

No. 14-15408

IN THE UNITED STATES COURT OF APPEALS  
FOR THE NINTH CIRCUIT

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LEONARD FYOCK, et al.,  
*Plaintiffs-Appellants,*

v.

CITY OF SUNNYVALE, et al.,  
*Defendants-Appellees.*

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APPEAL FROM THE UNITED STATES DISTRICT COURT  
FOR THE NORTHERN DISTRICT OF CALIFORNIA  
(CV 13-05807-RMW)

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**APPELLANTS' EXCERPTS OF RECORD VOLUMES III of V**

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**Counsel for Plaintiffs-Appellants**

Pursuant to Ninth Circuit Rule 30-1, Plaintiffs-Appellants Leonard Fyock, Scott Hochstetler, William Douglas, David Pearson, Brad Seifers, and Rod Swanson, by and through their counsel of record, hereby confirm to the contents and form of Appellants' Excerpts of Record on appeal.

Date: May 16, 2014

**MICHEL & ASSOCIATES, P.C.**

/s/ C. D. Michel

C. D. Michel

Attorney for *Plaintiffs-Appellants*  
Leonard Fyock, Scott Hochstetler,  
William Douglas, David Pearson,  
Brad Seifers, and Rod Swanson

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**CERTIFICATE OF SERVICE**

I hereby certify that on May 16, 2014, an electronic PDF of **APPELLANTS' EXCERPTS OF RECORD VOLUMES III of V** was uploaded to the Court's CM/ECF system, which will automatically generate and send by electronic mail a Notice of Docket Activity to all registered attorneys participating in the case. Such notice constitutes service on those registered attorneys.

Date: May 16, 2014

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/s/ C. D. Michel

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 official capacity, THE CHIEF OF THE  
 SUNNYVALE DEPARTMENT OF PUBLIC  
 SAFETY, FRANK GRGURINA, in his official  
 capacity

UNITED STATES DISTRICT COURT  
 NORTHERN DISTRICT OF CALIFORNIA  
 SAN JOSE DIVISION

LEONARD FYOCK,  
 SCOTT HOCHSTETLER,  
 WILLIAM DOUGLAS,  
 DAVID PEARSON, BRAD SEIFERS, and  
 ROD SWANSON,

Plaintiffs,

v.

THE CITY OF SUNNYVALE, THE  
 MAYOR OF SUNNYVALE,  
 ANTHONY SPITALERI in his official  
 capacity, THE CHIEF OF THE  
 SUNNYVALE DEPARTMENT OF  
 PUBLIC SAFETY, FRANK GRGURINA,  
 in his official capacity, and DOES 1-10

Defendants.

Case No. 13-cv-05807 RMW

**DECLARATION OF ANTHONY SPITALERI  
 IN SUPPORT OF SUNNYVALE'S  
 OPPOSITION TO PLAINTIFFS' MOTION  
 FOR PRELIMINARY INJUNCTION**

Date: February 21, 2014  
 Time: 9:00 a.m.  
 Location: San Jose Courthouse  
 Courtroom 6 – 4<sup>th</sup> Floor  
 280 South 1<sup>st</sup> Street  
 San Jose, CA 95113

I, Anthony Spitaleri, declare as follows:

1. I served as Mayor of the City of Sunnyvale from January 10, 2012 through January 7, 2014. I had previously served as Mayor of Sunnyvale from January 2008 through January

DECLARATION OF ANTHONY SPITALERI  
 – 13-cv-5807 RMW

2010. I served on the Sunnyvale City Council from January 2006 through January 2014.

2. For 36 years I was a firefighter with the Palo Alto Fire Department, before retiring as Captain.

3. I have sat for years on the National League of Cities' Public Safety and Crime Prevention Policy and Advocacy Committee. I was also a member of the League of California Cities' Public Safety Committee and Home Land Security Sub-Committee.

4. As a mayor with a long background in public safety, I became concerned with the potential for gun violence in the City of Sunnyvale, particularly after the mass shootings in Newtown and other cities around the country. Although Sunnyvale is not known for having high incidences of crime, the mass shootings in Newtown and other small municipalities demonstrated that these tragedies can hit any city, without regard to its size, location, or history of crime. Prompted by the incident in Newtown, I became increasingly interested in steps that could be taken to prevent a similar tragedy from occurring in Sunnyvale.

5. After Newtown, I became aware of the growing efforts of cities throughout California and the U.S. to take local action that could supplement federal and state regulations with the goal of stopping preventable deaths caused by gun violence. Some of these cities included San Francisco, Los Angeles and Sacramento.

6. As I understand it, one commonality of many of the mass shootings of recent years is the use of high powered, rapid fire assault weapons that utilize large capacity ammunition magazines ("LCMs"), which are capable of wreaking substantial amounts of lethal damage in brief bursts of violence.

7. I and the Sunnyvale City Council considered several measures to address this issue, some of which were borrowed from ordinances that had been successfully implemented in other California cities. Ultimately, four provisions were put to Sunnyvale voters as "Measure C." They are:

- a. A requirement that lost or stolen guns be reported within forty-eight hours.
- b. A requirements that residents safely store their weapons.
- c. A ban on the possession of LCMs; and

d. A requirement that merchants keep ammunition sales logs.

8. A true and correct copy of the proposed ordinance that led to the passage of Measure C — containing the complete text of Measure C — is attached hereto as Exhibit 1.

9. On November 5, 2013, Measure C, passed with 66.55% of the Sunnyvale voters voting “yes.”

10. As noted in the proposed ordinance that led to the passage of Measure C, the City of Sunnyvale determined that violence caused by the intentional and accidental misuse of guns constitutes a “clear and present danger to the populace” and found that “sensible gun safety measures provide some relief from that danger and are of benefit to the entire community.”

11. I believe that Measure C constitutes one such sensible gun safety measure and that it will benefit the community of the City of Sunnyvale and promote public safety. In putting Measure C on the ballot, the Sunnyvale City Council was similarly guided by its concern for the threat to public safety posed by LCMs.

12. As I understand it, only the ban on LCMs is at issue in this case. This provision limits the ammunition magazines that residents may possess to those that can hold no more than 10 rounds, subject to certain exceptions. The provision allows individuals possessing LCMs a 90-day grace period before the ban goes into effect.

13. We selected the ban on possession of LCM’s in order to reduce the threat of a mass shooting and the risk to law enforcement personnel posed by weapons that use these LCMs. We believed that given the narrow loophole in California law allowing possession (but not manufacture, sale or transfer) of LCMs, the most effective way to achieve this goal of reducing the threat of injury and death posed by LCMs was to ban their possession in our city (subject to certain exceptions, including for law enforcement).

14. I declare under penalty of perjury under the laws of the State of California that the foregoing is true and correct. Executed this 29th day of January, 2014, in Sunnyvale, California.

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By: Anthony (Tony) Spitaleri  
Anthony Spitaleri

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 official capacity, THE CHIEF OF THE  
 SUNNYVALE DEPARTMENT OF PUBLIC  
 SAFETY, FRANK GRGURINA, in his official  
 capacity

UNITED STATES DISTRICT COURT  
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LEONARD FYOCK,  
 SCOTT HOCHSTETLER,  
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 DAVID PEARSON, BRAD SEIFERS, and  
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THE CITY OF SUNNYVALE, THE  
 MAYOR OF SUNNYVALE,  
 ANTHONY SPITALERI in his official  
 capacity, THE CHIEF OF THE  
 SUNNYVALE DEPARTMENT OF  
 PUBLIC SAFETY, FRANK GRGURINA,  
 in his official capacity, and DOES 1-10

Defendants.

Case No. 13-cv-05807 RMW

**DECLARATION OF CHRISTOPHER S.  
 KOPER IN SUPPORT OF SUNNYVALE'S  
 OPPOSITION TO PLAINTIFFS' MOTION  
 FOR PRELIMINARY INJUNCTION**

Date: February 21, 2014  
 Time: 9:00 a.m.  
 Location: San Jose Courthouse  
 Courtroom 6 – 4<sup>th</sup> Floor  
 280 South 1<sup>st</sup> Street  
 San Jose, CA 95113

I, Christopher S. Koper, declare as follows:

1. I am an Associate Professor for the Department of Criminology, Law and Society  
 at George Mason University, in Fairfax, Virginia and a senior fellow at George Mason's Center

1 for Evidence-Based Crime Policy. My credentials, experience, and background are stated in my  
2 curriculum vitae, a true and correct copy of which is attached as Exhibit A.

3 2. In 1997, my colleague Jeffrey Roth and I conducted a study on the impact of Title  
4 XI, Subtitle A of the Violent Crime Control and Law Enforcement Act of 1994 (hereinafter the  
5 “federal assault weapons ban” or the “federal ban”), for the United States Department of Justice  
6 and the United States Congress.<sup>1</sup> I updated the original 1997 study in 2004<sup>2</sup> and briefly revisited  
7 the issue again by re-examining my 2004 report in 2013.<sup>3</sup> To my knowledge, these are the only  
8 published academic studies to have examined the efficacy of the federal ban on assault weapons  
9 and ammunition feeding devices holding more than ten rounds of ammunition (hereinafter  
10 referred to as “large-capacity magazines” or “LCMs”).<sup>4</sup> My 1997 study was based on limited  
11 data, especially with regard to the criminal use of large-capacity magazines. As a result, my  
12 conclusions on the impact of the federal ban are most accurately and completely set forth in my  
13 2004 and 2013 reports.

14 3. This declaration will summarize some of the key findings of those studies  
15 regarding the federal ban and its impact on crime prevention and public safety, and, based upon  
16 my findings, provide some opinions on the potential impact and efficacy of prohibitions and  
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18 <sup>1</sup> Jeffrey A. Roth & Christopher S. Koper, *Impact Evaluation of the Public Safety and*  
19 *Recreational Firearms Use Protection Act of 1994: Final Report* (1997), attached hereto as  
20 Exhibit B (hereinafter, “*Impact Evaluation*”).

21 <sup>2</sup> Christopher S. Koper, *An Updated Assessment of the Federal Assault Weapons Ban: Impacts*  
22 *on Gun Markets and Gun Violence, 1994-2003* (2004), attached hereto as Exhibit C (hereinafter,  
23 “*Updated Assessment of the Federal Assault Weapons Ban*”).

24 <sup>3</sup> Christopher S. Koper, *America’s Experience with the Federal Assault Weapons Ban, 1994-*  
25 *2004: Key Findings and Implications*, ch. 12, pp. 157-171 in *Reducing Gun Violence in*  
26 *America: Informing Policy with Evidence* (Daniel S. Webster & Jon S. Vernick eds. 2013),  
27 attached hereto as Exhibit D (hereinafter “*America’s Experience with the Federal Assault*  
28 *Weapons Ban*”).

<sup>4</sup> As discussed below, there have been some additional studies as to the impact and efficacy of the  
federal assault weapons ban conducted by non-academic institutions. In 2011, for example, the  
Washington Post published the results of its own investigation into the federal ban's impact on the  
criminal use of LCMs in Virginia. *See infra* ¶ 50. I am also aware of gun tracing analyses  
conducted by ATF (2003 Congressional Q&A memo provided to the author) and the Brady  
Center to Prevent Gun Violence (2004), both of which are consistent with the findings of my  
studies regarding the decline in assault weapons as a percentage of crime gun traces between the  
pre-ban and post-ban periods. *See infra* note 20.

1 restrictions on large-capacity magazines, like those contained in Sunnyvale's recently enacted  
 2 Sunnyvale Municipal Code, § 9.44.050, which was part of Measure C approved by some 67% of  
 3 Sunnyvale voters on November 5, 2013.

4 4. As discussed below, it is my considered opinion that Sunnyvale's LCM ban has  
 5 the potential to prevent and limit shootings, particularly those involving high numbers of shots  
 6 and victims—and thus are likely to advance Sunnyvale's interests in protecting its populace from  
 7 the dangers of such shootings.

#### 8 **I. CRIMINAL USES AND DANGERS OF LARGE-CAPACITY MAGAZINES**

9 5. Large-capacity magazines allow semiautomatic weapons to fire more than 10  
 10 rounds without the need for a shooter to reload the weapon.<sup>5</sup> Large-capacity magazines come in a  
 11 variety of sizes, including but not limited to 17-round magazines, 25- or 30-round magazines, and  
 12 drums with the capacity to accept up to 100 rounds.

13 6. The ability to accept a detachable magazine, including a large-capacity magazine,  
 14 is a common feature of guns typically defined as assault weapons.<sup>6</sup> In addition, LCMs are  
 15 frequently used with guns that fall outside of the definition of assault weapon.

16 7. One of the core rationales for legislative attempts to ban, or otherwise limit, the  
 17 availability of LCMs is that they are particularly dangerous because they facilitate the rapid firing  
 18 of high numbers of rounds. This increased firing capacity thereby potentially increases injuries  
 19 and deaths from gun violence. *See Updated Assessment of the Federal Assault Weapons Ban*, p.  
 20 97 (noting that “studies ... suggest that attacks with semiautomatics—including [assault weapons]  
 21 and other semiautomatics with LCMs—result in more shots fired, persons wounded, and wounds

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22 <sup>5</sup> A semiautomatic weapon is a gun that fires one bullet for each pull of the trigger and, after each  
 23 round of ammunition is fired, automatically loads the next round and cocks itself for the next  
 24 shot, thereby permitting a faster rate of fire relative to non-automatic firearms. Semiautomatics  
 25 are not to be confused with fully automatic weapons (*i.e.*, machine guns), which fire continuously  
 26 so long as the trigger is depressed. Fully automatic weapons have been illegal to own in the  
 27 United States without a federal permit since 1934. *See Updated Assessment of the Federal*  
 28 *Assault Weapons Ban*, p. 4 n.1 .

<sup>6</sup> Although the precise definition used by various federal, state, and local statutes has varied, the  
 term “assault weapons” generally includes semiautomatic pistols, rifles, and shotguns with  
 military features conducive to military and potential criminal applications but unnecessary in  
 shooting sports or for self-defense.



per victim than do other gun attacks”).

8. As such, semiautomatics equipped with LCMs have frequently been employed in highly publicized mass shootings, and are disproportionately used in the murders of law enforcement officers, crimes for which weapons with greater firepower would seem particularly useful. *See Updated Assessment of the Federal Assault Weapons Ban*, pp. 14-19, 87.

9. During the 1980s and early 1990s, semiautomatic firearms equipped with LCMs were involved in a number of highly publicized mass murder incidents that first raised public concerns and fears about the accessibility of high powered, military-style weaponry and other guns capable of discharging high numbers of rounds in a short period of time. For example:

- On July 18, 1984, James Huberty killed 21 persons and wounded 19 others in a San Ysidro, California McDonald’s restaurant, using an Uzi carbine, a shotgun, and another semiautomatic handgun, and equipped with a 25-round LCM;
- On January 17, 1989, Patrick Purdy used a civilian version of the AK-47 military rifle and a 75-round LCM to open fire in a Stockton, California schoolyard, killing five children and wounding 29 other persons;
- On September 14, 1989, Joseph Wesbecker, armed with an AK-47 rifle, two MAC-11 handguns, a number of other firearms, and multiple 30-round magazines, killed seven and wounded 15 people at his former workplace in Louisville, Kentucky;
- On October 16, 1991, George Hennard, armed with two semiautomatic handguns with LCMs (and reportedly a supply of extra LCMs), killed 22 people and wounded another 23 in Killeen, Texas;
- On July 1, 1993, Gian Luigi Ferri, armed with two Intratec TEC-DC9 assault pistols and 40 to 50 round magazines killed nine and wounded six at the law offices of Pettit & Martin in San Francisco, California; and
- On December 7, 1993, Colin Ferguson, armed with a handgun and multiple LCMs, opened fire on commuters on a Long Island Rail Road train, killing 6 and wounding 19.

*See Updated Assessment of the Federal Assault Weapons Ban*, p. 14.<sup>7</sup>

<sup>7</sup> Additional details regarding these incidents were obtained from: Violence Policy Center, *Mass Shootings in the United States Involving High-Capacity Ammunition Magazines*, available at [http://www.vpc.org/fact\\_sht/VPCshootinglist.pdf](http://www.vpc.org/fact_sht/VPCshootinglist.pdf) (hereinafter, “Violence Policy Center Report”); Mark Follman, Gavin Aronsen & Deanna Pan, *US Mass Shootings, 1982-2012: Data from Mother Jones’ Investigation* (updated Feb. 27, 2013), available at <http://www.motherjones.com/politics/2012/12/mass-shootings-mother-jones-full-data> (hereinafter, “Follman, Aronsen & Pan 2013”); and Mark Follman, Gavin Aronsen & Jaeah Lee,



10. More recently, in the years since the expiration of the federal ban in 2004, there have been another well-publicized series of mass shooting incidents involving previously banned assault weapons and/or LCMs. Since 2007, for example, there have been at least fifteen incidents in which offenders using assault-type weapons or other semiautomatics with LCMs have wounded and/or killed eight or more people.<sup>8</sup> Some of the more notorious of these incidents include:

- Blacksburg, Virginia, April 16, 2007: Student Seung-Hui Cho killed 33 (including himself) and wounded 17 on the campus of Virginia Tech, armed with a handgun and multiple LCMs;
- Tucson, Arizona, January 8, 2011: Jared Loughner, armed with a handgun and multiple LCMs, killed 6 and wounded 13, including Congresswoman Gabrielle Giffords;
- Aurora, Colorado, July 20, 2012: James Holmes killed 12 and wounded 58 in a movie theater, armed with a Smith & Wesson M&P1 5 assault rifle, 100-round LCMs, and other firearms; and
- Newtown, Connecticut, December 14, 2012: Adam Lanza killed 26 (twenty of whom were young children) and wounded two at Sandy Hook Elementary School, armed with a Bushmaster AR-15-style assault rifle, two handguns, and multiple LCMs.

*See America's Experience with the Federal Assault Weapons Ban*, pp. 157-58.<sup>9</sup>

11. There is evidence to suggest that the particularly large ammunition capacities of assault weapons, along with their military-style features, are more attractive to criminals than lawful users. *See Updated Assessment of the Federal Assault Weapons Ban*, pp. 17-18.

12. The available evidence also suggests that large-capacity magazines, along with assault weapons, pose particular dangers by their large and disproportionate involvement in two aspects of crime and violence: mass shootings and murders of police. *See Updated Assessment of the Federal Assault Weapons Ban*, pp. 14- 19, 87.

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*More Than Half of Mass Shooters Used Assault Weapons and High-Capacity Magazines* (Feb. 27, 2013), available at <http://www.motherjones.com/politics/2013/02/assault-weapons-high-capacity-magazines-mass-shootings-feinstein> (hereinafter, "Pollman, Aronsen & Lee 2013").

<sup>8</sup> See Violence Policy Center Report; Follman, Aronsen & Pan 2013; Follman, Aronsen & Lee 2013.

<sup>9</sup> Additional details regarding these incidents were obtained from: Violence Policy Center Report; Follman, Aronsen & Pan 2013; and Follman, Aronsen & Lee 2013.

13. With respect to mass shootings, the available evidence before the federal assault weapons ban was enacted in 1994 and after its expiration in 2004 both support this conclusion. Prior to the federal ban, assault weapons or other semiautomatics with LCMs were involved in 6, or 40%, of 15 mass shooting incidents occurring between 1984 and 1993 in which six or more persons were killed or a total of 12 or more were wounded. See *Updated Assessment of the Federal Assault Weapons Ban*, p. 14.<sup>10</sup>

14. More recently, a media investigation and compilation of 62 public mass shooting incidents that involved the death of four or more people, over the period 1982-2012, showed that, of the cases where magazine capacity could be determined, 31 of 36 cases, or 86%, involved a large-capacity magazine. Including all cases, including those where magazine capacity could not be determined, exactly half of the cases (31 of 62) are known to have involved an LCM.<sup>11</sup>

15. LCMs, because they can be and are used both with assault weapons and guns that fall outside the definition of an assault weapon, appear to present even greater dangers to crime and violence than assault weapons alone.

16. Prior to the federal assault weapons ban, for example, guns with LCMs were used in roughly 13-26% of most gun crimes (as opposed to somewhere between about 1% and 8% for assault weapons alone). See *Updated Assessment of the Federal Assault Weapons Ban*, pp. 15, 18-19; *America's Experience with the Federal Assault Weapons Ban*, pp. 161-62.

17. And, in New York City, the New York State Division of Criminal Justice Services reported that, in 1993, at least 16%, and as many as 25%, of guns recovered in murder investigations were equipped with LCMs. See *Updated Assessment of the Federal Assault Weapons Ban*, p. 18.<sup>12</sup>

<sup>10</sup> These figures are based on tabulations that I and my research team did using data reported in Gary Kleck, *Targeting Guns: Firearms and Their Control* (1997), pp. 124-26.

<sup>11</sup> This investigation and compilation of data on mass shootings was done by reporters at *Mother Jones* magazine. See Follman, Aronsen & Pan 2013; Follman Aronsen & Lee 2013; Mark Follman, Gavin Aronsen & Deanna Pan, *A Guide to Mass Shootings in America* (updated Feb. 27, 2013), available at <http://www.motherjones.com/politics/2012/07/mass-shootings-map>.

<sup>12</sup> The minimum estimate is based on cases in which discharged firearms were recovered, while the maximum estimate is based on cases in which recovered firearms were positively linked to the case with ballistic evidence. See *Updated Assessment of the Federal Assault Weapons Ban*, p. 18

18. It also appears that guns with LCMs have been used disproportionately in murders of police. Specifically, the available data, from prior to the federal ban, indicates that LCMs are used in somewhere between 31% to 41% of gun murders of police. *See Updated Assessment of the Federal Assault Weapons Ban*, p. 18; *America's Experience with the Federal Assault Weapons Ban*, p. 162.

19. Working under my direction, a graduate student at George Mason University recently analyzed the *Mother Jones* data for his Master's thesis, and compared the number of deaths and fatalities of the 62 mass shootings identified therein to determine how the presence of assault weapons and LCMs impacted the outcome.<sup>13</sup> With respect to LCMs, he compared cases where an LCM was known to have been used (or at least possessed by the shooter) against cases where either an LCM was not used or not known to have been used. He found that the LCM cases (which included assault weapons) had significantly higher numbers of fatalities and casualties: an average of 10.19 fatalities in LCM cases compared to 6.35 fatalities in non-LCM/unknown cases. He found an average of 12.39 people were shot but not killed in public mass shootings involving LCMs, compared to just 3.55 people shot in the non-LCM/unknown LCM shootings. These findings reflect a total victim differential of 22.58 killed or wounded in the LCM cases compared to 9.9 in the non-LCM/unknown LCM cases.<sup>14</sup> All of these differences were statistically significant and not a result of mere chance.

20. In addition, the available evidence suggests that gun attacks with semiautomatics—including both assault weapons and guns equipped with LCMs—tend to result in more shots fired, more persons wounded, and more wounds inflicted per victim than do attacks with other firearms. *See Updated Assessment of the Federal Assault Weapons Ban*, p. 97; *America's Experience with the Federal Assault Weapons Ban*, pp. 166-67.

21. For example, in mass shooting incidents that resulted in at least 6 deaths or at least

n.15.

<sup>13</sup> See Luke Dillon, *Mass Shootings in the United States: An Exploratory Study of the Trends from 1982 to 2012*. 2013. Master's thesis. Fairfax, VA: Department of Criminology, Law and Society, George Mason University.

<sup>14</sup> The patterns were also very similar when comparing the LCM cases against just those cases in which it was clear that an LCM was not used (though this was a very small number).

1 12 total gunshot victims from 1984 through 1993, offenders who clearly possessed assault  
2 weapons or other semiautomatics with LCMs wounded or killed an average of 29 victims in  
3 comparison to an average of 13 victims wounded or killed by other offenders. *See Updated*  
4 *Assessment of the Federal Assault Weapons Ban*, pp. 85-86; *America's Experience with the*  
5 *Federal Assault Weapons Ban*, p. 167.

6 22. Similarly, a study of handguns attacks in Jersey City, New Jersey during the 1990s  
7 found that the average number of victims wounded in gunfire incidents involving semiautomatic  
8 pistols was 15% higher than in those involving revolvers. The study further found that attackers  
9 using semiautomatics to fire more than ten shots were responsible for nearly 5% of all gunshot  
10 victims and that 100% of these incidents involved injury to at least one victim. *See Updated*  
11 *Assessment of the Federal Assault Weapons Ban*, pp. 84-86, 90-91; *America's Experience with*  
12 *the Federal Assault Weapons Ban*, p. 167.

13 23. Similar evidence comes from Milwaukee, Wisconsin. Between 1992 and 1995,  
14 gun homicide victims in Milwaukee who were killed by guns with LCMs had 55% more gunshot  
15 wounds than those victims killed by non-LCM firearms. *See Updated Assessment of the Federal*  
16 *Assault Weapons Ban*, p. 86.

17 24. And, in an analysis I conducted of guns recovered by police in Baltimore, I also  
18 found LCMs to be associated with gun crimes that resulted in more lethal and injurious outcomes.  
19 For instance, I found, among other things, that guns used in shootings that resulted in gunshot  
20 victimizations were 17% to 26% more likely to have LCMs than guns used in gunfire cases with  
21 no wounded victims, and guns linked to murders were 8% to 17% more likely to have LCMs than  
22 guns linked to non-fatal gunshot victimizations. *See Updated Assessment of the Federal Assault*  
23 *Weapons Ban*, p. 87.

24 25. In short, while tentative, the available evidence suggests more often than not that  
25 attacks with semiautomatics, particularly those equipped with LCMs, result in more shots fired,  
26 leading both to more injuries and injuries of greater severity. Such attacks also appear to result in  
27 more wounds per victim. This is significant because gunshot victims who are shot more than  
28 once are more than 60% more likely to die than victims who receive only one gunshot wound.

1 See *Updated Assessment of the Federal Assault Weapons Ban*, p. 87 (citing studies showing 63%  
2 increase and 61% increases, respectively, in fatality rates among gunshot victims suffering more  
3 than one wound).

4 26. In addition, diminishing the number of victims of shootings by even a small  
5 percentage can result in significant cost savings because of the significant social costs of  
6 shootings, as discussed *supra* in ¶¶ 52-53.

## 7 **II. EFFECTS OF THE 1994 FEDERAL ASSAULT WEAPONS BAN**

### 8 **A. Provisions of the Federal Assault Weapons Ban**

9 27. Enacted on September 13, 1994—in the wake of many of the mass shootings  
10 described above—the federal assault weapons ban imposed prohibitions and restrictions on the  
11 manufacture, transfer, and possession of both certain semiautomatic firearms designated as  
12 assault weapons and certain LCMs. Pub. L. No. 103-322, tit. XI, subtit. A, 108 Stat. 1796, 1996-  
13 2010 (1994).

14 28. The federal assault weapons ban was to expire after ten years, unless renewed by  
15 Congress. *Id.* § 110105(2). It was not renewed, and thus, by its own terms, the federal ban  
16 expired on September 13, 2004.<sup>15</sup>

#### 17 **1. Banned Assault Weapons and Features**

18 29. As noted, the federal assault weapons ban imposed a ten-year ban on the  
19 manufacture, transfer, or possession of what the statute defined as “semiautomatic assault  
20 weapons.” The federal ban was not a prohibition on all semiautomatic firearms; rather, it was  
21 directed against those semiautomatics having features that are useful in military and criminal  
22 applications but that are unnecessary in shooting sports or for self-defense.

23 30. Banned firearms were identified under the federal law in two ways: (i) by specific  
24 make and model; and (ii) by enumerating certain military-style features and generally prohibiting  
25 those semiautomatic firearms having two or more of those features.

26 <sup>15</sup> I understand that California prohibited assault weapons in 1989, before the federal ban, but  
27 grandfathered most existing assault weapons; and that California prohibited large-capacity  
28 magazines in 2000 but grandfathered existing LCMs. For further information, *see infra* ¶ 54. I  
am not aware of any studies of the effects of these California laws.

31. First, the federal ban specifically prohibited 18 models and variations of semiautomatic guns by name (*e.g.*, the Intratec TEC-9 pistol and the Colt AR-15 rifle), as well as revolving cylinder shotguns. This list also included a number of foreign rifles that the federal government had banned from importation into the country beginning in 1989 (*e.g.*, the Avtomat Kalashnikov models). And, indeed, several of the guns banned by name were civilian copies of military weapons and accepted ammunition magazines made for those military weapons. (A list of the weapons banned by name in the 1994 law is set forth in Table 2-1 of the *Updated Assessment of the Federal Assault Weapons Ban*, p. 5.)

32. Second, the federal assault weapons ban contained a “features test” provision that generally prohibited other semiautomatic guns having two or more military-style features. Examples of such features include pistol grips on rifles, flash suppressors, folding rifle stocks, threaded barrels for attaching silencers, and the ability to accept detachable magazines. (This “features test” of the federal ban is described more fully in Table 2-2 of the *Updated Assessment of the Federal Assault Weapons Ban*, p. 6, and in Table 12-1 of *America’s Experience with the Federal Assault Weapons Ban*, p. 160.)

## 2. Banned Large-Capacity Magazines

33. The federal ban also prohibited most ammunition feeding devices holding more than ten rounds of ammunition (which I have referred to herein as “large-capacity magazines” or “LCMs”).

34. The federal ban on LCMs extended to LCMs or similar devices that had the capacity to accept more than ten rounds of ammunition, or that could be “readily restored or converted or to accept” more than ten rounds of ammunition.<sup>16</sup>

## 3. Exemptions and Limitations to the Federal Ban

35. The 1994 federal assault weapons ban contained several important exemptions that limited its potential impact, especially in the short-term. *See Updated Assessment of the Federal*

<sup>16</sup> Technically, the ban prohibited any magazine, belt, drum, feed strip, or similar device that had the capacity to accept more than 10 rounds of ammunition, or which could be readily converted or restored to accept more than 10 rounds of ammunition. The ban exempted attached tubular devices capable of operating only with 22 caliber rimfire (*i.e.*, low velocity) ammunition.



1 *Assault Weapons Ban*, pp. 10-11.

2 36. First, assault weapons and LCMs manufactured before the effective date of the ban  
3 were “grandfathered” in and thus legal to own and transfer. Estimates suggest that there may  
4 have been upward of 1.5 million assault weapons and 25-50 million LCMs thus exempted from  
5 the federal ban. Moreover, an additional 4.8 million pre-ban LCMs were imported into the  
6 country from 1994 through 2000 under the grandfathering exemption. Importers were also  
7 authorized to import another 42 million pre-ban LCMs, which may have arrived after 2000. *See*  
8 *Updated Assessment of the Federal Assault Weapons Ban*, p. 10; *America’s Experience with the*  
9 *Federal Assault Weapons Ban*, pp. 160-61.

10 37. Furthermore, although the 1994 law banned “copies or duplicates” of the named  
11 firearms banned by make and model, federal authorities emphasized exact copies in enforcing this  
12 provision. Similarly, the federal ban did not apply to a semiautomatic weapon possessing only  
13 one military-style feature listed in the ban’s features test provision.<sup>17</sup> Thus, many civilian rifles  
14 patterned after military weapons were legal under the ban with only slight modifications. *See*  
15 *Updated Assessment of the Federal Assault Weapons Ban*, pp. 10-11.<sup>18</sup>

16 **B. Impact of the Federal Assault Weapons Ban**

17 38. This section of my declaration discusses the empirical evidence of the impact of  
18 the federal assault weapons ban. I understand that the Plaintiffs in this litigation contend that  
19 Sunnyvale’s prohibition on the possession of LCMs will not have an effect on crime or gunshot  
20 victimization because criminal users of firearms will not comply with Sunnyvale’s ban. In my

21 \_\_\_\_\_  
22 <sup>17</sup> It should be noted, however, that any firearms imported into the country must still meet the  
23 “sporting purposes test” established under the federal Gun Control Act of 1968. In 1989, ATF  
24 determined that foreign semiautomatic rifles having any one of a number of named military  
25 features (including those listed in the features test of the 1994 federal assault weapons ban) fail  
26 the sporting purposes test and cannot be imported into the country. In 1998, the ability to accept  
27 an LCM made for a military rifle was added to the list of disqualifying features. Consequently, it  
28 was possible for foreign rifles to pass the features test of the federal assault weapons ban but not  
meet the sporting purposes test for imports. *See Updated Assessment of the Federal Assault  
Weapons Ban*, p. 10 n.7.

<sup>18</sup> Examples of some of these modified, legal versions of banned guns that manufacturers  
produced in an effort to evade the ban are listed in Table 2-1 of the *Updated Assessment of the  
Federal Assault Weapons Ban*, p. 5.

1 opinion, that contention misunderstands the effect of possession bans. The issue is not only  
2 whether criminals will be unwilling to comply with such laws, though this could be an important  
3 consideration if the penalties for possession or use are particularly severe. The issue is also how  
4 possession bans affect the availability of weapons for offenders. Examining the effects of the  
5 federal ban on LCMs could cast some light on how a local prohibition on possession of LCMs  
6 may diminish their availability for offenders. It is difficult, however, to assess trends in LCM use  
7 because of limited information. *See infra* ¶¶ 47 *et seq.* For that reason, this section discusses  
8 both the impacts of the federal ban both on LCM use, for which information is limited, and on  
9 ownership and use of assault weapons, for which there is more information.

### 10 **1. Assault Weapons**

11 39. Prior to the federal ban, the best estimates are that there were approximately  
12 1.5 million privately owned assault weapons in the United States (less than 1% of the total  
13 civilian gun stock). *See America's Experience with the Federal Assault Weapons Ban*, pp. 160-  
14 61; *Updated Assessment of the Federal Assault Weapons Ban*, p. 10.

15 40. Although there was a surge in production of assault weapon-type firearms as  
16 Congress debated the ban in 1994, the federal ban's restriction of new assault weapon supply  
17 helped drive up the prices for many assault weapons (notably assault pistols) and appeared to  
18 make them less accessible and affordable to criminal users. *See America's Experience with the*  
19 *Federal Assault Weapons Ban*, pp. 162-63; *Updated Assessment of the Federal Assault Weapons*  
20 *Ban*, pp. 25-38.

21 41. Analyses that my research team and I conducted of several national and local  
22 databases on guns recovered by law enforcement indicated that crimes with assault weapons  
23 declined after the federal assault weapons ban was enacted in 1994.

24 42. In particular, across six major cities (Baltimore, Miami, Milwaukee, Boston, St.  
25 Louis, and Anchorage), the share of gun crimes involving assault weapons declined by 17% to  
26 72%, based on data covering all or portions of the 1995-2003 post-ban period. *See Updated*  
27 *Assessment of the Federal Assault Weapons Ban*, pp. 2, 46-60; *America's Experience with the*  
28 *Federal Assault Weapons Ban*, p. 163.



43. This analysis of local data is consistent with patterns found in the national data on guns recovered by law enforcement agencies around the country and reported to the federal Bureau of Alcohol, Tobacco, Firearms and Explosives (“ATF”) for investigative gun tracing.<sup>19</sup> Specifically, although the interpretation is complicated by changes in tracing practices that occurred during this time, the national gun tracing data suggests that use of assault weapons in crime declined with the onset of the 1994 federal assault weapons ban, as the percentage of gun traces for assault weapons fell 70% between 1992-93 and 2001-02 (from 5.4% to 1.6%). And, notably, this downward trend did not begin until 1994, the year the federal ban was enacted. *See Updated Assessment of the Federal Assault Weapons Ban*, pp. 2, 39-46, 51-52; *America’s Experience with the Federal Assault Weapons Ban*, p. 163.<sup>20</sup>

44. In short, the analysis that my research team and I conducted indicates that the criminal use of assault weapons declined after the federal assault weapons ban was enacted in 1994, independently of trends in gun crime. *See Updated Assessment of the Federal Assault Weapons Ban*, pp. 51-52; *America’s Experience with the Federal Assault Weapons Ban*, p. 163.

45. This decline in crimes with assault weapons was due primarily to a reduction in the use of assault pistols. Assessment of trends in the use of assault rifles was complicated by the rarity of crimes with such rifles and by the substitution in some cases of post-ban rifles that were very similar to the banned models. In general, however, the decline in assault weapon use was only partially offset by substitution of post-ban assault weapon-type models. Even counting the post-ban models as assault weapons, the share of crime guns that were assault weapons fell 24% to 60% across most of the local jurisdictions studied. Patterns in the local data sources also suggested that crimes with assault weapons were becoming increasingly rare as the years passed.

<sup>19</sup> A gun trace is an investigation that typically tracks a gun from its manufacture to its first point of sale by a licensed dealer. It is undertaken by the ATF, upon request by a law enforcement agency. The trace is generally initiated when the requesting law enforcement agency provides ATF with a trace request including identifying information about the firearm, such as make, model and serial number. For the full discussion of the use of ATF gun tracing data, see section 6.2 of *Updated Assessment of the Federal Assault Weapons Ban*, pp. 40-46.

<sup>20</sup> These findings are consistent with other tracing analyses conducted by ATF and the Brady Center to Prevent Gun Violence. *See Updated Assessment of the Federal Assault Weapons Ban*, p. 44 n.43.

1 *See Updated Assessment of the Federal Assault Weapons Ban*, pp. 46-52; *America's Experience*  
2 *with the Federal Assault Weapons Ban*, pp. 163-64.

3 46. Thus, while developing a national estimate of the number of assault weapons  
4 crimes prevented by the federal ban is complicated by the range of estimates of assault weapon  
5 use and changes therein derived from different data sources, tentatively, it appears that the federal  
6 ban prevented a few thousand crimes with assault weapons annually. For example, using 2% as  
7 the best estimate of the share of gun crimes involving assault weapons prior to the ban, and 40%  
8 as a reasonable estimate of the post- ban drop in this figure, implies that almost 2,900 murders,  
9 robberies, and assaults with assault weapons were prevented in 2002. *See Updated Assessment of*  
10 *the Federal Assault Weapons Ban*, p. 52 n.61.<sup>21</sup> If this tentative conclusion is correct, then  
11 contrary to Plaintiffs' contention, prohibitions like the federal ban do have an impact on criminal  
12 users of guns.

## 13 2. Large-Capacity Magazines

14 47. Assessing trends in LCM use is much more difficult because there was, and is, no  
15 national data source on crimes with LCMs, and few local jurisdictions maintain this sort of  
16 information.

17 48. It was possible, nonetheless, to examine trends in the use of guns with LCMs in  
18 four jurisdictions: Baltimore, Milwaukee, Anchorage, and Louisville. In all four jurisdictions,  
19 the overall share of crime guns equipped with LCMs rose or remained steady through at least the  
20 late 1990s. This failure to reduce overall LCM use for at least several years after the federal ban  
21 was likely due to the immense stock of exempted pre-ban magazines, which, as noted, was  
22 enhanced by post-ban imports. *See Updated Assessment of the Federal Assault Weapons Ban*, p.  
23 68-79; *America's Experience with the Federal Assault Weapons Ban*, p. 164.

24 49. My studies did show that crimes with LCMs may have been decreasing by the  
25 early 2000s, but the available data in the four cities I investigated were too limited and

26 <sup>21</sup> While it seems likely that some or all of these crimes happened regardless, as perpetrators  
27 merely substituted some other gun for the assault weapon, it also seems likely that the number of  
28 victims per shooting incident, and the number of wounds inflicted per victim, was diminished in  
some of those instances.

1 inconsistent to draw any clear overall conclusions in this regard. *See America's Experience with*  
 2 *the Federal Assault Weapons Ban*, p. 164; *Updated Assessment of the Federal Assault Weapons*  
 3 *Ban*, pp. 68-79.

4 50. However, a later investigation by the Washington Post of LCM use in Virginia,  
 5 analyzing data maintained by the Virginia State Police as to guns recovered in crimes by local  
 6 law enforcement officers across the state, suggests that the ban may have had a more substantial  
 7 impact on the supply of LCMs to criminal users by the time it expired in 2004. In Virginia, the  
 8 share of recovered guns with LCMs generally varied between 13% and 16% from 1994 through  
 9 2000 but fell to 9% by 2004. Following expiration of the federal ban in 2004, the share of  
 10 Virginia crime guns with an LCM rose to 20% by 2010. *See America's Experience with the*  
 11 *Federal Assault Weapons Ban*, p. 165.<sup>22</sup> These data suggest that the federal ban may have been  
 12 reducing the use of LCMs in gun crime by the time it expired in 2004, and that it could have had  
 13 a stronger impact had it remained in effect.

### 14 3. Summary of Results of the Federal Assault Weapons Ban

15 51. The federal ban's exemption of millions of pre-ban assault weapons and LCMs  
 16 meant that the effects of the law would occur only gradually—and that those effects were still  
 17 unfolding when the ban expired in 2004. Nevertheless, while the ban did not appear to have a  
 18 measurable effect on overall gun crime during the limited time it was in effect, as just discussed,  
 19 my studies and others do appear to show a significant impact on the number of gun crimes

20 \_\_\_\_\_  
 21 <sup>22</sup> The results of the *Washington Post's* original investigation (which are what are conveyed in  
 22 *America's Experience with the Federal Assault Weapons Ban*, p. 165) are reported in David S.  
 23 Fallis & James V. Grimaldi, *Va. Data Show Drop in Criminal Firepower During Assault Gun*  
 24 *Ban*, Wash. Post, Jan. 23, 2011, available at [http://www.washingtonpost.com/wp-](http://www.washingtonpost.com/wp-dyn/content/article/2011/01/22/AR2011012203452.html)  
 25 [dyn/content/article/2011/01/22/AR2011012203452.html](http://www.washingtonpost.com/wp-dyn/content/article/2011/01/22/AR2011012203452.html), and attached as Exhibit E to this  
 26 declaration. In early 2013, the Post updated this analysis, and slightly revised the figures it  
 27 reported by identifying and excluding from its counts more than 1,000 .22-caliber rifles with  
 28 large-capacity tubular magazines, which were not subject to the federal ban (and which are  
 similarly not subject to New York's ban on large-capacity magazines). *See* David S. Fallis, *Data*  
*Indicate Drop in High-Capacity Magazines During Federal Gun Ban*, Wash. Post, Jan. 10, 2013,  
 available at [http://failover.washingtonpost.com/investigations/data-point-to-drop-in-high-](http://failover.washingtonpost.com/investigations/data-point-to-drop-in-high-capacity-magazines-during-federal-gun-ban/2013/01/10/d56d3bb6-4b91-11e2-a6a6-aabac85e8036_story.html)  
[capacity-magazines-during-federal-gun-ban/2013/01/10/d56d3bb6-4b91-11e2-a6a6-](http://failover.washingtonpost.com/investigations/data-point-to-drop-in-high-capacity-magazines-during-federal-gun-ban/2013/01/10/d56d3bb6-4b91-11e2-a6a6-aabac85e8036_story.html)  
[aabac85e8036\\_story.html](http://failover.washingtonpost.com/investigations/data-point-to-drop-in-high-capacity-magazines-during-federal-gun-ban/2013/01/10/d56d3bb6-4b91-11e2-a6a6-aabac85e8036_story.html), and attached as Exhibit F to this declaration. This updated data is  
 reported above.

1 involving assault weapons and a possibly significant impact (based on the *Washington Post's*  
2 analysis of Virginia data) on those crimes involving LCMs.<sup>23</sup>

3 52. Moreover, as set forth in my 2013 book chapter, there is evidence that, had the  
4 federal ban remained in effect longer (or were it renewed), it could conceivably have yielded  
5 significant additional societal benefits as well, potentially preventing hundreds of gunshot  
6 victimizations annually and producing millions of dollars of cost savings per year in medical care  
7 alone. Indeed, reducing shootings by even a very small margin could produce substantial long-  
8 term savings for society, especially as the shootings prevented accrue over many years. *See*  
9 *America's Experience with the Federal Assault Weapons Ban*, pp. 166-67; *see also Updated*  
10 *Assessment of the Federal Assault Weapons Ban*, p. 100 n.118. Some studies have shown that the  
11 lifetime medical costs for gunshot injuries are about \$28,894 (adjusted for inflation). Thus, even  
12 a 1% reduction in gunshot victimizations at the national level would result in roughly  
13 \$18,781,100 in lifetime medical costs savings from the shootings prevented each year. (*See*  
14 *America's Experience with the Federal Assault Weapons Ban*, pp. 166-67; *see also Updated*  
15 *Assessment of the Federal Assault Weapons Ban*, p. 100 n.18).

16 53. The cost savings potentially could be substantially higher if one looks beyond just  
17 medical costs. For example, some estimates suggest that the full societal costs of gun violence --  
18 including medical, criminal justice, and other government and private costs (both tangible and  
19 intangible) -- could be as high as \$1 million per shooting. Based on those estimates, even a 1%  
20 decrease in shootings nationally could result in roughly \$650 million in cost savings to society  
21 from shootings prevented each year. (*See America's Experience with the Federal Assault*  
22 *Weapons Ban*, pp. 166-67).

---

23  
24  
25 <sup>23</sup> In our initial 1997 study on the impact of the federal assault weapons ban, Jeffrey Roth and I  
26 also estimated that gun murders were about 7% lower than expected in 1995 (the first year after  
27 the ban), adjusting for pre-existing trends. *See Impact Evaluation*, pp. 6, 79-85. However, the  
28 very limited post-ban data available for that study precluded a definitive judgment as to whether  
this drop was statistically meaningful. Our later findings on LCM use made it difficult to credit  
the ban with this effect, however, and we did not update it for our 2004 report. *See Updated*  
*Assessment of the Federal Assault Weapons Ban*, p. 92 n.109.

1     **III.     SUNNYVALE’S LARGE-CAPACITY MAGAZINE PROHIBITION**

2             54.     On November 5, 2013, the citizens of the City of Sunnyvale voted to approve  
3     Measure C by some 67% of the vote. Measure C contained provisions requiring reporting of lost  
4     or stolen firearms, safe storage of firearms, logging of ammunition sales, and a prohibition on  
5     possession of LCMs. The LCM possession ban was codified in Sunnyvale Municipal Code §  
6     9.44.050, which prohibits the possession of LCMs within Sunnyvale’s borders subject to  
7     enumerates exceptions, principally for law enforcement. California law already prohibits the  
8     manufacture, import, sale, or transfer of large-capacity magazines but does not directly regulate  
9     the possession of magazines. *See* California Penal Code § 32310. The practical effect of  
10    California’s law is to permit people who lawfully owned large-capacity magazines prior to  
11    January 1, 2000, the effective date of California’s ban, to retain these grandfathered magazines.  
12    Sunnyvale tightens existing restrictions on LCMs by prohibiting the possession of LCMs  
13    grandfathered under California law. I examine Sunnyvale’s prohibition on large-capacity  
14    magazines, and opine as to its potential impact and likely efficacy in this section of my  
15    declaration.

16            55.     Sunnyvale’s ordinance was recently enacted and I have not undertaken any study  
17    or analysis of its effects. But any law or regulation prohibiting the possession of large-capacity  
18    magazines, with no exception for grandfathered LCMs, addresses some weaknesses that were  
19    present in the federal ban.

20            56.     While the LCM ban was arguably the most important feature of the 1994 federal  
21    ban (given that LCMs are the key feature contributing to an assault weapon’s firepower, and that  
22    the reach of the LCM was much greater than the assault weapons ban as many semiautomatic  
23    guns that were not banned could still accept LCMs), my studies as to the effects of the federal ban  
24    indicated that the LCM ban was likely not as efficacious in reducing the use of these magazines in  
25    crime as it otherwise might have been because of the large number of pre-ban LCMs which were  
26    exempted from the ban. The Washington Post’s investigation of recovered guns with LCMs in  
27    Virginia, which showed an increasing decline in the number of recovered guns with LCMs the  
28    longer the ban was in effect, similarly suggests that the grandfathering of pre-ban LCMs delayed

1 the full impact of the federal ban. In my opinion, eliminating the grandfathering of pre-ban  
2 LCMs would have improved the efficacy of the federal ban.

3 57. In my opinion, based on the data and information contained in this declaration and  
4 the sources referred to herein, a complete ban on the possession of LCMs has the potential to (1)  
5 reduce the number of crimes committed with LCMs; (2) reduce the number of shots fired in gun  
6 crimes; (3) reduce the number of gunshot victims in such crimes; (4) reduce the number of  
7 wounds per gunshot victim; (5) reduce the lethality of gunshot injuries when they do occur; and  
8 (6) reduce the substantial societal costs that flow from shootings.

9 58. Through Sunnyvale Municipal Code, § 9.44.050, Sunnyvale has enacted a ban on  
10 the possession of LCMs. I believe this measure has the potential to help prevent the use and  
11 spread of particularly dangerous magazines, and is a reasonable and well-constructed measure  
12 that is likely to advance Sunnyvale's interest in protecting its citizens and its police force. I  
13 believe that the effects of such a measure will be amplified if similar measures are adopted in  
14 other jurisdictions as well.

15 59. I declare under penalty of perjury under the laws of the State of California that the  
16 foregoing is true and correct. Executed this 28<sup>th</sup> day of January, 2014, in Ashburn, Virginia.

17   
18 Christopher S. Koper

**EXHIBIT C**  
**To**  
**Declaration of Christopher S. Koper in**  
**Support of Sunnyvale's Opposition to**  
**Plaintiffs' Motion for Preliminary**  
**Injunction**



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# **An Updated Assessment of the Federal Assault Weapons Ban: Impacts on Gun Markets and Gun Violence, 1994-2003**

**Report to the National Institute of Justice,  
United States Department of Justice**

By

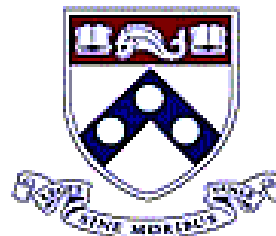
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(Principal Investigator)

With

Daniel J. Woods and Jeffrey A. Roth

**June 2004**

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## PREFACE

Gun violence continues to be one of America's most serious crime problems. In 2000, over 10,000 persons were murdered with firearms and almost 49,000 more were shot in the course of over 340,000 assaults and robberies with guns (see the Federal Bureau of Investigation's annual *Uniform Crime Reports* and Simon et al., 2002). The total costs of gun violence in the United States – including medical, criminal justice, and other government and private costs – are on the order of at least \$6 to \$12 billion per year and, by more controversial estimates, could be as high as \$80 billion per year (Cook and Ludwig, 2000).

However, there has been good news in recent years. Police statistics and national victimization surveys show that since the early 1990s, gun crime has plummeted to some of the lowest levels in decades (see the *Uniform Crime Reports* and Rennison, 2001). Have gun controls contributed to this decline, and, if so, which ones?

During the last decade, the federal government has undertaken a number of initiatives to suppress gun crime. These include, among others, the establishment of a national background check system for gun buyers (through the Brady Act), reforms of the licensing system for firearms dealers, a ban on juvenile handgun possession, and Project Safe Neighborhoods, a collaborative effort between U.S. Attorneys and local authorities to attack local gun crime problems and enhance punishment for gun offenders.

Perhaps the most controversial of these federal initiatives was the ban on semiautomatic assault weapons and large capacity ammunition magazines enacted as Title XI, Subtitle A of the *Violent Crime Control and Law Enforcement Act of 1994*. This law prohibits a relatively small group of weapons considered by ban advocates to be particularly dangerous and attractive for criminal purposes. In this report, we investigate the ban's impacts on gun crime through the late 1990s and beyond. This study updates a prior report on the short-term effects of the ban (1994-1996) that members of this research team prepared for the U.S. Department of Justice and the U.S. Congress (Roth and Koper, 1997; 1999).

## ACKNOWLEDGMENTS

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## 1. IMPACTS OF THE FEDERAL ASSAULT WEAPONS BAN, 1994-2003: KEY FINDINGS AND CONCLUSIONS

This overview presents key findings and conclusions from a study sponsored by the National Institute of Justice to investigate the effects of the federal assault weapons ban. This study updates prior reports to the National Institute of Justice and the U.S. Congress on the assault weapons legislation.

### The Ban Attempts to Limit the Use of Guns with Military Style Features and Large Ammunition Capacities

- Title XI, Subtitle A of the Violent Crime Control and Law Enforcement Act of 1994 imposed a 10-year ban on the “manufacture, transfer, and possession” of certain semiautomatic firearms designated as assault weapons (AWs). The ban is directed at semiautomatic firearms having features that appear useful in military and criminal applications but unnecessary in shooting sports or self-defense (examples include flash hiders, folding rifle stocks, and threaded barrels for attaching silencers). The law bans 18 models and variations by name, as well as revolving cylinder shotguns. It also has a “features test” provision banning other semiautomatics having two or more military-style features. In sum, the Bureau of Alcohol, Tobacco, Firearms, and Explosives (ATF) has identified 118 models and variations that are prohibited by the law. A number of the banned guns are foreign semiautomatic rifles that have been banned from importation into the U.S. since 1989.
- The ban also prohibits most ammunition feeding devices holding more than 10 rounds of ammunition (referred to as large capacity magazines, or LCMs). An LCM is arguably the most functionally important feature of most AWs, many of which have magazines holding 30 or more rounds. The LCM ban’s reach is broader than that of the AW ban because many non-banned semiautomatics accept LCMs. Approximately 18% of civilian-owned firearms and 21% of civilian-owned handguns were equipped with LCMs as of 1994.
- The ban exempts AWs and LCMs manufactured before September 13, 1994. At that time, there were upwards of 1.5 million privately owned AWs in the U.S. and nearly 25 million guns equipped with LCMs. Gun industry sources estimated that there were 25 million pre-ban LCMs available in the U.S. as of 1995. An additional 4.7 million pre-ban LCMs were imported into the country from 1995 through 2000, with the largest number in 1999.
- Arguably, the AW-LCM ban is intended to reduce gunshot victimizations by limiting the national stock of semiautomatic firearms with large ammunition capacities – which enable shooters to discharge many shots rapidly – and other features conducive to criminal uses. The AW provision targets a relatively small number of weapons based on features that have little to do with the weapons’

operation, and removing those features is sufficient to make the weapons legal. The LCM provision limits the ammunition capacity of non-banned firearms.

### **The Banned Guns and Magazines Were Used in Up to A Quarter of Gun Crimes Prior to the Ban**

- AWs were used in only a small fraction of gun crimes prior to the ban: about 2% according to most studies and no more than 8%. Most of the AWs used in crime are assault pistols rather than assault rifles.
- LCMs are used in crime much more often than AWs and accounted for 14% to 26% of guns used in crime prior to the ban.
- AWs and other guns equipped with LCMs tend to account for a higher share of guns used in murders of police and mass public shootings, though such incidents are very rare.

### **The Ban's Success in Reducing Criminal Use of the Banned Guns and Magazines Has Been Mixed**

- Following implementation of the ban, the share of gun crimes involving AWs declined by 17% to 72% across the localities examined for this study (Baltimore, Miami, Milwaukee, Boston, St. Louis, and Anchorage), based on data covering all or portions of the 1995-2003 post-ban period. This is consistent with patterns found in national data on guns recovered by police and reported to ATF.
- The decline in the use of AWs has been due primarily to a reduction in the use of assault pistols (APs), which are used in crime more commonly than assault rifles (ARs). There has not been a clear decline in the use of ARs, though assessments are complicated by the rarity of crimes with these weapons and by substitution of post-ban rifles that are very similar to the banned AR models.
- However, the decline in AW use was offset throughout at least the late 1990s by steady or rising use of other guns equipped with LCMs in jurisdictions studied (Baltimore, Milwaukee, Louisville, and Anchorage). The failure to reduce LCM use has likely been due to the immense stock of exempted pre-ban magazines, which has been enhanced by recent imports.

### **It is Premature to Make Definitive Assessments of the Ban's Impact on Gun Crime**

- Because the ban has not yet reduced the use of LCMs in crime, we cannot clearly credit the ban with any of the nation's recent drop in gun violence. However, the ban's exemption of millions of pre-ban AWs and LCMs ensured that the effects

of the law would occur only gradually. Those effects are still unfolding and may not be fully felt for several years into the future, particularly if foreign, pre-ban LCMs continue to be imported into the U.S. in large numbers.

### **The Ban's Reauthorization or Expiration Could Affect Gunshot Victimization, But Predictions are Tenuous**

- Should it be renewed, the ban's effects on gun violence are likely to be small at best and perhaps too small for reliable measurement. AWs were rarely used in gun crimes even before the ban. LCMs are involved in a more substantial share of gun crimes, but it is not clear how often the outcomes of gun attacks depend on the ability of offenders to fire more than ten shots (the current magazine capacity limit) without reloading.
- Nonetheless, reducing criminal use of AWs and especially LCMs could have non-trivial effects on gunshot victimizations. The few available studies suggest that attacks with semiautomatics – including AWs and other semiautomatics equipped with LCMs – result in more shots fired, more persons hit, and more wounds inflicted per victim than do attacks with other firearms. Further, a study of handgun attacks in one city found that 3% of the gunfire incidents resulted in more than 10 shots fired, and those attacks produced almost 5% of the gunshot victims.
- Restricting the flow of LCMs into the country from abroad may be necessary to achieve desired effects from the ban, particularly in the near future. Whether mandating further design changes in the outward features of semiautomatic weapons (such as removing all military-style features) will produce measurable benefits beyond those of restricting ammunition capacity is unknown. Past experience also suggests that Congressional discussion of broadening the AW ban to new models or features would raise prices and production of the weapons under discussion.
- If the ban is lifted, gun and magazine manufacturers may reintroduce AW models and LCMs, perhaps in substantial numbers. In addition, pre-ban AWs may lose value and novelty, prompting some of their owners to sell them in undocumented secondhand markets where they can more easily reach high-risk users, such as criminals, terrorists, and other potential mass murderers. Any resulting increase in crimes with AWs and LCMs might increase gunshot victimizations for the reasons noted above, though this effect could be difficult to measure.



## 2. PROVISIONS OF THE ASSAULT WEAPONS BAN

### 2.1. Assault Weapons

Enacted on September 13, 1994, Title XI, Subtitle A of the *Violent Crime Control and Law Enforcement Act of 1994* imposes a 10-year ban on the “manufacture, transfer, and possession” of certain semiautomatic firearms designated as assault weapons (AWs).<sup>1</sup> The AW ban is not a prohibition on all semiautomatics. Rather, it is directed at semiautomatics having features that appear useful in military and criminal applications but unnecessary in shooting sports or self-defense. Examples of such features include pistol grips on rifles, flash hiders, folding rifle stocks, threaded barrels for attaching silencers, and the ability to accept ammunition magazines holding large numbers of bullets.<sup>2</sup> Indeed, several of the banned guns (e.g., the AR-15 and Avtomat Kalashnikov models) are civilian copies of military weapons and accept ammunition magazines made for those military weapons.

As summarized in Table 2-1, the law specifically prohibits nine narrowly defined groups of pistols, rifles, and shotguns. A number of the weapons are foreign rifles that the federal government has banned from importation into the U.S. since 1989. Exact copies of the named AWs are also banned, regardless of their manufacturer. In addition, the ban contains a generic “features test” provision that generally prohibits other semiautomatic firearms having two or more military-style features, as described in Table 2-2. In sum, the federal Bureau of Alcohol, Tobacco, Firearms, and Explosives (ATF) has identified 118 model and caliber variations that meet the AW criteria established by the ban.<sup>3</sup>

Figures 2-1 and 2-2 illustrate a few prominent AWs and their features. Figure 2-1 displays the Intratec TEC-9 assault pistol, the AW most frequently used in crime (e.g., see Roth and Koper 1997, Chapter 2). Figure 2-2 depicts the AK-47 assault rifle, a weapon of Soviet design. There are many variations of the AK-47 produced around the world, not all of which have the full complement of features illustrated in Figure 2-2.

<sup>1</sup> A semiautomatic weapon fires one bullet for each squeeze of the trigger. After each shot, the gun automatically loads the next bullet and cocks itself for the next shot, thereby permitting a somewhat faster rate of fire relative to non-automatic firearms. Semiautomatics are not to be confused with fully automatic weapons (i.e., machine guns), which fire continuously as long as the trigger is held down. Fully automatic weapons have been illegal to own in the United States without a federal permit since 1934.

<sup>2</sup> Ban advocates stress the importance of pistol grips on rifles and heat shrouds or forward handgrips on pistols, which in combination with large ammunition magazines enable shooters to discharge high numbers of bullets rapidly (in a “spray fire” fashion) while maintaining control of the firearm (Violence Policy Center, 2003). Ban opponents, on the other hand, argue that AW features also serve legitimate purposes for lawful gun users (e.g., see Kopel, 1995).

<sup>3</sup> This is based on AWs identified by ATF’s Firearms Technology Branch as of December 1997.

**Table 2-1. Firearms Banned by the Federal Assault Weapons Ban**

<b>Firearm</b>	<b>Description</b>	<b>1993 Blue Book Price</b>	<b>Pre-Ban Federal Legal Status</b>	<b>Examples of Legal Substitutes</b>
Avtomat Kalashnikov (AK) (by Norinco, Mitchell, Poly Technologies)	Chinese, Russian, other foreign and domestic: .223 or 7.62x39mm caliber, semiauto. rifle; 5, 10, or 30 shot magazine, may be supplied with bayonet	\$550 (generic import); add 10-15% for folding stock models	Imports banned in 1989.	Norinco NHM 90/91 <sup>1</sup>
Uzi, Galil	Israeli: 9mm, .41, or .45 caliber semiauto. carbine, mini-carbine, or pistol. Magazine capacity of 16, 20, or 25, depending on model and type (10 or 20 on pistols).	\$550-\$1050 (Uzi) \$875-\$1150 (Galil)	Imports banned in 1989	Uzi Sporter <sup>2</sup>
Beretta AR-70	Italian: .222 or .223 caliber semiauto. paramilitary design rifle; 5, 8, or 30 shot magazine.	\$1050	Imports banned in 1989.	
Colt AR-15	Domestic: primarily .223 caliber paramilitary rifle or carbine; 5 shot magazines, often comes with two 5-shot detachable magazines. Exact copies by DPMS, Eagle, Olympic, and others.	\$825-\$1325	Legal (civilian version of military M-16)	Colt Sporter, Match H-Bar, Target models
Fabrique National FN/FAL, FN/LAR, FNC	Belgian design: .308 caliber semiauto. rifle or .223 combat carbine with 30 shot magazine. Rifle comes with flash hider, 4 position fire selector on automatic models. Discontinued in 1988.	\$1100-\$2500	Imports banned in 1989.	L1A1 Sporter (FN, Century) <sup>2</sup>
Steyr AUG	Austrian: .223/5.56mm caliber semiauto. paramilitary design rifle.	\$2500	Imports banned in 1989	
SWD M-10, 11, 11/9, 12	Domestic: 9mm, .380, or .45 caliber paramilitary design semiauto. pistol; 32 shot magazine. Also available in semiauto. carbine and fully automatic variations.	\$215 (M-11/9)	Legal	Cobray PM11, 12
TEC-9, DC9, 22	Domestic: 9mm caliber semiauto. paramilitary design pistol, 10 or 32 shot magazine.; .22 caliber semiauto. paramilitary design pistol, 30 shot magazine.	\$145-\$295	Legal	TEC-AB
Revolving Cylinder Shotguns	Domestic: 12 gauge, 12 shot rotary magazine; paramilitary configuration	\$525 (Street Sweeper)	Legal	

<sup>1</sup> Imports were halted in 1994 under the federal embargo on the importation of firearms from China.

<sup>2</sup> Imports banned by federal executive order, April 1998.

**Table 2-2. Features Test of the Federal Assault Weapons Ban**

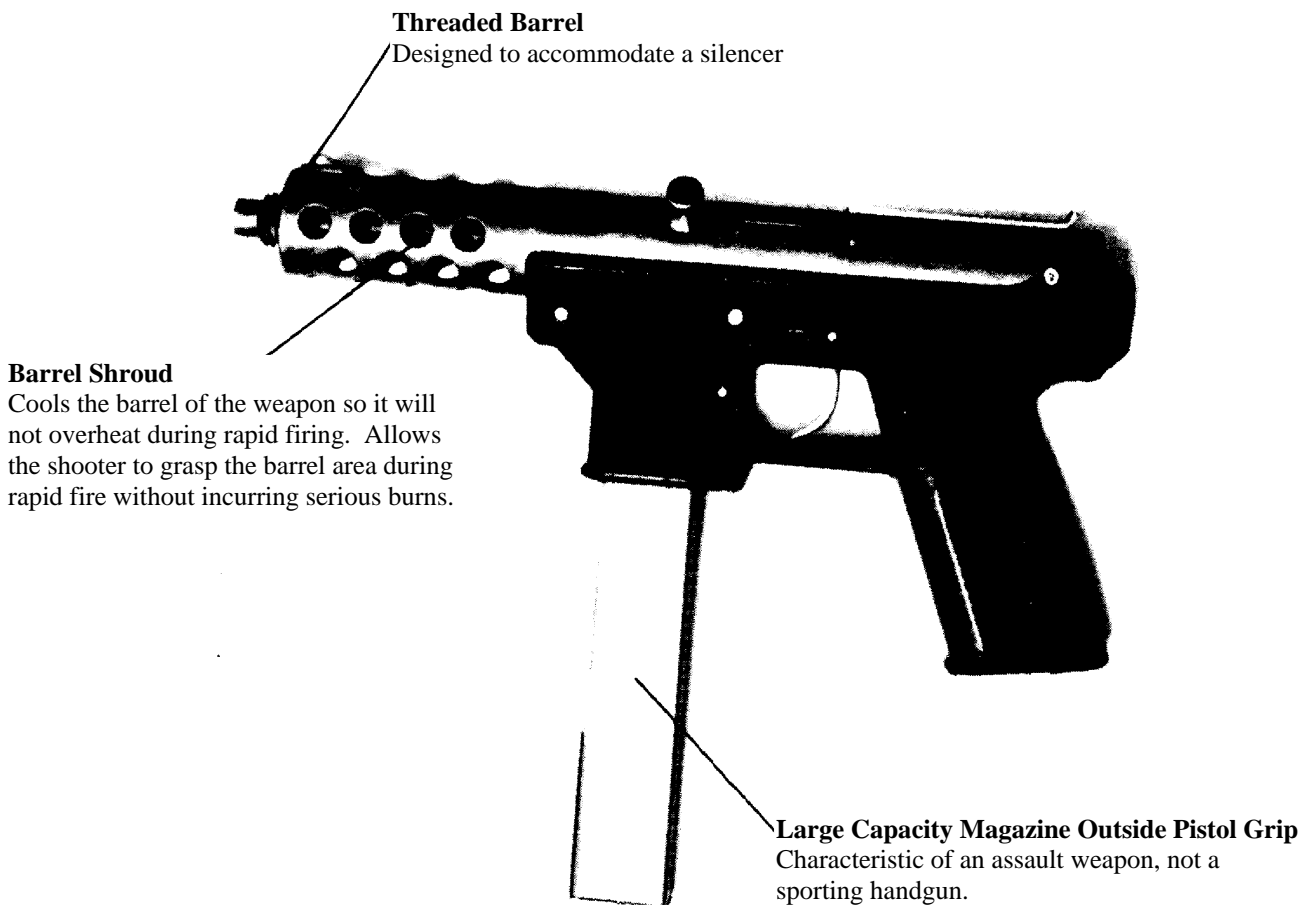
<b>Weapon Category</b>	<b>Military-Style Features (Two or more qualify a firearm as an assault weapon)</b>
Semiautomatic pistols accepting detachable magazines:	<ol style="list-style-type: none"> <li>1) ammunition magazine that attaches outside the pistol grip</li> <li>2) threaded barrel capable of accepting a barrel extender, flash hider, forward handgrip, or silencer</li> <li>3) heat shroud attached to or encircling the barrel</li> <li>4) weight of more than 50 ounces unloaded</li> <li>5) semiautomatic version of a fully automatic weapon</li> </ol>
Semiautomatic rifles accepting detachable magazines:	<ol style="list-style-type: none"> <li>1) folding or telescoping stock</li> <li>2) pistol grip that protrudes beneath the firing action</li> <li>3) bayonet mount</li> <li>4) flash hider or threaded barrel designed to accommodate one</li> <li>5) grenade launcher</li> </ol>
Semiautomatic shotguns:	<ol style="list-style-type: none"> <li>1) folding or telescoping stock</li> <li>2) pistol grip that protrudes beneath the firing action</li> <li>3) fixed magazine capacity over 5 rounds</li> <li>4) ability to accept a detachable ammunition magazine</li> </ol>

## 2.2. Large Capacity Magazines

In addition, the ban prohibits most ammunition feeding devices holding more than 10 rounds of ammunition (referred to hereafter as large capacity magazines, or LCMs).<sup>4</sup> Most notably, this limits the capacity of detachable ammunition magazines for semiautomatic firearms. Though often overlooked in media coverage of the law, this provision impacted a larger share of the gun market than did the ban on AWs. Approximately 40 percent of the semiautomatic handgun models and a majority of the semiautomatic rifle models being manufactured and advertised prior to the ban were sold with LCMs or had a variation that was sold with an LCM (calculated from Murtz et al., 1994). Still others could accept LCMs made for other firearms and/or by other manufacturers. A national survey of gun owners found that 18% of all civilian-owned firearms and 21% of civilian-owned handguns were equipped with magazines having 10 or more rounds as of 1994 (Cook and Ludwig, 1996, p. 17). The AW provision did not affect most LCM-compatible guns, but the LCM provision limited the capacities of their magazines to 10 rounds.

<sup>4</sup> Technically, the ban prohibits any magazine, belt, drum, feed strip, or similar device that has the capacity to accept more than 10 rounds or ammunition, or which can be readily converted or restored to accept more than 10 rounds of ammunition. The ban exempts attached tubular devices capable of operating only with .22 caliber rimfire (i.e., low velocity) ammunition.

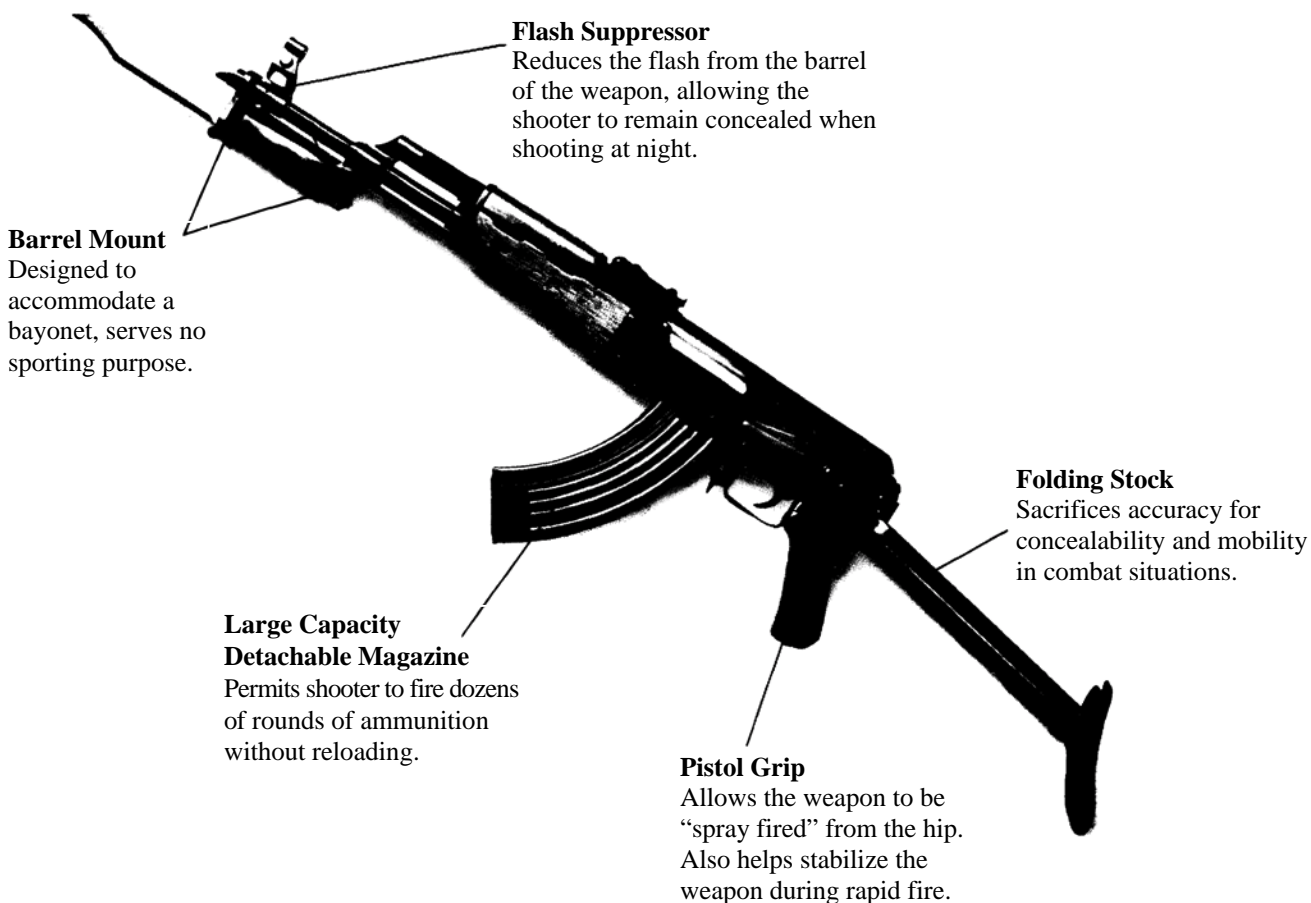
**Figure 2-1. Features of Assault Weapons:  
The Intratec TEC-9 Assault Pistol**



Adapted from exhibit of the Center to Prevent Handgun Violence.

As discussed in later chapters, an LCM is perhaps the most functionally important feature of many AWs. This point is underscored by the AW ban's exemptions for semiautomatic rifles that cannot accept a detachable magazine that holds more than five rounds of ammunition and semiautomatic shotguns that cannot hold more than five rounds in a fixed or detachable magazine. As noted by the U.S. House of Representatives, most prohibited AWs came equipped with magazines holding 30 rounds and could accept magazines holding as many as 50 or 100 rounds (U.S. Department of the Treasury, 1998, p. 14). Also, a 1998 federal executive order (discussed below) banned further importation of foreign semiautomatic rifles capable of accepting LCMs made for military rifles. Accordingly, the magazine ban plays an important role in the logic and interpretations of the analyses presented here.

**Figure 2-2. Features of Assault Weapons:  
The AK-47 Assault Rifle**



Adapted from exhibit of the Center to Prevent Handgun Violence.

### 2.3. Foreign Rifles Accepting Large Capacity Military Magazines

In April of 1998, the Clinton administration broadened the range of the AW ban by prohibiting importation of an additional 58 foreign semiautomatic rifles that were still legal under the 1994 law but that can accept LCMs made for military assault rifles like the AK-47 (U.S. Department of the Treasury, 1998).<sup>5</sup> Figure 2-3 illustrates a few such rifles (hereafter, LCMM rifles) patterned after the banned AK-47 pictured in Figure 2-2. The LCMM rifles in Figure 2-3 do not possess the military-style features incorporated into the AK-47 (such as pistol grips, flash suppressors, and bayonet mounts), but they accept LCMs made for AK-47s.<sup>6</sup>

<sup>5</sup> In the civilian context, AWs are semiautomatic firearms. Many semiautomatic AWs are patterned after military firearms, but the military versions are capable of semiautomatic and fully automatic fire.

<sup>6</sup> Importation of some LCMM rifles, including a number of guns patterned after the AK-47, was halted in 1994 due to trade sanctions against China (U.S. Department of the Treasury, 1998).

**Figure 2-3. Foreign Semiautomatic Rifles Capable of Accepting Large Capacity Military Magazines: AK47 Copies Banned by Executive Order in 1998**



MISR



ARM



MAK90



WUM 1

Taken from U.S. Department of the Treasury (1998)

## 2.4. Ban Exemptions

### 2.4.1. *Guns and Magazines Manufactured Prior to the Ban*

The ban contains important exemptions. AWs and LCMs manufactured before the effective date of the ban are “grandfathered” and thus legal to own and transfer. Around 1990, there were an estimated 1 million privately owned AWs in the U.S. (about 0.5% of the estimated civilian gun stock) (Cox Newspapers, 1989, p. 1; American Medical Association Council on Scientific Affairs, 1992), though those counts probably did not correspond exactly to the weapons prohibited by the 1994 ban. The leading domestic AW producers manufactured approximately half a million AWs from 1989 through 1993, representing roughly 2.5% of all guns manufactured in the U.S. during that time (see Chapter 5).

We are not aware of any precise estimates of the pre-ban stock of LCMs, but gun owners in the U.S. possessed an estimated 25 million guns that were equipped with LCMs or 10-round magazines in 1994 (Cook and Ludwig, 1996, p. 17), and gun industry sources estimated that, including aftermarket items for repairing and extending magazines, there were at least 25 million LCMs available in the United States as of 1995 (Gun Tests, 1995, p. 30). As discussed in Chapter 7, moreover, an additional 4.8 million pre-ban LCMs were imported into the U.S. from 1994 through 2000 under the grandfathering exemption.

### 2.4.2. *Semiautomatics With Fewer or No Military Features*

Although the law bans “copies or duplicates” of the named gun makes and models, federal authorities have emphasized exact copies. Relatively cosmetic changes, such as removing a flash hider or bayonet mount, are sufficient to transform a banned weapon into a legal substitute, and a number of manufacturers now produce modified, legal versions of some of the banned guns (examples are listed in Table 2-1). In general, the AW ban does not apply to semiautomatics possessing no more than one military-style feature listed under the ban’s features test provision.<sup>7</sup> For instance, prior to going out of business, Intratec, makers of the banned TEC-9 featured in Figure 2-1, manufactured an AB-10 (“after ban”) model that does not have a threaded barrel or a barrel shroud but is identical to the TEC-9 in other respects, including the ability to accept an ammunition magazine outside the pistol grip (Figure 2-4). As shown in the illustration, the AB-10 accepts grandfathered, 32-round magazines made for the TEC-9, but post-ban magazines produced for the AB-10 must be limited to 10 rounds.

<sup>7</sup> Note, however, that firearms imported into the country must still meet the “sporting purposes test” established under the federal Gun Control Act of 1968. In 1989, ATF determined that foreign semiautomatic rifles having any one of a number of named military features (including those listed in the features test of the 1994 AW ban) fail the sporting purposes test and cannot be imported into the country. In 1998, the ability to accept an LCM made for a military rifle was added to the list of disqualifying features. Consequently, it is possible for foreign rifles to pass the features test of the federal AW ban but not meet the sporting purposes test for imports (U.S. Department of the Treasury, 1998).



Another example is the Colt Match Target H-Bar rifle (Figure 2-5), which is a legalized version of the banned AR-15 (see Table 2-1). AR-15 type rifles are civilian weapons patterned after the U.S. military's M-16 rifle and were the assault rifles most commonly used in crime before the ban (Roth and Koper, 1997, Chapter 2). The post-ban version shown in Figure 2-5 (one of several legalized variations on the AR-15) is essentially identical to pre-ban versions of the AR-15 but does not have accessories like a flash hider, threaded barrel, or bayonet lug. The one remaining military feature on the post-ban gun is the pistol grip. This and other post-ban AR-15 type rifles can accept LCMs made for the banned AR15, as well as those made for the U.S. military's M-16. However, post-ban magazines manufactured for these guns must hold fewer than 11 rounds.

The LCMM rifles discussed above constituted another group of legalized AW-type weapons until 1998, when their importation was prohibited by executive order. Finally, the ban includes an appendix that exempts by name several hundred models of rifles and shotguns commonly used in hunting and recreation, 86 of which are semiautomatics. While the exempted semiautomatics generally lack the military-style features common to AWs, many take detachable magazines, and some have the ability to accept LCMs.<sup>8</sup>

## 2.5. Summary

In the broadest sense, the AW-LCM ban is intended to limit crimes with semiautomatic firearms having large ammunition capacities – which enable shooters to discharge high numbers of shots rapidly – and other features conducive to criminal applications. The gun ban provision targets a relatively small number of weapons based on outward features or accessories that have little to do with the weapons' operation. Removing some or all of these features is sufficient to make the weapons legal. In other respects (e.g., type of firing mechanism, ammunition fired, and the ability to accept a detachable magazine), AWs do not differ from other legal semiautomatic weapons. The LCM provision of the law limits the ammunition capacity of non-banned firearms.

---

<sup>8</sup> Legislators inserted a number of amendments during the drafting process to broaden the consensus behind the bill (Lennett 1995). Among changes that occurred during drafting were: dropping a requirement to register post-ban sales of the grandfathered guns, dropping a ban on "substantial substitutes" as well as "exact copies" of the banned weapons, shortening the list of named makes and models covered by the ban, adding the appendix list of exempted weapons, and mandating the first impact study of the ban that is discussed below.



**Figure 2-4. Post-Ban, Modified Versions of Assault Weapons:  
The Intratec AB (“After Ban”) Model (See Featured Firearm)**

**AMERICAN PRIDE**

**BRAND NEW**

**AMERICAN MADE**

**Introducing The AB-10 Stainless Steel 9mm Pistol!**  
The New non-threaded AB-10 Stainless Steel Firearm is now available with a 32-round Stainless Steel capacity magazine. This new edition is one of the most affordable and reliable firearms on the market! In Standard Blue or Stainless Steel, the AB-10 series makes an ideal firearm for self-defense or recreation.  
*A super profit-maker!*

**"Cat"-9**  
9mm, Luger. Magazine 7+1

**Sport -22**  
Non-Threaded Barrel  
10-Round Magazine

**"Cat"-9/.380 Auto**  
Magazine 7+1

**"Cat" -45**  
45 A.C.P.  
Magazine 6+1

**Pro-"tec"-tor Series**  
Protec 25B, 8-Round Mag.  
Protec 25KB, 8-Round Mag.

**INTRATEC**  
12405 S.W. 130th St., Miami, FL 33186  
<http://amfire.com/intratec.html>  
Fax: (305) 253-7207

**Figure 2-5. Post-Ban, Modified Versions of Assault Weapons:  
The Colt Match Target HBAR Model**



### 3. CRIMINAL USE OF ASSAULT WEAPONS AND LARGE CAPACITY MAGAZINES BEFORE THE BAN

During the 1980s and early 1990s, AWs and other semiautomatic firearms equipped with LCMs were involved in a number of highly publicized mass murder incidents that raised public concern about the accessibility of high powered, military-style weaponry and other guns capable of discharging high numbers of bullets in a short period of time (Cox Newspapers, 1989; Kleck, 1997, pp.124-126,144; Lenett, 1995). In one of the worst mass murders ever committed in the U.S., for example, James Huberty killed 21 persons and wounded 19 others in a San Ysidro, California MacDonald's restaurant on July 18, 1984 using an Uzi carbine, a shotgun, and another semiautomatic handgun. On September 14, 1989, Joseph Wesbecker, armed with an AK-47 rifle, two MAC-11 handguns, and a number of other firearms, killed 7 persons and wounded 15 others at his former workplace in Louisville, Kentucky before taking his own life. Another particularly notorious incident that precipitated much of the recent debate over AWs occurred on January 17, 1989 when Patrick Purdy used a civilian version of the AK-47 military rifle to open fire on a schoolyard in Stockton, California, killing 5 children and wounding 29 persons.

There were additional high profile incidents in which offenders using semiautomatic handguns with LCMs killed and wounded large numbers of persons. Armed with two handguns having LCMs (and reportedly a supply of extra LCMs), a rifle, and a shotgun, George Hennard killed 22 people and wounded another 23 in Killeen, Texas in October 1991. In a December 1993 incident, a gunman named Colin Ferguson, armed with a handgun and LCMs, opened fire on commuters on a Long Island train, killing 5 and wounding 17.

Indeed, AWs or other semiautomatics with LCMs were involved in 6, or 40%, of 15 mass shooting incidents occurring between 1984 and 1993 in which six or more persons were killed or a total of 12 or more were wounded (Kleck, 1997, pp.124-126, 144). Early studies of AWs, though sometimes based on limited and potentially unrepresentative data, also suggested that AWs recovered by police were often associated with drug trafficking and organized crime (Cox Newspapers, 1989; also see Roth and Koper, 1997, Chapter 5), fueling a perception that AWs were guns of choice among drug dealers and other particularly violent groups. All of this intensified concern over AWs and other semiautomatics with large ammunition capacities and helped spur the passage of AW bans in California, New Jersey, Connecticut, and Hawaii between 1989 and 1993, as well as the 1989 federal import ban on selected semiautomatic rifles. Maryland also passed AW legislation in 1994, just a few months prior to the passage of the 1994 federal AW ban.<sup>9</sup>

Looking at the nation's gun crime problem more broadly, however, AWs and LCMs were used in only a minority of gun crimes prior to the 1994 federal ban, and AWs were used in a particularly small percentage of gun crimes.

<sup>9</sup> A number of localities around the nation also passed AW bans during this period.

### 3.1. Criminal Use of Assault Weapons

Numerous studies have examined the use of AWs in crime prior to the federal ban. The definition of AWs varied across the studies and did not always correspond exactly to that of the 1994 law (in part because a number of the studies were done prior to 1994). In general, however, the studies appeared to focus on various semiautomatics with detachable magazines and military-style features. According to these accounts, AWs typically accounted for up to 8% of guns used in crime, depending on the specific AW definition and data source used (e.g., see Beck et al., 1993; Hargarten et al., 1996; Hutson et al., 1994; 1995; McGonigal et al., 1993; New York State Division of Criminal Justice Services, 1994; Roth and Koper, 1997, Chapters 2, 5, 6; Zawitz, 1995). A compilation of 38 sources indicated that AWs accounted for 2% of crime guns on average (Kleck, 1997, pp.112, 141-143).<sup>10</sup>

Similarly, the most common AWs prohibited by the 1994 federal ban accounted for between 1% and 6% of guns used in crime according to most of several national and local data sources examined for this and our prior study (see Chapter 6 and Roth and Koper, 1997, Chapters 5, 6):

- Baltimore (all guns recovered by police, 1992-1993): 2%
- Miami (all guns recovered by police, 1990-1993): 3%
- Milwaukee (guns recovered in murder investigations, 1991-1993): 6%
- Boston (all guns recovered by police, 1991-1993): 2%
- St. Louis (all guns recovered by police, 1991-1993): 1%
- Anchorage, Alaska (guns used in serious crimes, 1987-1993): 4%
- National (guns recovered by police and reported to ATF, 1992-1993): 5%<sup>11</sup>
- National (gun thefts reported to police, 1992-Aug. 1994): 2%
- National (guns used in murders of police, 1992-1994): 7-9%<sup>12</sup>
- National (guns used in mass murders of 4 or more persons, 1992-1994): 4-13%<sup>13</sup>

Although each of the sources cited above has limitations, the estimates consistently show that AWs are used in a small fraction of gun crimes. Even the highest

<sup>10</sup> The source in question contains a total of 48 estimates, but our focus is on those that examined all AWs (including pistols, rifles, and shotguns) as opposed to just assault rifles.

<sup>11</sup> For reasons discussed in Chapter 6, the national ATF estimate likely overestimates the use of AWs in crime. Nonetheless, the ATF estimate lies within the range of other presented estimates.

<sup>12</sup> The minimum estimate is based on AW cases as a percentage of all gun murders of police. The maximum estimate is based on AW cases as a percentage of cases for which at least the gun manufacturer was known. Note that AWs accounted for as many as 16% of gun murders of police in 1994 (Roth and Koper, 1997, Chapter 6; also see Adler et al., 1995).

<sup>13</sup> These statistics are based on a sample of 28 cases found through newspaper reports (Roth and Koper, 1997, Appendix A). One case involved an AW, accounting for 3.6% of all cases and 12.5% of cases in which at least the type of gun (including whether the gun was a handgun, rifle, or shotgun and whether the gun was a semiautomatic) was known. Also see the earlier discussion of AWs and mass shootings at the beginning of this chapter.

estimates, which correspond to particularly rare events such as mass murders and police murders, are no higher than 13%. Note also that the majority of AWs used in crime are assault pistols (APs) rather than assault rifles (ARs). Among AWs reported by police to ATF during 1992 and 1993, for example, APs outnumbered ARs by a ratio of 3 to 1 (see Chapter 6).

The relative rarity of AW use in crime can be attributed to a number of factors. Many AWs are long guns, which are used in crime much less often than handguns. Moreover, a number of the banned AWs are foreign weapons that were banned from importation into the U.S. in 1989. Also, AWs are more expensive (see Table 2-1) and more difficult to conceal than the types of handguns that are used most frequently in crime.

### *3.1.1. A Note on Survey Studies and Assault Weapons*

The studies and statistics discussed above were based primarily on police information. Some survey studies have given a different impression, suggesting substantial levels of AW ownership among criminals and otherwise high-risk juvenile and adult populations, particularly urban gang members (Knox et al., 1994; Sheley and Wright, 1993a). A general problem with these studies, however, is that respondents themselves had to define terms like “military-style” and “assault rifle.” Consequently, the figures from these studies may lack comparability with those from studies with police data. Further, the figures reported in some studies prompt concerns about exaggeration of AW ownership (perhaps linked to publicity over the AW issue during the early 1990s when a number of these studies were conducted), particularly among juvenile offenders, who have reported ownership levels as high as 35% just for ARs (Sheley and Wright, 1993a).<sup>14</sup>

Even so, most survey evidence on the actual use of AWs suggests that offenders rarely use AWs in crime. In a 1991 national survey of adult state prisoners, for example, 8% of the inmates reported possessing a “military-type” firearm at some point in the past (Beck et al., 1993, p. 19). Yet only 2% of offenders who used a firearm during their conviction offense reported using an AW for that offense (calculated from pp. 18, 33), a figure consistent with the police statistics cited above. Similarly, while 10% of adult inmates and 20% of juvenile inmates in a Virginia survey reported having owned an AR, none of the adult inmates and only 1% of the juvenile inmates reported having carried them at crime scenes (reported in Zawitz, 1995, p. 6). In contrast, 4% to 20% of inmates surveyed in eight jails across rural and urban areas of Illinois and Iowa reported having used an AR in committing crimes (Knox et al., 1994, p. 17). Nevertheless, even assuming the accuracy and honesty of the respondents’ reports, it is not clear what

<sup>14</sup> As one example of possible exaggeration of AW ownership, a survey of incarcerated juveniles in New Mexico found that 6% reported having used a “military-style rifle” against others and 2.6% reported that someone else used such a rifle against them. However, less than 1% of guns recovered in a sample of juvenile firearms cases were “military” style guns (New Mexico Criminal Justice Statistical Analysis Center, 1998, pp. 17-19; also see Ruddell and Mays, 2003).



weapons they were counting as ARs, what percentage of their crimes were committed with ARs, or what share of all gun crimes in their respective jurisdictions were linked to their AR uses. Hence, while some surveys suggest that ownership and, to a lesser extent, use of AWs may be fairly common among certain subsets of offenders, the overwhelming weight of evidence from gun recovery and survey studies indicates that AWs are used in a small percentage of gun crimes overall.

### *3.1.2. Are Assault Weapons More Attractive to Criminal Users Than Other Gun Users?*

Although AWs are used in a small percentage of gun crimes, some have argued that AWs are more likely to be used in crime than other guns, i.e., that AWs are more attractive to criminal than lawful gun users due to the weapons' military-style features and their particularly large ammunition magazines. Such arguments are based on data implying that AWs are more common among crime guns than among the general stock of civilian firearms. According to some estimates generated prior to the federal ban, AWs accounted for less than one percent of firearms owned by civilians but up to 11% of guns used in crime, based on firearms reported by police to ATF between 1986 and 1993 (e.g., see Cox Newspapers, 1989; Lennett, 1995). However, these estimates were problematic in a number of respects. As discussed in Chapter 6, ATF statistics are not necessarily representative of the types of guns most commonly recovered by police, and ATF statistics from the late 1980s and early 1990s in particular tended to overstate the prevalence of AWs among crime guns. Further, estimating the percentage of civilian weapons that are AWs is difficult because gun production data are not reported by model, and one must also make assumptions about the rate of attrition among the stock of civilian firearms.

Our own more recent assessment indicates that AWs accounted for about 2.5% of guns produced from 1989 through 1993 (see Chapter 5). Relative to previous estimates, this may signify that AWs accounted for a growing share of civilian firearms in the years just before the ban, though the previous estimates likely did not correspond to the exact list of weapons banned in 1994 and thus may not be entirely comparable to our estimate. At any rate, the 2.5% figure is comparable to most of the AW crime gun estimates listed above; hence, it is not clear that AWs are used disproportionately in most crimes, though AWs still seem to account for a somewhat disproportionate share of guns used in murders and other serious crimes.

Perhaps the best evidence of a criminal preference for AWs comes from a study of young adult handgun buyers in California that found buyers with minor criminal histories (i.e., arrests or misdemeanor convictions that did not disqualify them from purchasing firearms) were more than twice as likely to purchase APs than were buyers with no criminal history (4.6% to 2%, respectively) (Wintemute et al., 1998a). Those with more serious criminal histories were even more likely to purchase APs: 6.6% of those who had been charged with a gun offense bought APs, as did 10% of those who had been charged with two or more serious violent offenses. AP purchasers were also more likely to be arrested subsequent to their purchases than were other gun purchasers.

Among gun buyers with prior charges for violence, for instance, AP buyers were more than twice as likely as other handgun buyers to be charged with any new offense and three times as likely to be charged with a new violent or gun offense. To our knowledge, there have been no comparable studies contrasting AR buyers with other rifle buyers.

### 3.2. Criminal Use of Large Capacity Magazines

Relative to the AW issue, criminal use of LCMs has received relatively little attention. Yet the overall use of guns with LCMs, which is based on the combined use of AWs and non-banned guns with LCMs, is much greater than the use of AWs alone. Based on data examined for this and a few prior studies, guns with LCMs were used in roughly 14% to 26% of most gun crimes prior to the ban (see Chapter 8; Adler et al., 1995; Koper, 2001; New York Division of Criminal Justice Services, 1994).

- Baltimore (all guns recovered by police, 1993): 14%
- Milwaukee (guns recovered in murder investigations, 1991-1993): 21%
- Anchorage, Alaska (handguns used in serious crimes, 1992-1993): 26%
- New York City (guns recovered in murder investigations, 1993): 16-25%<sup>15</sup>
- Washington, DC (guns recovered from juveniles, 1991-1993): 16%<sup>16</sup>
- National (guns used in murders of police, 1994): 31%-41%<sup>17</sup>

Although based on a small number of studies, this range is generally consistent with national survey estimates indicating approximately 18% of all civilian-owned guns and 21% of civilian-owned handguns were equipped with LCMs as of 1994 (Cook and Ludwig, 1996, p. 17). The exception is that LCMs may have been used disproportionately in murders of police, though such incidents are very rare.

As with AWs and crime guns in general, most crime guns equipped with LCMs are handguns. Two handgun models manufactured with LCMs prior to the ban (the Glock 17 and Ruger P89) were among the 10 crime gun models most frequently recovered by law enforcement and reported to ATF during 1994 (ATF, 1995).

<sup>15</sup> The minimum estimate is based on cases in which discharged firearms were recovered, while the maximum estimate is based on cases in which recovered firearms were positively linked to the case with ballistics evidence (New York Division of Criminal Justice Services, 1994).

<sup>16</sup> Note that Washington, DC prohibits semiautomatic firearms accepting magazines with more than 12 rounds (and handguns in general).

<sup>17</sup> The estimates are based on the sum of cases involving AWs or other guns sold with LCMs (Adler et al., 1995, p.4). The minimum estimate is based on AW-LCM cases as a percentage of all gun murders of police. The maximum estimate is based on AW-LCM cases as a percentage of cases in which the gun model was known.

### 3.3. Summary

In sum, AWs and LCMs were used in up to a quarter of gun crimes prior to the 1994 AW-LCM ban. By most estimates, AWs were used in less than 6% of gun crimes even before the ban. Some may have perceived their use to be more widespread, however, due to the use of AWs in particularly rare and highly publicized crimes such as mass shootings (and, to a lesser extent, murders of police), survey reports suggesting high levels of AW ownership among some groups of offenders, and evidence that some AWs are more attractive to criminal than lawful gun buyers.

In contrast, guns equipped with LCMs – of which AWs are a subset – are used in roughly 14% to 26% of gun crimes. Accordingly, the LCM ban has greater potential for affecting gun crime. However, it is not clear how often the ability to fire more than 10 shots without reloading (the current magazine capacity limit) affects the outcomes of gun attacks (see Chapter 9). All of this suggests that the ban's impact on gun violence is likely to be small.



#### 4. OVERVIEW OF STUDY DESIGN, HYPOTHESES, AND PRIOR FINDINGS

Section 110104 of the AW-LCM ban directed the Attorney General of the United States to study the ban's impact and report the results to Congress within 30 months of the ban's enactment, a provision which was presumably motivated by a sunset provision in the legislation (section 110105) that will lift the ban in September 2004 unless Congress renews the ban. In accordance with the study requirement, the National Institute of Justice (NIJ) awarded a grant to the Urban Institute to study the ban's short-term (i.e., 1994-1996) effects. The results of that study are available in a number of reports, briefs, and articles written by members of this research team (Koper and Roth, 2001a; 2001b; 2002a; Roth and Koper, 1997; 1999).<sup>18</sup> In order to understand the ban's longer-term effects, NIJ provided additional funding to extend the AW research. In 2002, we delivered an interim report to NIJ based on data extending through at least the late 1990s (Koper and Roth, 2002b). This report is based largely on the 2002 interim report, but with various new and updated analyses extending as far as 2003. It is thus a compilation of analyses conducted between 1998 and 2003. The study periods vary somewhat across the analyses, depending on data availability and the time at which the data were collected.

##### 4.1. Logical Framework for Research on the Ban

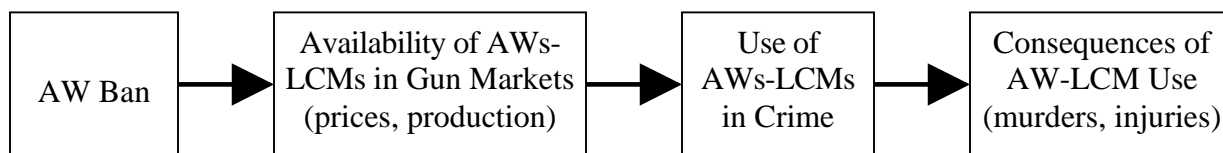
An important rationale for the AW-LCM ban is that AWs and other guns equipped with LCMs are particularly dangerous weapons because they facilitate the rapid firing of high numbers of shots, thereby potentially increasing injuries and deaths from gun violence. Although AWs and LCMs were used in only a modest share of gun crimes before the ban, it is conceivable that a decrease in their use might reduce fatal and non-fatal gunshot victimizations, even if it does not reduce the overall rate of gun crime. (In Chapter 9, we consider in more detail whether forcing offenders to substitute other guns and smaller magazines can reduce gun deaths and injuries.)

It is not clear how quickly such effects might occur, however, because the ban exempted the millions of AWs and LCMs that were manufactured prior to the ban's effective date in September 1994. This was particularly a concern for our first study, which was based on data extending through mid-1996, a period potentially too short to observe any meaningful effects. Consequently, investigation of the ban's effects on gun markets – and, most importantly, how they have affected criminal use of AWs and LCMs – has played a central role in this research. The general logic of our studies, illustrated in Figure 4-1, has been to first assess the law's impact on the availability of AWs and LCMs, examining price and production (or importation) indices in legal markets and relating them to trends in criminal use of AWs and LCMs. In turn, we can relate these market patterns to trends in the types of gun crimes most likely to be affected by changes in the use of AWs and LCMs. However, we cannot make definitive assessments of the

<sup>18</sup> The report to Congress was the Roth and Koper (1997) report.

ban's impact on gun violence until it is clear that the ban has indeed reduced criminal use of AWs and LCMs.

**Figure 4-1. Logic Model for Research on the Assault Weapons Ban**



## 4.2. Hypothesized Market Effects

### 4.2.1. A General Description of Gun Markets

Firearms are distributed in markets commonly referred to as primary and secondary markets. Illicit gun transactions occur in both markets. Primary markets include wholesale and retail transactions by federally-licensed gun dealers, referred to as federal firearm licensees. Licensed dealers are required to, among things, follow federal and state background procedures to verify the eligibility of purchasers, observe any legally required waiting period prior to making transfers, and maintain records of gun acquisitions and dispositions (though records are not required for sales of ammunition magazines).

Despite these restrictions, survey data suggest that as many as 21% of adult gun offenders obtained guns from licensed dealers in the years prior to the ban (Harlow, 2001, p. 6; also see Wright and Rossi, 1986, pp. 183,185). In more recent years, this figure has declined to 14% (Harlow, 2001, p. 6), due likely to the Brady Act, which established a national background check system for purchases from licensed dealers, and reforms of the federal firearms licensing system that have greatly reduced the number of licensed gun dealers (see ATF, 2000; Koper, 2002). Some would-be gun offenders may be legally eligible buyers at the time of their acquisitions, while others may seek out corrupt dealers or use other fraudulent or criminal means to acquire guns from retail dealers (such as recruiting a legally entitled buyer to act as a “straw purchaser” who buys a gun on behalf of a prohibited buyer).

Secondary markets encompass second-hand gun transactions made by non-licensed individuals.<sup>19</sup> Secondary market participants are prohibited from knowingly transferring guns to ineligible purchasers (e.g., convicted felons and drug abusers). However, secondary transfers are not subject to the federal record-keeping and background check requirements placed on licensed dealers, thus making the secondary

<sup>19</sup> Persons who make only occasional sales of firearms are not required to obtain a federal firearms license (ATF, 2000, p. 11).

market almost entirely unregulated and, accordingly, a better source of guns for criminal users.<sup>20</sup> In the secondary market, ineligible buyers may obtain guns from a wide variety of legitimate or illegitimate gun owners: relatives, friends, fences, drug dealers, drug addicts, persons selling at gun shows, or other strangers (e.g., see Wright and Rossi, 1986; Sheley and Wright, 1993a). Of course, ineligible purchasers may also steal guns from licensed gun dealers and private gun owners.

Secondary market prices are generally lower than primary market prices (because the products are used), though the former may vary substantially across a range of gun models, places, circumstances, and actors. For example, street prices of AWs and other guns can be 3 to 6 times higher than legal retail prices in jurisdictions with strict gun controls and lower levels of gun ownership (Cook et al., 1995, p. 72). Nonetheless, experts note that primary and secondary market prices correspond to one another, in that relatively expensive guns in the primary market are also relatively expensive in the secondary market. Moreover, in any given locality, trends in secondary market prices can be expected to track those in the primary market because a rise in primary market prices for new weapons will increase demand for used weapons and therefore increase secondary market prices (Cook et al., 1995, p. 71).

#### 4.2.2. *The AW-LCM Ban and Gun Markets*

In the long term, we can expect prices of the banned guns and magazines to gradually rise as supplies dwindle. As prices rise, more would-be criminal users of AWs and LCMs will be unable or unwilling to pay the higher prices. Others will be discouraged by the increasing non-monetary costs (i.e., search time) of obtaining the weapons. In addition, rising legal market prices will undermine the incentive for some persons to sell AWs and LCMs to prohibited buyers for higher premiums, thereby bidding some of the weapons away from the channels through which they would otherwise reach criminal users. Finally, some would-be AW and LCM users may become less willing to risk confiscation of their AWs and LCMs as the value of the weapons increases. Therefore, we expect that over time diminishing stocks and rising prices will lead to a reduction in criminal use of AWs and LCMs.<sup>21</sup>

<sup>20</sup> Some states require that secondary market participants notify authorities about their transactions. Even in these states, however, it is not clear how well these laws are enforced.

<sup>21</sup> We would expect these reductions to be apparent shortly after the price increases (an expectation that, as discussed below, was confirmed in our earlier study) because a sizeable share of guns used in crime are used within one to three years of purchase. Based on analyses of guns recovered by police in 17 cities, ATF (1997, p. 8) estimates that guns less than 3 years old (as measured by the date of first retail sale) comprise between 22% and 43% of guns seized from persons under age 18, between 30% and 54% of guns seized from persons ages 18 to 24, and between 25% and 46% of guns seized from persons over 24. In addition, guns that are one year old or less comprise the largest share of relatively new crime guns (i.e., crime guns less than three years old) (Pierce et al., 1998, p. 11). Similar data are not available for secondary market transactions, but such data would shorten the estimated time from acquisition to criminal use.

However, the expected timing of the market processes is uncertain. We can anticipate that AW and LCM prices will remain relatively stable for as long as the supply of grandfathered weapons is adequate to meet demand. If, in anticipation of the ban, gun manufacturers overestimated the demand for AWs and LCMs and produced too many of them, prices might even fall before eventually rising. Market responses can be complicated further by the continuing production of legal AW substitute models by some gun manufacturers. If potential AW buyers are content with an adequate supply of legal AW-type weapons having fewer military features, it will take longer for the grandfathered AW supply to constrict and for prices to rise. Similarly, predicting LCM price trends is complicated by the overhang of military surplus magazines that can fit civilian weapons (e.g., military M-16 rifle magazines that can be used with AR-15 type rifles) and by the market in reconditioned magazines. The “aftermarket” in gun accessories and magazine extenders that can be used to convert legal guns and magazines into banned ones introduces further complexity to the issue.

#### 4.3. Prior Research on the Ban’s Effects

To summarize the findings of our prior study, Congressional debate over the ban triggered pre-ban speculative price increases of upwards of 50% for AWs during 1994, as gun distributors, dealers, and collectors anticipated that the weapons would become valuable collectors’ items. Analysis of national and local data on guns recovered by police showed reductions in criminal use of AWs during 1995 and 1996, suggesting that rising prices made the weapons less accessible to criminal users in the short-term aftermath of the ban.

However, the speculative increase in AW prices also prompted a pre-ban boost in AW production; in 1994, AW manufacturers produced more than twice their average volume for the 1989-1993 period. The oversupply of grandfathered AWs, the availability of the AW-type legal substitute models mentioned earlier, and the steady supply of other non-banned semiautomatics appeared to have saturated the legal market, causing advertised prices of AWs to fall to nearly pre-speculation levels by late 1995 or early 1996. This combination of excess supply and reduced prices implied that criminal use of AWs might rise again for some period around 1996, as the large stock of AWs would begin flowing from dealers’ and speculators’ gun cases to the secondary markets where ineligible purchasers may obtain guns more easily.

We were not able to gather much specific data about market trends for LCMs. However, available data did reveal speculative, pre-ban price increases for LCMs that were comparable to those for AWs (prices for some LCMs continued to climb into 1996), leading us to speculate – incorrectly, as this study will show (see Chapter 8) – that there was some reduction in LCM use after the ban.<sup>22</sup>

<sup>22</sup> To our knowledge, there have been two other studies of changes in AW and LCM use during the post-ban period. One study reported a drop in police recoveries of AWs in Baltimore during the first half of 1995 (Weil and Knox, 1995), while the other found no decline in recoveries of AWs or LCMs in Milwaukee homicide cases as of 1996 (Hargarten et al., 2000). Updated analyses for both of these cities

Determining whether the reduction in AW use (and perhaps LCM use) following the ban had an impact on gun violence was more difficult. The gun murder rate dropped more in 1995 (the first year following the ban) than would have been expected based on preexisting trends, but the short post-ban follow-up period available for the analysis precluded a definitive assessment as to whether the reduction was statistically meaningful (see especially Koper and Roth, 2001a). The reduction was also larger than would be expected from the AW-LCM ban, suggesting that other factors were at work in accelerating the decline. Using a number of national and local data sources, we also examined trends in measures of victims per gun murder incident and wounds per gunshot victim, based on the hypothesis that these measures might be more sensitive to variations in the use of AWs and LCMs. These analyses revealed no ban effects, thus failing to show confirming evidence of the mechanism through which the ban was hypothesized to affect the gun murder rate. However, newly available data presented in subsequent chapters suggest these assessments may have been premature, because any benefits from the decline in AW use were likely offset by steady or rising use of other guns equipped with LCMs, a trend that was not apparent at the time of our earlier study.

We cautioned that the short-term patterns observed in the first study might not provide a reliable guide to longer-term trends and that additional follow-up was warranted. Two key issues to be addressed were whether there had been a rebound in AW use since the 1995-1996 period and, if so, whether that rebound had yet given way to a long-term reduction in AW use. Another key issue was to seek more definitive evidence on short and long-term trends in the availability and criminal use of LCMs. These issues are critical to assessing the effectiveness of the AW-LCM ban, but they also have broader implications for other important policy concerns, namely, the establishment of reasonable timeframes for sunset and evaluation provisions in legislation. In other words, how long is long enough in evaluating policy and setting policy expiration dates?

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are presented in Chapters 6 and 8.

## 5. MARKET INDICATORS FOR ASSAULT WEAPONS: PRICES AND PRODUCTION

This chapter assesses the ban's impact on the availability of AWs in primary and secondary markets, as measured by trends in AW prices and post-ban production of legal AW substitute models. Understanding these trends is important because they influence the flow of grandfathered weapons to criminals and the availability of non-banned weapons that are close substitutes for banned ones. In the next chapter, we assess the impact of these trends on criminal use of AWs, as approximated by statistics on gun seizures by police. (Subsequent chapters present similar analyses for LCMs.)

Following our previous methods, we compare trends for AWs to trends for various non-banned firearms. The AW analyses generally focus on the most common AWs formerly produced in the U.S., including Intratec and SWD-type APs and AR-15-type ARs produced by Colt and others. In addition, we selected a small number of domestic pistol and rifle models made by Calico and Feather Industries that fail the features test provision of the AW legislation and that were relatively common among crime guns reported by law enforcement agencies to ATF prior to the ban (see Roth and Koper, 1997, Chapter 5). Together, this group of weapons represented over 80% of AWs used in crime and reported to ATF from 1993 through 1996, and the availability of these guns was not affected by legislation or regulations predating the AW-LCM ban.<sup>23</sup> We also examine substitution of legalized, post-ban versions of these weapons, including the Intratec AB-10 and Sport-22, FMJ's PM models (substitutes for the SWD group), Colt Sporters, Calico Liberty models, and others. We generally did not conduct comparative analyses of named foreign AWs (the Uzi, Galil, and AK weapons) because the 1989 federal import ban had already limited their availability, and their legal status was essentially unchanged by the 1994 ban.

The exact gun models and time periods covered vary across the analyses (based on data availability and the time at which data were collected). The details of each analysis are described in the following sections.

### 5.1. Price Trends for Assault Weapons and Other Firearms

To approximate trends in the prices at which AWs could be purchased throughout the 1990s, we collected annual price data for several APs, ARs, and non-banned comparison firearms from the *Blue Book of Gun Values* (Fjestad, 1990-1999). The *Blue Book* provides national average prices for an extensive list of new and used firearms based on information collected at gun shows and input provided by networks of dealers

<sup>23</sup> The Intratec group includes weapons made by AA Arms. The SWD group contains related models made by Military Armaments Corporation/Ingram and RPB Industries. The AR-15 group contains models made by Colt and copies made by Bushmaster, Olympic Arms, Eagle Arms, SGW Enterprises, Essential Arms, DPMS, and Sendra.



and collectors. The *Blue Book* is utilized widely in the gun industry, though prices in any given locality may differ notably from the averages appearing in the *Blue Book*.

To assess time trends in gun prices, we conducted hedonic price analyses (Berndt, 1990) in which the gun prices were regressed upon a series of year and model indicators. The coefficients for the year indicators show annual changes in the prices of the guns relative to 1994 (the year the ban went into effect), controlling for time-stable differences in the prices of various gun models. Since manufacturers' suggested retail prices (MSRP) were not available for banned AWs during post-ban years, we utilized prices for AWs in 100% condition for all years.<sup>24</sup> For non-banned firearms, we used MSRP.<sup>25</sup> For all models, we divided the gun prices by annual values of the gross domestic product price deflator provided in the December 2001 and 2000 issues of *Economic Indicators* and logged these adjusted prices.

Each model presented below is based on data pooled across a number of firearm models and years, so that observation  $P_{jt}$  represents the price of gun model  $j$  during year  $t$ . We weighted each observation,  $P_{jt}$ , based on cumulative estimates of the production of model  $j$  from 1985 or 1986 (depending on data availability) through year  $t$  using data provided by gun manufacturers to ATF and published by the Violence Policy Center (1999).<sup>26, 27</sup>

<sup>24</sup> Project staff also collected prices of weapons in 80% condition. However, the levels and annual changes of the 80% prices were very highly correlated (0.86 to 0.99) with those of the 100% condition prices. Therefore, we limited the analysis to the 100% prices.

<sup>25</sup> We utilized prices for the base model of each AW and comparison firearm (in contrast to model variations with special features or accessories).

<sup>26</sup> The regression models are based on equal numbers of observations for each gun model. Hence, unweighted regressions would give equal weight to each gun model. This does not seem appropriate, however, because some guns are produced in much larger numbers than are other guns. Weighting the regression models by production estimates should therefore give us a better sense of what one could "typically" expect to pay for a generic gun in each study category (e.g., a generic assault pistol).

<sup>27</sup> Several of the selected weapons began production in 1985 or later. In other cases, available production data extended back to only the mid-1980s. Published production figures for handguns are broken down by type (semiautomatic, revolver) and caliber and thus provide perfect or very good approximations of production for the handgun models examined in this study. Rifle production data, however, are not disaggregated by gun type, caliber, or model. For the ARs under study, the production counts should be reasonable approximations of AR production because most of the rifles made by the companies in question prior to the ban were ARs. The rifles used in the comparison (i.e., non-banned) rifle analysis are made by companies (Sturm Ruger, Remington, and Marlin) that produce numerous semiautomatic and non-semiautomatic rifle models. However, the overall rifle production counts for these companies should provide some indication of differences in the availability of the comparison rifles relative to one another. Because production data were available through only 1997 at the time this particular analysis was conducted (Violence Policy Center, 1999), we used cumulative production through 1997 to weight the 1998 and 1999 observations for the comparison handgun and comparison rifle models. This was not a consideration for AWs since their production ceased in 1994 (note that the AW production figures for 1994 may include some post-ban legal substitute models manufactured after September 13, 1994). Nonetheless, weighting had very little effect on the inferences from either of the comparison gun models.

### 5.1.1. Assault Pistol Prices

The analysis of AP prices focuses on the Intratec TEC-9/DC-9, TEC-22, SWD M-11/9, and Calico M950 models. Regression results are shown in Table 5-1, while Figure 5-1 graphically depicts the annual trend in prices for the period 1990 through 1999. None of the yearly coefficients in Table 5-1 is statistically significant, thus indicating that average annual AP prices did not change during the 1990s after adjusting for inflation. Although the model is based on a modest number of observations ( $n=40$ ) that may limit its statistical power (i.e., its ability to detect real effects), the size of the yearly coefficients confirm that prices changed very little from year to year. The largest yearly coefficient is for 1990, and it indicates that AP prices were only 4% higher in 1990 than in 1994.<sup>28</sup>

This stands in contrast to our earlier finding (Roth and Koper, 1997, Chapter 4) that prices for SWD APs may have risen by as much as 47% around the time of the ban. However, the earlier analyses were based on semi-annual or quarterly analyses advertised by gun distributors and were intended to capture short-term fluctuations in price that assumed greater importance in the context of the first AW study, which could examine only short-term ban outcomes. *Blue Book* editions released close in time to the ban (e.g., 1995) also cautioned that prices for some AWs were volatile at that time. This study emphasizes longer-term price trends, which appear to have been more stable.<sup>29</sup>

<sup>28</sup> To interpret the coefficient of each indicator variable in terms of a percentage change in the dependent variable, we exponentiate the coefficient, subtract 1 from the exponentiated value, and multiply the difference by 100.

<sup>29</sup> Although the earlier analysis of AP prices focused on the greatest variations observed in semi-annual prices, the results also provide indications that longer-term trends were more stable. Prices in 1993, for example, averaged roughly 73% of the peak prices reached at the time the ban was implemented (i.e., late 1994), while prices in early 1994 and late 1995 averaged about 83% and 79% of the peak prices, respectively. Hence, price variation was much more modest after removing the peak periods around the time of the ban's implementation (i.e., late 1994 and early 1995). The wider range of APs used in the current study may also be responsible for some of the differences between the results of this analysis and the prior study.



**Table 5-1. Regression of Assault Pistol and Comparison Handgun Prices on Annual Time Indicators, 1990-1999, Controlling for Gun Model**

	Assault Pistols (n=40)		Comparison Handguns (n=38)	
	Estimate	T Value	Estimate	T Value
Constant	1.56	26.94***	-0.21	-6.81***
1990	0.04	1.07	0.12	2.07**
1991	0.01	0.30	0.09	1.79*
1992	-0.01	-0.32	0.05	1.30
1993	-0.03	-1.09	0.02	0.48
1995	0.01	0.22	-0.02	-0.48
1996	-0.01	-0.45	-0.09	-2.69***
1997	-0.03	-1.13	-0.11	-3.26***
1998	0.00	-0.10	-0.07	-1.99*
1999	-0.02	-0.58	-0.14	-4.02***
Tec-9	-0.67	-11.95***		
Tec-22	-0.89	-15.59***		
SWD	-0.64	-11.49***		
Davis P32			0.09	3.63***
Davis P380			0.20	8.20***
Lorcin L380			0.29	11.35***
F value	27.79		16.24	
(p value)	<.01		<.01	
Adj. R-square	0.89		0.83	

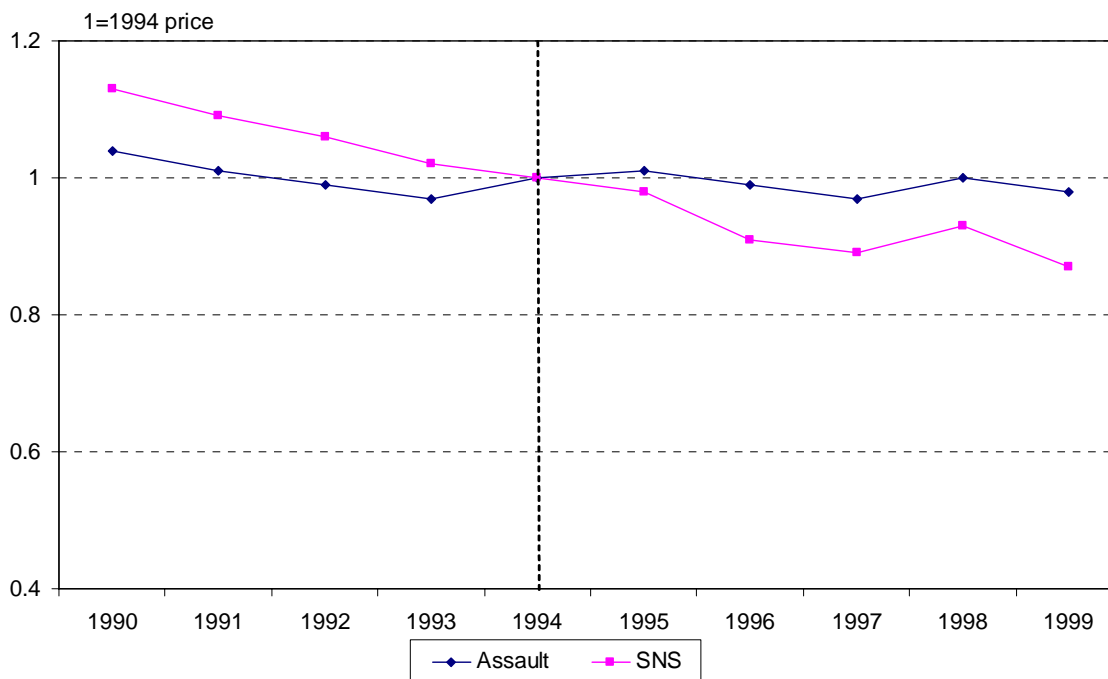
Time indicators are interpreted relative to 1994. Assault pistol model indicators are interpreted relative to Calico 9mm. Comparison handgun models are interpreted relative to Lorcin .25 caliber.

\* Statistically significant at  $p \leq .10$ .

\*\* Statistically significant at  $p \leq .05$ .

\*\*\* Statistically significant at  $p \leq .01$ .

**Figure 5-1. Annual Price Trends for Assault Pistols and SNS Handguns, 1990-1999**



Assault pistol prices based on TEC9, TEC22, SWD M11/9, and Calico M950. SNS prices based on Davis P32 and P380 and Lorcin L25 and L380.

### 5.1.2. Comparison Handgun Prices

For comparison, Table 5-1 and Figure 5-1 illustrate price trends for a number of non-banned, cheaply priced, and readily concealable semiautomatic handgun models: the Davis P32 and P380 and the Lorcin L25 and L380. Such guns are often referred to as Saturday night specials (SNS). By a number of accounts, SNS-type guns, and Davis and Lorcin models in particular, are among the guns most frequently used in crime (ATF, 1995; 1997; Kennedy et al., 1996; Wintemute, 1994). Although the differences between APs and SNS handguns (particularly the fact that most SNS handguns do not have LCMs) suggest they are likely to be used by gun consumers with different levels of firearms experience and sophistication, the SNS guns are arguably a good comparison group for APs because both groups of guns are particularly sensitive to criminal demand. Like AP buyers, SNS buyers are more likely than other gun buyers to have criminal histories and to be charged with new offenses, particularly violent or firearm offenses, subsequent to their purchases (Wintemute et al., 1998b).

Prices of SNS handguns dropped notably throughout the 1990s. Prices for SNS handguns were 13% higher in 1990 than in 1994. Prices then dropped another 13% from 1994 to 1999. This suggests that although AP prices remained generally stable throughout the 1990s, they increased relative to prices of other guns commonly used in crime. We say more about this below.

### 5.1.3. Assault Rifle Prices

To assess trends in prices of ARs, we examined prices for several Colt and Olympic rifle models in the AR-15 class, as well as Calico models M900 and M951 and Feather models AT9 and AT22.<sup>30</sup> Because rifle production data are not disaggregated by weapon type (semiautomatic, bolt action, etc.), caliber, or model, the regressions could only be weighted using overall rifle production counts for each company. For this reason, we calculated the average price of the ARs made by each company for each year and modeled the trends in these average prices over time, weighting by each company's total rifle production.<sup>31</sup>

Results shown in Table 5-2 and Figure 5-2 demonstrate that AR prices rose significantly during 1994 and 1995 before falling back to pre-ban levels in 1996 and remaining there through 1999. Prices rose 16% from 1993 to 1994 and then increased another 13% in 1995 (representing an increase of nearly one third over the 1993 level). Yet by 1996, prices had fallen to levels virtually identical to those before 1994. These patterns are consistent with those we found earlier for the 1992-1996 period (Roth and Koper, 1997, Chapter 4), though the annual price fluctuations shown here were not as dramatic as the quarterly changes shown in the earlier study.

Note, however, that these patterns were not uniform across all of the AR categories. The results of the model were driven largely by the patterns for Colt rifles, which are much more numerous than the other brands. Olympic rifles increased in price throughout the time period, while prices for most Calico and Feather rifles tended to fall throughout the 1990s without necessarily exhibiting spikes around the time of the ban.

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<sup>30</sup> Specifically, we tracked prices for the Match Target Lightweight (R6530), Target Government Model (R6551), Competition H-Bar (R6700), and Match Target H-Bar (R6601) models by Colt and the Ultramatch, Service Match, Multimatch M1-1, AR15, and CAR15 models by Olympic Arms. Each of these models has a modified, post-ban version. We utilized prices for the pre-ban configurations during post-ban years.

<sup>31</sup> Prices for the different models made by a given manufacturer tended to follow comparable trends, thus strengthening the argument for averaging prices.

**Table 5-2. Regression of Assault Rifle and Comparison Semiautomatic Rifle Prices on Annual Time Indicators, 1991-1999, Controlling for Gun Make**

	Assault Rifles (n=36)		Comparison Rifles (n=27)	
	Estimate	T value	Estimate	T value
Constant	1.31	21.15***	1.40	76.75***
1991	-0.12	-1.98*	-0.01	-0.21
1992	-0.13	-2.26**	0.01	0.30
1993	-0.15	-2.78**	0	-0.13
1995	0.12	2.47**	0.03	1.08
1996	-0.11	-2.27**	0.04	1.69
1997	-0.11	-2.23**	0.03	1.46
1998	-0.12	-2.47**	0.02	0.91
1999	-0.14	-2.71**	0.03	1.21
Colt (AR-15 type)	1.07	19.93***		
Olympic (AR-15 type)	1.14	16.08***		
Calico	0.43	5.53***		
Ruger			0.26	20.07***
Remington			0.29	21.69***
F statistic	50.52		63.62	
(p value)	<.01		<.01	
Adj. R-square	0.94		0.96	

Time indicators interpreted relative to 1994. Assault rifle makes interpreted relative to Feather.

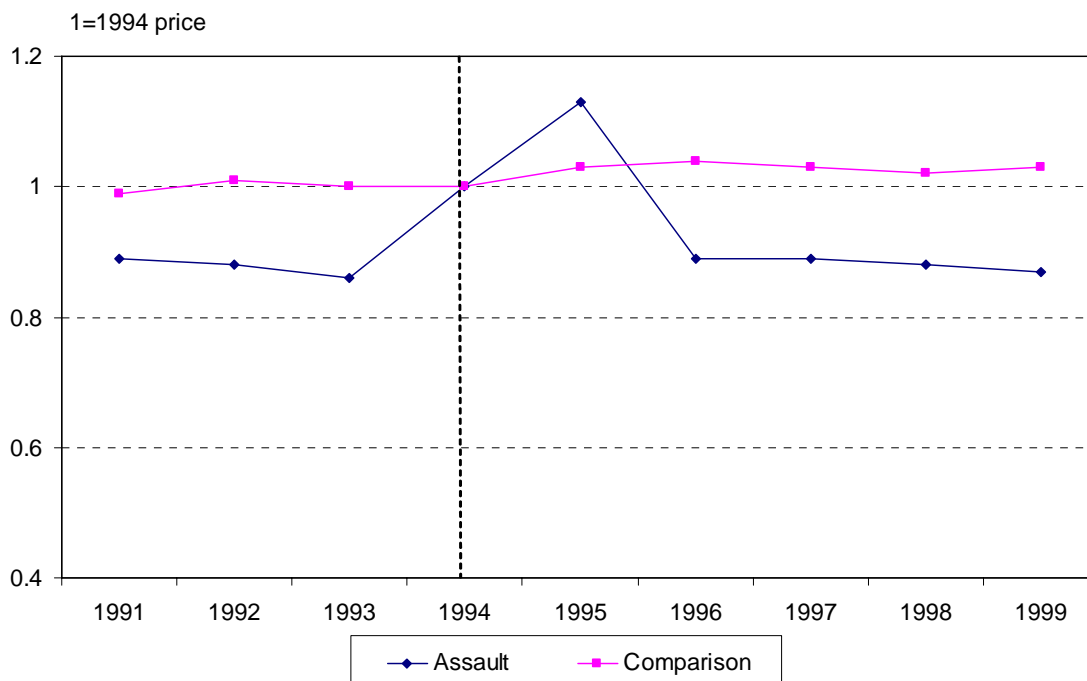
Comparison rifle makes interpreted relative to Marlin.

\* Statistically significant at  $p \leq .10$ .

\*\* Statistically significant at  $p \leq .05$ .

\*\*\* Statistically significant at  $p \leq .01$ .

**Figure 5-2. Annual Price Trends for Assault Rifles and Comparison Semiautomatic Rifles, 1991-1999**



Assault rifle prices based on Colt and Olympic AR-type, Calico, and Feather models. Comparison rifle prices based on selected Remington, Marlin, and Sturm Ruger models.

#### 5.1.4. Comparison Semiautomatic Rifles.

The analysis of comparison rifle prices includes the Remington 7400, Marlin Model 9, and Sturm Ruger Mini-14 and Mini-30 models (the Ruger model prices were averaged for each year). The AW legislation exempted each of these semiautomatic rifles by name, though the exemption does not apply to Mini-14 models with folding stocks (a feature included in the ban's features test). The Ruger models are of particular interest since they are among only four exempted guns that can accept LCMs made for military rifles (U.S. Department of the Treasury, 1998, p. 23), though Ruger produced LCMs only for the Mini-14 model and substituted a 5-round magazine for this gun in 1989 (Fjestad, 2002, pp. 1361-1362). The Marlin model was also manufactured with an LCM prior to 1990 (Fjestad, 2002, p. 917). The Remington model is manufactured with a detachable 4-round magazine.

Prices for these guns remained steady throughout the decade (see Table 5-2 and Figure 5-2). The largest change was a 4% increase (non-significant) in prices in 1996 relative to prices in 1994. Therefore, the rifle price spikes in 1994 and 1995 were specific to assault rifles. However, the steady annual price trends may mask short-term fluctuations that we found

previously (Roth and Koper, 1997, Chapter 4) for some non-banned semiautomatic rifles (including the Ruger Mini-14) during 1994 and early 1995.<sup>32</sup>

## 5.2. Production Trends for Assault Weapons and Other Firearms

To more fully assess the ban's effects on gun markets, examination of pre and post-ban trends in production of AWs and legal AW substitutes is a useful complement to studying price trends. Our earlier work revealed a spike in AW production during 1994 as the ban was being debated. Post-ban production of legal AW substitutes should reveal additional information about the reaction of gun markets to the ban. If production of these models has fallen off dramatically, it may suggest that the market for AWs has been temporarily saturated and/or that consumers of AWs favor the original AW models that have more military-style features. Stable or rising production levels, on the other hand, may indicate substantial consumer demand for AW substitutes, which would suggest that consumers consider the legal substitute models to be as desirable as the banned models.

### 5.2.1. Production of Assault Pistols and Other Handguns

Figure 5-3 presents production trends for a number of domestic AP manufacturers from 1985 through 2001 (the most recent year available for data on individual manufacturers).<sup>33</sup> After rising in the early 1990s and surging notably to a peak in 1994, production by these companies dropped off dramatically, falling 80% from 1993-1994 to 1996-1997 and falling another 35% by 1999-2000 (Table 5-3).<sup>34</sup> Makers of Intratec and SWD-type APs continued manufacturing modified versions of their APs for at least a few years following the ban, but at much lower volumes than that at which they produced APs just prior to the ban. Companies like AA Arms and Calico produced very few or no AP-type pistols from 1995 onward, and Intratec – producers of the APs most frequently used in crime – went out of business after 1999.

However, the pattern of rising and then falling production was not entirely unique to APs. Table 5-3 shows that production of all handguns and production of SNS-type pistols both declined sharply in the mid to late 1990s following a peak in 1993. Nonetheless, the trends –

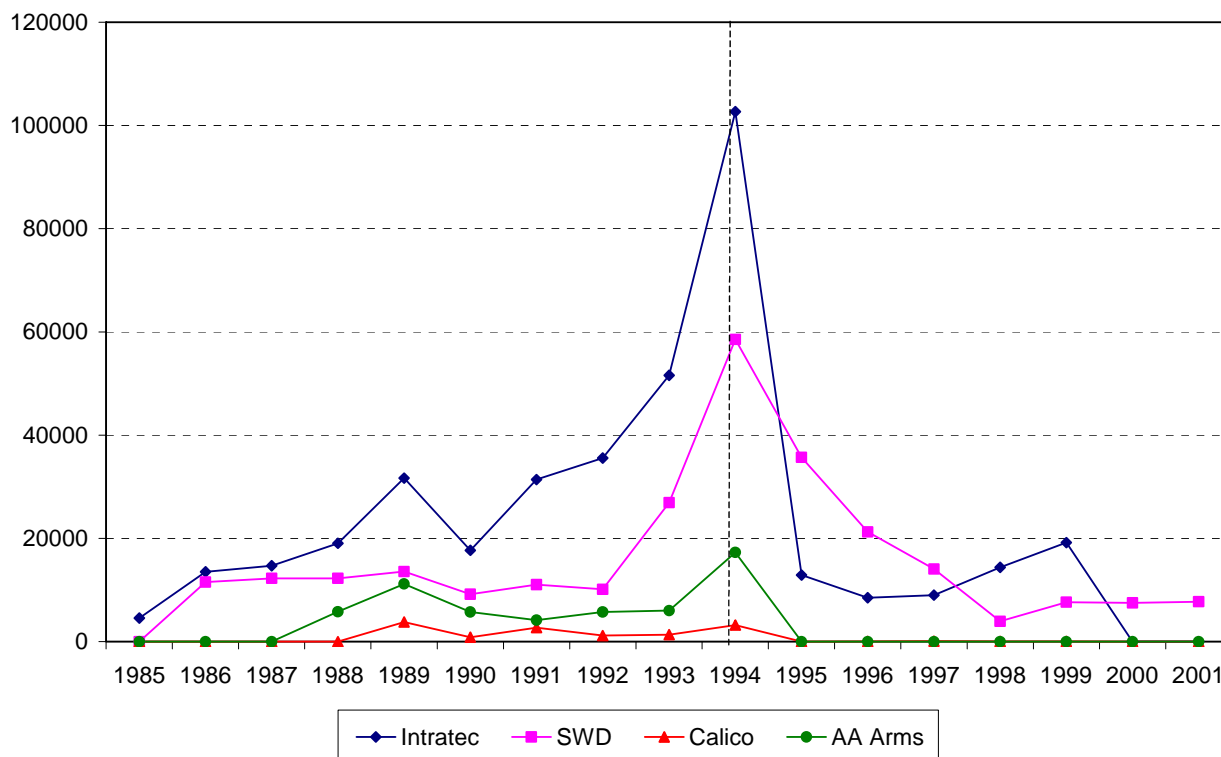
<sup>32</sup> We attributed those short-term fluctuations to pre-ban uncertainty regarding which semiautomatic rifles would be prohibited by the ban. Also note that the prior findings were based on a different set of comparison semiautomatic rifles that included a number of foreign rifles. We concentrated on domestically produced rifles for this updated analysis in order to make more explicit links between rifle price and production trends (data for the latter are available only for domestic firearms).

<sup>33</sup> Production figures for individual manufacturers through 2000 have been compiled by the Violence Policy Center (2002). Year 2001 data are available from ATF via the Internet (see [www.atf.treas.gov](http://www.atf.treas.gov)). National gun production totals through 1998 are also available from ATF (2000, p. A-3).

<sup>34</sup> The assault pistol production figures used here and in the price analysis include 9mm and .22 caliber pistols made by Intratec, 9mm pistols manufactured by AA Arms, all non-.22 caliber pistols manufactured by S.W. Daniels, Wayne Daniels, and Military Armaments Corporation (which together constitute the SWD group), and .22 and 9mm pistols manufactured by Calico. Intratec produces a few non-AW models in .22 and 9mm calibers, so the Intratec figures will overstate production of assault pistols and their legal substitutes to some degree. The comparison, SNS production figures are based on all handguns produced by Lorcin Engineering and Davis Industries.

both peak and decline – were more dramatic for APs than for other handguns. Production of APs rose 69% from 1990-1991 to 1993-1994, while SNS production and overall handgun production each increased 47%. From 1993-1994 to 1996-1997, production of AP-type handguns, SNS models, and all handguns declined 80%, 66%, and 47%, respectively. Further, production of AP-type handguns continued to decline at a faster rate than that of other handguns through the end of the decade.<sup>35</sup>

**Figure 5-3. Assault Pistol Production, 1985-2001**



<sup>35</sup> Lorcin, a prominent SNS brand that we examined for the price and production analyses, went out of business after 1998. Unlike the situation in the AP market (where, to our knowledge, former AP makers have not been replaced on any large scale), the SNS market appears to have compensated somewhat to offset the loss of Lorcin. The SNS change from 1996-1997 to 1999-2000 is based on examination of a larger group of SNS-type makers, including Lorcin, Davis, Bryco, Phoenix Arms, and Hi-Point. Production among this group declined by 22% from 1996-1997 to 1999-2000, a decline greater than that for total handgun production but less than that for AP-type production.

**Table 5-3. Production Trends for Assault Weapons and Other Firearms, 1990-2000\***

<b>Firearm Category</b>	<b>% Change 1990/91 to 1993/94</b>	<b>% Change 1993/94 to 1996/97</b>	<b>% Change 1996/97 to 1999/2000</b>
Total Handguns	47%	-47%	-10%
Assault Pistols (or Post-Ban Models)	69%	-80%	-35%
SNS Handguns	47%	-66%	-22%
Total Rifles	22%	8%	18%
Assault Rifles (or Post-Ban Models)	81%	-51%	156%
Comparison Rifles	15%	13%	-16%

\* Total handgun and rifle figures include all production by U.S. manufacturers. Assault pistols include Intratec group, SWD group, and Calico models. SNS figures are based on Lorcin Engineering and Davis Industries for changes up through 1996-1997. Because Lorcin went out of business after 1998, the SNS change from 1996-1997 to 1999-2000 is based on a larger group of SNS makers including Lorcin, Davis, Bryco, Phoenix Arms, and Hi-Point. Assault rifles include AR-15 type models by Colt and others. Comparison rifles include Sturm Ruger, Remington, and Marlin.

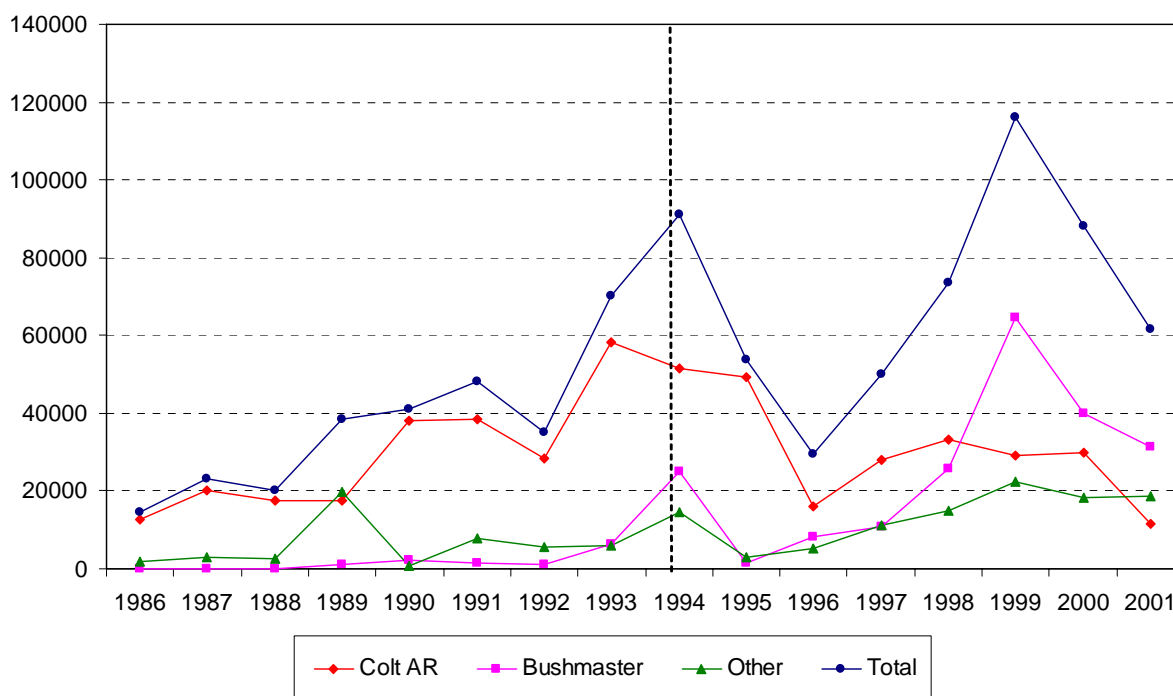
### *5.2.2. Production of Assault Rifles and Other Rifles*

As shown in Figure 5-4, production of AR-15 type rifles surged during the early 1990s, reaching a peak in 1994.<sup>36</sup> AR production during the early 1990s rose almost 4 times faster than total rifle production and over 5 times faster than production of the comparison rifles examined in the price analysis (Table 5-3). Yet, by 1996 and 1997, production of legalized AR-type rifles had fallen by 51%, as production of other rifles continued increasing. AR production trends reversed again during the late 1990s, however, rising over 150%.<sup>37</sup> Total rifle production increased much more modestly during this time (18%), while production of the comparison rifles declined.

<sup>36</sup> Note again that the AR and legalized AR production figures are approximations based on all rifles produced by the companies in question (rifle production data are not available by type, caliber, or model), but it appears that most rifles made by these companies during the study period were AR-type rifles. Also, the figures for the comparison rifle companies (Ruger, Marlin, and Remington) are based on all rifles produced by these companies (the price analysis focused on selected semiautomatic models).

<sup>37</sup> There was also a notable shift in market shares among AR makers, as Bushmaster overtook Colt as the leading producer of AR-15 type rifles (Figure 5-4).



**Figure 5-4. Assault Rifle Production, 1986-2001 (AR-15 Type)**

Other: Olympic, Eagle/Armalite, DPMS, Essential Arms, Sendra.

### 5.3. Summary and Interpretations

Below, we offer some interpretations of the patterns found in the price and production analyses, keeping in mind that these analyses were largely descriptive, so causal inferences must be made cautiously. As documented in our earlier study, Congressional debate over the AW-LCM ban triggered speculative price increases for AWs in the months leading up to the ban's enactment. This study's examination of longer-term, annual price trends suggests that this speculative effect was very brief (and perhaps quite variable across jurisdictions) for APs but persisted through 1995 for ARs. This implies that speculators and sophisticated gun collectors (who we suspect played a large role in driving price trends) have more interest in ARs, which tend to be higher in quality and price than APs.

Responding to the speculative price growth, AW manufacturers boosted their production of AWs in 1994. Although total handgun and rifle production were increasing during the early 1990s, the rise in AW production was steeper, and there was a production peak unique to AWs in 1994 (production of other handguns peaked in 1993). It seems that this boost in the supply of grandfathered AWs was sufficient to satisfy speculative demand, thereby restoring national average AP prices to pre-ban levels within a year of the ban and doing the same for AR prices by 1996. AW prices remained stable through the late 1990s, and production of legalized AW-type weapons dropped off

substantially, at least through 1998. This suggests that the supply of grandfathered AWs was sufficient to meet demand through the late 1990s.

However, prices of APs rose relative to other handguns commonly used in crime during the 1990s. Handgun prices and production declined in general during the late 1990s, implying a decrease in demand for APs and other handguns that probably stemmed from the nation's declining crime rates.<sup>38</sup> But the AW ban's restriction of the AP supply, combined with the interest of speculators and collectors in these guns, may have prevented AP prices from falling as did prices for other handguns. The market patterns also suggest that consumers of APs are not as easily satisfied by legalized APs with fewer military-style features; despite the increasing value of APs (in relative terms), post-ban production of legalized APs declined faster than did production of other handguns, and some AP makers went out of business.

Prices of ARs, on the other hand, remained steady during the late 1990s (after the speculative price bubble of 1994-1995) both in absolute terms and relative to other rifles. The failure of AR prices to rise in at least relative terms, as occurred for APs, and the temporary drop in production of AR-type rifles after the ban may signify that the AR market was saturated relative to the AP market for at least a number of years following the ban. However, demand for AR-type rifles later rebounded, as evidenced by the resurgence in production of legalized, AR-type rifles in the late 1990s. In fact, more of these guns were produced in 1999 than in 1994. Unlike AP users, therefore, rifle users appear to be readily substituting the legalized AR-type rifles for the banned ARs, which may be another factor that has kept prices of the latter rifles from rising. All of this suggests that rifle owners, who have a lower prevalence of criminal users than do handgun owners, can more easily substitute rifles with fewer or no military features for the hunting and other sporting purposes that predominate among rifle consumers.

Another relevant factor may have been a surge in the supply of foreign semiautomatic rifles that can accept LCMs for military weapons (the LCMM rifles discussed in Chapter 2) during the early 1990s. Examples of LCMM rifles include legalized versions of banned AK-47, FN-FAL, and Uzi rifles. Importation of LCMM rifles rose from 19,147 in 1991 to 191,341 in 1993, a nine-fold increase (Department of the Treasury, 1998, p. 34). Due to an embargo on the importation of firearms from China (where many legalized AK-type rifles are produced), imports of LCMM rifles dropped

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<sup>38</sup> It seems likely that the rise and fall of handgun production was linked to the rising crime rates of the late 1980s and early 1990s and the falling crime rates of the mid and late 1990s. Self-defense and fear of crime are important motivations for handgun ownership among the general population (e.g., Cook and Ludwig, 1996; McDowall and Loftin, 1983), and the concealability and price of handguns make them the firearms of choice for criminal offenders. It is likely that the peak in 1993 was also linked to the Congressional debate and passage of the Brady Act, which established a background check system for gun purchases from retail dealers. It is widely recognized in the gun industry that the consideration of new gun control legislation tends to increase gun sales.

The decline in production was more pronounced for SNS handguns, whose sales are likely to be particularly sensitive to crime trends. Criminal offenders make disproportionate use of these guns. We can also speculate that they are prominent among guns purchased by low-income citizens desiring guns for protection. In contrast, the poor quality and reliability of these guns make them less popular among more knowledgeable and affluent gun buyers.

back down to 21,261 in 1994. Importation of all foreign LCMM rifles was ended by federal executive order in 1998.

ATF has reported that criminal use of LCMM rifles increased more quickly during the early 1990s than did that of other military-style rifles (U.S. Department of the Treasury, 1998, p. 33; also see Chapter 6). Accordingly, it is possible that the availability of LCMM rifles also helped to depress the prices of domestic ARs and discourage the production of legalized ARs during the 1990s, particularly if criminal users of rifles place a premium on the ability to accept LCMs. It is noteworthy, moreover, that the rebound in domestic production of legalized ARs came on the heels of the 1998 ban on LCMM rifles, perhaps suggesting the LCMM ban increased demand for domestic rifles accepting LCMs.

In sum, this examination of the AW ban's impact on gun prices and production suggests that there has likely been a sustained reduction in criminal use of APs since the ban but not necessarily ARs. Since most AWs used in crime are APs, this should result in an overall decline in AW use. In the following chapter, we examine the accuracy of this prediction.

## 6. CRIMINAL USE OF ASSAULT WEAPONS AFTER THE BAN

### 6.1. Measuring Criminal Use of Assault Weapons: A Methodological Note

In this chapter, we examine trends in the use of AWs using a number of national and local data sources on guns recovered by law enforcement agencies (we focus on the domestic AW models discussed at the beginning of the previous chapter). Such data provide the best available indicator of changes over time in the types (and especially the specific makes and models) of guns used in violent crime and possessed and/or carried by criminal and otherwise deviant or high-risk persons. The majority of firearms recovered by police are tied to weapon possession and carrying offenses, while the remainder are linked primarily to violent crimes and narcotics offenses (e.g., see ATF, 1976; 1977; 1997; Brill, 1977). In general, up to a quarter of guns confiscated by police are associated with violent offenses or shots fired incidents (calculated from ATF, 1977, pp. 96-98; 1997; Brill, 1977, pp. 24,71; Shaw, 1994, pp. 63, 65; also see data presented later in this chapter). Other confiscated guns may be found by officers, turned in voluntarily by citizens, or seized by officers for temporary safekeeping in situations that have the potential for violence (e.g., domestic disputes).

Because not all recovered guns are linked to violent crime investigations, we present analyses based on all gun recoveries and gun recoveries linked to violent crimes where appropriate (some of the data sources are based exclusively, or nearly so, on guns linked to violent crimes). However, the fact that a seized gun is not clearly linked to a violent crime does not rule out the possibility that it had been or would have been used in a violent crime. Many offenders carry firearms on a regular basis for protection and to be prepared for criminal opportunities (Sheley and Wright, 1993a; Wright and Rossi, 1986). In addition, many confiscated guns are taken from persons involved in drugs, a group involved disproportionately in violence and illegal gun trafficking (National Institute of Justice, 1995; Sheley and Wright, 1993a). In some instances, criminal users, including those fleeing crime scenes, may have even possessed discarded guns found by patrol officers. For all these reasons, guns recovered by police should serve as a good approximation of the types of guns used in violent crime, even though many are not clearly linked to such crimes.

Two additional caveats should be noted with respect to tracking the use of AWs. First, we can only identify AWs based on banned makes and models. The databases do not contain information about the specific features of firearms, thus precluding any assessment of non-banned gun models that were altered after purchase in ways making them illegal. In this respect, our numbers may understate the use of AWs, but we know of no data source with which to evaluate the commonality of such alterations. Second, one cannot always distinguish pre-ban versions of AWs from post-ban, legalized versions of the same weapons based on weapon make and model information (this occurs when the post-ban version of an AW has the same name as the pre-ban version), a factor which may have caused us to overstate the use of AWs after the ban. This was more of a problem for our assessment of ARs, as will be discussed below.

Finally, we generally emphasize trends in the percentage of crime guns that are AWs in order to control for overall trends in gun violence and gun recoveries. Because gun violence was declining throughout the 1990s, we expected the number of AW recoveries to drop independently of the ban's impact.

## **6.2. National Analysis of Guns Reported By Police to the Federal Bureau of Alcohol, Tobacco, and Firearms**

### *6.2.1. An Introduction to Gun Tracing Data*

In this section, we examine national trends in AW use based on firearm trace requests submitted to ATF by federal, state, and local law enforcement personnel throughout the nation. A gun trace is an investigation that typically tracks a gun from its manufacture to its first point of sale by a licensed dealer. Upon request, ATF traces guns seized by law enforcement as a service to federal, state, and local agencies. In order to initiate a trace on a firearm, the requesting law enforcement agency provides information about the firearm, such as make, model, and serial number.

Although ATF tracing data provide the only available national sample of the types of guns used in crime and otherwise possessed or carried by criminal and high-risk groups, they do have limitations for research purposes. Gun tracing is voluntary, and police in most jurisdictions do not submit trace requests for all, or in some cases any, guns they seize. Crime and tracing data for 1994, for example, suggest that law enforcement agencies requested traces for 27% of gun homicides but only 1% of gun robberies and gun assaults known to police during that year (calculated from ATF, 1995 and Federal Bureau of Investigation, 1995, pp. 13, 18, 26, 29, 31, 32).

The processes by which state and local law enforcement agencies decide to submit guns for tracing are largely unknown, and there are undoubtedly important sources of variation between agencies in different states and localities. For example, agencies may be less likely to submit trace requests in states that maintain their own registers of gun dealers' sales. Knowledge of ATF's tracing capabilities and procedures,<sup>39</sup> as well as participation in federal/state/local law enforcement task forces, are some of the other factors that may affect an agency's tracing practices. Further, these factors are likely to vary over time, a point that is reinforced below.

Therefore, firearms submitted to ATF for tracing may not be representative of the

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<sup>39</sup> To illustrate, ATF cannot (or does not) trace military surplus weapons, imported guns without the importer name (generally, pre-1968 guns), stolen guns, or guns without a legible serial number (Zawitz 1995). Tracing guns manufactured before 1968 is also difficult because licensed dealers were not required to keep records of their transactions prior to that time. Throughout much of the 1990s, ATF did not generally trace guns older than 5-10 years without special investigative reasons (Kennedy et al., 1996, p. 171). Our data are based on trace requests rather than successful traces, but knowledge of the preceding operational guidelines might have influenced which guns law enforcement agencies chose to trace in some instances.

types of firearms typically seized by police. In general, not much is known about the nature of potential bias in tracing data. In prior studies, however, AWs tended to be more common in tracing data than in more representative samples of guns confiscated by police (Kleck, 1997, pp. 112, 141). This suggests that police have been more likely historically to initiate traces for seized AWs than for other seized guns. Although comparisons across studies are complicated by varying definitions of AWs used in different analyses, studies of guns confiscated by police or used in particular types of crimes generally suggest that AWs accounted for up to 6% of crime guns and about 2% on average prior to the federal AW ban (see Chapter 3 and Kleck, 1997, p. 141), whereas studies of pre-ban tracing data indicated that 8% of traced guns, and sometimes as many as 11%, were AWs (Cox Newspapers, 1989; Lenett, 1995; Zawitz, 1995).

Changes over time in the tracing practices of law enforcement agencies present additional complexities in analyzing tracing data. Due to improvements in the tracing process, ATF promotional efforts, and special initiatives like the Youth Crime Gun Interdiction Initiative (see ATF, 1997; 1999 and more recent reports available via the Internet at [www.atf.treas.gov](http://www.atf.treas.gov)),<sup>40</sup> the utilization of tracing grew substantially throughout the 1990s in jurisdictions that chose to participate (also see ATF, 2000; Roth and Koper, 1997). To illustrate, trace requests to ATF rose from roughly 42,300 in 1991 to 229,500 in 2002 (see Table 6-1 in the next section), an increase of 443%. This growth reflects changes in tracing practices (i.e., changes in the number of agencies submitting trace requests and/or changes in the percentage of recovered guns for which participating agencies requested traces) rather than changes in gun crime; gun homicides, for example, were falling throughout the 1990s (see Table 6-1 in the next section) and were a third lower in 2002 than in 1991.

Therefore, an increase in trace requests for AWs does not necessarily signal a real increase in the use of AWs. Further, examining trends in the percentage of trace requests associated with AWs is also problematic. Because law enforcement agencies were more likely to request traces for AWs than for other guns in years past, we can expect the growth rate in tracing for non-AWs to exceed the growth rate in traces for AWs as gun tracing becomes more comprehensive. Consequently, AWs are likely to decline over time as a share of trace requests due simply to reporting effects, except perhaps during periods when AWs figure prominently in public discourse on crime.<sup>41</sup>

<sup>40</sup> As part of this initiative, police in a few dozen large cities are submitting trace requests to ATF for all guns that they confiscate. The initiative began with 17 cities in 1996 and has since spread to 55 major urban jurisdictions.

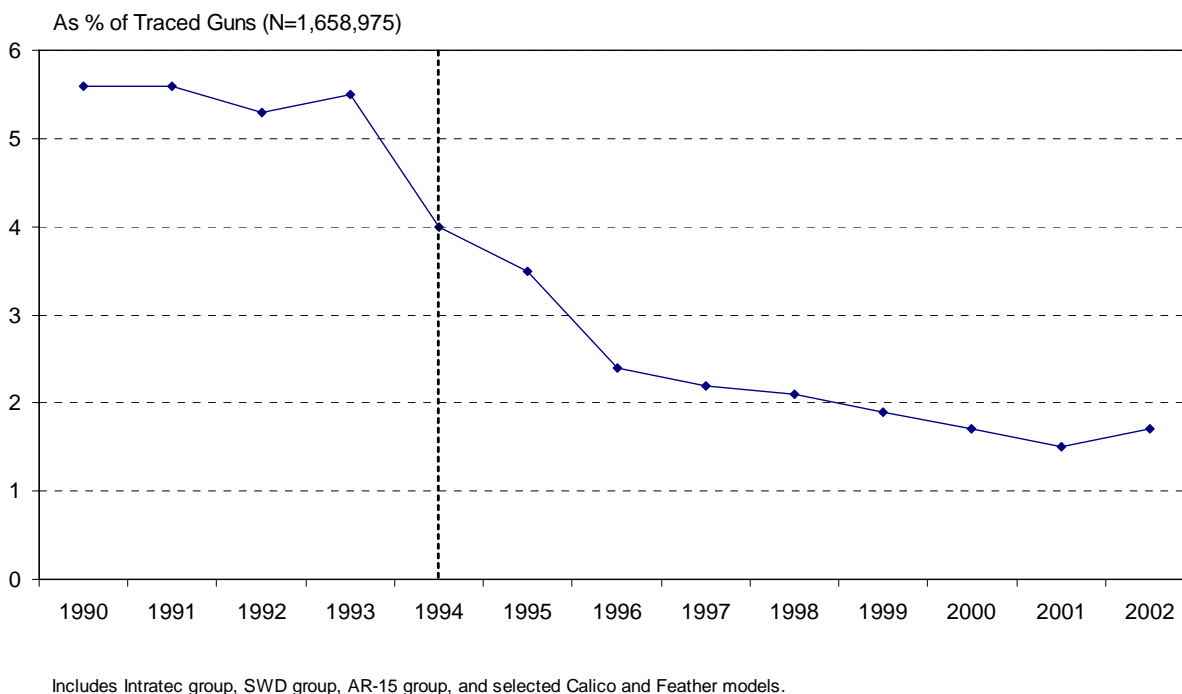
<sup>41</sup> To illustrate, assume that a hypothetical police agency recovers 100 guns a year, 2 of which are AWs, and that the agency has a selective tracing policy that results in the submission of trace requests for 20 of the guns, including 1 of the recovered AWs. Under this scenario, the department would be almost three times as likely to request traces for AWs as for other guns. If the department adopted a policy to request traces on all guns (and again recovered 2 AWs and 98 other guns), AW traces would double and traces of other guns would increase by more than 400%. Moreover, AWs would decline from 5% of traced guns to 2% of traced guns due simply to the change in tracing policy.



### 6.2.2. Traces of Assault Weapons, 1990-2002

Figure 6-1 illustrates the share of all traces that were for AWs from 1990 through 2002. A more detailed assessment of annual changes in traces for AWs and other guns is presented in Table 6-1. Changes in gun murders are also shown in Table 6-1 to emphasize the differences in trends for tracing and gun crime. Below, we summarize key points from the analysis. Due to the instrumentation problems inherent in tracing data, statistical tests are not presented.<sup>42</sup>

**Figure 6-1. Police Recoveries of Assault Weapons Reported to ATF (National), 1990-2002**



<sup>42</sup> Nearly 30% of the tracing records lack specific gun model designations (the crucial elements for conducting a trace are the gun make and serial number). For the makes and types of guns likely to be AWs, however, the missing model rate was slightly under 10%. Further, we were able to identify some of the latter weapons as AWs with reasonable confidence based on the makes, types, and calibers alone. Nevertheless, we conducted a supplemental analysis using only those records for which the gun model was identified. The results of that analysis were substantively very similar to those presented below.



**Table 6-1. Annual Percentage Changes in Gun Murders and Police Requests to ATF for Traces of Assault Weapons and Other Firearms, 1991-2002 (Number of Traces in Parentheses)**

<u>Year</u>	<u>Gun Murders</u> (1)	<u>All Traces</u> (2)	<u>AW Traces*</u> (3)	<u>AP Traces</u> (4)	<u>AR Traces</u> (5)	<u>AW and AW Substitute Traces</u> (6)	<u>Violent Crime Traces</u> (7)	<u>AW Violent Crime Traces</u> (8)	<u>LCMM Rifle Traces**</u> (9)
1991	9%	14% (42281)	14% (2378)	24% (1775)	-6% (603)	14% (2378)	19% (6394)	20% (344)	--
1992	-1%	6% (44992)	1% (2398)	4% (1838)	-7% (560)	1% (2398)	3% (6558)	7% (367)	--
1993	5%	20% (54189)	25% (2994)	20% (2199)	42% (795)	25% (2994)	26% (8248)	41% (516)	252% (183)
1994	-4%	53% (82791)	11% (3337)	23% (2706)	-21% (631)	11% (3337)	22% (10083)	-18% (424)	223% (592)
1995	-10%	-6% (77503)	-19% (2730)	-24% (2051)	8% (679)	-18% (2747)	23% (12439)	-15% (362)	-10% (530)
1996	-9%	66% (128653)	12% (3059)	13% (2309)	10% (750)	17% (3214)	67% (20816)	27% (459)	40% (743)
1997	-7%	42% (183225)	31% (4019)	31% (3017)	34% (1002)	36% (4362)	11% (23147)	13% (519)	24% (925)
1998	-11%	5% (192115)	0% (4014)	-9% (2751)	26% (1263)	7% (4681)	3% (23844)	-22% (404)	33% (1227)
1999	-8%	-2% (188296)	-11% (3581)	-12% (2414)	-8% (1167)	-6% (4406)	3% (24663)	0% (404)	-18% (1003)
2000	1%	-3% (182961)	-11% (3196)	-16% (2027)	0% (1169)	-6% (4143)	-13% (21465)	-25% (305)	-14% (859)
2001	-1%	18% (215282)	1% (3238)	5% (2138)	-6% (1100)	3% (4273)	20% (25822)	6% (322)	-3% (833)
2002	6%	7% (229525)	19% (3839)	4% (2214)	48% (1625)	12% (4765)	20% (30985)	65% (531)	4% (865)

\* Based on Intratec group, SWD group, AR-15 group, and Calico and Feather models.

\*\* Foreign semiautomatic rifles accepting large capacity military magazines (banned by executive order in 1998). (Data are not shown for 1991 and 1992 because very few of these guns were traced in those years.)

### 6.2.2.1. *Assault Weapons as a Percentage of Crime Gun Traces*

As shown in Figure 6-1, AWs declined from 5.4% of crime gun traces in 1992-1993 to 1.6% in 2001-2002, a decline of 70%. Although this downward trend could be attributable in large part to changes in tracing practices, it is noteworthy that it did not begin until 1994 (the year of the ban); during the pre-ban years, 1990 to 1993, AWs accounted for a steady share of traces despite a 46% increase in total tracing volume. It is also remarkable that about 3,200 AWs were traced in both 2000 and 2001, which is virtually identical to the average number traced during 1993 and 1994 (3,166) even though total traces increased more than 190% during the same period (Table 6-1, columns 2 and 3).<sup>43</sup>

### 6.2.2.2. *Annual Changes in Traces for Assault Weapons and Other Guns*

Throughout most of the post-ban period (particularly 1995 to 2001), AW traces either increased less or declined more than total traces (Table 6-1, columns 2 and 3), a pattern that is also consistent with a decline in the use of AWs relative to other guns, though it too may be distorted by changes in tracing practices. This pattern was largely consistent whether analyzing all traces or only traces associated with violent crimes (columns 7 and 8).<sup>44</sup>

The years when total traces declined or were relatively flat are arguably the most informative in the series because they appear to have been less affected by changes in tracing practices. For example, there was a 6% decline in total trace requests from 1994 to 1995 (the years featured in our earlier study) that coincided with a 10% drop in gun murders (Table 6-1, column 1). Therefore, it seems tracing practices were relatively stable (or, conversely, reporting effects were relatively small) from 1994 to 1995. The 19% reduction in AW traces during this same period implies that AW use was declining faster than that of other guns. Furthermore, there were fewer AW traces in 1995 than in 1993, the year prior to the ban. The fact that this occurred during a period when the AW issue was very prominent (and hence police might have been expected to trace more of the AWs they recovered) arguably strengthens the causal inference of a ban effect.<sup>45</sup>

Total traces also declined slightly (2%-3%) in 1999 and 2000. In each of those years, the decline was greater for AWs (11%). Thus, in years when tracing declined overall, AW traces fell 3 to 6 times faster than did total traces. Put another way, AWs fell between 9% and 13% as a percentage of all traces in each of these years.

The general pattern of AW traces increasing less or declining more than those of

<sup>43</sup> These general findings are consistent with those of other tracing analyses conducted by ATF (2003 Congressional Q&A memo provided to the author) and the Brady Center to Prevent Gun Violence (2004).

<sup>44</sup> A caveat is that requests without specific crime type information are often grouped with weapons offenses (ATF, 1999). Therefore, traces associated with violent crimes are likely understated to some degree.

<sup>45</sup> This inference is also supported by our earlier finding that trace requests for AWs declined by only 8% in states that had their own AW bans prior to the federal ban (Roth and Koper, 1997, Chapter 5).

other crime guns was clearly apparent for APs but less consistent for ARs (Table 6-1, columns 4 and 5). For example, AR traces went up 26% in 1998 while total traces went up only 5% and AP traces declined 9%. In 2000, total and AP traces fell 3% and 16%, respectively, but AR traces remained flat. This is consistent with predictions derived from the price and production analyses described above. But note that the post-ban AR counts could be overstated because the data do not distinguish pre-ban from post-ban versions of some popular AR-15 type rifles like the Colt Sporter and Bushmaster XM-15. (Also note that the percentage of traces for ARs did fall from 1.4% in 1992-1993 to 0.6% in 2001-2002.)

More generally, the use of post-ban AW-type weapons (including both legalized APs and ARs) has not been widespread enough to completely offset the apparent decline in the use of banned AWs. Combined traces for banned AWs and AW substitutes (Table 6-1, column 6) also followed the pattern of increasing less or declining more than did total traces throughout most of the period, though the differences were not as pronounced as those between AWs and total traces. In 1999 and 2000, for example, AWs traces dropped 11%, while combined traces for AWs and legal substitutes declined only 6%. Still, the latter figure was greater than the 2%-3% drop for total traces.

Finally, traces of the LCMM rifles banned by executive order in 1998 were generally rising to that point, reaching levels as high as those for AR-15 type rifles (Table 6-1, column 9). Since 1998, however, the number of traces for LCMM rifles has fallen substantially. Despite a 4% increase from 2001 to 2002, the number of LCMM traces in 2002 (865) was 30% lower than the peak number traced in 1998 (1,227). Tentatively, this suggests that the 1998 extension of the ban has been effective in curtailing weapons that offenders may have been substituting for the ARs banned in 1994.

#### 6.2.2.3. *Did Use of Assault Weapons Rebound in 2002?*

In 2002, tracing volume increased 7%, which closely matched the 6% increase in gun murders for that year. In contrast to the general pattern, AW traces increased by 19%, suggesting a possible rebound in AW use independent of changes in tracing practices, a development that we have predicted elsewhere (Roth and Koper, 1997) based on the boom in AW production leading up to the ban. The disproportionate growth in AW traces was due to ARs, however, so it could partially reflect increasing use of post-ban AR-type rifles (see the discussion above).

Moreover, this pattern could be illusory. With data from the most recent years, it was possible to run a supplementary analysis screening out traces of older weapons (not shown). Focusing on just those guns recovered and traced in the same year for 2000 through 2002 revealed that recoveries of AWs declined in 2001, more so for ARs (16%) than for APs (9%), while total traces increased 1%.<sup>46</sup> Traces for APs and ARs then

<sup>46</sup> The tracing database indicates when guns were recovered and when they were traced. However, the recovery dates were missing for 30% of the records overall and were particularly problematic for years prior to 1998. For this reason, the main analysis is based on request dates. The auxiliary analysis for 2000-

increased in 2002 (1% and 6%, respectively) but by less than total traces (8%). Therefore, the disproportionate growth in AR traces in 2002 shown in Table 6-1 may have been due to tracing of older AWs by newly participating police agencies.

#### 6.2.2.4. *Summary of the ATF Gun Tracing Analysis*

Complexities arising from recent changes in the use of gun tracing by law enforcement warrant caution in the interpretation of ATF gun tracing data. Notwithstanding, the data suggest that use of AWs in crime, though relatively rare from the start, has been declining. The percentage of gun traces that were for AWs plummeted 70% between 1992-1993 and 2001-2002 (from 5.4% to 1.6%), and this trend did not begin until the year of the AW ban. On a year-to-year basis, AW traces generally increased less or declined by more than other gun traces. Moreover, in years when tracing volume declined – that is, years when changes in reporting practices were least likely to distort the data – traces of AWs fell 3 to 6 times faster than gun traces in general. The drop in AW use seemed most apparent for APs and LCMM rifles (banned in 1998). Inferences were less clear for domestic ARs, but assessment of those guns is complicated by the possible substitution of post-ban legal variations.

### 6.3. Local Analyses of Guns Recovered By Police

Due to concerns over the validity of national ATF tracing data for investigating the types of guns used in crime, we sought to confirm the preceding findings using local data on guns recovered by police. To this end, we examined data from half a dozen localities and time periods.

- All guns recovered by the Baltimore Police Department from 1992 to 2000 (N=33,933)
- All guns recovered by the Metro-Dade Police Department (Miami and Dade County, Florida) from 1990 to 2000 (N=39,456)
- All guns recovered by the St. Louis Police Department from 1992 to 2003 (N=34,143)
- All guns recovered by the Boston Police Department (as approximated by trace requests submitted by the Department to ATF) from 1991 to 1993 and 2000 to 2002 (N=4,617)<sup>47</sup>

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2002 focuses on guns both recovered and traced in the same year because it is likely that some guns recovered in 2002 had not yet been traced by the spring of 2003 when this database was created. Using only guns recovered and traced in the same year should mitigate this bias.

<sup>47</sup> The Boston Police Department has been tracing guns comprehensively since 1991 (Kennedy et al., 1996). However, we encountered difficulties in identifying Boston Police Department traces for several years in the mid-1990s. For this reason, we chose to contrast the 1991 to 1993 period with the 2000 to 2002 period.

- Guns recovered during murder investigations in Milwaukee County from 1991 to 1998 (N=592)<sup>48</sup>
- Guns linked to serious crimes in Anchorage and other parts of Alaska and submitted to state firearm examiners for evidentiary testing from 1987 to 2000 (N=900)<sup>49</sup>

The selection of these particular locations and samples reflects data availability.<sup>50</sup> The locations were not selected randomly, and some of the samples are small for conducting trend analysis of relatively rare events (i.e., AW recoveries). Accordingly, we must use caution in generalizing the results to other places. However, the data sources reflect a wide geographic range and cover post-ban periods extending through at least the latter 1990s (and typically through the year 2000 or beyond). To the extent that the results are similar across these jurisdictions, therefore, we can have more confidence that they reflect national patterns.

In each jurisdiction, we examined pre-post changes in recoveries of AWs (focusing on the domestic AW group defined earlier) and substitution of post-ban AW models for the banned models. Where possible, we conducted separate analyses of all AW recoveries and those linked specifically to violent crimes.<sup>51</sup> We also differentiated between AP and AR trends using the larger databases from Baltimore, Miami, and St. Louis. But since most of these databases do not extend more than two years beyond 1998, we do not present analyses specifically for LCMM rifles.

Key summary results are summarized in Table 6-2, while more detailed results from each site appear at the end of the chapter in Tables 6-3 through 6-6 and Figures 6-2 through 6-6.<sup>52</sup> The number of AW recoveries declined by 28% to 82% across these

<sup>48</sup> The data are described in reports from the Medical College of Wisconsin (Hargarten et al., 1996; 2000) and include guns used in the murders and other guns recovered at the crime scenes. Guns are recovered in approximately one-third of Milwaukee homicide cases.

<sup>49</sup> The data include guns submitted by federal, state, and local agencies throughout the state. Roughly half come from the Anchorage area. Guns submitted by police to the state lab are most typically guns that were used in major crimes against persons (e.g. murder, attempted murder, assault, robbery).

<sup>50</sup> We contacted at least 20 police departments and crime labs in the course of our data search, focusing much of our attention on police departments participating in ATF's Youth Crime Gun Interdiction Initiative (YCGII) (ATF, 1997; 1999). Departments participating in the YCGII submit data to ATF on all guns that they recover. Though the YCGII did not begin until 1996 (well after the implementation of the AW ban), we suspected that these departments would be among those most likely to have electronically-stored gun data potentially extending back in time to before the ban. Unfortunately, most of these departments either did not have their gun data in electronic format or could not provide data for other reasons (e.g., resource constraints). In the course of our first AW study (Roth and Koper, 1997), we contacted many other police departments that also did not have adequate data for the study.

<sup>51</sup> All of the Milwaukee and Anchorage analyses were limited to guns involved in murders or other serious crimes. Despite evidence of a decline, AW recoveries linked to violence were too rare in Boston to conduct valid test statistics.

<sup>52</sup> We omitted guns recovered in 1994 from both the pre and post-ban counts because the speculative price increases for AWs that occurred in 1994 (see previous section and Roth and Koper, 1997, Chapter 4) raise questions about the precise timing of the ban's impact on AW use during that year, thereby clouding the designation of the intervention point. This is particularly a concern for the Baltimore analysis due to a



locations and time periods, but the discussion below focuses on changes in AWs as a share of crime guns in order to control for general trends in gun crime and gun seizures. Prior to the ban, AWs ranged from about 1% of guns linked to violent crimes in St. Louis to nearly 6% of guns recovered in Milwaukee murder cases.<sup>53</sup>

AWs dropped as share of crime guns in all jurisdictions after the ban. Reductions ranged from a low of 17% in Milwaukee (based on guns linked to homicides) to a high of 72% in Boston (based on all crime guns) but were generally between 32% and 40%.<sup>54, 55</sup> A decline in the use of AWs relative to other guns was generally apparent whether examining all AW recoveries or just those linked to violent crimes.<sup>56</sup> An exception was in St. Louis, where

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state AP ban that took effect a few months prior to the federal AW ban.

<sup>53</sup> These figures should be treated as approximations of the prevalence of AWs. On the one hand, the numbers may understate the prevalence of AWs to a small degree because they are based on only the domestic AW group defined earlier. Based on analysis of national ATF gun tracing data, we estimated previously that the domestic AW group accounts for 82% of AWs used in crime (Roth and Koper, 1997, Chapter 5). To further test the reliability of this assessment, we investigated the prevalence of all banned AW models among guns recovered in Baltimore using an ATF list of all guns defined as AWs under the 1994 Crime Act criteria (118 model and caliber combinations). We chose the Baltimore database because it provides a complete inventory of guns recovered by police in that city during the study period and, having been maintained by crime lab personnel, is particularly thorough with regard to make and model identifications. Though there was some ambiguity in classifying a small number of AK-type semiautomatic rifles (there are many civilian variations of the AK-47 rifle, some of which were legal under the 1994 legislation), our examination suggested that the domestic AW group accounted for approximately 90% of the AWs recovered in Baltimore. (In addition, including all AWs had virtually no effect on the pre-post changes in AW use in Baltimore.) But as discussed previously, the counts could also overstate AW use to some degree because imprecision in the identification of gun models in some data sources may have resulted in some legalized firearms being counted as banned AWs.

<sup>54</sup> The AW counts for Miami also include Interdynamics KG9 and KG99 models. These models were produced during the early 1980s and were forerunners to the Intratec models (ATF restricted the KG9 during the early 1980s because it could be converted too easily to fully automatic fire). These weapons were very rare or non-existent in most of the local data sources, but they were more common in Miami, where Interdynamics was formerly based. Including these guns increased the AW count in Miami by about 9% but did not affect pre-post changes in AW recoveries.

<sup>55</sup> State AW legislation passed in Maryland and Massachusetts could have had some impact on AW trends in Baltimore and Boston, respectively. Maryland implemented an AP ban, similar in coverage to the federal AW ban, in June 1994 (Maryland has also required background checks for retail sales of a broader list of state-defined AWs since 1989), and Massachusetts implemented additional legislation on federally-defined AWs in late 1998. The timing and scope of these laws make them largely redundant with the federal ban, so they should not unduly complicate inferences from the analysis. However, Maryland forbids additional transfers of grandfathered APs, and Massachusetts has imposed additional requirements for possession and transfer of LCMs and guns accepting LCMs. Both states also have enhanced penalties for certain crimes involving APs, LCMs, and/or guns accepting LCMs. Hence, the ban on AWs was arguably strengthened in Baltimore and Boston, relative to the other jurisdictions under study. This does not appear to have affected trends in AW use in Baltimore, which were very similar to those found in the other study sites. However, use of AWs and combined use of AWs and post-ban AW substitutes declined more in Boston than in any other study site. Although the trends in Boston could reflect ongoing, post-2000 reductions in use of AWs and similar weapons (Boston was one of the only study sites from which we obtained post-2000 data), it is possible that the Massachusetts legislation was also a contributing factor.

<sup>56</sup> There may be some inconsistency across jurisdictions in the identification of guns associated with violent crimes. In Miami, for example, 28% of the guns had an offense code equal to "other/not listed," and this percentage was notably higher for the later years of the data series.

**Table 6-2. Pre-Post Changes in Assault Weapons As a Share of Recovered Crime Guns For Selected Localities and Time Periods: Summary Results (Total Number of Assault Weapons for Pre and Post Periods in Parentheses) <sup>a</sup>**

Locality and Time Period	AWs	AWs (Linked to Violence)	APs	ARs	AWs and Post-Ban Substitutes
Baltimore (all recoveries) pre=1992-1993, post=1995-2000	-34%*** (425)	-41%** (75)	-35%*** (383)	-24% (42)	-29%*** (444)
Miami-Dade (all recoveries) pre=1990-1993, post=1995-2000	-32%*** (733)	-39%*** (101)	-40%*** (611)	37%* (115)	-30%*** (746)
St. Louis (all recoveries) pre=1992-1993, post=1995-2003	-32%*** (306)	1% (28)	-34%*** (274)	10% (32)	-24%** (328)
Boston (all recoveries) pre=1991-1993, post=2000-2002	-72%*** (71)	N/A	N/A	N/A	-60%*** (76)
Milwaukee (recoveries in murder cases) pre=1991-1993, post=1995-1998	N/A	-17% (28)	N/A	N/A	2% (31)
Anchorage, AK (recoveries in serious crimes) pre=1987-1993, post=1995-2000	N/A	-40% (24)	N/A	N/A	-40% (24)

a. Based on Intratec group, SWD group, AR-15 group, and Calico and Feather models. See the text for additional details about each sample and Tables 6-3 through 6-6 for more detailed results from each locality.

\* Statistically significant change at chi-square p level < .1

\*\* Statistically significant change at chi-square p level < .05

\*\*\* Statistically significant change at chi-square p level < .01



AWs declined as share of all guns but not of guns linked to violent crimes, though the latter test was based on rather small samples.

These reductions were not due to any obvious pre-ban trends (see Figures 6-2 through 6-6 at the end of the chapter). On the contrary, AW recoveries reached a peak in most of these jurisdictions during 1993 or 1994 (Boston, which is not shown in the graphs due to missing years, was an exception). We tested changes in AW prevalence using simple chi-square tests since there were no observable pre-existing time trends in the data. Due to the small number of AWs in some of these samples, these changes were not all statistically significant. Nonetheless, the uniformity of the results is highly suggestive, especially when one considers the consistency of these results with those found in the national ATF tracing analysis.

The changes in Tables 6-2 through 6-6 reflect the average decline in recoveries of AWs during the post-ban period in each locality. However, some of these figures may understate reductions to date. In several of the localities, the prevalence of AWs among crime guns was at, or close to, its lowest mark during the most recent year analyzed (see Figures 6-2 through 6-6 at the end of the chapter), suggesting that AW use continues to decline. In Miami, for example, AWs accounted for 1.7% of crime guns for the whole 1995 to 2000 period but had fallen to 1% by 2000. Further, the largest AW decline was recorded in Boston, one of two cities for which data extended beyond the year 2000 (however, this was not the case in St. Louis, the other locality with post-2000 data).

Breakouts of APs and ARs in Baltimore, Miami, and St. Louis show that the decline in AW recoveries was due largely to APs, which accounted for the majority of AWs in these and almost all of the other localities (the exception was Anchorage, where crimes with rifles were more common, as a share of gun crimes, than in the other sites). Pre-post changes in recoveries of the domestic AR group weapons, which accounted for less than 1% of crime guns in Baltimore, Miami, and St. Louis, were inconsistent. AR recoveries declined after the ban in Baltimore but increased in St. Louis and Miami. As discussed previously, however, the AR figures may partly reflect the substitution of post-ban, legalized versions of these rifles, thus overstating post-ban use of the banned configurations. Further, trends for these particular rifles may not be indicative of those for the full range of banned rifles, including the various foreign rifles banned by the 1994 law and the import restrictions of 1989 and 1998 (e.g., see the ATF gun tracing analysis of LCMM rifles).<sup>57</sup>

<sup>57</sup> As discussed in the last chapter, our research design focused on common AWs that were likely to be most affected by the 1994 ban as opposed to earlier regulations (namely, the 1989 import ban) or other events (e.g., company closings or model discontinuations prior to 1994). However, an auxiliary analysis with the Baltimore data revealed a statistically meaningful drop in recoveries of all ARs covered by the 1994 legislation (not including the LCMM rifles) that was larger than that found for just the domestic group ARs discussed in the text. Similarly, an expanded AR analysis in Miami showed that total AR recoveries declined after the ban, in contrast to the increase found for the domestic group ARs. (Even after expanding the analysis, ARs still accounted for no more than 0.64% of crime guns before the ban in both locations. As with the domestic AR group, there are complexities in identifying banned versus non-banned versions of some of the other ARs, so these numbers are approximations.) Consequently, a more nuanced view of AR trends may be that AR use is declining overall, but this decline may be due largely to the 1989 import

Finally, the overall decline in AW use was only partially offset by substitution of the post-ban legalized models. Even if the post-ban models are counted as AWs, the share of crime guns that were AWs still fell 24% to 60% across most jurisdictions. The exception was Milwaukee where recoveries of a few post-ban models negated the drop in banned models in a small sample of guns recovered during murder investigations.<sup>58</sup>

#### 6.4. Summary

Consistent with predictions derived from the analysis of market indicators in Chapter 5, analyses of national ATF gun tracing data and local databases on guns recovered by police in several localities have been largely consistent in showing that criminal use of AWs, while accounting for no more than 6% of gun crimes even before the ban, declined after 1994, independently of trends in gun crime. In various places and times from the late 1990s through 2003, AWs typically fell by one-third or more as a share of guns used in crime.<sup>59, 60</sup> Some of the most recent, post-2000 data suggest

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restrictions that predated the AW ban. It is not yet clear that there has been a decline in the most common ARs prohibited exclusively by the 1994 ban.

<sup>58</sup> This was not true when focusing on just those guns that were used in the incident as opposed to all guns recovered during the investigations. However, the samples of AWs identified as murder weapons were too small for valid statistical tests of pre-post changes.

<sup>59</sup> These findings are also supported by prior research in which we found that reported thefts of AWs declined 7% in absolute terms and 14% as a fraction of stolen guns in the early period following the ban (i.e., late 1994 through early 1996) (Koper and Roth, 2002a, p. 21). We conducted that analysis to account for the possibility that an increase in thefts of AWs might have offset the effect of rising AW prices on the availability of AWs to criminals. Because crimes with AWs appear to have declined after the ban, the theft analysis is not as central to the arguments in this paper.

<sup>60</sup> National surveys of state prisoners conducted by the federal Bureau of Justice Statistics show an increase from 1991 to 1997 in the percentage of prisoners who reported having used an AW (Beck et al., 1993; Harlow, 2001). The 1991 survey (discussed in Chapter 3) found that 2% of violent gun offenders had carried or used an AW in the offense for which they were sentenced (calculated from Beck et al. 1993, pp. 18,33). The comparable figure from the 1997 survey was nearly 7% (Harlow, 2001, pp.3, 7).

Although these figures appear contrary to the patterns shown by gun recovery data, there are ambiguities in the survey findings that warrant caution in such an interpretation. First, the definition of an AW (and most likely the respondents' interpretation of this term) was broader in the 1997 survey. For the 1991 survey, respondents were asked about prior ownership and use of a "...military-type weapon, such as an Uzi, AK-47, AR-15, or M-16" (Beck et al., 1993, p. 18), all of which are ARs or have AR variations. The 1997 survey project defined AWs to "...include the Uzi, TEC-9, and the MAC-10 for handguns, the AR-15 and AK-47 for rifles, and the 'Street Sweeper' for shotguns" (Harlow, 2001, p. 2). (Survey codebooks available from the Inter-University Consortium for Political and Social Research also show that the 1997 survey provided more detail and elaboration about AWs and their features than did the 1991 survey, including separate definitions of APs, ARs, and assault shotguns.)

A second consideration is that many of the respondents in the 1997 survey were probably reporting criminal activity prior to or just around the time of the ban. Violent offenders participating in the survey, for example, had been incarcerated nearly six years on average at the time they were interviewed (Bureau of Justice Statistics, 2000, p. 55). Consequently, the increase in reported AW use may reflect an upward trend in the use of AWs from the 1980s through the early to mid 1990s, as well as a growing recognition of these weapons (and a greater tendency to report owning or using them) stemming from publicity about the AW issue during the early 1990s.

Finally, we might view the 1997 estimate skeptically because it is somewhat higher than that from most other sources. Nevertheless, it is within the range of estimates discussed earlier and could reflect a

reductions as high as 70%.<sup>61</sup> This trend has been driven primarily by a decline in the use of APs, which account for a majority of AWs used in crime. AR trends have been more varied and complicated by the substitution of post-ban guns that are very similar to some banned ARs. More generally, however, the substitution of post-ban AW-type models with fewer military features has only partially offset the decline in banned AWs.

These findings raise questions as to the whereabouts of surplus AWs, particularly APs, produced just prior to the ban. Presumably, many are in the hands of collectors and speculators holding them for their novelty and value.<sup>62</sup> Even criminal possessors may be more sensitive to the value of their AWs and less likely to use them for risk of losing them to police.

Finally, it is worth noting the ban has not completely eliminated the use of AWs, and, despite large relative reductions, the share of gun crimes involving AWs is similar to that before the ban. Based on year 2000 or more recent data, the most common AWs continue to be used in up to 1.7% of gun crimes.

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somewhat higher use of AWs among the subset of offenders who are most active and/or dangerous; recall that the highest estimate of AW use among the sources examined in this chapter came from a sample of guns recovered during murder investigations in Milwaukee (also see the discussion of offender surveys and AWs in Chapter 3).

<sup>61</sup> Developing a national estimate of the number of AW crimes prevented by the ban is complicated by the range of estimates of AW use and changes therein derived from different data sources. Tentatively, nonetheless, it appears the ban prevents a few thousand crimes with AWs annually. For example, using 2% as the best estimate of the share of gun crimes involving AWs prior to the ban (see Chapter 3) and 40% as a reasonable estimate of the post-ban drop in this figure implies that almost 2,900 murders, robberies, and assaults with AWs were prevented in 2002 (this assumes that 1.2% of the roughly 358,000 gun murders, gun robberies, and gun assaults reported to police in 2002 [see the *Uniform Crime Reports*] involved AWs but that 2% would have involved AWs had the ban not been in effect). Even if this estimate is accurate, however, it does not mean the ban prevented 2,900 gun crimes in 2002; indeed, the preceding calculation assumes that offenders prevented from using AWs committed their crimes using other guns. Whether forcing such weapon substitution can reduce the number of persons wounded or killed in gun crimes is considered in more detail in Chapter 9.

<sup>62</sup> The 1997 national survey of state prisoners discussed in footnote 60 found that nearly 49% of AW offenders obtained their gun from a “street” or illegal source, in contrast to 36% to 42% for other gun users (Harlow, 2001, p. 9). This could be another sign that AWs have become harder to acquire since the ban, but the data cannot be used to make an assessment over time.

**Table 6-3. Trends in Police Recoveries of Domestic Assault Weapons in Baltimore, 1992-2000 <sup>a</sup>**

	<u><b>Pre-Ban Period</b></u>	<u><b>Post-Ban Period</b></u>	<u><b>Change</b></u>
<u><b>A. All Recoveries</b></u>	Jan. 1992-Dec. 1993	Jan. 1995-Dec. 2000	
Total AWs	135	290	
Annual Mean	67.5	48.33	-28%
AW's as % of Guns	1.88%	1.25%	-34% **
APs	123	260	
Annual Mean	61.5	43.33	-30%
APs as % of Guns	1.71%	1.12%	-35% **
ARs	12	30	
Annual Mean	6	5	-17%
ARs as % of Guns	0.17%	0.13%	-24%
Total AWs and Substitutes	135	309	
Annual Mean	67.5	51.5	-24%
AWs/Subs as % of Guns	1.88%	1.33%	-29% **
<u><b>B. Recoveries Linked to Violent Crimes <sup>b</sup></b></u>			
Total AWs	28	47	
Annual Mean	14	7.83	-44%
AWs as % of Violent Crime Guns	2.1%	1.24%	-41% *

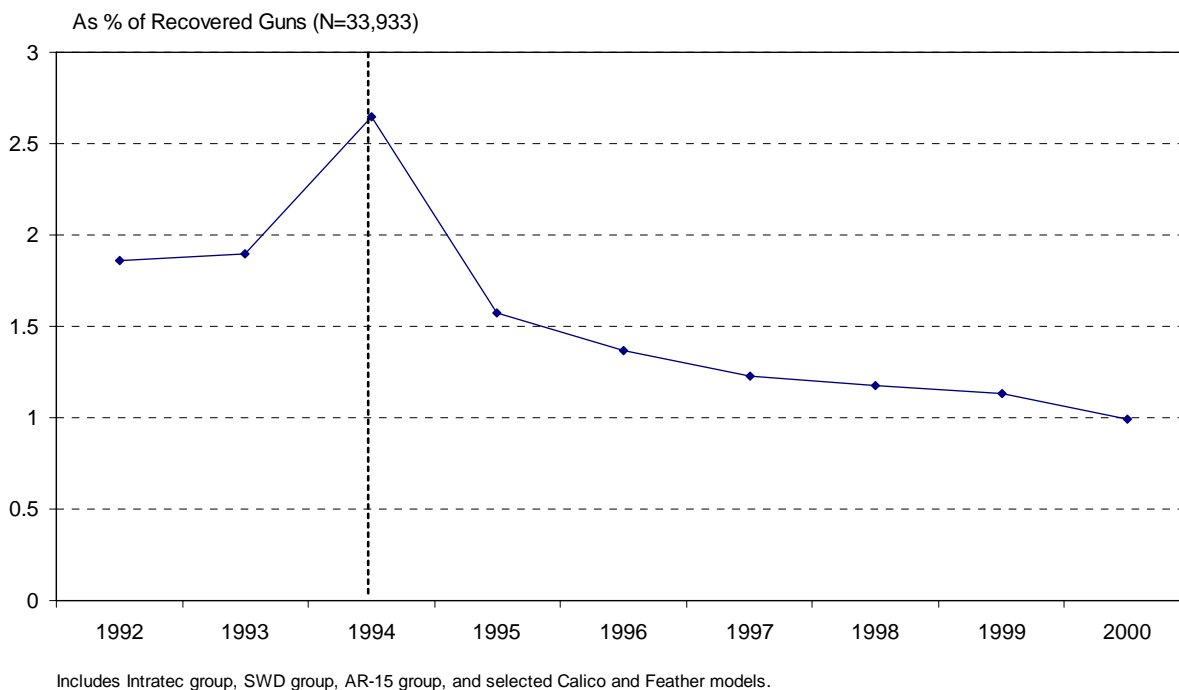
a. Domestic assault weapons include Intratec group, SWD group, AR-15 group, and Calico and Feather models.

b. Murders, assaults, and robberies

\* Chi-square p level < .05 (changes in percentages of guns that were AWs/APs/ARs/AW-subs were tested for statistical significance).

\*\* Chi-square p level < .01 (changes in percentages of guns that were AWs/APs/ARs/AW-subs were tested for statistical significance).

**Figure 6-2. Police Recoveries of Assault Weapons in Baltimore, 1992-2000**



**Table 6-4. Trends in Police Recoveries of Domestic Assault Weapons in Miami (Metro-Dade), 1990-2000 <sup>a</sup>**

	<u>Pre-Ban Period</u>	<u>Post-Ban Period</u>	<u>Change</u>
<b><u>A. All Recoveries</u></b>	Jan. 1990-Dec. 1993	Jan. 1995-Dec. 2000	
Total AWs	403	330	
Annual Mean	100.75	55	-45%
AW's as % of Guns	2.53%	1.71%	-32%***
APs	355	256	
Annual Mean	88.75	42.67	-52%
APs as % of Guns	2.23%	1.33%	-40%***
ARs	43	72	
Annual Mean	10.75	12	12%
ARs as % of Guns	0.27%	0.37%	37%*
Total AWs and Substitutes	403	343	
Annual Mean	100.75	57.17	-43%
AWs/Subs as % of Guns	2.53%	1.78%	-30%***
<b><u>B. Recoveries Linked to Violent Crimes <sup>b</sup></u></b>			
Total AWs	69	32	
Annual Mean	17.25	5.33	-69%
AWs as % of Violent Crime Guns	2.28%	1.39%	-39%**

a. Domestic assault weapons include Intratec group, SWD group, AR-15 group, and Calico and Feather models.

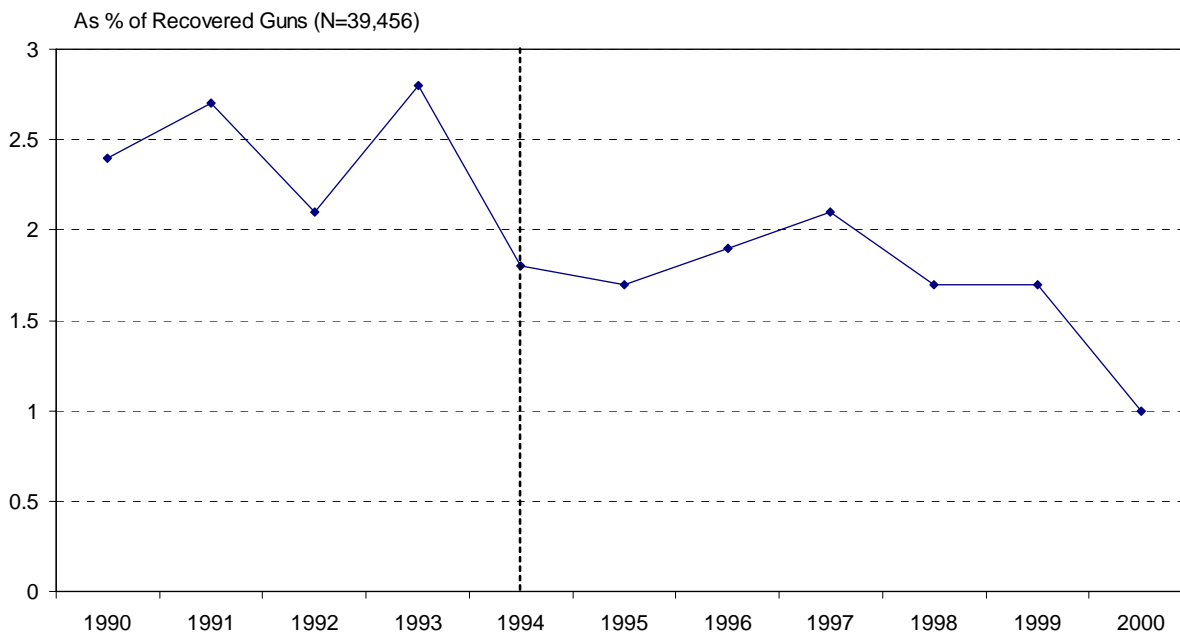
b. Murders, assaults, and robberies

\* Chi-square p level < .1 (changes in percentages of guns that were AWs/APs/ARs/AW-subs were tested for statistical significance)

\*\* Chi-square p level < .05 (changes in percentages of guns that were AWs/APs/ARs/AW-subs were tested for statistical significance)

\*\*\* Chi-square p level < .01 (changes in percentages of guns that were AWs/APs/ARs/AW-subs were tested for statistical significance)

**Figure 6-3. Police Recoveries of Assault Weapons in Miami (Metro-Dade), 1990-2000**



Includes Intratec group, SWD group, AR-15 group, and selected Calico and Feather models.



**Table 6-5. Trends in Police Recoveries of Domestic Assault Weapons in St. Louis, 1992-2003 <sup>a</sup>**

	<u><b>Pre-Ban Period</b></u>	<u><b>Post-Ban Period</b></u>	<u><b>Change</b></u>
<u><b>A. All Recoveries</b></u>	Jan. 1992-Dec. 1993	Jan. 1995-Dec. 2003	
Total AWs	94	212	
Annual Mean	47	23.56	-50%
AW's as % of Guns	1.33%	0.91%	-32% **
APs	87	187	
Annual Mean	43.5	20.78	-52%
APs as % of Guns	1.23%	0.81%	-34% **
ARs	7	25	
Annual Mean	3.5	2.78	-21%
ARs as % of Guns	0.1%	0.11%	10%
Total AWs and Substitutes	94	234	
Annual Mean	47	26	-45%
AWs/Subs as % of Guns	1.33%	1.01%	-24% *
<u><b>B. Recoveries Linked to Violent Crimes <sup>b</sup></b></u>			
Total AWs	8	20	
Annual Mean	4	2.2	-45%
AWs as % of Violent Crime Guns	0.8%	0.81%	1%

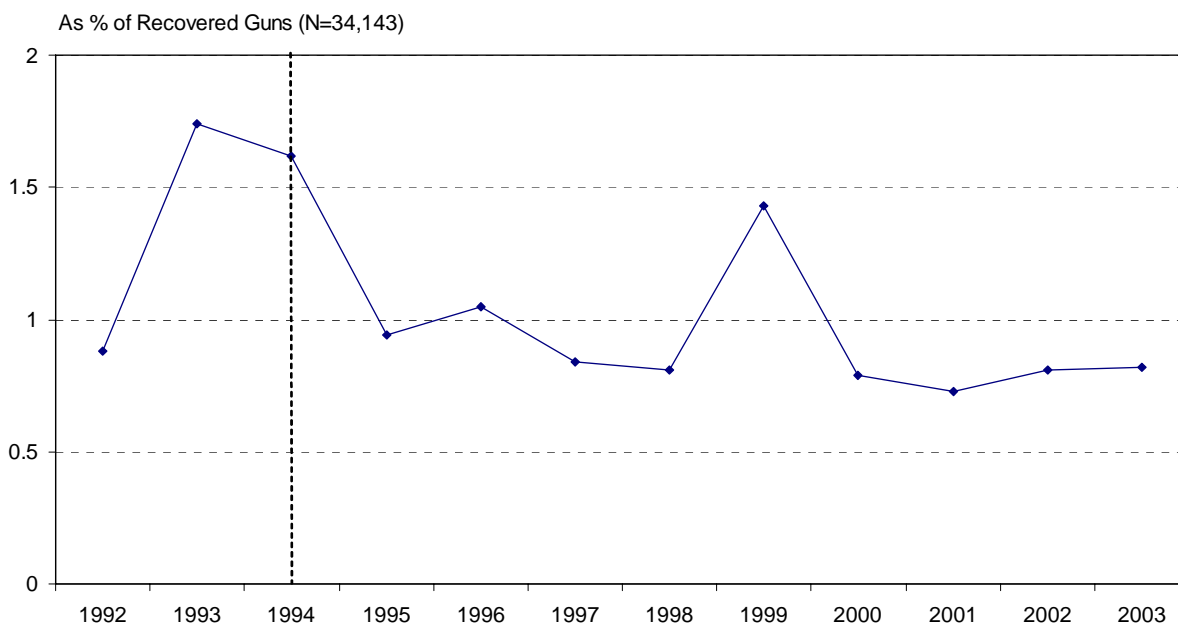
a. Domestic assault weapons include Intratec group, SWD group, AR-15 group, and Calico and Feather models.

b. Murders, assaults, and robberies

\* Chi-square p level < .05 (changes in percentages of guns that were AWs/APs/ARs/AW-subs were tested for statistical significance)

\*\* Chi-square p level < .01 (changes in percentages of guns that were AWs/APs/ARs/AW-subs were tested for statistical significance)

**Figure 6-4. Police Recoveries of Assault Weapons in St. Louis, 1992-2003**



Includes Intratec group, SWD group, AR-15 group, and selected Calico and Feather models.

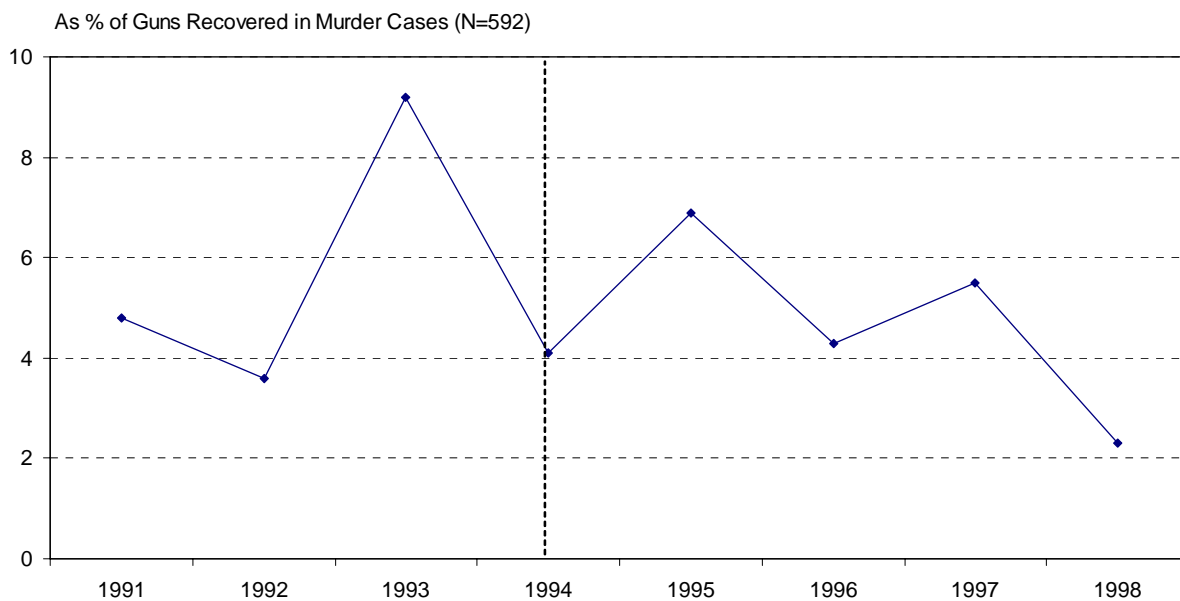
**Table 6-6. Trends in Police Recoveries of Domestic Assault Weapons in Boston, Milwaukee, and Anchorage (Alaska) <sup>a</sup>**

	<u>Pre-Ban Period</u>	<u>Post-Ban Period</u>	<u>Change</u>
<b><u>Boston</u></b>	Jan. 1991-Dec. 1993	Jan. 2000-Dec. 2002	
(All Gun Traces)			
AWs	60	11	
Annual Mean	20	3.7	-82%
AWs as % of Guns	2.16%	0.6%	-72%*
AWs and Substitutes	60	16	
Annual Mean	20	5.3	-74%
AWs/Subs as % of Guns	2.16%	0.87%	-60%*
<b><u>Milwaukee</u></b>	Jan. 1991-Dec. 1993	Jan. 1995-Dec. 1998	
(Guns Recovered in Murder Cases)			
AWs	15	13	
Annual Mean	5	3.25	-35%
AWs as % of Guns	5.91%	4.91%	-17%
AWs and Substitutes	15	16	
Annual Mean	5	4	-20%
AWs/Subs as % of Guns	5.91%	6.04%	2%
<b><u>Anchorage</u></b>	Jan. 1987-Dec. 1993	Jan. 1995-Dec. 2000	
(Guns Tested for Evidence)			
AWs	16	8	
Annual Mean	2.29	1.33	-42%
AW's as % of Guns	3.57%	2.13%	-40%
AWs and Substitutes	N/A	N/A	

a. Domestic assault weapons include Intratec group, SWD group, AR-15 group, and Calico and Feather models.

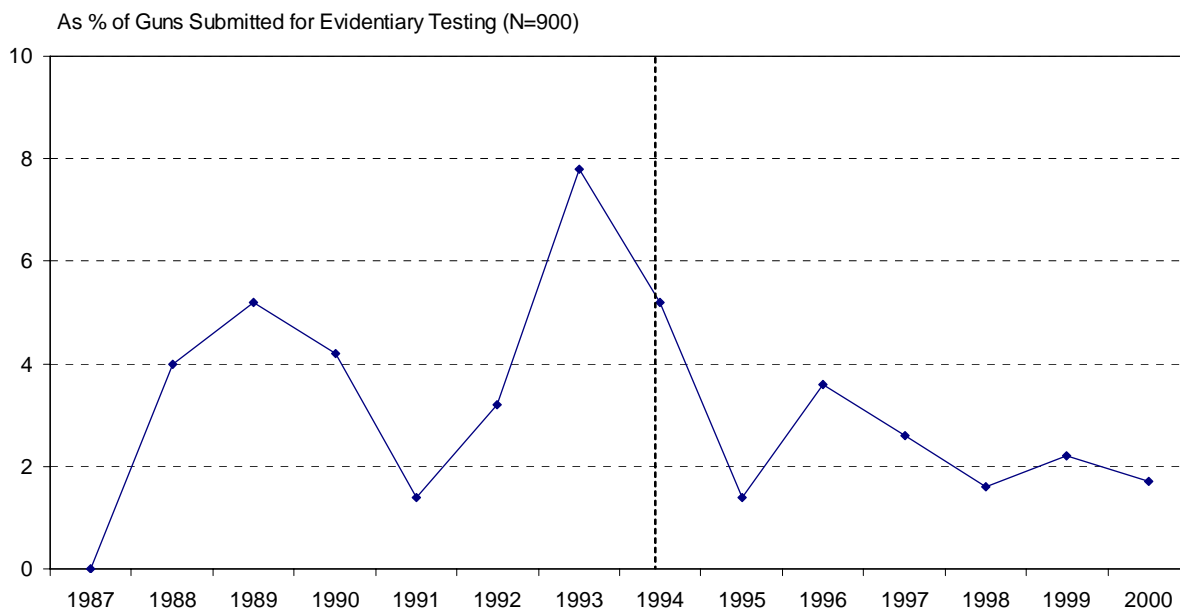
\* Chi-square p level < .01 (changes in percentages of guns that were AWs/AW-subs were tested for statistical significance)

**Figure 6-5. Assault Weapons Recovered in Milwaukee County Murder Cases, 1991-1998**



Includes Intratec group, SWD group, AR-15 group, and selected Calico and Feather models.

**Figure 6-6. Police Recoveries of Assault Weapons in Anchorage (Alaska), 1987-2000**



Includes Intratec group, SWD group, AR-15 group, and selected Calico and Feather models.

## 7. MARKET INDICATORS FOR LARGE CAPACITY MAGAZINES: PRICES AND IMPORTATION

The previous chapters examined the AW-LCM ban's impact on the availability and criminal use of AWs. In this chapter and the next, we consider the impact of the ban's much broader prohibition on LCMs made for numerous banned and non-banned firearms. We begin by studying market indicators. Our earlier study of LCM prices for a few gun models revealed that prices rose substantially during 1994 and into 1995 (Roth and Koper, 1997, Chapter 4). Prices of some LCMs remained high into 1996, while others returned to pre-ban levels or oscillated more unpredictably. The price increases may have reduced LCM use at least temporarily in the short-term aftermath of the ban, but we could not confirm this in our prior investigation.

### 7.1. Price Trends for Large Capacity Magazines

For this study, we sought to approximate longer term trends in the prices at which users could purchase banned LCMs throughout the country. To that end, we analyzed quarterly data on the prices of LCMs advertised by eleven gun and magazine distributors in *Shotgun News*, a national gun industry publication, from April 1992 to December 1998.<sup>63</sup> Those prices are available to any gun dealer, and primary market retailers generally re-sell within 15% of the distributors' prices.<sup>64</sup> The distributors were chosen during the course of the first AW study (Roth and Koper, 1997) based on the frequency with which they advertised during the April 1992 to June 1996 period. For each quarterly period, project staff coded prices for one issue from a randomly selected month. We generally used the first issue of each selected month based on a preliminary, informal assessment suggesting that the selected distributors advertised more frequently in those issues. In a few instances, first-of-month issues were unavailable to us or provided too few observations, so we substituted other issues.<sup>65</sup> Also, we were unable to obtain *Shotgun News* issues for the last two quarters of 1996. However, we aggregated the data annually to study price trends, and the omission of those quarters did not appear to affect the results (this is explained further below).

We ascertained trends in LCM prices by conducting hedonic price analyses,

<sup>63</sup> The *Blue Book of Gun Values*, which served as the data source for the AW price analysis, does not contain ammunition magazine prices.

<sup>64</sup> According to gun market experts, retail prices track wholesale prices quite closely (Cook et al., 1995, p. 71). Retail prices to eligible purchasers generally exceed wholesale (or original-purchase) prices by 3% to 5% in the large chain stores, by about 15% in independent dealerships, and by about 10% at gun shows (where overhead costs are lower).

<sup>65</sup> The decision to focus on first-of-month issues was made prior to data collection for price analysis update. For the earlier study (Roth and Koper, 1997), project staff coded data for one or more randomly selected issues of every month of the April 1992 to June 1996 period. For this analysis, we utilized data from only the first-of-month issues selected at random during the prior study. If multiple first-of-month issues were available for a given quarter, we selected one at random or based on the number of recorded advertisements. If no first-of-month issue was available for a given quarter, we selected another issue at random from among those coded during the first study.

similar to those described in the AW price analysis (Chapter 5), in which we regressed inflation-adjusted LCM prices (logged) on several predictors: magazine capacity (logged), gun make (for which the LCM was made), year of the advertisement, and distributor. We cannot account fully for the meaning of significant distributor effects. They may represent unmeasured quality differentials in the merchandise of different distributors, or they may represent other differences in stock volume or selling or service practices between the distributors.<sup>66</sup> We included the distributor indicators when they proved to be significant predictors of advertised price. In addition, we focused on LCMs made for several of the most common LCM-compatible handguns and rifles, rather than try to model the differences in LCM prices between the several hundred miscellaneous makes and models of firearms that were captured in the data. Finally, for both the handgun and rifle models, we created and tested seasonal indicator variables to determine if their incorporation would affect the coefficient for 1996 (the year with winter/spring data only), but they proved to be statistically insignificant and are not shown in the results below.<sup>67</sup>

#### *7.1.1. Large Capacity Magazines for Handguns*

The handgun LCM analysis tracks the prices of LCMs made for Intratec and Cobray (i.e., SWD) APs and non-banned semiautomatic pistols made by Smith and Wesson, Glock, Sturm Ruger, Sig-Sauer, Taurus, and Beretta (each of the manufacturers in the former group produces numerous models capable of accepting LCMs). In general, LCMs with greater magazine capacities commanded higher prices, and there were significant price differentials between LCMs made for different guns and sold by different distributors (see Table 7-1). Not surprisingly, LCMs made for Glock handguns were most expensive, followed by those made for Beretta and Sig-Sauer firearms.

Turning to the time trend indicators (see Table 7-1 and Figure 7-1), prices for these magazines increased nearly 50% from 1993 to 1994, and they rose another 56% in 1995. Prices declined somewhat, though not steadily, from 1996 to 1998. Nevertheless, prices in 1998 remained 22% higher than prices in 1994 and nearly 80% higher than those in 1993.

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<sup>66</sup> For example, one possible difference between the distributors may have been the extent to which they sold magazines made of different materials (e.g., steel, aluminum, etc.) or generic magazines manufactured by companies other than the companies manufacturing the firearms for which the magazines were made. For example, there were indications in the data that 3% of the handgun LCMs and 10% of the AR-15 and Mini-14 rifle LCMs used in the analyses (described below) were generic magazines. We did not control for these characteristic, however, because such information was often unclear from the advertisements and was not recorded consistently by coders.

<sup>67</sup> Project staff coded all LCM advertisements by the selected distributors. Therefore, the data are inherently weighted. However, the weights are based on the frequency with which the different LCMs were advertised (i.e., the LCMs that were advertised most frequently have the greatest weight in the models) rather than by production volume.

**Table 7-1. Regression of Handgun and Rifle Large Capacity Magazine Prices on Annual Time Indicators, 1992-1998, Controlling for Gun Makes/Models and Distributors**

	Handgun LCMs (n=1,277)		Rifle LCMs (n=674)	
	Estimate	T value	Estimate	T value
Constant	-1.79	-12.74***	-4.10	-19.12***
1992	-0.19	-2.11**	-0.48	-4.20***
1993	-0.38	-6.00***	-0.55	-6.14***
1995	0.44	6.88***	-0.25	-2.64***
1996	0.29	4.05***	-0.12	-0.93
1997	0.36	6.33***	-0.31	-3.68***
1998	0.20	3.51***	-0.44	-5.19***
Rounds (logged)	0.26	5.73***	0.84	15.08***
Cobray	-0.36	-4.15***		
Glock	0.41	8.15***		
Intratec	-0.40	-4.18***		
Ruger	-0.42	-7.79***		
Smith&Wesson	-0.08	-1.71*		
Sig-Sauer	0	-0.09		
Taurus	-0.31	-6.10***		
AK-type			-0.25	-3.15***
Colt AR-15			0.14	1.68*
Ruger Mini-14			-0.08	-0.92
Distributor 1	-0.72	-16.38***	-0.35	-5.15***
Distributor 2	-0.15	-0.97	-0.83	-5.24***
Distributor 3	-0.16	-3.93***	0.19	2.69***
Distributor 4	-0.55	-5.72***	0.16	0.80
Distributor 5	-0.07	-1.79*	-0.18	-2.65***
Distributor 6	-0.53	-1.23	-0.12	-0.32
Distributor 7	-1.59	-3.70***	-0.10	-0.91
Distributor 8			0.14	0.70
Distributor 9	-0.91	-12.52***	-0.48	-4.00***
F statistic	58.76		21.22	
(p value)	<.0001		<.0001	
Adj. R-square	0.51		0.38	

Year indicators are interpreted relative to 1994, and distributors are interpreted relative to distributor 10.

Handgun makes are relative to Beretta and rifle models are relative to SKS.

\* Statistically significant at  $p \leq .10$ .

\*\* Statistically significant at  $p \leq .05$ .

\*\*\* Statistically significant at  $p \leq .01$ .



**Figure 7-1. Annual Price Trends for Large Capacity Magazines, 1992-1998**



Based on 1,277 sampled ads for LCMs fitting models of 8 handgun makers and 674 sampled ads for LCMs fitting 4 rifle model groups.

### 7.1.2. Large Capacity Magazines for Rifles

We approximated trends in the prices of LCMs for rifles by modeling the prices of LCMs manufactured for AR-15, Mini-14, SKS,<sup>68</sup> and AK-type rifle models (including various non-banned AK-type models). As in the handgun LCM model, larger LCMs drew higher prices, and there were several significant model and distributor effects. AR-15 magazines tended to have the highest prices, and magazines for AK-type models had the lowest prices (Table 7-1).

Like their handgun counterparts, prices for rifle LCMs increased over 40% from 1993 to 1994, as the ban was debated and implemented (see Table 7-1 and Figure 7-1). However, prices declined over 20% in 1995. Following a rebound in 1996, prices moved downward again during 1997 and 1998. Prices in 1998 were over one third lower than the peak prices of 1994 and were comparable to pre-ban prices in 1992 and 1993.

<sup>68</sup> The SKS is a very popular imported rifle (there are Russian and Chinese versions) that was not covered by either the 1989 AR import ban or the 1994 AW ban. However, importation of SKS rifles from China was discontinued in 1994 due to trade restrictions.

## 7.2. Post-Ban Importation of Large Capacity Magazines

ATF does not collect (or at least does not publicize) statistics on production of LCMs. Therefore, we cannot clearly document pre-ban production trends. Nevertheless, it seems likely that gun and magazine manufacturers boosted their production of LCMs during the debate over the ban, just as AW makers increased production of AWs. Regardless, gun industry sources estimated that there were 25 million LCMs available as of 1995 (including aftermarket items for repairing magazines or converting them to LCMs) (Gun Tests, 1995, p. 30).

Moreover, the supply of LCMs continued to grow even after the ban due to importation of foreign LCMs that were manufactured prior to the ban (and thus grandfathered by the LCM legislation), according to ATF importation data.<sup>69</sup> As shown in Table 7-2, nearly 4.8 million LCMs were imported for commercial sale (as opposed to law enforcement uses) from 1994 through 2000, with the largest number (nearly 3.7 million) arriving in 1999.<sup>70</sup> During this period, furthermore, importers received permission to import a total of 47.2 million LCMs; consequently, an additional 42 million LCMs may have arrived after 2000 or still be on the way, based on just those approved through 2000.<sup>71, 72</sup>

To put this in perspective, gun owners in the U.S. possessed 25 million firearms that were equipped with magazines holding 10 or more rounds as of 1994 (Cook and Ludwig, 1996, p. 17). Therefore, the 4.7 million LCMs imported in the U.S. from 1994 through 2000 could conceivably replenish 19% of the LCMs that were owned at the time of the ban. The 47.2 million approved during this period could supply nearly 2 additional LCMs for all guns that were so equipped as of 1994.

## 7.3. Summary and Interpretations

Prices of LCMs for handguns rose significantly around the time of the ban and, despite some decline from their peak levels in 1995, remained significantly higher than pre-ban prices through at least 1998. The increase in LCM prices for rifles proved to be more temporary, with prices returning to roughly pre-ban levels by 1998.<sup>73</sup>

<sup>69</sup> To import LCMs into the country, importers must certify that the magazines were made prior to the ban. (The law requires companies to mark post-ban LCMs with serial numbers.) As a practical matter, however, it is hard for U.S. authorities to know for certain whether imported LCMs were produced prior to the ban.

<sup>70</sup> The data do not distinguish between handgun and rifle magazines or the specific models for which the LCMs were made. But note that roughly two-thirds of the LCMs imported from 1994 through 2000 had capacities between 11 and 19 rounds, a range that covers almost all handgun LCMs as well as many rifle LCMs. It seems most likely that the remaining LCMs (those with capacities of 20 or more rounds) were primarily for rifles.

<sup>71</sup> The statistics in Table 7-2 do not include belt devices used for machine guns.

<sup>72</sup> A caveat to the number of approved LCMs is that importers may overstate the number of LCMs they have available to give themselves leeway to import additional LCMs, should they become available.

<sup>73</sup> A caveat is that we did not examine prices of smaller magazines, so the price trends described here may not have been entirely unique to LCMs. Yet it seems likely that these trends reflect the unique impact of the ban on the market for LCMs.

**Table 7-2. Large Capacity Magazines Imported into the United States or Approved For Importation for Commercial Sale, 1994-2000**

<u>Year</u>	<u>Imported</u>	<u>Approved</u>
1994	67,063	77,666
1995	3,776	2,066,228
1996	280,425	2,795,173
1997	99,972	1,889,773
1998	337,172	20,814,574
1999	3,663,619	13,291,593
2000	346,416	6,272,876
<i>Total</i>	<i>4,798,443</i>	<i>47,207,883</i>

Source: Firearms and Explosives Imports Branch, Bureau of Alcohol, Tobacco, Firearms, and Explosives. Counts do not include “links” (belt devices) or imports for law enforcement purposes.

The drop in rifle LCM prices between 1994 and 1998 may have due to the simultaneous importation of approximately 788,400 grandfathered LCMs, most of which appear to have been rifle magazines (based on the fact that nearly two-thirds had capacities over 19 rounds), as well as the availability of U.S. military surplus LCMs that fit rifles like the AR-15 and Mini-14. We can also speculate that demand for LCMs is not as great among rifle consumers, who are less likely to acquire their guns for defensive or criminal purposes.

The pre-ban supply of handgun LCMs may have been more constricted than the supply of rifle LCMs for at least a few years following the ban, based on prices from 1994 to 1998. Although there were an estimated 25 million LCMs available in the U.S. as of 1995, some major handgun manufacturers (including Ruger, Sig Sauer, and Glock) had or were close to running out of new LCMs by that time (Gun Tests, 1995, p. 30). Yet the frequency of advertisements for handgun LCMs during 1997 and 1998, as well as the drop in prices from their 1995 peak, suggests that the supply had not become particularly low. In 1998, for example, the selected distributors posted a combined total of 92 LCM ads per issue (some of which may have been for the same make, model, and capacity combinations) for just the handguns that we incorporated into our model.<sup>74</sup> Perhaps the

<sup>74</sup> Project staff found substantially more advertisements per issue for 1997 and 1998 than for earlier years. For the LCMs studied in the handgun analysis, staff recorded an average of 412 LCM advertisements per year (103 per issue) during 1997 and 1998. For 1992-1996, staff recorded an average of about 100 ads per year (25 per issue) for the same LCMs. A similar but smaller differential existed in the volume of ads for the LCMs used in the rifle analysis. The increase in LCM ads over time may reflect changes in supply and

demand for enhanced firepower among handgun consumers, who are more likely to acquire guns for crime or defense against crime, was also a factor (and perhaps a large one) putting a premium on handgun LCMs.

Although we might hypothesize that high prices depressed use of handguns with LCMs for at least a few years after the ban, a qualification to this prediction is that LCM use may be less sensitive to prices than is use of AWs because LCMs are much less expensive than the firearms they complement and therefore account for a smaller fraction of users' income (e.g., see Friedman, 1962). To illustrate, TEC-9 APs typically cost \$260 at retail during 1992 and 1993, while LCMs for the TEC-9, ranging in capacity from 30 to 36 rounds, averaged \$16.50 in *Shotgun News* advertisements (and probably \$19 or less at retail) during the same period. So, for example, a doubling of both gun and LCM prices would likely have a much greater impact on purchases of TEC-9 pistols than purchases of LCMs for the TEC-9. Users willing and able to pay for a gun that accepts an LCM are most likely willing and able to pay for an LCM to use with the gun.

Moreover, the LCM supply was enhanced considerably by a surge in LCM imports that occurred after the period of our price analysis. During 1999 and 2000, an additional 4 million grandfathered LCMs were imported into the U.S., over two-thirds of which had capacities of 11-19 rounds, a range that covers almost all handgun LCMs (as well as many rifle LCMs). This may have driven prices down further after 1998.

In sum, market indicators yield conflicting signs on the availability of LCMs. It is perhaps too early to expect a reduction in crimes with LCMs, considering that tens of millions of grandfathered LCMs were available at the time of the ban, an additional 4.8 million – enough to replenish one-fifth of those owned by civilians – were imported from 1994 through 2000, and that the elasticity of demand for LCMs may be more limited than that of firearms. And if the additional 42 million foreign LCMs approved for importation become available, there may not be a reduction in crimes with LCMs anytime in the near future.

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demand for LCMs during the study period, as well as product shifts by distributors and perhaps changes in ad formats (e.g., ads during the early period may have been more likely to list magazines by handgun model without listing the exact capacity of each magazine, in which case coders would have been more likely to miss some LCMs during the early period). Because the data collection effort for the early period was part of a larger effort that involved coding prices in *Shotgun News* for LCMs and numerous banned and non-banned firearms, it is also possible that coders were more likely to miss LCM ads during that period due to random factors like fatigue or time constraints.

## 8. CRIMINAL USE OF LARGE CAPACITY MAGAZINES AFTER THE BAN

Assessing trends in criminal use of LCMs is difficult. There is no national data source on crime guns equipped with LCMs (ATF national tracing data do not include information about magazines recovered with traced firearms), and, based on our contacts with numerous police departments over the course of this study and the first AW study, it seems that even those police departments that maintain electronic databases on recovered firearms do not typically record the capacity of the magazines with which the guns are equipped.<sup>75,76</sup> Indeed, we were unable to acquire sufficient data to examine LCM use for the first AW study (Roth and Koper, 1997).

For the current study, we obtained four data sources with which to investigate trends in criminal use of LCMs. Three of the databases utilized in the AW analysis – those from Baltimore, Milwaukee, and Anchorage – contained information about the magazines recovered with the guns (see the descriptions of these databases in Chapter 6). Using updated versions of these databases, we examined all LCM recoveries in Baltimore from 1993 through 2003, recoveries of LCMs in Milwaukee murder cases from 1991 to 2001, and recoveries of LCMs linked to serious crimes in Anchorage (and other parts of Alaska) from 1992 through 2002.<sup>77</sup> In addition, we studied records of guns and magazines submitted to the Jefferson Regional Forensics Lab in Louisville, Kentucky from 1996 through 2000. This lab of the Kentucky State Police services law enforcement agencies throughout roughly half of Kentucky, but most guns submitted to the lab are from the Louisville area. Guns examined at the lab are most typically those associated with serious crimes such as murders, robberies, and assaults.

The LCM analyses and findings were not as uniform across locations as were those for AWs. Therefore, we discuss each site separately. As in the AW analysis, we emphasize changes in the percentage of guns equipped with LCMs to control for overall trends in gun crime and gun recoveries. Because gun crime was falling during the latter 1990s, we anticipated that the number of guns recovered with LCMs might decline independently of the ban's impact. (Hereafter, we refer to guns equipped with LCMs as LCM guns.)

<sup>75</sup> For the pre-ban period, one can usually infer magazine capacity based on the firearm model. For post-ban recoveries, this is more problematic because gun models capable of accepting LCMs may have been equipped with grandfathered LCMs or with post-ban magazines designed to fit the same gun but holding fewer rounds.

<sup>76</sup> As for the AW analysis in Chapter 6, we utilize police data to examine trends in criminal use of LCMs. The reader is referred to the general discussion of police gun seizure data in Chapter 6.

<sup>77</sup> Findings presented in our 2002 interim report (Koper and Roth, 2002b) indicated that LCM use had not declined as of the late 1990s. Therefore, we sought to update the LCM analyses where possible for this version of the report.

## 8.1. Baltimore

In Baltimore, about 14% of guns recovered by police were LCM guns in 1993. This figure remained relatively stable for a few years after the ban but had dropped notably by 2002 and 2003 (Figure 8-1). For the entire post-ban period (1995-2003), recoveries of LCM guns were down 8% relative to those of guns with smaller magazines (Table 8-1, panel A), a change of borderline statistical significance. Focusing on the most recent years, however, LCM gun recoveries were 24% lower in 2002 and 2003 than during the year prior to the ban, a difference that was clearly significant (Table 8-1, panel B).<sup>78,79,80</sup> This change was attributable to a 36% drop in LCM handguns (Table 8-1, panel C). LCM rifles actually increased 36% as a share of crime guns, although they still accounted for no more than 3% in 2002 and 2003 (Table 8-1, panel D).<sup>81</sup>

Yet there was no decline in recoveries of LCM guns used in violent crimes (i.e., murders, shootings, robberies, and other assaults). After the ban, the percentage of violent crime guns with LCMs generally oscillated in a range consistent with the pre-ban level (14%) and hit peaks of roughly 16% to 17% in 1996 and 2003 (Figure 8-1).<sup>82</sup> Whether comparing the pre-ban period to the entire post-ban period (1995-2003) or the most recent years (2002-2003), there was no meaningful decline in LCM recoveries linked to violent crimes (Table 8-2, panels A and B).<sup>83</sup> Neither violent uses of LCM

<sup>78</sup> Data on handgun magazines were also available for 1992. An auxiliary analysis of those data did not change the substantive inferences described in the text.

<sup>79</sup> The Maryland AP ban enacted in June 1994 also prohibited ammunition magazines holding over 20 rounds and did not permit additional sales or transfers of such magazines manufactured prior to the ban. This ban, as well as the Maryland and federal bans on AWs that account for many of the guns with magazines over 20 rounds, may have contributed to the downward trend in LCMs in Baltimore, but only 2% of the guns recovered in Baltimore from 1993 to 2000 were equipped with such magazines.

<sup>80</sup> All comparisons of 1993 to 2002-2003 in the Baltimore data are based on information from the months of January through November of each year. At the time we received these data, information was not yet available for December 2003, and preliminary analysis revealed that guns with LCMs were somewhat less likely to be recovered in December than in other months for years prior to 2003. Nevertheless, utilizing the December data for 1993 and 2002 did not change the substantive inferences. We did not remove December data from the comparisons of 1993 and the full post-ban period because those comparisons seemed less likely to be influenced by the absence of one month of data.

<sup>81</sup> This increase may have been due largely to a general increase in rifle seizures. LCM rifles actually dropped as a percentage of all rifle recoveries from 1993 to 2002-2003, suggesting that recoveries of LCM rifles were increasing less than recoveries of other rifles.

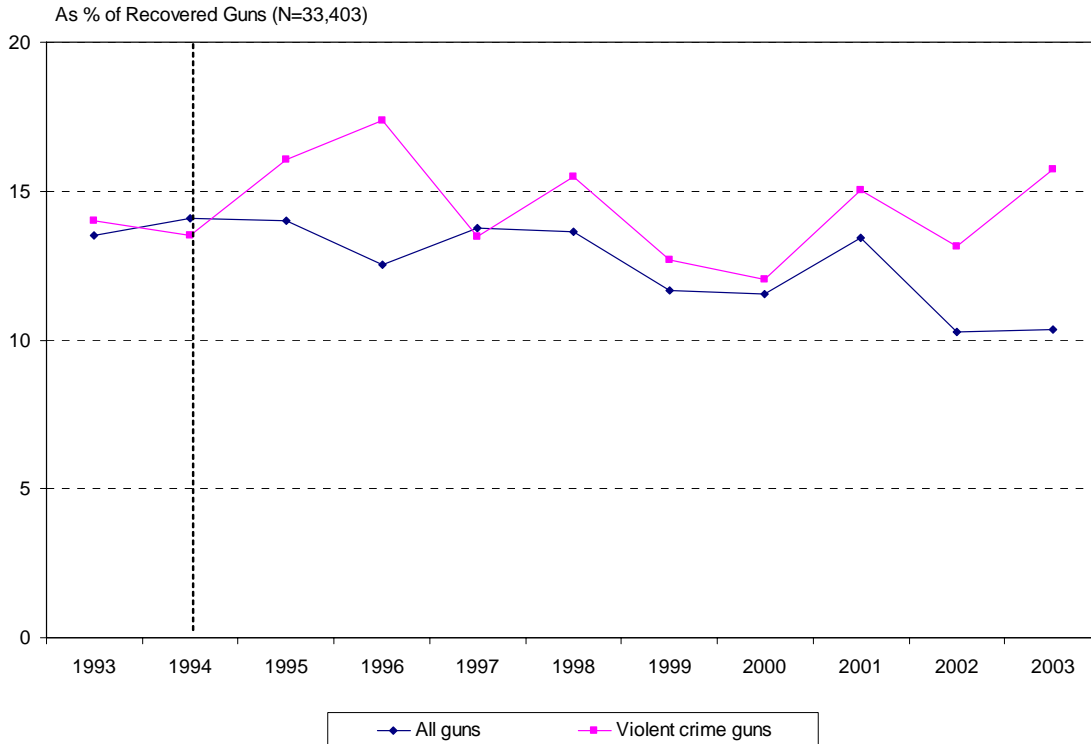
<sup>82</sup> For 1996, 45% of all records and 24% of those linked to violent crimes had missing data for magazine capacity (due to temporary changes in operational procedures in the Baltimore crime lab). For other years, missing data rates were no more than 6%. Based on those cases for which data were available, the share of guns with LCMs in 1996 was comparable to that in other years, particularly when examining all gun recoveries. At any rate, the analyses focusing on 1993, 2002, and 2003 reinforce the findings of those that include the 1996 data.

<sup>83</sup> The ammunition capacity code in the Baltimore data usually reflected the full capacity of the magazine and weapon, but sometimes reflected the capacity of the magazine only. (For instance, a semiautomatic with a 10-round magazine and the ability to accept one additional round in the chamber might have been coded as having a capacity of 10 or 11.) Informal assessment suggested that capacity was more likely to reflect the exact capacity of the magazine in the early years of the database and more likely to reflect the full capacity of the gun and magazine in later years. For the main runs presented in the text and tables, guns were counted as having LCMs if the coded capacity was greater than 11 rounds. This ensured that LCMs were not overestimated, but it potentially understated LCM prevalence, particularly for the earlier



handguns or LCM rifles had declined appreciably by 2002-2003 (Table 8-2, panels C and D). Hence, the general decline in LCM recoveries may reflect differences in the availability and use of LCMs among less serious offenders, changes in police practices,<sup>84</sup> or other factors.

**Figure 8-1. Police Recoveries of Guns Equipped With Large Capacity Magazines in Baltimore, 1993-2003**



years. However, coding the guns as LCM weapons based on a threshold of 10 (i.e., a coded capacity over 10 rounds) in 1993 and a threshold of 11 (i.e., a coded capacity over 11 rounds) for 2002-2003 did not change the inferences of the violent crime analysis. Further, this coding increased the pre-ban prevalence of LCMs by very little (about 4% in relative terms).

<sup>84</sup> During the late 1990s, for example, Baltimore police put greater emphasis on detecting illegal gun carrying (this statement is based on prior research and interviews the author has done in Baltimore as well as the discussion in Center to Prevent Handgun Violence, 1998). One can hypothesize that this effort reduced the fraction of recovered guns with LCMs because illegal gun carriers are probably more likely to carry smaller, more concealable handguns that are less likely to have LCMs.



**Table 8-1. Trends in All Police Recoveries of Firearms Equipped With Large Capacity Magazines, Baltimore, 1993-2003**

	<u><b>Pre-Ban Period</b></u>	<u><b>Post-Ban Period</b></u>	<u><b>Change</b></u>
<u><b>A. All LCM Guns</b></u>	Jan.-Dec. 1993	Jan. 1995-Nov. 2003	
Total	473	3703	
Annual Mean	473	445.86 <sup>a</sup>	-6%
LCM Guns as % of All Guns	13.51%	12.38%	-8%*
<u><b>B. All LCM Guns</b></u>	Jan.-Nov. 1993	Jan.-Nov. 2002-2003	
Total	430	626	
Annual Mean	430	313	-27%
LCM Guns as % of All Guns	13.47%	10.3%	-24%***
<u><b>C. LCM Handguns</b></u>	Jan.-Nov. 1993	Jan.-Nov. 2002-2003	
Total	359	440	
Annual Mean	359	220	-39%
LCM Handguns as % of All Guns	11.25%	7.24%	-36%***
<u><b>D. LCM Rifles</b></u>	Jan.-Nov. 1993	Jan.-Nov. 2002-2003	
LCM Rifles	71	183	
Annual Mean	71	91.5	29%
LCM Rifles as % of All Guns	2.22%	3.01%	36%**

a. Annual average calculated without 1996 and 2003 (to correct for missing months or missing magazine data).

\* Chi-square p level < .10 (changes in percentages of guns equipped with LCMs were tested for statistical significance)

\*\* Chi-square p level < .05 (changes in percentages of guns equipped with LCMs were tested for statistical significance)

\*\*\* Chi-square p level < .01 (changes in percentages of guns equipped with LCMs were tested for statistical significance)

**Table 8-2. Trends in Police Recoveries of Firearms Equipped With Large Capacity Magazines in Violent Crime Cases, Baltimore, 1993-2003**

	<u><b>Pre-Ban Period</b></u>	<u><b>Post-Ban Period</b></u>	<u><b>Change <sup>a</sup></b></u>
<u><b>A. All LCM Guns</b></u>	Jan.-Dec. 1993	Jan. 1995-Nov. 2003	
Total	87	711	
Annual Mean	87	81.86 <sup>b</sup>	-6%
LCM Guns as % of All Guns	14.01%	14.44%	3%
<u><b>B. All LCM Guns</b></u>	Jan.-Nov. 1993	Jan.-Nov. 2002-2003	
Total	79	104	
Annual Mean	79	52	-34%
LCM Guns as % of All Guns	13.96%	13.65%	-2%
<u><b>C. LCM Handguns</b></u>	Jan.-Nov. 1993	Jan.-Nov. 2002-2003	
Total	62	81	
Annual Mean	62	40.5	-35%
LCM Handguns as % of All Guns	10.95%	10.63%	-3%
<u><b>D. LCM Rifles</b></u>	Jan.-Nov. 1993	Jan.-Nov. 2002-2003	
LCM Rifles	17	23	
Annual Mean	17	11.5	-32%
LCM Rifles as % of All Guns	3%	3.02%	1%

a. Changes in the percentages of guns with LCMs were statistically insignificant in chi-square tests.

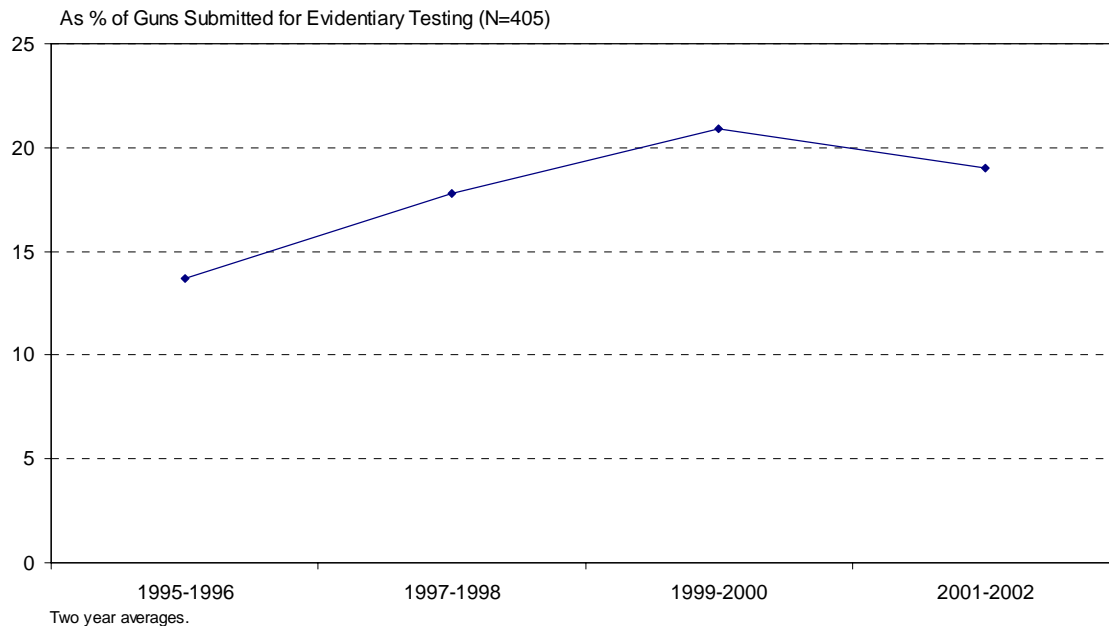
b. Annual average calculated without 1996 and 2003 (to correct for missing months or missing magazine data).

## 8.2. Anchorage

In the Alaska database, magazine capacity was recorded only for guns recovered during the post-ban years, 1995 through 2002. However, we estimated pre-ban use of LCM handguns by identifying handgun models inspected during 1992 and 1993 that were manufactured with LCMs prior to the ban.<sup>85</sup> This permitted an assessment of pre-post changes in the use of LCM handguns.

As shown in Figure 8-2 (also see Table 8-3, panel A), LCM guns rose from 14.5% of crime guns in 1995-1996 to 24% in 2000-2001 (we present two-year averages because the sample are relatively small, particularly for the most recent years) and averaged about 20% for the entire post-ban period. LCM handguns drove much of this trend, but LCM rifles also increased from about 3% of crime guns in 1995-96 to 11% in 2000-2001.

**Figure 8-2. Police Recoveries of Guns Equipped With Large Capacity Magazines in Anchorage (Alaska), 1995-2002**



<sup>85</sup> To make these determinations, we consulted gun catalogs such as the *Blue Book of Gun Values* and *Guns Illustrated*.

**Table 8-3. Trends in Police Recoveries of Firearms Equipped With Large Capacity Magazines in Violent Crime Cases, Anchorage (Alaska), 1992-2002 <sup>a</sup>**

	<u>Pre-Ban Period</u>	<u>Post-Ban Period</u>	<u>Change <sup>b</sup></u>
<b><u>A. All LCM Guns</u></b>	N/A	Jan. 1995-Dec. 2002	
Total		80	
Annual Mean		10	N/A
LCM Guns as % of All Guns		19.75%	N/A
<b><u>B. LCM Handguns</u></b>	Jan. 1992-Dec. 1993	Jan. 1995-Dec. 2002	
Total	17	57	
Annual Mean	8.5	7.13	-16%
LCM Handguns as % All Handguns	26.15%	22.35%	-15%
<b><u>C. LCM Handguns</u></b>	Jan. 1992-Dec. 1993	Jan. 2001-Dec. 2002	
Total	17	10	
Annual Mean	8.5	5	-41%
LCM Handguns as % of All Handguns	26.15%	19.23%	-26%

a. Based on guns submitted to State Police for evidentiary testing.

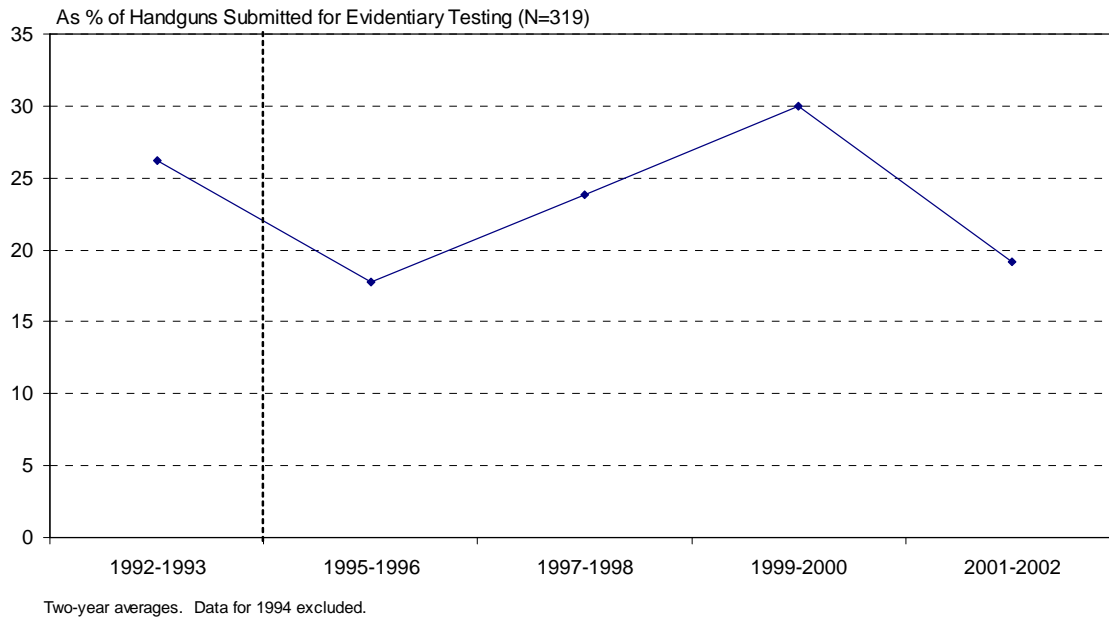
b. Changes in the percentages of guns equipped with LCMs were statistically insignificant in chi-square tests.

Investigation of pre-post changes for handguns revealed an inconsistent pattern (Figure 8-3). LCM handguns dropped initially after the ban, declining from 26% of handguns in 1992-1993 to 18% in 1995-1996. However, they rebounded after 1996, reaching a peak of 30% of handguns in 1999-2000 before declining to 19% in 2001-2002.

For the entire post-ban period, the share of handguns with LCMs was about 15% lower than in the pre-ban period (Table 8-3, panel B). By the two most recent post-ban years (2001-2002), LCM use had dropped 26% from the pre-ban years (Table 8-3, panel C). These changes were not statistically significant, but the samples of LCM handguns were rather small for rigorous statistical testing. Even so, it seems premature to conclude

that there has been a lasting reduction in LCM use in Alaska. LCM use in 2001-2002 was somewhat higher than that immediately following the ban in 1995-1996, after which there was a substantial rebound. Considering the inconsistency of post-ban patterns, further follow-up seems warranted before making definitive conclusions about LCM use in Alaska.

**Figure 8-3. Police Recoveries of Handguns Equipped With Large Capacity Magazines in Anchorage (Alaska), 1992-2002**



### 8.3. Milwaukee

LCM guns accounted for 21% of guns recovered in Milwaukee murder investigations from 1991 to 1993 (Table 8-4, panel A). Following the ban, this figure rose until reaching a plateau of over 36% in 1997 and 1998 (Figure 8-4). On average, the share of guns with LCMs grew 55% from 1991-1993 to 1995-1998, a trend that was driven by LCM handguns (Table 8-4, panels A and B).<sup>86</sup> LCM rifles held steady at between 4% and 5% of the guns (Table 8-4, panel C).

We also analyzed a preliminary database on 48 guns used in murders during 2000 and 2001 (unlike the 1991-1998 database, this database did not include information on other guns recovered during the murder investigations). About 11% of these guns were LCM guns, as compared to 19% of guns used in murders from 1991 to 1993 (analyses not shown). However, nearly a quarter of the 2000-2001 records were missing information on magazine capacity.<sup>87</sup> Examination of the types and models of guns with

<sup>86</sup> LCM guns also increased as share of guns that were used in the murders (the full sample results discussed in the text include all guns recovered during the investigations).

<sup>87</sup> Magazine capacity was missing for less than 4% of the records in earlier years.

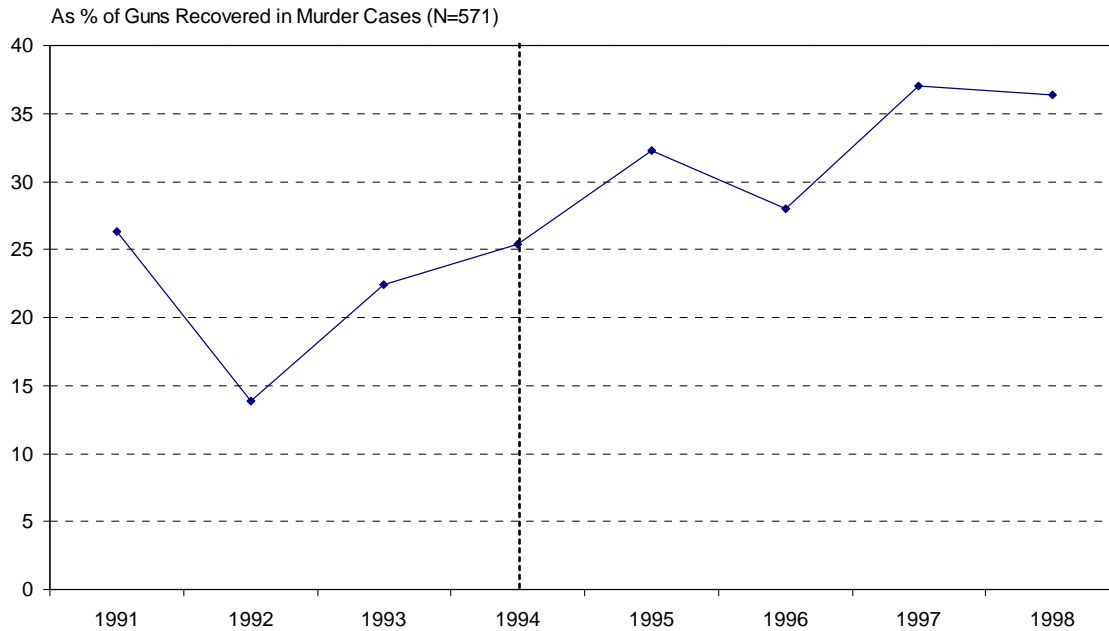
unidentified magazines suggested that as many as 17% of guns used in murders during 2000 and 2001 may have been LCM guns (based on all those that either had LCMs, were models sold with LCMs prior to the ban, or were unidentified semiautomatics). While this still suggests a drop in LCM use from the peak levels of the late 1990s (26% of guns used in murders from 1995 to 1998 had LCMs), it is not clear that LCM use has declined significantly below pre-ban levels.

**Table 8-4. Trends in Police Recoveries of Firearms Equipped With Large Capacity Magazines in Murder Cases, Milwaukee County, 1991-1998**

	<u>Pre-Ban Period</u>	<u>Post-Ban Period</u>	<u>Change</u>
	Jan. 1991-Dec. 1993	Jan. 1995-Dec. 1998	
<b><u>A. All LCM Guns</u></b>			
Total	51	83	
Annual Mean	17	20.75	22%
LCM Guns as % of All Guns	20.9%	32.42%	55%*
<b><u>B. LCM Handguns</u></b>	Jan. 1991-Dec. 1993	Jan. 1995-Dec. 1998	
Total	40	71	
Annual Mean	13.33	17.75	33%
LCM Handguns as % of All Guns	16.39%	27.73%	69%*
<b><u>C. LCM Rifles</u></b>	Jan. 1991-Dec. 1993	Jan. 1995-Dec. 1998	
Total	11	12	
Annual Mean	3.67	3	-18%
LCM Rifles as % of All Guns	4.51%	4.69%	4%

\* Chi-square p level < .01 (changes in percentages of guns equipped with LCMs were tested for statistical significance)

**Figure 8-4. Recoveries of Guns Equipped With Large Capacity Magazines in Milwaukee County Murder Cases, 1991-1998**

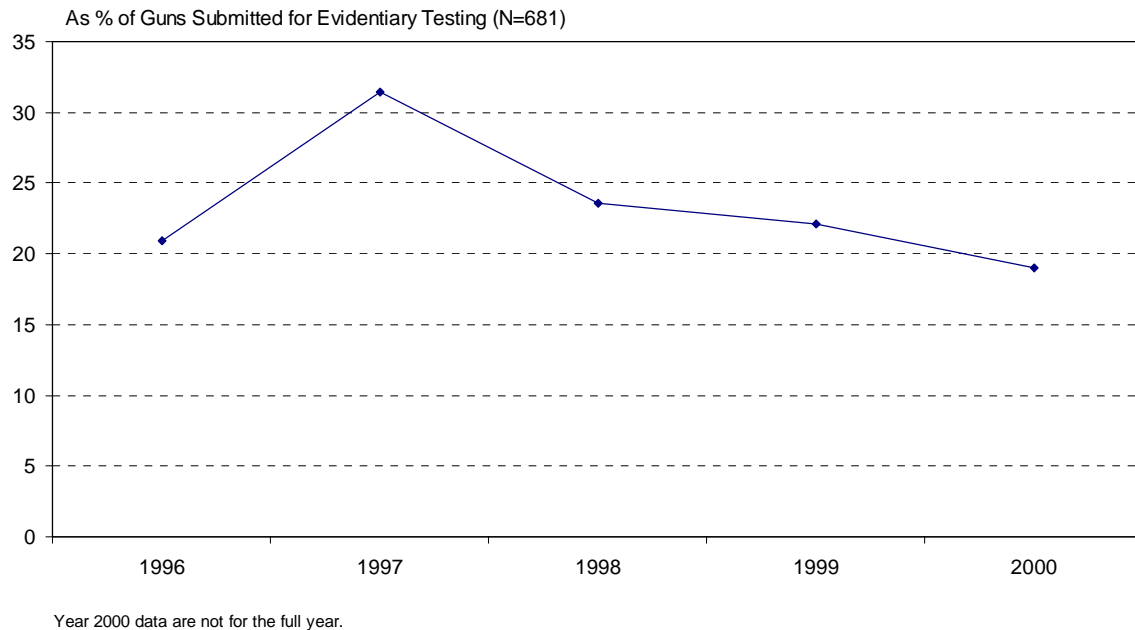


#### 8.4. Louisville

The Louisville LCM data are all post-ban (1996-2000), so we cannot make pre-post comparisons. Nonetheless, the share of crime guns with LCMs in Louisville (24%) was within the range of that observed in the other cities during this period. And similar to post-ban trends in the other sites, LCM recoveries peaked in 1997 before leveling off and remaining steady through the year 2000 (Figure 8-5). LCM rifles dropped 21% as a share of crime guns between 1996 and 2000 (analyses not shown), but there were few in the database, and they never accounted for more than 6.2% of guns in any year.



**Figure 8-5. Police Recoveries of Guns Equipped With Large Capacity Magazines in Louisville (Kentucky), 1996-2000**



## 8.5. Summary

Despite a doubling of handgun LCM prices between 1993 and 1995 and a 40% increase in rifle LCM prices from 1993 to 1994, criminal use of LCMs was rising or steady through at least the latter 1990s, based on police recovery data from four jurisdictions studied in this chapter. These findings are also consistent with an earlier study finding no decline in seizures of LCM guns from juveniles in Washington, DC in the year after the ban (Koper, 2001).<sup>88</sup> Post-2000 data, though more limited and inconsistent, suggest that LCM use may be dropping from peak levels of the late 1990s but provide no definitive evidence of a drop below pre-ban levels.<sup>89</sup> These trends have been driven primarily by LCM handguns, which are used in crime roughly three times as

<sup>88</sup> From 1991 to 1993, 16.4% of guns recovered from juveniles in Washington, DC had LCMs (14.2% had LCMs in 1993). In 1995, this percentage increased to 17.1%. We did not present these findings in this chapter because the data were limited to guns recovered from juveniles, the post-ban data series was very short, and the gun markets supplying DC and Baltimore are likely to have much overlap (Maryland is a leading supplier of guns to DC – see ATF, 1997; 1999).

<sup>89</sup> We reran selected key analyses with the Baltimore, Milwaukee, and Louisville data after excluding .22 caliber guns, some of which could have been equipped with attached tubular magazines that are exempted from the LCM ban, and obtained results consistent with those reported in the text. It was possible to identify these exempted magazines in the Anchorage data. When they were removed from Anchorage's LCM count, the general pattern in use of banned LCMs was similar to that presented in the main 1995-2002 analysis: guns with banned LCMs rose, reaching a peak of 21% of crime guns in 1999-2000, before declining slightly to 19% in 2001-2002.

often as LCM rifles. Nonetheless, there has been no consistent reduction in the use of LCM rifles either.

The observed patterns are likely due to several factors: a hangover from pre-ban growth in the production and marketing of LCM guns (Cook and Ludwig, 1997, pp. 5-6; Wintemute, 1996);<sup>90</sup> the low cost of LCMs relative to the firearms they complement, which seems to make LCM use less sensitive to prices than is firearm use;<sup>91</sup> the utility that gun users, particularly handgun users, attach to LCMs; a plentiful supply of grandfathered LCMs, likely enhanced by a pre-ban surge in production (though this has not been documented) and the importation of millions of foreign LCMs since the ban;<sup>92</sup> thefts of LCM firearms (see Roth and Koper, 1997, Chapter 4); or some combination of these factors.<sup>93</sup> However, it is worth noting that our analysis did not reveal an upswing in use of LCM guns following the surge of LCM importation in 1999 (see the previous chapter). It remains to be seen whether recent imports will have a demonstrable effect on patterns of LCM use.

Finally, we must be cautious in generalizing these results to the nation because they are based on a small number of non-randomly selected jurisdictions. Nonetheless, the consistent failure to find clear evidence of a pre-post drop in LCM use across these geographically diverse locations strengthens the inference that the findings are indicative of a national pattern.

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<sup>90</sup> To illustrate this trend, 38% of handguns acquired by gun owners during 1993 and 1994 were equipped with magazines holding 10 or more rounds, whereas only 14% of handguns acquired before 1993 were so equipped (Cook and Ludwig, 1997, pp. 5-6).

<sup>91</sup> Although elevated post-ban prices did not suppress use of LCMs, a more subtle point is that LCM use rose in most of these locations between 1995 and 1998, as LCM prices were falling from their peak levels of 1994-1995. Therefore, LCM use may have some sensitivity to price trends.

<sup>92</sup> However, we do not have the necessary data to determine if LCMs used in crime after the ban were acquired before or after the ban.

<sup>93</sup> In light of these considerations, it is conceivable that the ban slowed the rate of growth in LCM use, accelerated it temporarily (due to a pre-ban production boom), or had no effect. We do not have the data necessary to examine this issue rigorously. Moreover, the issue might be regarded as somewhat superfluous; the more critical point would seem to be that nearly a decade after the ban, LCM use has still not declined demonstrably below pre-ban levels.

## 9. THE CONSEQUENCES OF CRIMES WITH ASSAULT WEAPONS AND LARGE CAPACITY MAGAZINES

One of the primary considerations motivating passage of the ban on AWs and LCMs was a concern over the perceived dangerousness of these guns and magazines. In principal, semiautomatic weapons with LCMs enable offenders to fire high numbers of shots rapidly, thereby potentially increasing both the number of person wounded per gunfire incident (including both intended targets and innocent bystanders) and the number of gunshot victims suffering multiple wounds, both of which would increase deaths and injuries from gun violence. Ban advocates also argued that the banned AWs possessed additional features conducive to criminal applications.

The findings of the previous chapters suggest that it is premature to make definitive assessments of the ban's impact on gun violence. Although criminal use of AWs has declined since the ban, this reduction was offset through at least the late 1990s by steady or rising use of other guns equipped with LCMs. As argued previously, the LCM ban has greater potential for reducing gun deaths and injuries than does the AW ban. Guns with LCMs – of which AWs are only a subset – were used in up to 25% of gun crimes before the ban, whereas AWs were used in no more than 8% (Chapter 3). Furthermore, an LCM is arguably the most important feature of an AW. Hence, use of guns with LCMs is probably more consequential than use of guns with other military-style features, such as flash hiders, folding rifle stocks, threaded barrels for attaching a silencers, and so on.<sup>94</sup>

This is not to say that reducing use of AWs will have no effect on gun crime; a decline in the use of AWs does imply fewer crimes with guns having particularly large magazines (20 or more rounds) and other military-style features that could facilitate some crimes. However, it seems that any such effects would be outweighed, or at least

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<sup>94</sup> While it is conceivable that changing features of AWs other than their magazines might prevent some gunshot victimizations, available data provide little if any empirical basis for judging the likely size of such effects. Speculatively, some of the most beneficial weapon redesigns may be the removal of folding stocks and pistol grips from rifles. It is plausible that some offenders who cannot obtain rifles with folding stocks (which make the guns more concealable) might switch to handguns, which are more concealable but generally cause less severe wounds (e.g. see DiMaio, 1985). However, such substitution patterns cannot be predicted with certainty. Police gun databases rarely have information sufficiently detailed to make assessments of changes over time in the use of weapons with specific features like folding stocks. Based on informal assessments, there was no consistent pattern in post-ban use of rifles (as a share of crime guns) in the local databases examined in the prior chapters (also see the specific comments on LCM rifles in the previous chapters).

Pistol grips enhance the ability of shooters to maintain control of a rifle during rapid, “spray and pray” firing (e.g., see Violence Policy Center, 2003). (Heat shrouds and forward handgrips on APs serve the same function.) While this feature may prove useful in military contexts (e.g., firefights among groups at 100 meters or less – see data of the U.S. Army's Operations Research Office as cited in Violence Policy Center, 2003), it is unknown whether civilian attacks with semiautomatic rifles having pistol grips claim more victims per attack than do those with other semiautomatic rifles. At any rate, most post-ban AR-type rifles still have pistol grips. Further, the ban does not count a stock thumbhole grip, which serves the same function as a pistol grip (e.g., see the illustration of LCMM rifles in Chapter 2), as an AR feature.

obscured, by the wider effects of LCM use, which themselves are likely to be small at best, as we argue below.<sup>95</sup>

Because offenders can substitute non-banned guns and small magazines for banned AWs and LCMs, there is not a clear rationale for expecting the ban to reduce assaults and robberies with guns.<sup>96</sup> But by forcing AW and LCM offenders to substitute non-AWs with small magazines, the ban might reduce the number of shots fired per gun attack, thereby reducing both victims shot per gunfire incident and gunshot victims sustaining multiple wounds. In the following sections, we consider the evidence linking high-capacity semiautomatics and AWs to gun violence and briefly examine recent trends in lethal and injurious gun violence.

### **9.1. The Spread of Semiautomatic Weaponry and Trends in Lethal and Injurious Gun Violence Prior to the Ban**

Nationally, semiautomatic handguns grew from 28% of handgun production in 1973 to 80% in 1993 (Zawitz, 1995, p. 3). Most of this growth occurred from the late 1980s onward, during which time the gun industry also increased marketing and production of semiautomatics with LCMs (Wintemute, 1996). Likewise, semiautomatics grew as a percentage of crime guns (Koper, 1995; 1997), implying an increase in the average firing rate and ammunition capacity of guns used in crime.<sup>97</sup>

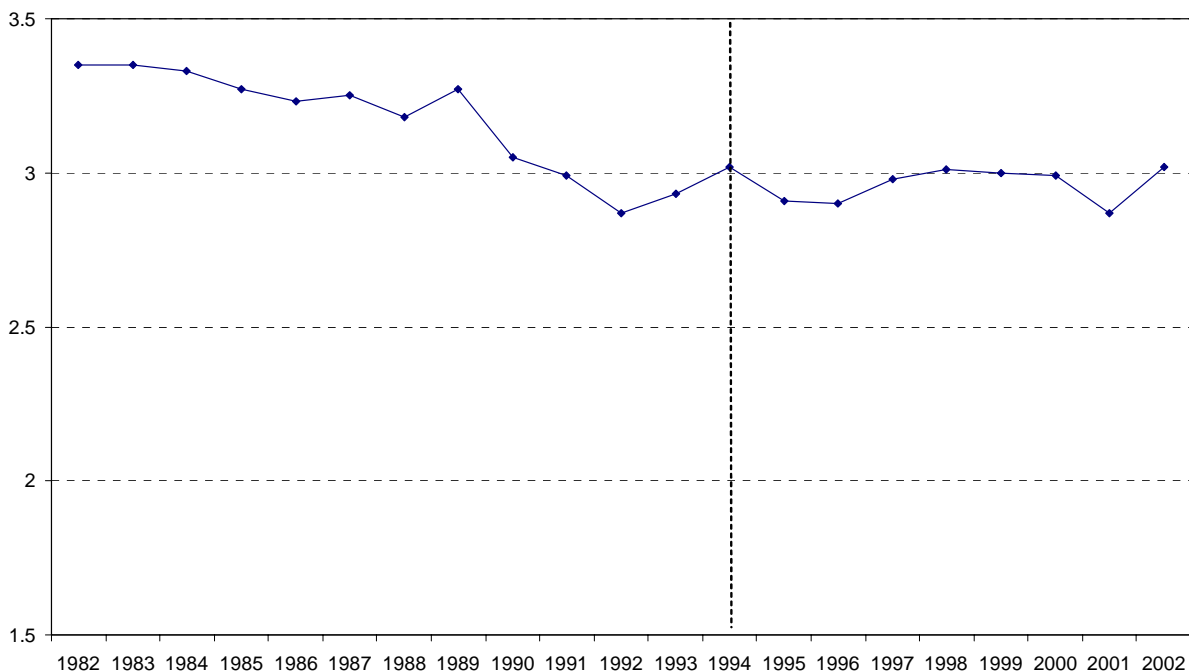
<sup>95</sup> On a related note, a few studies suggest that state-level AW bans have not reduced crime (Koper and Roth, 2001a; Lott, 2003). This could be construed as evidence that the federal AW ban will not reduce gunshot victimizations without reducing LCM use because the state bans tested in those studies, as written at the time, either lacked LCM bans or had LCM provisions that were less restrictive than that of the federal ban. (New Jersey's 1990 AW ban prohibited magazines holding more than 15 rounds. AP bans passed by Maryland and Hawaii prohibited magazines holding more than 20 rounds and pistol magazines holding more than 10 rounds, respectively, but these provisions did not take effect until just a few months prior to the federal ban.) However, it is hard to draw definitive conclusions from these studies for a number of reasons, perhaps the most salient of which are the following: there is little evidence on how state AW bans affect the availability and use of AWs (the impact of these laws is likely undermined to some degree by the influx of AWs from other states, a problem that was probably more pronounced prior to the federal ban when the state laws were most relevant); studies have not always examined the effects of these laws on gun homicides and shootings, the crimes that are arguably most likely to be affected by AW bans (see discussion in the main text); and the state AW bans that were passed prior to the federal ban (those in California, New Jersey, Hawaii, Connecticut, and Maryland) were in effect for only three months to five years (two years or less in most cases) before the imposition of the federal ban, after which they became largely redundant with the federal legislation and their effects more difficult to predict and estimate.

<sup>96</sup> One might hypothesize that the firepower provided by AWs and other semiautomatics with LCMs emboldens some offenders to engage in aggressive behaviors that prompt more shooting incidents. On the other hand, these weapons might also prevent some acts of violence by intimidating adversaries, thus discouraging attacks or resistance. We suspect that firepower does influence perceptions, considering that many police departments have upgraded their weaponry in recent years – often adopting semiautomatics with LCMs – because their officers felt outgunned by offenders. However, hypotheses about gun types and offender behavior are very speculative, and, pending additional research on such issues, it seems prudent to focus on indicators with stronger theoretical and empirical foundations.

<sup>97</sup> Revolvers, the most common type of non-semiautomatic handgun, typically hold only 5 or 6 rounds (and sometimes up to 9). Semiautomatic pistols, in contrast, hold ammunition in detachable magazines that, prior to the ban, typically held 5 to 17 bullets and sometimes upwards of 30 (Murtz et al., 1994).

The impact of this trend is debatable. Although the gun homicide rate rose considerably during the late 1980s and early 1990s (Bureau of Justice Statistics, 1994, p. 13), the percentage of violent gun crimes resulting in death was declining (see Figure 9-1 and the related discussion in section 9.3). Similarly, the percentage of victims killed or wounded in handgun discharge incidents declined from 27% during the 1979-1987 period to 25% for the 1987-1992 period (calculated from Rand, 1990, p. 5; 1994, p. 2) as semiautomatics were becoming more common crime weapons.<sup>98</sup> On the other hand, an increasing percentage of gunshot victims died from 1992 to 1995 according to hospital data (Cherry et al., 1998), a trend that could have been caused in part by a higher number of gunshot victims with multiple wounds (also see McGonigal et al., 1993). Most notably, the case fatality rate for assaultive gunshot cases involving 15 to 24-year-old males rose from 15.9% in late 1993 to 17.5% in early 1995 (p. 56).

**Figure 9-1. Percentage of Violent Gun Crimes Resulting in Death (National), 1982-2002**



Based on gun homicides, gun robberies, and gun assaults reported in the Uniform Crime Reports and Supplemental Homicide Reports.

<sup>98</sup> A related point is that there was a general upward trend in the average number of shots fired by offenders in gunfights with New York City police from the late 1980s through 1992 (calculated from Goehl, 1993, p. 51). However, the average was no higher during this time than during many years of the early 1980s and 1970s.

Some researchers have inferred links between the growing use of semiautomatics in crime and the rise of both gun homicides and bystander shootings in a number of cities during the late 1980s and early 1990s (Block and Block, 1993; McGonigal et al., 1993; Sherman et al., 1989; Webster et al., 1992). A study in Washington, DC, for example, reported increases in wounds per gunshot victim and gunshot patient mortality during the 1980s that coincided with a reported increase in the percentage of crime guns that were semiautomatics (Webster et al., 1992).

Nevertheless, changes in offender behavior, coupled with other changes in crime guns (e.g., growing use of large caliber handguns – see Caruso et al., 1999; Koper, 1995; 1997; Wintemute, 1996), may have been key factors driving such trends. Washington, DC, for example, was experiencing an exploding crack epidemic at the time of the aforementioned study, and this may have raised the percentage of gun attacks in which offenders had a clear intention to injure or kill their victims. Moreover, studies that attempted to make more explicit links between the use of semiautomatic firearms and trends in lethal gun violence via time series analysis failed to produce convincing evidence of such links (Koper, 1995; 1997). However, none of the preceding research related specific trends in the use of AWs or LCMs to trends in lethal gun violence.

## 9.2. Shots Fired in Gun Attacks and the Effects of Weaponry on Attack Outcomes

The evidence most directly relevant to the potential of the AW-LCM ban to reduce gun deaths and injuries comes from studies examining shots fired in gun attacks and/or the outcomes of attacks involving different types of guns. Unfortunately, such evidence is very sparse.

As a general point, the faster firing rate and larger ammunition capacities of semiautomatics, especially those equipped with LCMs, have the potential to affect the outcomes of many gun attacks because gun offenders are not particularly good shooters. Offenders wounded their victims in no more than 29% of gunfire incidents according to national, pre-ban estimates (computed from Rand, 1994, p. 2; also see estimates presented later in this chapter). Similarly, a study of handgun assaults in one city revealed a 31% hit rate per shot, based on the sum totals of all shots fired and wounds inflicted (Reedy and Koper, 2003, p. 154). Other studies have yielded hit rates per shot ranging from 8% in gunfights with police (Goehl, 1993, p. 8) to 50% in mass murders (Kleck, 1997, p. 144). Even police officers, who are presumably certified and regularly re-certified as proficient marksman and who are almost certainly better shooters than are average gun offenders, hit their targets with only 22% to 39% of their shots (Kleck, 1991, p. 163; Goehl, 1993). Therefore, the ability to deliver more shots rapidly should raise the likelihood that offenders hit their targets, not to mention innocent bystanders.<sup>99</sup>

<sup>99</sup> However, some argue that this capability is offset to some degree by the effects of recoil on shooter aim, the limited number of shots fired in most criminal attacks (see below), and the fact that criminals using non-semiautomatics or semiautomatics with small magazines usually have the time and ability to deliver multiple shots if desired (Kleck, 1991, pp. 78-79).



A few studies have compared attacks with semiautomatics, sometimes specifically those with LCMs (including AWs), to other gun assaults in terms of shots fired, persons hit, and wounds inflicted (see Tables 9-1 and 9-2). The most comprehensive of these studies examined police reports of attacks with semiautomatic pistols and revolvers in Jersey City, New Jersey from 1992 through 1996 (Reedy and Koper, 2003), finding that use of pistols resulted in more shots fired and higher numbers of gunshot victims (Table 9-1), though not more gunshot wounds per victim (Table 9-2).<sup>100</sup> Results implied there would have been 9.4% fewer gunshot victims overall had semiautomatics not been used in any of the attacks. Similarly, studies of gun murders in Philadelphia (see McGonigal et al., 1993 in Table 9-1) and a number of smaller cities in Pennsylvania, Ohio, and Iowa (see Richmond et al., 2003 in Table 9-2) found that attacks with semiautomatics resulted in more shots fired and gunshot wounds per victim. An exception is that the differential in shots fired between pistol and revolver cases in Philadelphia during 1990 did not exist for cases that occurred in 1985, when semiautomatics and revolvers had been fired an average of 1.6 and 1.9 times, respectively. It is not clear whether the increase in shots fired for pistol cases from 1985 to 1990 was due to changes in offender behavior, changes in the design or quality of pistols (especially an increase in the use of models with LCMs – see Wintemute, 1996), the larger sample for 1990, or other factors.

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<sup>100</sup> But unlike other studies that have examined wounds per victim (see Table 9-2), this study relied on police reports of wounds inflicted rather than medical reports, which are likely to be more accurate.



**Table 9-1. Shots Fired and Victims Hit in Gunfire Attacks By Type of Gun and Magazine**

<b>Data Source</b>	<b>Measure</b>	<b>Outcome</b>
Gun attacks with semiautomatic pistols and revolvers, Jersey City, 1992-1996 <sup>a</sup>	Shots Fired	Avg. = 3.2 – 3.7 (n=165 pistol cases) * Avg. = 2.3 – 2.6 (n=71 revolver cases) *
Gun homicides with semiautomatic pistols and revolvers, Philadelphia, 1985 and 1990 <sup>b</sup>	Shots Fired	Avg. = 1.6 (n=21 pistol cases, 1985) Avg. = 1.9 (n=57 revolver cases, 1985)  Avg. = 2.7 (n=95 pistol cases, 1990) Avg. = 2.1 (n=108 revolver cases, 1990)
Gun attacks with semiautomatic pistols and revolvers, Jersey City, 1992-1996 <sup>a</sup>	Victims Hit	Avg. = 1.15 (n=95 pistol cases) * Avg. = 1.0 (n=40 revolver cases) *
Mass shootings with AWs, semiautomatics having LCMs, or other guns, 6+ dead or 12+ shot, United States, 1984-1993 <sup>c</sup>	Victims Hit	Avg. = 29 (n=6 AW/LCM cases)  Avg. = 13 (n=9 non-AW/LCM cases)
Self-reported gunfire attacks by state prisoners with AWs, other semiautomatics, and non-semiautomatic firearms, United States, 1997 or earlier <sup>d</sup>	% of Attacks With Victims Hit	19.5% (n=72 AW or machine gun cases)  22.3% (n=419 non-AW, semiautomatic cases)  23.3% (n=608 non-AW, non-semiautomatic cases)

a. Reedy and Koper (2003)

b. McGonigal et al. (1993)

c. Figures calculated by Koper and Roth (2001a) based on data presented by Kleck (1997, p. 144)

d. Calculated from Harlow (2001, p. 11). (Sample sizes are based on unpublished information provided by the author of the survey report.)

\* Pistol/revolver differences statistically significant at  $p < .05$  (only Reedy and Koper [2003] and Harlow [2001] tested for statistically significant differences). The shots fired ranges in Reedy and Koper are based on minimum and maximum estimates.

**Table 9-2. Gunshot Wounds Per Victim By Type of Gun and Magazine**

Data Source	Measure	Outcome
Gun attacks with semiautomatic pistols and revolvers, Jersey City, 1992-1996 <sup>a</sup>	Gunshot Wounds	Avg. = 1.4 (n=107 pistol victims) Avg. = 1.5 (n=40 revolver victims)
Gun homicides with semiautomatic pistols and revolvers, Iowa City (IA), Youngstown (OH), and Bethlehem (PA), 1994-1998 <sup>b</sup>	Gunshot Wounds	Avg. = 4.5 total (n=212 pistol victims)* Avg. = 2.9 entry  Avg. = 2.0 total (n=63 revolver victims)* Avg. = 1.5 entry
Gun homicides with assault weapons (AWs), guns having large capacity magazines (LCMs), and other firearms, Milwaukee, 1992-1995 <sup>c</sup>	Gunshot Wounds	Avg. = 3.23 (n=30 LCM victims) ** Avg. = 3.14 (n=7 AW victims)  Avg. = 2.08 (n=102 non-AW/LCM victims)**

a. Reedy and Koper (2003)

b. Richmond et al. (2003)

c. Roth and Koper (1997, Chapter 6)

\* Pistol/revolver differences statistically significant at  $p < .01$ .

\*\* The basic comparison between LCM victims and non-AW/LCM victims was moderately significant ( $p < .10$ ) with a one-tailed test. Regression results (with a slightly modified sample) revealed a difference significant at  $p = .05$  (two-tailed test). Note that the non-LCM group included a few cases involving non-banned LCMs (.22 caliber attached tubular devices).

Also, a national survey of state prisoners found that, contrary to expectations, offenders who reported firing on victims with AWs and other semiautomatics were no more likely to report having killed or injured victims than were other gun offenders who reported firing on victims (Table 9-1). However, the measurement of guns used and attack outcomes were arguably less precise in this study, which was based on offender self-reports, than in other studies utilizing police and medical reports.<sup>101</sup>

Attacks with AWs or other guns with LCMs may be particularly lethal and injurious, based on very limited evidence. In mass shooting incidents (defined as those in which at least 6 persons were killed or at least 12 were wounded) that occurred during the decade preceding the ban, offenders using AWs and other semiautomatics with LCMs (sometimes in addition to other guns) claimed an average of 29 victims in comparison to an average of 13 victims for other cases (Table 9-1). (But also see the study discussed in the preceding paragraph in regards to victims hit in AW cases.)

Further, a study of Milwaukee homicide victims from 1992 through 1995 revealed that those killed with AWs were shot 3.14 times on average, while those killed with any

<sup>101</sup> See the discussion of self-reports and AW use in Chapter 3.

gun having an LCM were shot 3.23 times on average (Table 9-2). In contrast, victims shot with guns having small magazines had only 2.1 wounds on average. If such a wound differential can be generalized to other gun attacks – if, that is, both fatal and non-fatal LCM gunshot victims are generally hit one or more extra times – then LCM use could have a considerable effect on the number of gunshot victims who die. To illustrate, the fatality rate among gunshot victims in Jersey City during the 1990s was 63% higher for those shot twice than for those shot once (26% to 16%) (Koper and Roth, 2001a; 2001b). Likewise, fatality rates are 61% higher for patients with multiple chest wounds than for patients with a single chest wound (49% to 30.5%), based on a Washington, DC study (Webster et al., 1992, p. 696).

Similar conclusions can also be inferred indirectly from the types of crimes involving LCM guns. To illustrate, handguns associated with gunshot victimizations in Baltimore (see the description of the Baltimore gun and magazine data in the preceding chapter) are 20% to 50% more likely to have LCMs than are handguns associated with other violent crimes, controlling for weapon caliber (Table 9-3). This difference may be due to higher numbers of shots and hits in crimes committed with LCMs, although it is also possible that offenders using LCMs are more likely to fire on victims. But controlling for gunfire, guns used in shootings are 17% to 26% more likely to have LCMs than guns used in gunfire cases resulting in no wounded victims (perhaps reflecting higher numbers of shots fired and victims hit in LCM cases), and guns linked to murders are 8% to 17% more likely to have LCMs than guns linked to non-fatal gunshot victimizations (perhaps indicating higher numbers of shots fired and wounds per victim in LCM cases).<sup>102</sup> These differences are not all statistically significant, but the pattern is consistent. And as discussed in Chapter 3, AWs account for a larger share of guns used in mass murders and murders of police, crimes for which weapons with greater firepower would seem particularly useful.

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<sup>102</sup> Cases with and without gunfire and gunshot victims were approximated based on offense codes contained in the gun seizure data (some gunfire cases not resulting in wounded victims may not have been identified as such, and it is possible that some homicides were not committed with the guns recovered during the investigations). In order to control for caliber effects, we focused on 9mm and .38 caliber handguns. Over 80% of the LCM handguns linked to violent crimes were 9mm handguns. Since all (or virtually all) 9mm handguns are semiautomatics, we also selected .38 caliber guns, which are close to 9mm in size and consist almost entirely of revolvers and derringers.

The disproportionate involvement of LCM handguns in injury and death cases is greatest in the comparisons including both 9mm and .38 caliber handguns. This may reflect a greater differential in average ammunition capacity between LCM handguns and revolvers/derringers than between LCM handguns and other semiautomatics. The differential in fatal and non-fatal gunshot victims may also be due to caliber effects; 9mm is generally a more powerful caliber than .38 based on measures like kinetic energy or relative stopping power (e.g., see DiMaio, 1985, p. 140; Warner 1995, p. 223; Wintemute, 1996, p. 1751).

**Table 9-3. Probabilities That Handguns Associated With Murders, Non-Fatal Shootings, and Other Violent Crimes Were Equipped With Large Capacity Magazines in Baltimore, 1993-2000**

<u>Handgun Sample</u>	<u>% With LCM</u>	<u>% Difference (#2 Relative to #1)</u>
<b>A. Handguns Used in Violent Crimes With and Without Gunshot Injury</b>		
1) 9mm and .38: violence, no gunshot victims	23.21%	
2) 9mm and .38: violence with gunshot victims	34.87%	50%*
1) 9mm: violence, no gunshot victims	52.92%	
2) 9mm: violence with gunshot victims	63.24%	20%*
<b>B. Handguns Used in Gunfire Cases With and Without Gunshot Injury</b>		
1) 9mm and .38: gunfire, no gunshot victims	27.66%	
2) 9mm and .38: gunfire with gunshot victims	34.87%	26%
1) 9mm: gunfire, no gunshot victims	54.17%	
2) 9mm: gunfire with gunshot victims	63.24%	17%
<b>C. Handguns Used in Fatal Versus Non-Fatal Gunshot Victimizations</b>		
1) 9mm and .38: non-fatal gunshot victims	32.58%	
2) 9mm and .38: homicides	38.18%	17%
1) 9mm: non-fatal gunshot victims	61.14%	
2) 9mm: homicides	66.04%	8%

\* Statistically significant difference at  $p < .01$  (chi-square).

The findings of the preceding studies are subject to numerous caveats. There were few if any attempts to control for characteristics of the actors or situations that might have influenced weapon choices and/or attack outcomes.<sup>103</sup> Weapons data were typically missing for substantial percentages of cases. Further, many of the comparisons in the tables were not tested for statistical significance (see the notes to Tables 9-1 and 9-2).<sup>104</sup>

Tentatively, nonetheless, the evidence suggests more often than not that attacks with semiautomatics, particularly those equipped with LCMs, result in more shots fired, leading to both more injuries and injuries of greater severity. Perhaps the faster firing rate and larger ammunition capacities afforded by these weapons prompt some offenders to fire more frequently (i.e., encouraging what some police and military persons refer to as a “spray and pray” mentality). But this still begs the question of whether a 10-round limit on magazine capacity will affect the outcomes of enough gun attacks to measurably reduce gun injuries and deaths.

<sup>103</sup> In terms of offender characteristics, recall from Chapter 3 that AP buyers are more likely than other gun buyers to have criminal histories and commit subsequent crimes. This does not seem to apply, however, to the broader class of semiautomatic users: handgun buyers with and without criminal histories tend to buy pistols in virtually the same proportions (Wintemute et al., 1998b), and youthful gun offenders using pistols and revolvers have very comparable criminal histories (Sheley and Wright, 1993b, p. 381). Further, semiautomatic users, including many of those using AWs, show no greater propensity to shoot at victims than do other gun offenders (Harlow, 2001, p. 11; Reedy and Koper, 2003). Other potential confounders to the comparisons in Tables 9-1 and 9-2 might include shooter age and skill, the nature of the circumstances (e.g., whether the shooting was an execution-style shooting), the health of the victim(s), the type of location (e.g., indoor or outdoor location), the distance between the shooter and intended victim(s), the presence of multiple persons who could have been shot intentionally or accidentally (as bystanders), and (in the mass shooting incidents) the use of multiple firearms.

<sup>104</sup> Tables 9-1 and 9-2 present the strongest evidence from the available studies. However, there are additional findings from these studies and others that, while weaker, are relevant. Based on gun model information available for a subset of cases in the Jersey City study, there were 12 gunfire cases involving guns manufactured with LCMs before the ban (7 of which resulted in wounded victims) and 94 gunfire cases involving revolvers or semiautomatic models without LCMs. Comparisons of these cases produced results similar to those of the main analysis: shot fired estimates ranged from 2.83 to 3.25 for the LCM cases and 2.22 to 2.6 for the non-LCM cases; 1.14 victims were wounded on average in the LCM gunshot cases and 1.06 in the non-LCM gunshot cases; and LCM gunshot victims had 1.14 wound on average, which, contrary to expectations, was less than the 1.47 average for other gunshot victims.

The compilation of mass shooting incidents cited in Table 9-1 had tentative shots fired estimates for 3 of the AW-LCM cases and 4 of the other cases. The AW-LCM cases averaged 93 shots per incident, a figure two and a half times greater than the 36.5 shot average for the other cases.

Finally, another study of firearm mass murders found that the average number of victims killed (tallies did not include others wounded) was 6 in AW cases and 4.5 in other cases (Roth and Koper, 1997, Appendix A). Only 2 of the 52 cases studied clearly involved AWs (or very similar guns). However, the make and model of the firearm were available for only eight cases, so additional incidents may have involved LCMs; in fact, at least 35% of the cases involved unidentified semiautomatics. (For those cases in which at least the gun type and firing action were known, semiautomatics outnumbered non-semiautomatics by 6 to 1, perhaps suggesting that semiautomatics are used disproportionately in mass murders.)

### 9.2.1. *Will a 10-Round Magazine Limit Reduce Gunshot Victimization?*

Specific data on shots fired in gun attacks are quite fragmentary and often inferred indirectly, but they suggest that relatively few attacks involve more than 10 shots fired.<sup>105</sup> Based on national data compiled by the FBI, for example, there were only about 19 gun murder incidents a year involving four or more victims from 1976 through 1995 (for a total of 375) (Fox and Levin, 1998, p. 435) and only about one a year involving six or more victims from 1976 through 1992 (for a total of 17) (Kleck, 1997, p. 126). Similarly, gun murder victims are shot two to three times on average according to a number of sources (see Table 9-2 and Koper and Roth, 2001a), and a study at a Washington, DC trauma center reported that only 8% of all gunshot victims treated from 1988 through 1990 had five or more wounds (Webster et al., 1992, p. 696).

However, counts of victims hit or wounds inflicted provide only a lower bound estimate of the number of shots fired in an attack, which could be considerably higher in light of the low hit rates in gunfire incidents (see above).<sup>106</sup> The few available studies on shots fired show that assailants fire less than four shots on average (see sources in Table 9-1 and Goehl, 1993), a number well within the 10-round magazine limit imposed by the AW-LCM ban, but these studies have not usually presented the full distribution of shots fired for all cases, so it is usually unclear how many cases, if any, involved more than 10 shots.

An exception is the aforementioned study of handgun murders and assaults in Jersey City (Reedy and Koper, 2003). Focusing on cases for which at least the type of handgun (semiautomatic, revolver, derringer) could be determined, 2.5% of the gunfire cases involved more than 10 shots.<sup>107</sup> These incidents – all of which involved pistols – had a 100% injury rate and accounted for 4.7% of all gunshot victims in the sample (see Figure 9-2). Offenders fired a total of 83 shots in these cases, wounding 7 victims, only 1 of whom was wounded more than once. Overall, therefore, attackers fired over 8 shots

<sup>105</sup> Although the focus of the discussion is on attacks with more than 10 shots fired, a gun user with a post-ban 10-round magazine can attain a firing capacity of 11 shots with many semiautomatics by loading one bullet into the chamber before loading the magazine.

<sup>106</sup> As a dramatic example, consider the heavily publicized case of Amadou Diallo, who was shot to death by four New York City police officers just a few years ago. The officers in this case fired upon Diallo 41 times but hit him with only 19 shots (a 46% hit rate), despite his being confined in a vestibule. Two of the officers reportedly fired until they had emptied their 16-round magazines, a reaction that may not be uncommon in such high-stress situations. In official statistics, this case will appear as having only one victim.

<sup>107</sup> The shots fired estimates were based on reported gunshot injuries, physical evidence (for example, shell casings found at the scene), and the accounts of witnesses and actors. The 2.5% figure is based on minimum estimates of shots fired. Using maximum estimates, 3% of the gunfire incidents involved more than 10 shots (Reedy and Koper, 2003, p. 154).

A caveat to these figures is that the federal LCM ban was in effect for much of the study period (which spanned January 1992 to November 1996), and a New Jersey ban on magazines with more than 15 rounds predated the study period. It is thus conceivable that these laws reduced attacks with LCM guns and attacks with more than 10 shots fired, though it seems unlikely that the federal ban had any such effect (see the analyses of LCM use presented in the previous chapter). Approximately 1% of the gunfire incidents involved more than 15 shots.



for every wound inflicted, suggesting that perhaps fewer persons would have been wounded had the offenders not been able to fire as often.<sup>108</sup>

### **Figure 9-2. Attacks With More Than 10 Shots Fired**

#### **Jersey City Handgun Attacks, 1992-1996**

- **2.5% - 3% of gunfire incidents involved 11+ shots**
  - **3.6% - 4.2% of semiauto pistol attacks**
- **100% injury rate**
- **Produced 4.7% of all gunshot wound victims**
- **8.3 shots per gunshot wound**

Based on data reported by Reedy and Koper (2003). Injury statistics based on the 2.5% of cases involving 11+ shots by minimum estimate.

Caution is warranted in generalizing from these results because they are based on a very small number of incidents (6) from one sample in one city. Further, it is not known if the offenders in these cases had LCMs (gun model and magazine information was very limited); they may have emptied small magazines, reloaded, and continued firing. But subject to these caveats, the findings suggest that the ability to deliver more than 10 shots without reloading may be instrumental in a small but non-trivial percentage of gunshot victimizations.

On the other hand, the Jersey City study also implies that eliminating AWs and LCMs might only reduce gunshot victimizations by up to 5%. And even this estimate is probably overly optimistic because the LCM ban cannot be expected to prevent all incidents with more than 10 shots. Consequently, any effects from the ban (should it be extended) are likely to be smaller and perhaps quite difficult to detect with standard statistical methods (see Koper and Roth, 2001a), especially in the near future, if recent patterns of LCM use continue.

### **9.3. Post-Ban Trends in Lethal and Injurious Gun Violence**

Having established some basis for believing the AW-LCM ban could have at least a small effect on lethal and injurious gun violence, is there any evidence of such an effect to date? Gun homicides plummeted from approximately 16,300 in 1994 to 10,100 in 1999, a reduction of about 38% (see the Federal Bureau of Investigation's *Uniform Crime*

<sup>108</sup> These figures are based on a supplemental analysis not contained in the published study. We thank Darin Reedy for this analysis.



*Reports*). Likewise, non-fatal, assaultive gunshot injuries treated in hospitals nationwide declined one-third, from about 68,400 to under 46,400, between 1994 and 1998 (Gotsch et al., 2001, pp. 23-24). Experts believe numerous factors contributed to the recent drop in these and other crimes, including changing drug markets, a strong economy, better policing, and higher incarceration rates, among others (Blumstein and Wallman, 2000). Attributing the decline in gun murders and shootings to the AW-LCM ban is problematic, however, considering that crimes with LCMs appear to have been steady or rising since the ban. For this reason, we do not undertake a rigorous investigation of the ban's effects on gun violence.<sup>109</sup>

But a more casual assessment shows that gun crimes since the ban have been no less likely to cause death or injury than those before the ban, contrary to what we might expect if crimes with AWs and LCMs had both declined. For instance, the percentage of violent gun crimes resulting in death has been very stable since 1990 according to national statistics on crimes reported to police (see Figure 9-1 in section 9.1).<sup>110</sup> In fact, the percentage of gun crimes resulting in death during 2001 and 2002 (2.94%) was slightly higher than that during 1992 and 1993 (2.9%).

Similarly, neither medical nor criminological data sources have shown any post-ban reduction in the percentage of crime-related gunshot victims who die. If anything, this percentage has been higher since the ban, a pattern that could be linked in part to more multiple wound victimizations stemming from elevated levels of LCM use. According to medical examiners' reports and hospitalization estimates, about 20% of gunshot victims died nationwide in 1993 (Gotsch et al., 2001). This figure rose to 23% in 1996, before declining to 21% in 1998 (Figure 9-3).<sup>111</sup> Estimates derived from the Uniform Crime Reports and the Bureau of Justice Statistics' annual National Crime Victimization Survey follow a similar pattern from 1992 to 1999 (although the ratio of fatal to non-fatal cases is much higher in these data than that in the medical data) and also show a considerable increase in the percentage of gunshot victims who died in 2000 and 2001 (Figure 9-3).<sup>112</sup> Of course, changes in offender behavior or other changes in crime

<sup>109</sup> In our prior study (Koper and Roth 2001a; Roth and Koper, 1997, Chapter 6), we estimated that gun murders were about 7% lower than expected in 1995 (the first year after the ban), adjusting for pre-existing trends. However, the very limited post-ban data available for that study precluded a definitive judgment as to whether this drop was statistically meaningful (see especially Koper and Roth, 2001a). Furthermore, that analysis was based on the assumption that crimes with both AWs and LCMs had dropped in the short-term aftermath of the ban, an assumption called into question by the findings of this study. It is now more difficult to credit the ban with any of the drop in gun murders in 1995 or anytime since. We did not update the gun murder analysis because interpreting the results would be unavoidably ambiguous. Such an investigation will be more productive after demonstrating that the ban has reduced crimes with both AWs and LCMs.

<sup>110</sup> The decline in this figure during the 1980s was likely due in part to changes in police reporting of aggravated assaults in recent decades (Blumstein, 2000). The ratio of gun murders to gun robberies rose during the 1980s, then declined and remained relatively flat during the 1990s.

<sup>111</sup> Combining homicide data from 1999 with non-fatal gunshot estimates for 2000 suggests that about 20% of gunshot victimizations resulted in death during 1999 and 2000 (Simon et al., 2002).

<sup>112</sup> The SHR/NCVS estimates should be interpreted cautiously because the NCVS appears to undercount non-fatal gunshot wound cases by as much as two-thirds relative to police data, most likely because it fails to represent adequately the types of people most likely to be victims of serious crime (i.e., young urban males who engage in deviant lifestyles) (Cook, 1985). Indeed, the rate of death among gunshot victims

weaponry (such as an increase in shootings with large caliber handguns) may have influenced these trends. Yet is worth noting that multiple wound shootings were elevated over pre-ban levels during 1995 and 1996 in four of five localities examined during our first AW study, though most of the differences were not statistically significant (Table 9-4, panels B through E).

Another potential indicator of ban effects is the percentage of gunfire incidents resulting in fatal or non-fatal gunshot victimizations. If attacks with AWs and LCMs result in more shots fired and victims hit than attacks with other guns and magazines, we might expect a decline in crimes with AWs and LCMs to reduce the share of gunfire incidents resulting in victims wounded or killed. Measured nationally with UCR and NCVS data, this indicator was relatively stable at around 30% from 1992 to 1997, before rising to about 40% from 1998 through 2000 (Figure 9-4).<sup>113</sup> Along similar lines, multiple victim gun homicides remained at relatively high levels through at least 1998, based on the national average of victims killed per gun murder incident (Table 9-4, panel A).<sup>114</sup>

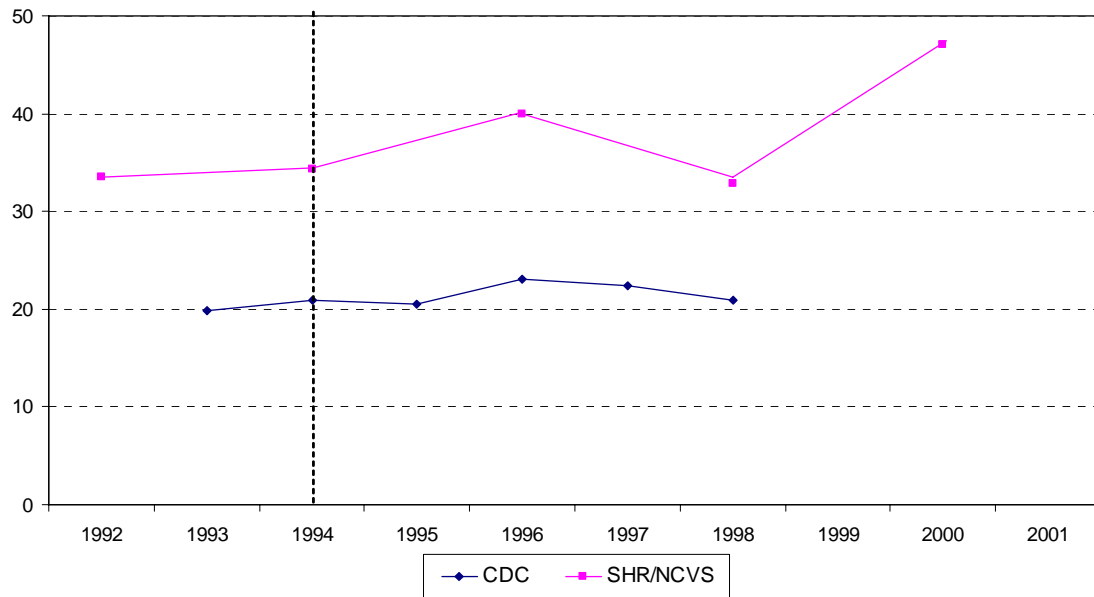
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appears much higher in the SHR/NCVS series than in data compiled from medical examiners and hospitals (see the CDC series in Figure 9-3). But if these biases are relatively consistent over time, the data may still provide useful insights into trends over time.

<sup>113</sup> The NCVS estimates are based on a compilation of 1992-2002 data recently produced by the Inter-University Consortium for Political and Social Research (ICPSR study 3691). In 2002, only 9% of non-fatal gunfire incidents resulted in gunshot victimizations. This implies a hit rate for 2002 that was below pre-ban levels, even after incorporating gun homicide cases into the estimate. However, the 2002 NCVS estimate deviates quite substantially from earlier years, for which the average hit rate in non-fatal gunfire incidents was 24% (and the estimate for 2001 was 20%). Therefore, we did not include the 2002 data in our analysis. We used two-year averages in Figures 9-3 and 9-4 because the annual NCVS estimates are based on very small samples of gunfire incidents. The 2002 sample was especially small, so it seems prudent to wait for more data to become available before drawing conclusions about hit rates since 2001.

<sup>114</sup> We thank David Huffer for this analysis.

**Figure 9-3. Percentage of Gunshot Victimization Resulting in Death (National), 1992-2001**



SHR/NCVS series based on two-year averages from the Supplemental Homicide Reports and National Crime Victimization Survey. CDC series based on homicide and hospitalization data from the Centers for Disease Control (reported by Gotsch et al. 2001).

**Table 9-4. Short-Term, Post-Ban Changes in the Lethality and Injuriousness of Gun Violence: National and Local Indicators, 1994-1998 <sup>a</sup>**

<b>Measure and Location</b>	<b><u>Pre-Ban Period</u></b>	<b><u>Post-Ban Period</u></b>	<b>Change</b>
A. Victims Per Gun Homicide Incident (National)	Jan. 1986-Sept. 1994 1.05 (N=106,668)	Oct. 1994-Dec. 1998 1.06 (N=47,511)	1% **
B. Wounds per Gun Homicide Victim: Milwaukee County	Jan. 1992-Aug. 1994 2.28 (N=282)	Sept. 1994-Dec. 1995 2.52 (N=136)	11%
C. Wounds Per Gun Homicide Victim: Seattle (King County)	Jan. 1992-Aug. 1994 2.08 (N=184)	Sept. 1994-Jun. 1996 2.46 (N=91)	18%
D. Wounds Per Gunshot Victim: Jersey City (NJ)	Jan. 1992-Aug. 94 1.42 (N=125)	Sept. 1994-Jun. 1996 1.39 (N=137)	-2%
E. % of Gun Homicide Victims With Multiple Wounds: San Diego County	Jan. 1992-Aug. 1994 41% (N=445)	Sept. 1994-Jun. 1996 43% (N=223)	5%
F. % of Non-Fatal Gunshot Victims With Multiple Wounds: Boston	Jan. 1992-Aug. 1994 18% (N=584)	Sept. 1994-Dec. 1995 24% (N=244)	33% *

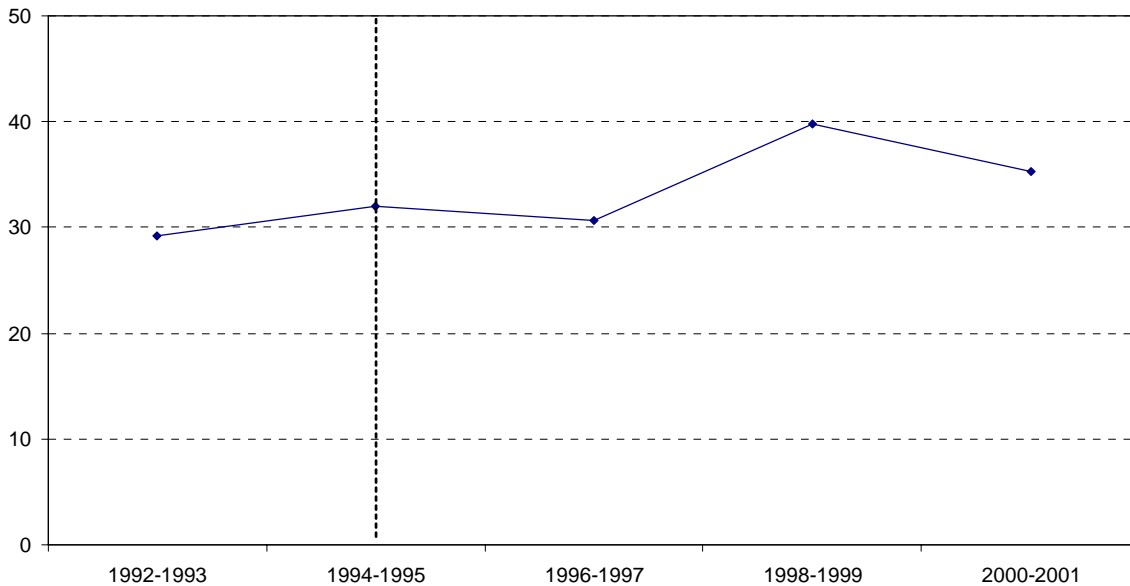
a. National victims per incident figures based on unpublished update of analysis reported in Roth and Koper (1997, Chapter 5). Gunshot wound data are taken from Roth and Koper (1997, Chapter 6) and Koper and Roth (2001a). Wound data are based on medical examiners' reports (Milwaukee, Seattle, San Diego), hospitalization data (Boston), and police reports (Jersey City).

\* Chi-square p level < .1.

\*\* T-test p level < .01.

If anything, therefore, gun attacks appear to have been more lethal and injurious since the ban. Perhaps elevated LCM use has contributed to this pattern. But if this is true, then the reverse would also be true – a reduction in crimes with LCMs, should the ban be extended, would reduce injuries and deaths from gun violence.

**Figure 9-4. Percentage of Gunfire Cases Resulting in Gunshot Victimizations (National), 1992-2001**



Based on two-year averages from the Supplemental Homicide Reports and National Crime Victimization Survey.

#### 9.4. Summary

Although the ban has been successful in reducing crimes with AWs, any benefits from this reduction are likely to have been outweighed by steady or rising use of non-banned semiautomatics with LCMs, which are used in crime much more frequently than AWs. Therefore, we cannot clearly credit the ban with any of the nation's recent drop in gun violence. And, indeed, there has been no discernible reduction in the lethality and injuriousness of gun violence, based on indicators like the percentage of gun crimes resulting in death or the share of gunfire incidents resulting in injury, as we might have expected had the ban reduced crimes with both AWs and LCMs.

However, the grandfathering provision of the AW-LCM ban guaranteed that the effects of this law would occur only gradually over time. Those effects are still unfolding and may not be fully felt for several years into the future, particularly if foreign, pre-ban LCMs continue to be imported into the U.S. in large numbers. It is thus premature to make definitive assessments of the ban's impact on gun violence.

Having said this, the ban's impact on gun violence is likely to be small at best, and perhaps too small for reliable measurement. AWs were used in no more than 8% of gun crimes even before the ban. Guns with LCMs are used in up to a quarter of gun crimes, but it is not clear how often the outcomes of gun attacks depend on the ability to fire more than 10 shots (the current limit on magazine capacity) without reloading.

Nonetheless, reducing crimes with AWs and especially LCMs could have non-trivial effects on gunshot victimizations. As a general matter, hit rates tend to be low in gunfire incidents, so having more shots to fire rapidly can increase the likelihood that offenders hit their targets, and perhaps bystanders as well. While not entirely consistent, the few available studies contrasting attacks with different types of guns and magazines generally suggest that attacks with semiautomatics – including AWs and other semiautomatics with LCMs – result in more shots fired, persons wounded, and wounds per victim than do other gun attacks. Further, a study of handgun attacks in one city found that about 3% of gunfire incidents involved more than 10 shots fired, and those cases accounted for nearly 5% of gunshot victims. However, the evidence on these matters is too limited (both in volume and quality) to make firm projections of the ban's impact, should it be reauthorized.

## 10. LOOKING TO THE FUTURE: RESEARCH RECOMMENDATIONS AND SPECULATION ABOUT THE CONSEQUENCES OF REAUTHORIZING, MODIFYING, OR LIFTING THE ASSAULT WEAPONS BAN

In this chapter, we discuss future lines of inquiry that would be informative whether or not the AW-LCM ban is renewed in September 2004. We then offer some brief thoughts about the possible consequences of reauthorizing the ban, modifying it, or allowing it to expire.

### 10.1. Research Recommendations and Data Requirements

#### *10.1.1. An Agenda for Assault Weapons Research and Recommendations for Data Collection by Law Enforcement*

The effects of the AW-LCM ban have yet to be fully realized; therefore, we recommend continued study of trends in the availability and criminal use of AWs and LCMs. Even if the ban is lifted, longer-term study of crimes with AWs and LCMs will inform future assessment of the consequences of these policy shifts and improve understanding of the responses of gun markets to gun legislation more generally.<sup>115</sup>

Developing better data on crimes with LCMs is especially important. To this end, we urge police departments and their affiliated crime labs to record information about magazines recovered with crime guns. Further, we recommend that ATF integrate ammunition magazine data into its national gun tracing system and encourage reporting of magazine data by police departments that trace firearms.

As better data on LCM use become available, more research is warranted on the impacts of AW and LCM trends (which may go up or down depending on the ban's fate) on gun murders and shootings, as well as levels of death and injury per gun crime. Indicators of the latter, such as victims per gunfire incident and wounds per gunshot victim, are useful complementary outcome measures because they reflect the mechanisms through which use of AWs and LCMs is hypothesized to affect gun deaths and injuries.<sup>116</sup> Other potentially promising lines of inquiry might relate AW and LCM use to mass murders and murders of police, crimes that are very rare but appear more likely to involve AWs (and perhaps LCMs) and to disproportionately affect public perceptions.<sup>117</sup>

<sup>115</sup> Establishing time series data on primary and secondary market prices and production or importation of various guns and magazines of policy interest could provide benefits for policy researchers. Like similar statistical series maintained for illegal drugs, such price and production series would be valuable instruments for monitoring effects of policy changes and other influences on markets for various weapons.

<sup>116</sup> However, more research is needed on the full range of factors that cause variation in these indicators over time and between places.

<sup>117</sup> Studying these crimes poses a number of challenges, including modeling of rare events, establishing the reliability and validity of methods for measuring the frequency and characteristics of mass murders (such as through media searches; see Duwe, 2000, Roth and Koper, 1997, Appendix A), and controlling for factors like the use of bullet-proof vests by police.



Finally, statistical studies relating AW and LCM use to trends in gun violence should include statistical power analysis to ensure that estimated models have sufficient ability to detect small effects, an issue that has been problematic in some of our prior time series research on the ban (Koper and Roth, 2001a) and is applicable more generally to the study of modest, incremental policy changes.

Research on aggregate trends should be complemented by more incident-based studies that contrast the dynamics and outcomes of attacks with different types of guns and magazines, while controlling for relevant characteristics of the actors and situations. Such studies would refine predictions of the change in gun deaths and injuries that would follow reductions in attacks with AWs and LCMs. For instance, how many homicides and injuries involving AWs and LCMs could be prevented if offenders were forced to substitute other guns and magazines? In what percentage of gun attacks does the ability to fire more than ten rounds without reloading affect the number of wounded victims or determine the difference between a fatal and non-fatal attack? Do other AW features (such as flash hiders and pistol grips on rifles) have demonstrable effects on the outcomes of gun attacks? Studies of gun attacks could draw upon police incident reports, forensic examinations of recovered guns and magazines, and medical and law enforcement data on wounded victims.

#### *10.1.2. Studying the Implementation and Market Impacts of Gun Control*

More broadly, this study reiterates the importance of examining the implementation of gun policies and the workings of gun markets, considerations that have been largely absent from prior research on gun control. Typical methods of evaluating gun policies involve statistical comparisons of total or gun crime rates between places and/or time periods with and without different gun control provisions. Without complimentary implementation and market measures, such studies have a “black box” quality and may lead to misleading conclusions. For example, a time series study of gun murder rates before and after the AW-LCM ban might find that the ban has not reduced gun murders. Yet the interpretation of such a finding would be ambiguous, absent market or implementation measures. Reducing attacks with AWs and LCMs may in fact have no more than a trivial impact on gun deaths and injuries, but any such impact cannot be realized or adequately assessed until the availability and use of the banned guns and magazines decline appreciably. Additionally, it may take many years for the effects of modest, incremental policy changes to be fully felt, a reality that both researchers and policy makers should heed. Similar implementation concerns apply to the evaluation of various gun control policies, ranging from gun bans to enhanced sentences for gun offenders.

Our studies of the AW ban have shown that the reaction of manufacturers, dealers, and consumers to gun control policies can have substantial effects on demand and supply for affected weapons both before and after a law’s implementation. It is important to study these factors because they affect the timing and form of a law’s impact

on the availability of weapons to criminals and, by extension, the law's impact on gun violence.

## **10.2. Potential Consequences of Reauthorizing, Modifying, or Lifting the Assault Weapons Ban**

### *10.2.1. Potential Consequences of Reauthorizing the Ban As Is*

Should it be renewed, the ban might reduce gunshot victimizations. This effect is likely to be small at best and possibly too small for reliable measurement. A 5% reduction in gunshot victimizations is perhaps a reasonable upper bound estimate of the ban's potential impact (based on the only available estimate of gunshot victimizations resulting from attacks in which more than 10 shots were fired), but the actual impact is likely to be smaller and may not be fully realized for many years into the future, particularly if pre-ban LCMs continue to be imported into the U.S. from abroad. Just as the restrictions imposed by the ban are modest – they are essentially limits on weapon accessories like LCMs, flash hiders, threaded barrels, and the like – so too are the potential benefits.<sup>118</sup> In time, the ban may be seen as an effective prevention measure that stopped further spread of weaponry considered to be particularly dangerous (in a manner similar to federal restrictions on fully automatic weapons). But that conclusion will be contingent on further research validating the dangers of AWs and LCMs.

### *10.2.2. Potential Consequences of Modifying the Ban*

We have not examined the specifics of legislative proposals to modify the AW ban. However, we offer a few general comments about the possible consequences of such efforts, particularly as they relate to expanding the range of the ban as some have advocated (Halstead, 2003, pp. 11-12).

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<sup>118</sup> But note that although the ban's impact on gunshot victimizations would be small in percentage terms and unlikely to have much effect on the public's fear of crime, it could conceivably prevent hundreds of gunshot victimizations annually and produce notable cost savings in medical care alone. To help place this in perspective, there were about 10,200 gun homicides and 48,600 non-fatal, assault-related shootings in 2000 (see the FBI's *Uniform Crime Reports* for the gun homicide estimate and Simon et al. [2002] for the estimate of non-fatal shootings). Reducing these crimes by 1% would have thus prevented 588 gunshot victimizations in 2000 (we assume the ban did not actually produce such benefits because the reduction in AW use as of 2000 was outweighed by steady or rising levels of LCM use). This may seem insubstantial compared to the 342,000 murders, assaults, and robberies committed with guns in 2000 (see the *Uniform Crime Reports*). Yet, gunshot victimizations are particularly costly crimes. Setting aside the less tangible costs of lost lives and human suffering, the lifetime medical costs of assault-related gunshot injuries (fatal and non-fatal) were estimated to be about \$18,600 per injury in 1994 (Cook et al., 1999). Therefore, the lifetime costs of 588 gun homicides and shootings would be nearly \$11 million in 1994 dollars (the net medical costs could be lower for reasons discussed by Cook and Ludwig [2000] but, on the other hand, this estimate does not consider other governmental and private costs that Cook and Ludwig attribute to gun violence). This implies that small reductions in gunshot victimizations sustained over many years could produce considerable long-term savings for society. We do not wish to push this point too far, however, considering the uncertainty regarding the ban's potential impact.

Gun markets react strongly merely to debates over gun legislation. Indeed, debate over the AW ban's original passage triggered spikes upwards of 50% in gun distributors' advertised AW prices (Roth and Koper, 1997, Chapter 4). In turn, this prompted a surge in AW production in 1994 (Chapter 5). Therefore, it seems likely that discussion of broadening the AW ban to additional firearms would raise prices and production of the weapons under discussion. (Such market reactions may already be underway in response to existing proposals to expand the ban, but we have not investigated this issue.) Heightened production levels could saturate the market for the weapons in question, depressing prices and delaying desired reductions in crimes with the weapons, as appears to have happened with banned ARs.

Mandating further design changes in the outward features of semiautomatic weapons (e.g., banning weapons having any military-style features) may not produce benefits beyond those of the current ban. As noted throughout this report, the most important feature of military-style weapons may be their ability to accept LCMs, and this feature has been addressed by the LCM ban and the LCMM rifle ban. Whether changing other features of military-style firearms will produce measurable benefits is unknown.

Finally, curbing importation of pre-ban LCMs should help reduce crimes with LCMs and possibly gunshot victimizations. Crimes with LCMs may not decline substantially for quite some time if millions of LCMs continue to be imported into the U.S.

### *10.2.3. Potential Consequences of Lifting the Ban*

If the ban is lifted, it is likely that gun and magazine manufacturers will reintroduce AW models and LCMs, perhaps in substantial numbers.<sup>119</sup> In addition, AWs grandfathered under the 1994 law may lose value and novelty, prompting some of their lawful owners to sell them in secondary markets, where they may reach criminal users. Any resulting increase in crimes with AWs and LCMs might increase gunshot victimizations, though this effect could be difficult to discern statistically.

It is also possible, and perhaps probable, that new AWs and LCMs will eventually be used to commit mass murder. Mass murders garner much media attention, particularly when they involve AWs (Duwe, 2000). The notoriety likely to accompany mass murders if committed with AWs and LCMs, especially after these guns and magazines have been deregulated, could have a considerable negative impact on public perceptions, an effect that would almost certainly be intensified if such crimes were committed by terrorists operating in the U.S.

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<sup>119</sup> Note, however, that foreign semiautomatic rifles with military features, including the LCMM rifles and several rifles prohibited by the 1994 ban, would still be restricted by executive orders passed in 1989 and 1998. Those orders stem from the sporting purposes test of the Gun Control Act of 1968.

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**EXHIBIT D**  
**To**  
**Declaration of Christopher S. Koper in**  
**Support of Sunnyvale's Opposition to**  
**Plaintiffs' Motion for Preliminary**  
**Injunction**

# REDUCING GUN VIOLENCE IN AMERICA

Informing Policy with  
Evidence and Analysis

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Edited by

**DANIEL W. WEBSTER**  
and **JON S. VERNICK**

Foreword by

**MICHAEL R. BLOOMBERG**



# Reducing Gun Violence in America

*Informing Policy with Evidence and Analysis*

EDITED BY

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*To victims of gun violence a  
to those who work daily  
to reduce it*



# America's Experience with the Federal Assault Weapons Ban, 1994–2004

## Key Findings and Implications

Christopher S. Koper

In 1994, the federal government imposed a ten-year ban on military-style semi-automatic firearms and ammunition-feeding devices holding more than ten rounds of ammunition. This legislation, commonly known as the federal assault weapons ban, was intended in the broadest sense to reduce gunshot victimizations by limiting the national stock of semi-automatic firearms with large ammunition capacities and other features conducive to criminal uses. Reflecting America's general political divisions over the issue of gun control, the debate over the law was highly contentious. Ten years later, Congress allowed the ban to expire.

More recently, there have been growing calls for a reexamination of the assault weapons issue. This debate has been fueled by a series of mass shooting incidents involving previously banned firearms or magazines. Since 2007, for example, there have been at least 11 incidents in which offenders using

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assault weapons or other semi-automatics with magazines larger than 10 rounds have wounded or killed eight or more people (Violence Policy Center 2012). Some of the most notorious of these incidents have been a 2007 shooting on the college campus of Virginia Tech that left 33 dead and 17 wounded; a 2011 shooting in an Arizona parking lot that killed 6 and wounded 13, including Congresswoman Gabrielle Giffords; a 2012 shooting in an Aurora, Colorado, movie theatre that left 12 dead and 58 wounded; and, most recently, a shooting in a Newtown, Connecticut, elementary school that left 26 victims dead, 20 of whom were children (an additional victim was killed elsewhere).

To help inform the new dialogue on this issue, this essay examines America's experience with the 1994 assault weapons law. During the course of the ban, the National Institute of Justice (NIJ) funded a series of studies on the law's impacts for the U.S. Department of Justice and the U.S. Congress (Koper 2004; Koper and Roth 2001, 2002; Roth and Koper 1997, 1999). I present highlights from those studies, with an emphasis on findings from the final evaluation reported in 2004 (Koper 2004). These studies sought to assess the law's impacts on (1) the availability of assault weapons (AWs) and large-capacity magazines (LCMs) as measured by price and production (or importation) indices in legal markets; (2) trends in criminal uses of AWs and LCMs; and (3) trends in the types of gun crimes that seemed most likely to be affected by changes in the use of AWs and LCMs. (The latter two issues are emphasized in this summary.) Finally, the research team examined studies of gun attacks more generally in order to estimate the ban's potential to produce longer-term reductions in shootings.

In summary, the ban had mixed effects in reducing crimes with the banned weaponry because of various exemptions and loopholes in the legislation. The ban did not appear to affect gun crime during the time it was in effect, but some evidence suggests it may have modestly reduced gunshot victimizations had it remained in place for a longer period. The ban's most important provision was arguably its prohibition on ammunition magazines holding more than 10 rounds. Policymakers considering a new version of the ban might particularly focus on this aspect of the previous legislation and reconsider the exemptions and loopholes that undermined the effectiveness of the original ban.

## Provisions of the Assault Weapons Ban

Enacted on September 13, 1994, Title XI, Subtitle A of the Violent Crime Control and Law Enforcement Act of 1994 imposed a ten-year ban on the "manufacture, transfer, and possession" of certain semi-automatic firearms designated as assault weapons. The AW ban did not prohibit all semi-automatics; rather, it was directed at semi-automatics having features that appear to be useful in military and criminal applications but unnecessary in shooting sports or self-defense. Examples of such features include pistol grips on rifles, flash hiders, folding rifle stocks, threaded barrels for attaching silencers, and the ability to accept ammunition magazines holding large numbers of bullets. The law specifically prohibited 18 models and variations by name (e.g., the Intratec TEC-9 pistol and the Colt AR-15 rifle), as well as revolving cylinder shotguns (see Koper 2004, 5). This list included a number of foreign rifles that the federal government had banned from importation into the country beginning in 1989 (e.g., Avtomat Kalashnikov models). In addition, the ban contained a generic "features test" provision that generally prohibited other semi-automatic firearms having two or more military-style features, as described in Table 12.1. In total, the federal Bureau of Alcohol, Tobacco, Firearms and Explosives (ATF) identified 118 model and caliber variations that met the AW criteria established by the ban.

The law also banned "copies or duplicates" of the named gun makes and models, but federal authorities emphasized exact copies. Relatively cosmetic changes, such as removing a flash hider or bayonet mount, were thus sufficient to transform a banned weapon into a legal substitute. In this sense, the law is perhaps best understood not as a gun ban but as a law that restricted weapon accessories. A number of gun manufacturers began producing modified, legal versions of some of the banned guns, though not all of these substitute weapons proved as popular as the banned versions.<sup>1</sup> In other respects (e.g., type of firing mechanism, ammunition fired, and the ability to accept a detachable magazine), the banned AWs did not differ from other legal semi-automatic weapons.

The other major component of the assault weapons legislation was a ban on most ammunition-feeding devices holding more than 10 rounds of ammunition (referred to as large-capacity magazines).<sup>2</sup> The LCM ban was arguably the most important part of the assault weapons law for two reasons. First, an LCM is the most functionally important feature of an AW-type firearm. As noted by the U.S. House of Representatives, most prohibited AWs came equipped with magazines holding 30 rounds and could accept magazines holding as

Table 12.1 Features test of the federal assault weapons ban

Weapon category	Military-style features (2 or more qualified a firearm as an assault weapon)
Semi-automatic pistols accepting detachable magazines	<ol style="list-style-type: none"> <li>1) ammunition magazine that attaches outside the pistol grip</li> <li>2) threaded barrel capable of accepting a barrel extender, flash hider, forward handgrip, or silencer</li> <li>3) heat shroud attached to or encircling the barrel</li> <li>4) weight of more than 50 ounces unloaded</li> <li>5) semiautomatic version of a fully automatic weapon</li> </ol>
Semi-automatic rifles accepting detachable magazines	<ol style="list-style-type: none"> <li>1) folding or telescoping stock</li> <li>2) pistol grip that protrudes beneath the firing action</li> <li>3) bayonet mount</li> <li>4) flash hider or a threaded barrel designed to accommodate one</li> <li>5) grenade launcher</li> </ol>
Semi-automatic shotguns	<ol style="list-style-type: none"> <li>1) folding or telescoping stock</li> <li>2) pistol grip that protrudes beneath the firing action</li> <li>3) fixed magazine capacity over 5 rounds</li> <li>4) ability to accept a detachable ammunition magazine</li> </ol>

many as 50 or 100 rounds (United States Department of the Treasury 1998, 14). Removing LCMs from these weapons thus greatly limits their firepower.

Second, the reach of the LCM ban was much broader than that of the AW ban because many semi-automatics that were not banned by the AW provision could accept LCMs. Approximately 40 percent of the semi-automatic handgun models and a majority of the semi-automatic rifle models that were being manufactured and advertised prior to the ban were sold with LCMs or had a variation that was sold with an LCM (calculated from Murtz and the Editors of Gun Digest 1994). Still others could accept LCMs made for other firearms and/or by other manufacturers. A national survey of gun owners in 1994 found that 18% of all civilian-owned firearms and 21% of civilian-owned handguns were equipped with magazines having 10 or more rounds (Cook and Ludwig 1996, 17). The AW provision did not affect most LCM-compatible guns, but the LCM provision limited the capacities of their magazines to 10 rounds.

The AW ban also contained important exemptions. AWs and LCMs manufactured before the effective date of the ban were “grandfathered” and thus legal to own and transfer. Though not precise, estimates suggest there were

upward of 1.5 million privately owned AWs in the United States when the ban took effect (American Medical Association Council on Scientific Affairs 1992; Cox Newspapers 1989, 1; Koper 2004, 10). Gun owners in America possessed an estimated 25 million guns that were equipped with LCMs or 10-round magazines in 1994 (Cook and Ludwig 1996, 17), and gun industry sources estimated that, including aftermarket items for repairing and extending magazines, there were at least 25 million LCMs available in the United States as of 1995 (Gun Tests 1995, 30). Moreover, an additional 4.8 million pre-ban LCMs were imported into the country from 1994 through 2000 under the grandfathering exemption, with the largest number arriving in 1999. During this same period, importers were also authorized to import another 42 million pre-ban LCMs that may have arrived after 2000.

### Criminal Use of Assault Weapons and Large-Capacity Magazines Prior to the Ban

During the 1980s and early 1990s, AWs and other semi-automatic firearms equipped with LCMs were involved in a number of highly publicized mass shootings that raised public concern about the accessibility of high-powered, military-style weaponry and other guns capable of rapidly discharging high numbers of bullets (Cox Newspapers 1989; Kleck 1997, 124-126, 144; Lenett 1995; Violence Policy Center 2012). Perhaps most notably, AWs or other semi-automatics with LCMs were used in 6, or 40%, of 15 particularly severe mass shooting incidents between 1984 and 1993 that resulted in at least 6 deaths or at least 12 killed or wounded (Kleck, 1997, 124-126, 144). Early studies of AWs, though sometimes based on limited and potentially unrepresentative data, also suggested that AWs recovered by police were often associated with drug trafficking and organized crime (Cox Newspapers 1989, 4; also see Roth and Koper 1997, chap. 5), fueling a perception that AWs were guns of choice among drug dealers and other particularly violent groups. These events intensified concern over AWs and other semi-automatics with LCMs and helped spur the 1989 federal import ban on selected semi-automatic rifles (implemented by executive order) and the passage of the 1994 federal AW ban (the states of California, New Jersey, Connecticut, Hawaii, and Maryland also passed AW legislation between 1989 and 1994).

Looking at the nation's gun crime problem more broadly, numerous studies of AW-type weapons conducted prior to the federal ban found that AWs

typically accounted for up to 8% of guns used in crime, depending on the specific AW definition and data source used (e.g., see Beck et al. 1993; Hargarten et al. 1996; Hutson, Anglin, and Pratts 1994; Hutson et al. 1995; McGonigal et al. 1993; New York State Division of Criminal Justice Services 1994; Roth and Koper 1997, chap. 2; Zawitz 1995). A compilation of 38 sources indicated that AWs accounted for about 2% of crime guns on average (Kleck 1997, 112, 141–143). Similarly, the most common AWs prohibited by the 1994 federal ban accounted for between 1% and 6% of guns used in crime according to most of several national and local data sources examined for the NIJ-funded studies summarized here (Koper 2004, 15).

As with crime guns in general, the majority of AWs used in crime were assault pistols rather than assault rifles. Among AWs reported by police to ATF during 1992 and 1993, for example, assault pistols outnumbered assault rifles by a ratio of three to one.

The relative rarity of AW use in crime can be attributed to a number of factors. Many of these models are long guns, which are used in crime much less often than handguns. Also, as noted, a number of the rifles named in the 1994 law were banned from importation into the United States in 1989. Further, AWs in general are more expensive and more difficult to conceal than the types of handguns that are used most frequently in crime.

Criminal use of guns equipped with LCMs had not been studied as extensively as criminal use of AWs at the time of the ban. However, the overall use of guns with LCMs, which is based on the combined use of AWs and non-banned guns with LCMs, is much greater than the use of AWs alone. Based on data examined for this and a few prior studies, guns with LCMs were used in roughly 13% to 26% of most gun crimes prior to the ban, though they appeared to be used in 31% to 41% of gun murders of police (see summary in Koper 2004, 18; also see Adler et al. 1995; Fallis 2011; New York Division of Criminal Justice Services 1994).

### The Ban's Effects on Crimes with Assault Weapons and Large-Capacity Magazines

Although there was a surge in production of AW-type weapons as Congress debated the ban in 1994, the law's restriction of the new AW supply and the interest of collectors and speculators in these weapons helped to drive prices higher for many AWs (notably assault pistols) through the end of the 1990s



Table 12.2 Assault weapons as a percentage of guns recovered by police

City	Pre-ban	Post-ban	% change
Baltimore, MD	1.88% (1992-1993)	1.25% (1995-2000)	-34%
Boston, MA	2.16% (1991-1993)	0.6% (2000-2002)	-72%
Miami, FL	2.53% (1990-1993)	1.71% (1995-2000)	-32%
St. Louis, MO	1.33% (1992-1993)	0.91% (1995-2003)	-32%
Anchorage, AK	3.57% (1987-1993)	2.13% (1995-2000)	-40%
Milwaukee, WI	5.91% (1991-1993)	4.91% (1995-1998)	-17%

*Note:* Figures for Baltimore, Boston, Miami, and St. Louis are based on all recovered guns. Figures for Anchorage and Milwaukee are based on, respectively, guns tested for evidence and guns recovered in murder cases. Changes in Baltimore, Boston, Miami, and St. Louis were statistically significant at  $p < .05$ . See Koper (2004) for further details about the data and analyses.

and appeared to make them less accessible and/or affordable to criminal users.<sup>3</sup> Analyses of several national and local databases on guns recovered by police indicated that crimes with AWs declined following the ban.

To illustrate, the share of gun crimes involving the most commonly used AWs declined by 17% to 72% across six major cities examined for this study (Baltimore, Miami, Milwaukee, Boston, St. Louis, and Anchorage), based on data covering all or portions of the 1995-2003 post-ban period (Table 12.2). (The number of AW recoveries also declined by 28% to 82% across these locations and time periods; the discussion here focuses on changes in AWs as a share of crime guns in order to control for general trends in gun crime and gun seizures.) Similar patterns were found in a national analysis of recovered guns reported by law enforcement agencies around the country to ATF for investigative gun tracing.<sup>4</sup> The percentage of gun traces that were for AWs fell 70% between 1992-1993 and 2001-2002 (from 5.4% to 1.6%), though the interpretation of these data was complicated by changes that occurred during this time in gun tracing practices (see Koper 2004 for further discussion).

The decline in crimes with AWs was due primarily to a reduction in the use of assault pistols. Assessment of trends in the use of assault rifles was complicated by the rarity of crimes with such rifles and by the substitution in some cases of post-ban rifles that were very similar to the banned models. In general, however, the decline in AW use was only partially offset by substitution of post-ban AW-type models. Even counting the post-ban models as AWs, the share of crime guns that were AWs fell 24% to 60% across most of the local



jurisdictions studied. Patterns in the local data sources also suggested that crimes with AWs were becoming increasingly rare as the years passed.

The decline in crimes with AWs appeared to have been offset throughout at least the late 1990s by steady or rising use of other semi-automatics equipped with LCMs. Assessing trends in LCM use was difficult because there is no national data source on crimes with LCMs and few contacted jurisdictions maintained such information. It was possible, nonetheless, to examine trends in the use of guns with LCMs in four jurisdictions: Baltimore, Milwaukee, Anchorage, and Louisville (KY). Across the different samples analyzed from these cities (some databases included all recovered guns and some included only guns associated with particular crimes), the share of guns with an LCM generally varied from 14% to 26% prior to the ban. In all four jurisdictions, the share of crime guns equipped with LCMs rose or remained steady through the late 1990s (Table 12.3). These trends were driven primarily by handguns with LCMs, which were used in crime roughly three times as often as rifles with LCMs (though crimes with rifles having LCMs also showed no general decline). Generalizing from such a small number of jurisdictions must be done very cautiously, but the consistency of the findings across these geographically diverse locations strengthens the inference that they reflected a national pattern.

Failure to reduce LCM use for at least several years after the ban was likely because of the immense stock of exempted pre-ban magazines, which, as noted, was enhanced by post-ban imports. The trend in crimes with LCMs may have been changing by the early 2000s, but the available data were too limited and inconsistent to draw clear inferences (post-2000 data were available for only two of the four study sites).

*Table 12.3* Guns with large-capacity magazines as a percentage of guns recovered by police (selected years)

City	Pre-ban	Late 1990s	Early 2000s
Baltimore, MD	14.0% (1993)	15.5% (1998)	15.7% (2003)
Anchorage, AK	26.2% (1992–1993)	30.0% (1999–2000)	19.2% (2001–2002)
Milwaukee, WI	22.4% (1993)	36.4% (1998)	N/A
Louisville, KY	N/A	20.9 (1996)	19.0% (2000)

*Note:* Figures for Baltimore and Milwaukee are based on, respectively, guns associated with violent crimes and with murders. Figures for Anchorage and Louisville are based on guns submitted for evidentiary testing. The Anchorage figures are based on handguns only. See Koper (2004) for further details about the data and analyses.

A later media investigation of LCM use in Richmond, Virginia, suggests that the ban may have had a more substantial impact on the supply of LCMs to criminal users by the time it expired in 2004. In that city, the share of recovered guns with LCMs generally varied between 18% and 20% from 1994 through 2000 but fell to 10% by 2004 (Fallis 2011). It is not clear whether the Richmond results represented a wider national or even regional trend. (The data from this study also show that after the ban was lifted, the share of Richmond crime guns with an LCM rose to 22% by 2008.)

### The Ban's Impacts on Gun Violence

Because offenders could substitute non-banned guns and small magazines for banned AWs and LCMs, there was not a clear rationale for expecting the ban to reduce assaults and robberies with guns. But by forcing this weapon substitution, it was conceivable that the ban would reduce the number and severity of shooting deaths and injuries by reducing the number of shots fired in gun attacks (thus reducing the number of victims per gunfire incident and the share of gunshot victims sustaining multiple wounds). Based on this logic, the research team examined several indicators of trends in the lethality and injuriousness of gun violence for different portions of the 1995-2002 post-ban period. These included national-level analyses of gun murders, the percentage of violent gun crimes resulting in death, the share of gunfire cases resulting in wounded victims, the percentage of gunshot victimizations resulting in death, and the average number of victims per gun homicide incident. For selected localities, the team also examined trends in wounds per gunshot victim or the percentage of gunshot victims sustaining multiple wounds.

On balance, these analyses showed no discernible reduction in the lethality or injuriousness of gun violence during the post-ban years (see Koper 2004, Koper and Roth 2001, and Roth and Koper 1997). Nationally, for example, the percentage of violent gun crimes resulting in death (based on gun homicides, gun assaults, and gun robberies reported to the Uniform Crime Reports) was the same for the period 2001-2002 (2.9%) as it was for the immediate pre-ban period 1992-1993 (Koper 2004, 82, 92). Accordingly, it was difficult to credit the ban with contributing to the general decline in gun crime and gun homicide that occurred during the 1990s.

However, the ban's exemption of millions of pre-ban AWs and LCMs meant that the effects of the law would occur only gradually. Those effects were still

unfolding when the ban was lifted and may not have been fully realized until several years beyond that, particularly if importation of foreign, pre-ban LCMs had continued in large numbers. In light of this, it was impossible to make definitive assessments of the ban's impact on gun violence.

It was also difficult to judge the ban's effects on the more specific problem of mass shootings. The research team attempted to assess changes in mass shootings during the first few years of the ban, but this effort was hampered by the difficulty of counting these incidents (results can be sensitive to the definitions and data sources used) and identifying the specific types of guns and magazines used in them (Roth and Koper 1997, app. A). There is no national data source that provides detailed information on the types of guns and magazines used in shooting incidents or that provides full counts of victims killed and wounded in these attacks. Studying mass shootings in particular poses a number of challenges with regard to defining these events, establishing the validity and reliability of methods for measuring their frequency and characteristics (particularly if done through media searches, as is often necessary), and modeling their trends, as they are particularly rare events (e.g., see Duwe 2000; Roth and Koper 1997, app. A).

Nonetheless, the issue of mass shootings continues to be a catalyst to the debate surrounding AW legislation. A recent media compilation of 62 mass shooting incidents that involved the death of four or more people over the period 1982–2012, for instance, suggests that 25% of the guns used in these attacks were AW-type weapons (these were not precisely defined) and another 48% were other types of semi-automatic handguns (Follman, Aronsen, and Pan 2012). Continuing improvements in media search tools and greater attention to the types of guns and magazines used in multiple-victim attacks may improve prospects for examining this issue more rigorously in future studies.

### Assessing the Potential Long-Term Effects of Banning Assault Weapons and Large-Capacity Magazines

Although available evidence is too limited to make firm projections, it suggests that the ban may have reduced shootings slightly had it remained in place long enough to substantially reduce crimes with both LCMs and AWs. A small number of studies suggest that gun attacks with semi-automatics—including AWs and other guns equipped with LCMs—tend to result in more shots fired, more persons wounded, and more wounds inflicted per victim

than do attacks with other firearms (see reviews in Koper 2004; Koper and Roth 2001; also see McGonigal et al. 1993; Richmond et al. 2003; Reedy and Koper 2003; Roth and Koper 1997). For example, in mass shooting incidents that resulted in at least 6 deaths or at least 12 total gunshot victims from 1984 through 1993, offenders who clearly possessed AWs or other semi-automatics with LCMs (sometimes in addition to other guns) wounded or killed an average of 29 victims in comparison to an average of 13 victims wounded or killed by other offenders (see Koper and Roth's [2001] analysis of data compiled by Kleck [1997, 144]).

Similarly, a study of handgun attacks in Jersey City, New Jersey, during the 1990s found that the average number of victims wounded in gunfire incidents involving semi-automatic pistols was in general 15% higher than in those involving revolvers (Reedy and Koper 2003). The study also found that attackers using semi-automatics to fire more than 10 shots were responsible for nearly 5% of the gunshot victims in the sample. Used as a tentative guide, this implies that the LCM ban could have eventually produced a small reduction in shootings overall, perhaps up to 5%, even if some gun attackers had the foresight to carry more than one small magazine (or more than one firearm) and the time and poise to reload during an attack.

Effects of this magnitude might be difficult to measure reliably, but they could nonetheless yield significant societal benefits. Consider that in 2010 there were 11,078 gun homicides in the United States and another 53,738 non-fatal assault-related shootings according to the federal Centers for Disease Control and Prevention (see the CDC's web-based injury statistics query and reporting system at <http://www.cdc.gov/injury/wisqars/index.html>). At these levels, reducing shootings by just 1% (arguably a reasonable ballpark estimate for the long-term impact of substantially reducing AW and LCM use) would amount to preventing about 650 shootings annually. The lifetime medical costs of assault-related gunshot injuries (fatal and nonfatal) were estimated to be about \$18,600 per injury in 1994 (Cook et al. 1999). Adjusting for inflation, this amounts to \$28,894 in today's dollars. Moreover, some estimates suggest that the full societal costs of gun violence—including medical, criminal justice, and other government and private costs (both tangible and intangible)—could be as high as \$1 million per shooting (Cook and Ludwig 2000). Hence, reducing shootings by even a very small margin could produce substantial long-term savings for society, especially as the shootings prevented accrue over many years.

## Lessons and Implications from the 1994 Ban

Studies of America's previous assault weapons ban provide a number of lessons that can inform future policymaking. A new law similar to the old ban will have little impact on most gun crimes, but it may prevent some shootings, particularly those involving high numbers of shots and victims. It may thus help to reduce the number and severity of mass shooting incidents as well as produce a small reduction in shootings overall.

The most important feature of the previous ban was the prohibition on large-capacity ammunition magazines. A large magazine is arguably the most critical feature of an assault weapon, and restrictions on magazines have the potential to affect many more gun crimes than do those on military-style weapons. Restrictions focused on magazine capacity may also have a greater chance of gaining sufficient public and political support for passage than would new restrictions on assault weapons, though current polling suggests that both measures are supported by three-quarters of non-gun owners and nearly half of gun owners (Barry et al., in this volume). To enhance the potential impact of magazine restrictions, policymakers might also consider limiting magazine capacity to fewer than 10 rounds for all or selected weapons (for example, lower limits might be set for magazines made for semi-automatic rifles).<sup>5</sup> It is unknown whether further restrictions on the outward features of semi-automatic weapons, such as banning weapons having any military-style features, will produce measurable benefits beyond those of restricting magazine capacity.

Policymakers must also consider the implications of any grandfathering provisions in new legislation. Assessing the political and practical difficulties of registering all assault weapons and large magazines or establishing turn-in or buyback programs for them is beyond the scope of this essay. Policymakers should note, however, that it may take many years to attain substantial reductions in crimes with banned weapons and/or magazines if a new law exempts the existing stock (which has likely grown considerably since the time of the original ban). Policies regarding exemptions must also explicitly address the status of imported guns and magazines.

Past experience further suggests that public debate on reinstating the ban or crafting a new one will raise prices and production of the guns and magazines likely to be affected. This could temporarily saturate the market for the guns and magazines in question (particularly if close substitutes emerge) and delay desired reductions in crimes with some categories of the banned weap-



onry (this appeared to happen with assault rifles that were banned by the 1994 law and may have contributed as well to the observed trends in use of large magazines).

A new ban on assault weapons and/or large-capacity magazines will certainly not be a panacea for America's gun violence problem nor will it stop all mass shootings. However, it is one modest measure that, like federal restrictions on fully automatic weapons and armor-piercing ammunition, can help to prevent the further spread of particularly dangerous weaponry.

#### NOTES

1. In general, the AW ban did not apply to semi-automatics possessing no more than one military-style feature listed under the ban's features test provision. Note, however, that firearms imported into the country still had to meet the "sporting purposes test" established under the federal Gun Control Act of 1968. In 1989, ATF determined that foreign semi-automatic rifles having any one of a number of named military features (including those listed in the features test of the 1994 AW ban) fail the sporting purposes test and cannot be imported into the country. In 1998, the ability to accept an LCM made for a military rifle was added to the list of disqualifying features. Consequently, it was possible for foreign rifles to pass the features test of the federal AW ban but not meet the sporting purposes test for imports (U.S. Department of the Treasury 1998).

2. Technically, the ban prohibited any magazine, belt, drum, feed strip, or similar device that has the capacity to accept more than 10 rounds of ammunition or which can be readily converted or restored to accept more than 10 rounds of ammunition. The ban exempted attached tubular devices capable of operating only with .22 caliber rimfire (i.e., low velocity) ammunition.

3. See Koper (2004), Koper and Roth (2002), and Roth and Koper (1997) for more extensive discussions of the ban's impacts on prices and production of AWs, non-banned firearms, and LCMs.

4. A gun trace is an investigation into the sales history of a firearm (e.g., see ATF 2000).

5. To support the formulation and evaluation of policy in this area, there are also a number of research needs worth noting. For one, it is important to develop better data on crimes with guns having LCMs. Policymakers should thus encourage police agencies to record information about magazines recovered with crime guns. Likewise, ATF should consider integrating ammunition magazine data into its national gun tracing system and encourage reporting of magazine data by police agencies that trace firearms. Second, there is a need for more studies that contrast the outcomes of attacks with different types of guns and magazines. Such studies would help to refine predictions of the change in gun deaths and injuries that would follow reductions in attacks with firearms having large-capacity magazines.

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# **EXHIBIT E**

## **Declaration of Christopher S. Koper in Support of Sunnyvale's Opposition to Plaintiffs' Motion for Preliminary Injunction**

# The Washington Post

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## CORRECTION TO THIS ARTICLE

An earlier version of this story incorrectly reported the limit on the capacity of gun magazines in Maryland. The limit is 20. This version has been corrected.

## Va. data show drop in criminal firepower during assault gun ban

By David S. Fallis and James V. Grimaldi  
Washington Post Staff Writers  
Sunday, January 23, 2011; 9:17 AM

The number of guns with high-capacity magazines seized by Virginia police dropped during a decade-long federal prohibition on assault weapons, but the rate has rebounded sharply since the ban was lifted in late 2004, [according to a Washington Post analysis](#).

More than 15,000 guns equipped with high-capacity magazines - defined under the lapsed federal law as holding 11 or more bullets - have been seized by Virginia police in a wide range of investigations since 1993, the data show.

The role of high-capacity magazines in gun crime was thrust into the national spotlight two weeks ago when 22-year-old [Jared Lee Loughner allegedly opened fire](#) with a semiautomatic handgun outside a Tucson grocery store, killing six and wounding 13, including Rep. Gabrielle Giffords (D-Ariz.). Authorities say Loughner used a legally purchased 9mm Glock 19 handgun with a 31-round clip and was tackled while changing magazines.

Of the seized Virginia weapons, 2,000 had magazines with a capacity of 30 or more bullets. Some states still limit magazine capacity. California, for example, limits them to 10 and Maryland to 20.

Last year in Virginia, guns with high-capacity magazines amounted to 22 percent of the weapons recovered and reported by police. In 2004, when the ban expired, the rate had reached a low of 10 percent. In each year since then, the rate has gone up.

"Maybe the federal ban was finally starting to make a dent in the market by the time it ended," said Christopher Koper, head of research at the Police Executive Research Forum, who [studied the assault weapons ban](#) for the National Institute of Justice, the research arm of the Justice Department.

Congress is considering legislation to reinstitute the assault weapon ban's prohibition on high-capacity magazines, a measure strongly opposed by gun rights advocates.

The analysis of the [Virginia records, obtained under the state's public information](#) law, provides a rare window into the firepower of guns used in crimes. The Bureau of Alcohol, Tobacco, Firearms and Explosives, which traces guns for local police agencies and regulates the firearms industry, does not track magazine sizes. Academic researchers said they were unaware of any other comprehensive study of firearms magazines.

The pattern in Virginia "may be a pivotal piece of evidence" that the assault weapons ban eventually had an impact on the proliferation of high-capacity magazines on the streets, said Garen Wintemute, [head of the Violence Prevention Research Program](#) at the University of California at Davis.

"Many people, me included, were skeptical about the chances that the magazine ban would make a difference back in 1994," Wintemute said. "But what I am seeing here is that after a few years' lag time the prevalence of high-capacity magazines was declining. The increase since the ban's repeal is quite striking."

Guns with high-capacity magazines have appeared in Virginia crimes ranging from the mundane to the murderous. The Post found that 200 guns with high-capacity magazines figured in Virginia homicides, including these incidents:

- In Richmond in 2003, Michael Antoine Wilson, 21, used his semiautomatic rifle with its 30-round magazine to shoot his 17-year-old girlfriend to death in front of children and relatives. Then he went to a nearby convenience store, killed two workers and stole a van before turning the gun on himself.
- In Roanoke in 2004, Marcus Jerome Nance, 22, used his legally purchased 9mm Glock 17 handgun with a high-capacity magazine to spray 33 bullets into a crowd that had gathered outside a Roanoke gas station after a nightclub closing, killing one and wounding two.
- In Newport News last year, Antonio Johnson, 34, began shooting at police during a traffic stop with a 9mm semiautomatic handgun outfitted with a 15-round magazine. "Subject shot police officer and then killed himself with weapon," state records say.

In the Arizona shootings, Loughner allegedly used a Glock 19 that he had legally purchased at a Tucson sporting goods store in November. The gun's capacity allowed Loughner to squeeze off more than 30 shots without reloading, authorities said.

The federal assault weapons ban from late 1994 through late 2004 prohibited the manufacturing of magazines capable of holding more than 10 rounds. But the act permitted the sale of magazines manufactured before the ban.

The federal prohibition was spurred by a mass killing in 1989 in Stockton, Calif., where Patrick Edward Purdy, 24, a mentally unbalanced drug addict, fired 110 shots from an AK-47 into a schoolyard, killing five children and wounding 29 others and a teacher. He used a 75-round rotary clip and a 35-round banana clip, one of four he was carrying.

### **New legislative interest**

Rep. Carolyn McCarthy (N.Y.) and 57 other Democrats proposed legislation last week to ban the sale or transfer of high-capacity magazines, no matter when they were manufactured. McCarthy's husband and five others were killed in 1993 on the Long Island Rail Road by a gunman armed with a semiautomatic pistol and four 15-round magazines. He fired 30 shots before being subdued while changing magazines.

The bill's [prospects are considered slim](#) in the Republican-controlled House. In the Senate, the National Rifle Association says it has a solid [50-senator pro-gun block](#) that could delay any legislation.

The NRA has announced its opposition to proposals that limit magazine capacity.

"These magazines are standard equipment for self-defense handguns and other firearms owned by tens of millions of Americans," according to a statement on its politics Web page, and in a letter circulating to members of Congress. "Law-abiding private citizens choose them for many reasons, including the same reason police officers do: to improve their odds in defensive situations."

The firearms industry also opposes the proposal. "The tragedy in Tucson was not about firearms, ammunition or magazine capacity," said Ted Novin, a spokesman for the National Shooting Sports Foundation, a gun industry group. "It was about the actions of a madman. Period."

The analysis by The Post is possible because of a little-known database of guns seized in Virginia. The database, called the Criminal Firearms Clearinghouse, has information on more than 100,000 firearms recovered by more than 200 local police departments since 1993. A federal [law in 2003, known as the Tiahrt Amendment](#) after the congressman who sponsored it, banned the release of federal data on guns recovered in crimes.

[Last year, The Post mined the database](#) to pierce the secrecy imposed by Congress on federal gun-tracing records. The analysis found that a fraction of licensed dealers in Virginia sell most of guns later seized by police. The vast majority of the guns in the database were confiscated because of illegal-possession charges. But thousands were swept up in the wake of assaults, robberies and shootings.

Two months before the ban expired in September 2004, Marcus Nance bought an extended magazine and a 9mm Glock 17 handgun at [a Roanoke gun store](#). Three nights later, down the street from the store, Nance opened fire on a crowded parking lot after arguing and fighting with people in the crowd.

A police officer called to investigate a disturbance heard shots and saw Nance holding a gun at arm's length and firing "randomly into the mass of people" before shooting several rounds into the air.

A police car's dashboard camera recorded the jackhammer sound of gunfire. In a car parked nearby, police found a Glock gun box and two boxes of ammunition, one of them partially empty.

Police went to the gun shop and confirmed that Nance had bought the handgun (\$555), a laser sight (\$380) and two extended magazines (\$135), paying cash in an entirely legal transaction. Police noted: "The magazines in question were manufactured before 1994 and not considered prohibited."

Nance, who said he had been attacked by members of the crowd and shot in self-defense, was convicted of second-degree murder and is in prison.

### **The 2004 study**

Koper's 108-page 2004 study for the National Institute of Justice found the ban on assault weapons had mixed results.

"Assault weapons were rarely used in gun crimes even before the ban," he said in the report. But he also concluded that the prohibition on high-capacity magazines might have affected public safety, because such magazines allow shooters to inflict more damage.

"Tentatively I was able to show that guns associated with large-capacity magazines tended to be associated with more serious crimes, more serious outcomes," he said.

Some gun rights activists argue that a ban on high-capacity magazines would violate the Second Amendment right to bear arms. One prominent gun rights activist who takes a less absolute position is Robert A. Levy, chairman of the Cato Institute. He is also the [lawyer who brought the case](#) that overturned D.C.'s handgun ban.

But Levy said the government would need to prove that such a ban was effective.

"The burden is on the government, not on the individual to show that the regulation isn't unduly intrusive," Levy said.

Colin Goddard, a lobbyist for the Brady Campaign to Prevent Gun Violence and a victim of the [2007 Virginia Tech shootings](#), said the high-capacity ban could save lives. The Virginia Tech shooter, Seung Hui Cho, used several 15-round magazines to fire 174 shots and kill 32 people in the worst gun-related mass murder by an individual in U.S. history.

"When you double and triple the amount of the clip size, you don't double or triple the number of deer you kill, you double and triple the amount of innocent people who are killed in shootings like this," said Goddard, 25, who was shot four times by Cho.

Bradley A. Buckles, ATF director from 1999 to 2004, said bureau officials advised Congress to focus on high-capacity magazines, which were "completely unregulated" and had almost no sporting purpose.

"The whole thing with magazine capacity came out of ATF," Buckles said. "It wasn't so much guns, but it was firepower. What made them more deadly than a hunting rifle was the fact that you could have a 20-round, 30-round clip, when most hunting rifles wouldn't have more than five rounds."

Buckles said lawmakers should have extended the ban on high-capacity magazines in 2004. Banning them now, he said, just puts everyone back at square one.

"There are so many millions of them out there, it probably wouldn't make any immediate difference over the course of 20 years," Buckles said. "It is not a short-term solution to anything."

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*Research editor Alice Crites and staff writer Sari Horwitz contributed to this story.*

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# **EXHIBIT F**

## **Declaration of Christopher S. Koper in Support of Sunnyvale's Opposition to Plaintiffs' Motion for Preliminary Injunction**

# The Washington Post

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## Data indicate drop in high-capacity magazines during federal gun ban

By [David S. Fallis](#), Published: January 10, 2013

During the 10-year federal ban on assault weapons, the percentage of firearms equipped with high-capacity magazines seized by police agencies in Virginia dropped, only to rise sharply once the restrictions were lifted in 2004, according to an analysis by The Washington Post.

The White House is leading a push to reinstate a national ban on large-capacity magazines and assault weapons after a gunman armed with an AR-15 and 30-round magazines killed 20 children and seven adults in Connecticut. Vice President Biden has been holding advisory meetings to hammer out a course of action that will address the issue of the larger magazines, which under the lapsed federal ban were those that held 11 or more rounds of ammunition.

In Virginia, The Post found that the rate at which police recovered firearms with high-capacity magazines — mostly handguns and, to a smaller extent, rifles — began to drop around 1998, four years into the ban. It hit a low of 9 percent of the total number of guns recovered the year the ban expired, 2004.

The next year, the rate began to climb and continued to rise in subsequent years, reaching 20 percent in 2010, according to the analysis of a little-known Virginia database of guns recovered by police. In the period The Post studied, police in Virginia recovered more than 100,000 firearms, more than 14,000 of which had high-capacity magazines.

### Researchers see impact

To some researchers, the snapshot in Virginia suggests that the federal ban may have started to curb the widespread availability of the larger magazines.

"I was skeptical that the ban would be effective, and I was wrong," said Garen Wintemute, head of the Violence Prevention Research Program at the University of California at Davis School of Medicine. The database analysis offers "about as clear an example as we could ask for of evidence that the ban was working."

The analysis is based on an examination of the Criminal Firearms Clearinghouse, a database obtained from state police under Virginia's public information law. The data, which were [first studied by The Post in 2011](#), offer a rare glimpse into the size of the magazines of guns seized during criminal investigations. The Bureau of Alcohol, Tobacco, Firearms and Explosives, which traces guns and regulates the industry, tracks details about the guns seized after crimes but not the magazine size.

The initial Post analysis was prompted by a mass shooting in Tucson. Jared Lee Loughner — armed with a legally purchased 9mm semiautomatic handgun and a 33-round magazine — opened fire outside a grocery store, killing six people and wounding 13, including Rep. Gabrielle Giffords (D-Ariz.).

In the following two years, a succession of mass shootings has occurred, including several in which the gunmen reportedly had high-capacity magazines.

At the Dec. 14 shooting in Newtown, Conn., the gunman was [reported to have been armed](#) with two handguns, an AR-15 rifle and numerous 30-round magazines. He killed himself at the scene. The guns were legally purchased by his mother.

The federal ban that expired in 2004 prohibited the manufacture of magazines capable of holding more than 10 rounds. But the law permitted the sale of magazines manufactured before the ban. By some estimates, 25 million of the large-capacity magazines were still on the market in 1995.

Many semiautomatic rifles and semiautomatic handguns accept magazines of various sizes. Larger magazines increase a gun's firepower, enabling more shots before reloading.

The Virginia database analyzed by The Post lists about three-quarters of guns recovered by police, missing the rest because some agencies failed to report their recoveries to the state. The database contains details about more than 100,000 guns recovered by 200 police departments in a wide range of investigations from 1993 through August 2010, when The Post last obtained it.

In recent weeks, The Post conducted additional analysis into the type of guns confiscated with large-capacity magazines. The guns included Glock and TEC-9 handguns and Bushmaster rifles. Most had magazines ranging from 11 to 30 rounds.

Of 14,478 guns equipped with large-capacity magazines that were confiscated by police, more than 87 percent — 12,664 — were classified as semiautomatic pistols. The remainder were mostly semiautomatic rifles.

The Post also identified and excluded from the counts more than 1,000 .22-caliber rifles with large-capacity tubular magazines, which were not subject to the ban.

In Virginia, handguns outfitted with large-capacity magazines saw the biggest fluctuation during and after the ban.

In 1997, three years into the ban, police across the state reported seizing 944 handguns with large-capacity magazines. In 2004, the year the ban ended, they confiscated 452. In 2009, the last full year for which data were available, the number had rebounded to 986 handguns, analysis showed.

Of these, the single biggest group were handguns equipped with 15-round magazines, accounting overall for 4,270 firearms over the 18 years.

### Effect hard to measure

Nationwide, researchers who studied the federal ban had difficulty determining its effect, in part because weapons and magazines manufactured before the ban could still be sold and in part because most criminals do not use assault weapons.

Christopher Koper, who studied the ban's effect for the National Institute of Justice, the research arm of the Justice Department, noted in a [2004 report](#) that the "success in reducing criminal use of the banned guns and magazines has been mixed."

He found that gun crimes involving assault weapons declined between 17 and 72 percent in the six cities covered in the study — Anchorage, Baltimore, Boston, Miami, Milwaukee and St. Louis. But he said he found no decline in crimes committed with other guns with large-capacity magazines, most likely "due to the immense stock of exempted pre-ban magazines."

Koper's study tracked guns through 2003. He said that The Post's findings, which looked at magazine capacity of guns recovered in Virginia before and after 2003, suggests that "maybe the federal ban was finally starting to make a dent in the market by the time it ended."

Koper, now an associate professor of criminology at George Mason University, also noted the ban on high-capacity magazines might improve public safety because larger magazines enable shooters to inflict more damage.

The use of high-capacity magazines is a contentious point in the gun debate.

"Anyone who's thought seriously about armed self-defense knows why honest Americans — private citizens and police alike — choose magazines that hold more than 10 rounds. Quite simply, they improve good people's odds in defensive situations," Chris W. Cox, the executive director of the National Rifle Association's legislative institute wrote in a [piece posted online](#). He called the ban a "dismal failure."

The federal prohibition on high-capacity magazines and assault weapons was spurred in part by the 1989 mass killing in Stockton, Calif. Patrick Edward Purdy, a mentally unbalanced drug addict, fired 110 rounds from an AK-47 into a schoolyard, killing five children and wounding 29 others and a teacher. Purdy used a 75-round drum magazine and a 35-round banana clip, one of four he carried.

Some states still limit magazine size. Maryland limits the size to 20 rounds; California limits it to 10. Connecticut, the location of Sandy Hook Elementary School, does not.

After Giffords's shooting, [Rep. Carolyn McCarthy](#) (N.Y.) and other Democrats proposed legislation to ban the sale or transfer of high-capacity magazines. McCarthy's husband and five others were killed in 1993 on the Long Island Rail Road by a gunman armed with a semiautomatic pistol and four 15-round magazines. He fired 30 shots before being subdued as he swapped magazines.

In the wake of the Newtown shooting, President Obama and lawmakers urged that a ban on assault weapons and high-capacity magazines be made permanent.

The NRA and the National Shooting Sports Foundation, a gun industry group, have historically opposed any restrictions on magazine capacity. The NRA did not respond to requests for comment, and the sports foundation declined to comment.

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THE CITY OF SUNNYVALE, THE MAYOR OF  
SUNNYVALE, ANTHONY SPITALERI in his  
official capacity, THE CHIEF OF THE  
SUNNYVALE DEPARTMENT OF PUBLIC  
SAFETY, FRANK GRGURINA, in his official  
capacity

UNITED STATES DISTRICT COURT  
NORTHERN DISTRICT OF CALIFORNIA  
SAN JOSE DIVISION

LEONARD FYOCK,  
SCOTT HOCHSTETLER,  
WILLIAM DOUGLAS,  
DAVID PEARSON, BRAD SEIFERS, and  
ROD SWANSON,

Plaintiffs,

v.

THE CITY OF SUNNYVALE, THE  
MAYOR OF SUNNYVALE,  
ANTHONY SPITALERI in his official  
capacity, THE CHIEF OF THE  
SUNNYVALE DEPARTMENT OF  
PUBLIC SAFETY, FRANK GRGURINA,  
in his official capacity, and DOES 1-10

Defendants.

Case No. 13-cv-05807 RMW

**DECLARATION OF FRANK GRGURINA IN  
SUPPORT OF SUNNYVALE'S OPPOSITION  
TO PLAINTIFF'S MOTION FOR  
PRELIMINARY INJUNCTION**

Date: February 21, 2014  
Time: 9:00 a.m.  
Location: San Jose Courthouse  
Courtroom 6 – 4<sup>th</sup> Floor  
280 South 1<sup>st</sup> Street  
San Jose, CA 95113

1 I, Frank Grgurina, declare as follows:

2 1. I am the Chief of the Sunnyvale Department of Public Safety and have served in  
3 this role since November 2011. Prior to my current position, I was a sworn officer for the  
4 Fremont Police Department ("FPD") for over 22 years. I held a wide variety of assignments  
5 throughout my career at FPD including positions as a Field Training Officer, Street Crimes  
6 Detective, Narcotics Agent, SWAT Team Member, and as a certified instructor in weaponless  
7 defense. My final position at FPD was that of a Police Captain with oversight of all field  
8 operations. As a supervisor, manager, and as a second in command, I had the opportunity to  
9 oversee almost every work group at the Fremont Police Department.

10 2. The information stated in this declaration is based on my knowledge, training,  
11 education and experience.

12 3. I understand that the plaintiffs in this case contend that they need to use large  
13 capacity magazines to defend themselves or their homes effectively. I am not personally aware of  
14 any specific instance in the Cities of Fremont and Sunnyvale where a citizen was unable to  
15 defend him or herself as a result of not having a large capacity magazine.

16 4. In my opinion, possession and use of large capacity magazines by those who  
17 commit crimes poses a significant threat to public safety personnel and members of the  
18 community. I am aware of several incidents in which criminal suspects have used a large  
19 capacity magazine to harm and kill others and themselves. As an example, Criminal Suspect  
20 Shareef Allman killed three co-workers and seriously injured several others individuals in a  
21 shooting rampage which began in the City of Cupertino and ended in the City of Sunnyvale. The  
22 incident came to a deadly conclusion in the City of Sunnyvale, when Allman was confronted by  
23 Santa Clara County Sheriff's Deputies resulting in an exchange of gun fire. Allman had been in  
24 possession of several weapons, which included high capacity magazines. The incident lasted for  
25 approximately 22 hours, placing members of the community in danger for an extended period of  
26 time and requiring a massive public safety response.

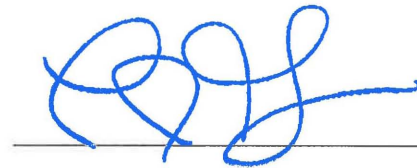
27 5. I am familiar with the Sunnyvale Department of Public Safety's ("DPS")  
28 expectations for off duty public safety officers. DPS officers are afforded the opportunity to take



1 enforcement action when confronted with criminal situations and may act as law enforcement  
2 officers at any time. This may involve assisting on-duty officers under appropriate circumstances  
3 or taking individual action while off-duty. Officers must also have the ability to defend  
4 themselves against subjects who may wish to harm them due to their role as a law enforcement  
5 officer.

6 6. I have been informed by the Sunnyvale City Attorney, Joan A. Borger, that  
7 Section 9.44.050 does not apply to law enforcement personnel. Law enforcement officers are  
8 exempt from Section 9.44.050, whether they are in possession of LCMs while on or off-duty.  
9 This exemption applies equally to Sunnyvale law enforcement personnel authorized to carry  
10 LCMs and to off-duty officers from other jurisdictions. Attached hereto as Exhibit A is a true and  
11 correct copy of a memorandum by Joan A. Borger and Rebecca L. Moon regarding exemptions to  
12 Section 9.44.050.

13 I declare under penalty of perjury under the laws of the California that the foregoing is  
14 true and correct and that this Declaration was executed on January 29, 2014, at Sunnyvale,  
15 California.



Frank Grgurina

**EXHIBIT A**  
**To**  
**DECLARATION OF FRANK**  
**GRGURINA IN SUPPORT OF**  
**SUNNYVALE'S OPPOSITION TO**  
**PLAINTIFF'S MOTION FOR**  
**PRELIMINARY INJUNCTION**





# CITY OF SUNNYVALE

## OFFICE OF THE CITY ATTORNEY


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### INTEROFFICE MEMORANDUM

TO: Frank Grgurina, Chief of Public Safety

FROM: Joan A. Borger, City Attorney   
Rebecca L. Moon, Assistant City Attorney

DATE: December 13, 2013

RE: Law Enforcement Exemption for Large-Capacity Magazines

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As you requested, this memo confirms the informal advice previously given by our office in regard to the interpretation of the law enforcement exemption in Sunnyvale Municipal Code Section 9.44.050(c)(2) (Sunnyvale Measure C).

Section 9.44.050(c)(2) provides that the prohibition on possession of large-capacity magazines does not apply to [1] “[a]ny government officer, agent, or employee, member of the armed forces of the United States, or peace officer, [2] to the extent that such person is otherwise authorized to possess a large-capacity magazine and does so while acting within the course and scope of his or her duties”. The section does not apply to any person who satisfies both conditions.

Questions have been raised concerning the application of this section to:

- (1) Officers who possess large-capacity magazines while off-duty.
- (2) Possession of personal (non-duty) weapons by officers.
- (3) Officers from other jurisdictions who are visiting or traveling through Sunnyvale.

It is our opinion that individuals listed in Section 9.44.050(c)(2), who are authorized as part of their duties to possess and use large-capacity magazines, are exempt under 9.44.050(c)(2) at all times, both while on and off duty. Further, the exemption is not limited to official duty weapons. Finally, the exemption applies to same extent to officers from other jurisdictions while in Sunnyvale.

Please do not hesitate to contact us if you have any additional questions or concerns.

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Office of the City Attorney

