-c to the vehicle and traffic law, prohibiting the use of a cellular phone by the driver of a motor vehicle while such vehicle is being operated on a public highway. The bill expressly exempts motor vehicle passengers from being subject to this provision. The use of a citizen's band radio by the police or other public safety agencies is also not a violation.

This bill allows a sixty-second grace period in which the operator of a motor vehicle receiving an incoming cellular phone transmission may pull off the road to a safe location where he or she may then continue the telephone conversation.

It is a defense to a violation of this bill that the operator of the vehicle was alone and used the cellular phone while in fear of his or her life and safety or the perpetration of a crime.

In addition, this bill requires that after enactment, any cellular phone sold, leased or rented in New York should have a message affixed to it stating that such phone should not be used by a person operating a motor vehicle.

Violation of this legislation will be punishable by a fine of fifty dollars for the first offense, one hundred dollars for a second offense within eighteen months of the first violation, and two-hundred dollars for any subsequent violations within such eighteen month period.

JUSTIFICATION: Distracted drivers endanger traffic safety on the highways of this state. According to a study conducted at the University of Toronto and reported in the New England Journal of Medicine, using a cellular phone while operating a motor vehicle increases the risk of automobile accidents four-fold, the same risk as when a person's blood alcohol level is .10 percent. Furthermore, the study found that the risk of accidents do not decrease even when the phone is not hand-held.

This legislation is necessary to discourage such activity due to the danger it imposes to other motorists. The provisions of such law will be clearly labeled on any car phone sold, leased or rented in New York so that motorists will have fair warning as to the prohibited activity. In recognition of the fact that cellular phones are useful in some dangerous situations, it is a defense to such violations that the motorist was alone and in fear of his or her safety. The bill also allows the driver a reasonable time to answer an incoming call and then pull safely off the road so as not to pose a threat to other vehicles. This bill imposes no penalties on the use of cellular phones by passengers, thus it is a minimally intrusive way of discouraging a potentially hazardous activity.

PRIOR LEGISLATION HISTORY: This bill is new for 1997.

FISCAL IMPLICATIONS: None.

EFFECTIVE DATE: This act shall take effect the first day of January next succeeding the date on which it shall have become a law.

New York State Bill A04547

All available information for bill A04547, except its text, is supplied in this document. You may jump to a particular item by selecting from the menu below, or you may simply scroll down through this document. To view the bill text, select the last item from the menu below.

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Summary of Bill A04547

BILL NO A04547

SPONSOR Ortiz

COSPNSR

MLTSPNSR Clark

Add S399-x, Gen Bus L; add S1199, V & T L

Requires manufacturers affix warning label on cellular phones or car phones that use while operating a motor vehicle may be dangerous; provides that violation shall be punishable by a fine of not more than \$150 for first offense and \$250 for each subsequent offense.

Actions on Bill A04547

BILL NO A04547

02/20/1997referred to consumer affairs and protection

01/07/1998referred to consumer affairs and protection

Votes on Bill A04547

Vote record not found for bill A4547

Memo on Bill A04547

BILL NUMBER: A4547

PURPOSE OR GENERAL IDEA OF BILL:

The purpose of this bill is to require that manufacturers affix warning labels on packaging of cellular phones or car phones that use while operating a motor vehicle may be dangerous.

SUMMARY OF SPECIFIC PROVISIONS:

This bill would add a new section to the general business law, Section 399-x requiring the manufacturer of any cellular telephone or car phone to affix to the packaging of such cellular telephones/car phones a warning label concerning the dangers of using such phone while operating a motor vehicle and provides for penalties when in violation of this measure.

This bill would also amend the vehicle and traffic law by adding a new Section 1199 requiring the Commissioner of Motor Vehicle to address this issue through public information and traffic safety publications.

JUSTIFICATION:

Cellular and car phones have become increasingly more popular and affordable to the general public. In the interest of protecting all citizens, motorists and pedestrians alike, those who utilize these portable phones should be made aware that the use of such devices while operating a motor vehicle have been known to be the cause of traffic accidents and caution is advised in such use.

Before an individual can obtain a driver's license, he/she is required to attend a safety driving course. The course is designed to educate people concerning the importance of being a responsible and alert driver. Since the use of cellular/car phones, while operating a motor vehicle, have (has) the potential of distracting the motorist and causing accidents, it seems appropriate that drivers be reminded of the conceivable dangers of using such devices.

PRIOR LEGISLATIVE HISTORY:

1996 - a.9768 Ref to Consumer Affairs & Protection

FISCAL IMPLICATIONS FOR STATE AND LOCAL GOVERNMENTS:

None.

EFFECTIVE DATE:

This act shall take effect on the one hundred eightieth day after it shall have become a law, provided that necessary rules and regulations may be promulgated prior to such date.

New York State Bill A04587

All available information for bill A04587, except its text, is supplied in this document. You may jump to a particular item by selecting from the menu below, or you may simply scroll down through this document. To view the bill text, select the last item from the menu below.

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Summary of Bill A04587

BILL NO A04587A

SPONSOR Ortiz

COSPNSR

MLTSPNSR Clark, Galef, Harenberg

Requires the department of motor vehicles to include information on accidents involving operator use of cellular or car phone in its annual summary of motor vehicle accidents.

Actions on Bill A04587

BILL NO A04587A

02/20/1997referred to transportation

01/07/1998referred to transportation

05/08/1998amend and recommit to transportation

05/08/1998print number 4587a

Votes on Bill A04587

Vote record not found for bill A4587

Memo on Bill A04587

Memo record not found for bill A4587

New York State Bill A04444

All available information for bill A04444, except its text, is supplied in this document. You may jump to a particular item by selecting from the menu below, or you may simply scroll down through this document. To view the bill text, select the last item from the menu below.

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Summary of Bill A04444

BILL NO A04444

SPONSOR Sidikman

COSPNSR

MLTSPNSR DiNapoli, Hochberg

Amd S375, V & T L

Prohibits use of a hand held cellular telephone while operating a motor vehicle.

Actions on Bill A04444

BILL NO A04444

02/18/1997referred to transportation

01/07/1998referred to transportation

05/05/1998held for consideration in transportation

Votes on Bill A04444

Vote record not found for bill A4444

Memo on Bill A04444

BILL NUMBER: A4444

PURPOSE OR GENERAL IDEA OF BILL:

To prohibit the use of a hand held cellular phone, while operating a motor vehicle.

SUMMARY OF SPECIFIC PROVISIONS:

Section one amends Section S375 of the Vehicle and Traffic Law by adding a new subdivision (24-b), which defines a hand held cellular phone, and makes it unlawful to operate a motor vehicle while using a hand held cellular phone.

JUSTIFICATION:

For years now, people have been using cellular phones in motor vehicles and they have often helped save lives, reduce traffic congestion, and report accidents. As such, there has been an explosion in the purchase and use of the hand held cellular phone. However, along with the increased usage of car phones, there is an increase in accidents related to the use of the phones. A recent report cited that people who use a cellular phone in the car, run a 34% higher risk of having an accident. A hands free operation kit is available at this time, but some are prohibitively expensive, leaving the average motorist to use only one hand on the wheel while using the car phone.

A 1995 study showed that talking on a cellular phone while driving quadruples the risk of an accident and is about as dangerous as being close to legally drunk behind the wheel.

This measure seeks to limit the chances of an accident being caused by the use of such a cell phone.

PRIOR LEGISLATIVE HISTORY:

None.

FISCAL IMPLICATIONS:

None to the State.

EFFECTIVE DATE:

January 1, 1998.

Bill A04444

[\[Summary\]](#) [\[Actions\]](#) [\[Votes\]](#) [\[Memo\]](#) [\[Text\]](#)

New York State Bill A06803

All available information for bill A06803, except its text, is supplied in this document. You may jump to a particular item by selecting from the menu below, or you may simply scroll down through this document. To view the bill text, select the last item from the menu below.

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Summary of Bill A06803

BILL NO A06803B

SPONSOR Weisenberg

COSPNSR Ortiz, Diaz, Galef, DiNapoli

MLTSPNSR Colton, Davis, Glick, Greene, Meeks, Perry, Sidikman, Sweeney

Add Art 34-C SS1280 - 1283, V & T L

Requires the governor's traffic safety committee to study the effects of cellular telephone technology and other driver distractions on highway and traffic safety and reducing motor vehicle accidents related to the use of cellular telephones or similar equipment in conjunction with the operation of such motor vehicles.

Actions on Bill A06803

BILL NO A06803B

03/25/1997referred to transportation
06/10/1997reported referred to ways and means
06/11/1997amend (t) and recommit to ways and means
06/11/1997print number 6803a
06/24/1997reported referred to rules
06/30/1997rules report cal. 627
06/30/1997ordered to third reading rules cal. 627
07/15/1997passed assembly
07/15/1997delivered to senate
07/16/1997REFERRED TO RULES
01/07/1998DIED IN SENATE
01/07/1998RETURNED TO ASSEMBLY

01/07/1998committed to rules
01/20/1998amend and recommit to rules 6803b
02/03/1998rules committee discharged and committed to transportation
03/17/1998reported
03/19/1998advanced to third reading cal. 58
03/23/1998passed assembly
03/23/1998delivered to senate
03/23/1998REFERRED TO TRANSPORTATION

Votes on Bill A06803

BILL: A06803B DATE: 03/23/1998 MOTION: YEA/NAY: 144/000

Memo on Bill A06803

BILL NUMBER: A6803B

PURPOSE OR GENERAL IDEA OF BILL:

To require the Governor's Traffic Safety Committee to address the use of cellular telephones while operating a motor vehicle.

JUSTIFICATION:

Cellular telephones have become an important communication device for many drivers on the roads of New York State. A study published recently in the New England Journal of Medicine regarding the use of cellular telephones while operating a motor vehicle has raised serious driver safety concerns. The study found that a person using a cellular telephone while operating a motor vehicle is four times as likely to have an accident than someone who is not on the phone. It also concluded that the risk of having a collision while driving and using a cellular telephone is equivalent to the risk of an accident associated with driving while intoxicated.

This bill provides for a logical and practical means for the legislature to address this highway safety concern. It requires the Governor's Traffic Safety Committee to submit a report providing recommendations for improving highway and traffic safety and reducing motor vehicle accidents related to the use of cellular telephones or similar equipment in conjunction with the operation of a motor vehicle.

PRIOR LEGISLATIVE HISTORY:

This is a new bill.

FISCAL IMPLICATIONS: None.

EFFECTIVE DATE: This act shall take effect immediately.

New York State Bill S05795

All available information for bill S05795, except its text, is supplied in this document. You may jump to a particular item by selecting from the menu below, or you may simply scroll down through this document. To view the bill text, select the last item from the menu below.

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Summary of Bill S05795

BILL NO S05795

SPONSOR STAVISKY

COSPNSR

MLTSPNSR

Amd S603, V & T L

Requires police accident reports indicate whether cellular or digital PCS telephones were present in vehicles and whether the use of such telephones is known or suspected as a contributing factor in such accident.

Actions on Bill S05795

BILL NO S05795

08/04/1997REFERRED TO RULES

01/07/1998COMMITTEE DISCHARGED AND COMMITTED TO
TRANSPORTATION

Votes on Bill S05795

Vote record not found for bill S5795

Memo on Bill S05795

Memo record not found for bill S5795
