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8
9 IN THE UNITED STATES DISTRICT COURT
10 FOR THE SOUTHERN DISTRICT OF CALIFORNIA

11 VIRGINIA DUNCAN, et al.,

12 Plaintiffs,

13 v.

14 XAVIER BECERRA, in his official
15 capacity as Attorney General of the State
16 of California,

17 Defendant.

Case No: 17-cv-1017-BEN-JLB

**DECLARATION OF ANNA M.
BARVIR IN SUPPORT OF
PLAINTIFFS' MOTION FOR
SUMMARY JUDGMENT OR,
ALTERNATIVELY, PARTIAL
SUMMARY JUDGMENT;
EXHIBITS 1-5**

Hearing Date: April 30, 2018
Hearing Time: 10:30 a.m.
Judge: Hon. Roger T. Benitez
Courtroom: 5A

DECLARATION OF ANNA M. BARVIR

1
2 1. I am an attorney at the law firm Michel & Associates, P.C., attorneys of
3 record for Plaintiffs in this action. I am licensed to practice law before the United
4 States District Court for the Southern District of California. I am also admitted to
5 practice before the Eastern, Central, and Northern Districts of California, the courts of
6 the state of California, the Supreme Court of the United States, and the D.C., Fourth,
7 Ninth, and Tenth Circuit Courts of Appeals. I have personal knowledge of the facts set
8 forth herein and, if called and sworn as a witness, could and would testify competently
9 thereto.

[Expert Reports]

10
11 2. On October 6, 2017, Plaintiffs served Defendant with Plaintiffs'
12 Disclosure of Expert Witnesses in this matter. Two exhibits were attached to
13 Plaintiffs' disclosure: (1) the Expert Report of Mr. James Curcuruto; and (2) the
14 Expert Report of Mr. Stephen Helsley. A true and correct copy of Mr. Curcuruto's
15 expert report, as appended to Plaintiffs' Disclosure of Expert Witnesses, is attached
16 hereto as **Exhibit 1**. A true and correct copy of Mr. Helsley's expert report, as
17 appended to Plaintiffs' Disclosure of Expert Witnesses, is attached hereto as **Exhibit**
18 **2**.

19 3. On November 3, 2017, Plaintiffs served Defendant with Plaintiffs'
20 Disclosure of Rebuttal Expert Witnesses in this matter. Two exhibits were attached to
21 Plaintiffs' disclosure: (1) the Expert Rebuttal Report of Professor Gary Kleck; and (2)
22 the Expert Rebuttal Report of Professor Carlisle Moody. A true and correct copy of
23 Professor Kleck's expert rebuttal, as appended to Plaintiffs' Disclosure of Rebuttal
24 Expert Witnesses, is attached hereto as **Exhibit 3**. A true and correct copy of
25 Professor Moody's expert rebuttal, as appended to Plaintiffs' Disclosure of Expert
26 Witnesses, is attached hereto as **Exhibit 4**.

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28 ///

4. On October 6, 2017, Defendant served Plaintiffs with the Expert Report of Dr. Christopher S. Koper. A true and correct copy of Dr. Koper's expert report, without the appendices attached, is attached hereto as **Exhibit 5**.

5. On November 3, 2017, Defendant served Plaintiffs with the Expert Rebuttal Report of John J. Donohue. A true and correct copy of Donohue's expert report is attached hereto as **Exhibit 6**.

[Firearm and Magazine Basics]

6. A true and correct copy of the Wikipedia page for “Magazine (firearms)”, [https://en.wikipedia.org/wiki/Magazine_\(firearms\)](https://en.wikipedia.org/wiki/Magazine_(firearms)) (last visited Mar. 1, 2018) is attached as **Exhibit 7**.

7. A true and correct copy of pages 33-36 from *NRA Guide to the Basics of Pistol Shooting* (2d ed. 2009) is attached as **Exhibit 8**.

8. A true and correct copy of pages 22-36 of John Malloy, *Complete Guide to Guns & Shooting* (DBI Books, Inc. 1995) is attached as **Exhibit 9**. This excerpt describes various rifle types and magazines.

9. A true and correct copy of pages 95-99 of John Malloy, *Complete Guide to Guns & Shooting* (DBI Books, Inc. 1995) is attached as **Exhibit 10**. This excerpt describes semi-automatic pistols.

10. A true and correct copy of Rick Hacker, *Magazine Disconnect*, Am. Rifleman (Sept. 11, 2015) is attached as **Exhibit 11**. This article explains the function of the “magazine disconnect” or “magazine disconnect safety.”

[History of Firearms and Magazines Capable of Holding More than Ten Rounds]

11. A true and correct copy of David B. Kopel, *The History of Firearm Magazines and Magazine Prohibitions*, 78 Albany L. Rev. 849 (2015), is attached as **Exhibit 12**.

12. A true and correct copy of pages 168-70 of Lewis Winant, *Firearms Curiosa* (2009) (1st pub. 1954) is attached as **Exhibit 13**. A true and correct copy of *16-Shot Wheel Lock*, Am.'s 1st Freedom (May 10, 2014), *available at* <http://www.americanfirstfreedom.com/16-shot-wheel-lock>

1 www.nrapublications.org/index.php/17739/a-16-shot-wheel-lock/, is attached as

2 **Exhibit 14.** These references document the first known firearm able to fire more than
3 ten rounds without reloading: a 16-shooter using “superposed” loads.

4 13. A true and correct copy of Clayton E. Cramer & Joseph Olson, *Pistols,*
5 *Crime, and Public Safety in Early America*, 44 Willamette L. Rev. 699 (2008) is
6 attached as **Exhibit 15.** This law review article documents, inter alia, the continued
7 development of multi-shot firearms through the seventeenth and eighteenth centuries.

8 14. A true and correct copy of “Defence” *Rapid-Fire Gun Patented: 15 May*
9 *1718*, History Channel, [http://www.historychannel.com.au/classroom/day-in-](http://www.historychannel.com.au/classroom/day-in-history/600/defence-rapid-fire-gun-patented)
10 [history/600/defence-rapid-fire-gun-patented](http://www.historychannel.com.au/classroom/day-in-history/600/defence-rapid-fire-gun-patented) (last visited Mar. 1, 2018) is attached as

11 **Exhibit 16.** This article documents the introduction of the Puckle “Defence Gun,”
12 “the first-well documented rapid-fire gun in the world,” in 1718. The “Defence Gun”
13 “held 11 charges and could fire 63 shots in seven minutes, or 9 shots per minute.”

14 15. A true and correct copy of pages 91-103 of Jim Garry, *Weapons of the*
15 *Lewis and Clark Expedition* (2012) is attached as **Exhibit 17.** A true and correct copy
16 of pages 69-70 of John Plaster, *The History of Sniping and Sharpshooting* (2008) is
17 attached as **Exhibit 18.** A true and correct copy of page 31 of Jim Supica, Doug
18 Wicklund & Philip Shreier, *Treasures of the NRA National Firearms Museum* (2013)
19 is attached as **Exhibit 19.** A true and correct copy of the Wikipedia page for the
20 Girandoni Air Rifle, http://en.wikipedia.org/wiki/Girandoni_Air_Rifle (last visited
21 Mar. 1, 2018) is attached as **Exhibit 20.** These resources document the Founding-era
22 popularity of the Girandoni air rifle, with a 20- or 22-shot capacity, and detail its
23 many uses.

24 16. A true and correct copy of page 683 of Norm Flayderman, *Flayderman’s*
25 *Guide to Antique American Firearms and Their Values* (9th ed. 2007) is attached as
26 **Exhibit 21.** This excerpt of *Flayderman’s Guide* documents the introduction of the
27 Jennings multi-shot flintlock rifle in 1821 which, according to this resource, allowed
28 12 shots without reloading.

1 17. A true and correct copy of page 33 of Jim Supica, Doug Wicklund &
 2 Philip Shreier, *Treasures of the NRA National Firearms Museum* (2013) is attached as
 3 **Exhibit 22**. A true and correct copy of pages 16, 148-49 and 167 of Jack Dunlap,
 4 *American British and Continental Pepperbox Firearms* (1964) is attached as **Exhibit**
 5 **23**. A true and correct copy of pages 249-50 from Lewis Winant, *Firearms Curiosa*
 6 (2009) (1st pub. 1954) is attached as **Exhibit 24**. A true and correct copy of page 66
 7 of *Catalogue of Contents: Doe Run Lead Company's Museum* (July 1, 1912) is
 8 attached as **Exhibit 25**. These sources document some advancements in pistol
 9 technology from the early 1800s that permitted more than ten shots to be fired without
 10 reloading, including a variety of "Pepperbox" pistols that had capacities over 10
 11 rounds.

12 18. A true and correct copy of pages 711, 713, and 716 of Norm Flayderman,
 13 *Flayderman's Guide to Antique American Firearms and Their Values* (9th ed. 2007)
 14 is attached as **Exhibit 26**. These pages document several different firearm designs in
 15 the 1830s to 1850s that increased ammunition capacity beyond ten rounds.

16 19. A true and correct copy of pages 9-44 of Harold F. Williamson,
 17 *Winchester: The Gun That Won the West* (1952) is attached as **Exhibit 27**. A true and
 18 correct copy of pages 303-06 of Norm Flayderman, *Flayderman's Guide to Antique*
 19 *American Firearms and Their Values* (9th ed. 2007) is attached as **Exhibit 28**. A true
 20 and correct copy of Joseph Bilby, *The Guns of 1864*, in *Am. Rifleman* (May 5, 2014),
 21 available at <https://www.americanrifleman.org/articles/2014/5/5/the-guns-of-1864/>,
 22 is attached as **Exhibit 29**. These sources document the development of the Volcanic
 23 Repeating Arms Company's lever action rifle in 1855 with up to a 30-round tubular
 24 magazine and its evolution into a 15-round Henry lever action rifle.

25 20. A true and correct copy of page 49 of Harold F. Williamson, *Winchester:*
 26 *The Gun That Won the West* (1952) is attached as **Exhibit 30**. A true and correct copy
 27 of pages 11 and 22-35 of R.L. Wilson, *Winchester: An American Legend* (1991) is
 28 attached as **Exhibit 31**. A true and correct copy of pages 116-29 of Louis A.

1 Garavaglia & Charles G. Worman, *Firearms of the American West* (1985) is attached
 2 as **Exhibit 32**. These sources further explain the evolution of the Henry rifle into the
 3 Winchester repeating rifle that could hold 17 rounds in the magazine and 1 in the
 4 chamber.

5 21. A true and correct copy of pages 307-12 of Norm Flayderman,
 6 *Flayderman's Guide to Antique American Firearms and Their Values* (9th ed. 2007)
 7 is attached as **Exhibit 33**. A true and correct copy of pages 137, 1240-41 of the *2014*
 8 *Standard Catalogue of Firearms* (Jerry Lee ed. 2013) is attached as **Exhibit 34**. A
 9 true and correct copy of pages 108-09 of Jim Supica, Doug Wicklund & Philip
 10 Shreier, *Treasures of the NRA National Firearms Museum* (2013) is attached as
 11 **Exhibit 35**. These sources document the historical popularity of the Winchester
 12 M1873 and then the M1892, lever action rifles holding 12 to 17 rounds in tubular
 13 magazines.

14 22. A true and correct copy of pages 122-23 of Norm Flayderman,
 15 *Flayderman's Guide to Antique American Firearms and Their Values* (9th ed. 2007)
 16 is attached as **Exhibit 36**. This reference documents the nineteenth-century popularity
 17 of the Colt Lightening rifle, a pump action firearm with a 15-round capacity.

18 23. A true and correct copy of pages 60-63, 67-71, 204-208, 244-45 of Lewis
 19 Winant, *Firearms Curiosa* (2009) (1st pub. 1954) is attached as **Exhibit 37**. These
 20 excerpts document the introduction of firearms with detachable box magazines in
 21 handguns in the 1850s, including the Jarre harmonica pistol, patented in 1862.

22 24. A true and correct copy of pages 708-09 of the *2014 Standard Catalog of*
 23 *Firearms* is attached as **Exhibit 38**. A true and correct copy of pages 23, 30-32, 38-39,
 24 54-55, and 272 of John W. Breathed, Jr. & Joseph J. Schroeder, Jr., *System Mauser: A*
 25 *Pictorial History of the Model 1896 Self-Loading Pistol* (1967) is attached as **Exhibit**
 26 **39**. A true and correct copy of John Elliot, *A Sweeping History of the Mauser C96*
 27 *Broomhandle Pistol*, Guns.com (Jan. 26, 2012), [http://www.guns.com/2012/01/26/a-](http://www.guns.com/2012/01/26/a-sweeping-history-of-the-mauser-c96-broomhandle-pistol/)
 28 [sweeping-history-of-the-mauser-c96-broomhandle-pistol/](http://www.guns.com/2012/01/26/a-sweeping-history-of-the-mauser-c96-broomhandle-pistol/) is attached as **Exhibit 40**.

1 These excerpts note that semi-automatic pistols were introduced in the late nineteenth
2 century and companies had begun selling firearms and magazines with capacities over
3 ten rounds, including the Model 1896 Broomhandle Mauser, with one variant capable
4 of holding 20 rounds.

5 25. A true and correct copy of pages 191-92 of Jim Perkins, *American Boys*
6 *Rifles 1890-1945* (1976) is attached as **Exhibit 41**. These pages explain that in 1911,
7 Savage Repeating Arms Company introduced the Model 1911, a 20-shot repeater that
8 was popular among boys and in shooting galleries.

9 26. A true and correct copy of page 84 of the *2014 Standard Catalog of*
10 *Firearms* (Jerry Lee ed. 2013) is attached as **Exhibit 42**. This excerpt reflects that, in
11 1927, the Auto Ordinance Company introduced a semi-automatic rifle that used a 30-
12 round magazine.

13 27. A true and correct copy of page 104 of Patrick Sweeney, *Gun Digest*
14 *Book of the AR-15* (2005) is attached **Exhibit 43**. This page states that the Armalite 15
15 was originally equipped with a 20-round magazine; a 30-round magazine later
16 appeared.

17 28. A true and correct copy of page 294 of *Gun Digest 24th Anniversary*
18 *Deluxe Edition* (John T. Amber ed. 1969) is attached as **Exhibit 44**. This excerpt lists
19 several other firearms with magazines between 20 and 30 rounds available by 1969.

20 29. A true and correct copy of page 1102 of *2014 Standard Catalogue of*
21 *Firearms* (Jerry Lee ed. 2013) is attached as **Exhibit 45**. This page recounts the
22 production of the M1A semi-automatic rifle with a 20-round detachable magazine).

23 30. A true and correct copy of page 1173 of the *2014 Standard Catalog of*
24 *Firearms* (Jerry Lee ed. 2013) is attached as **Exhibit 46**. This excerpt recounts the
25 introduction of the Ruger Mini-14 in 1975 with manufacturer-supplied standard 5-
26 10-, or 20-round detachable magazines.

27 31. The following paragraphs introduce reference materials showing that the
28 historical prevalence and ubiquity of citizen firearms with detachable magazines

1 holding more than ten rounds were not limited to rifles:

- 2 a. A true and correct copy of pages 182-83, 432-33 of the *2014*
3 *Standard Catalogue of Firearms* (Jerry Lee ed. 2013) is attached as
4 **Exhibit 47** (Browning Hi-Power pistol with 13-round detachable
5 magazine).
- 6 b. A true and correct copy of pages 464-65 of the *2014 Standard*
7 *Catalogue of Firearms* (Jerry Lee ed. 2013) is attached as **Exhibit 48**
8 (Spanish Gabilondo with 20-round “Plus Ultra” was introduced in 1925).
- 9 c. True and correct copies of pages 72-73 of the *2014 Standard*
10 *Catalogue of Firearms* and pages 216-17 of Joseph J. Shroeder, Jr.,
11 *System Mauser, a Pictorial History of the Model 1896 Self-Loading*
12 *Pistol* (1967) are attached as **Exhibit 49** (Azul semi-automatic pistol with
13 magazines of 10, 20, and 30 rounds entered the market in 1935). A true
14 and correct copy of page 121 of the *2014 Standard Catalogue of*
15 *Firearms* is attached as **Exhibit 50** (Beretta model 92 with a 16-round
16 magazine entered the market in 1976).
- 17 d. A true and correct copy of page 184 of the *2014 Standard*
18 *Catalogue of Firearms* (Jerry Lee ed. 2013) is attached as **Exhibit 51**
19 (The Browning Double Action with 14 rounds introduced in 1977).

20 **[Modern Prevalence and Use of Magazines Over Ten Rounds]**

21 32. A true and correct copy of various pages from *Gun Digest* 2017 (71st ed.
22 2016), which identify the magazine capacities for a variety of handguns and rifles, is
23 attached as **Exhibit 52**.

24 33. True and correct copies of pages from the current websites of various
25 firearm manufacturers advertising firearms for self-defense purposes, and the
26 specifications demonstrating these firearms have a magazine capacity exceeding ten
27 rounds, are attached as **Exhibit 53**. See Glock “Safe Action” Gen4 Pistols, Glock,
28 https://us.glock.com/documents/BG_Gen4_6_2010_EN_MAIL.pdf (last visited Mar.

1 1, 2018) (specifications for the model 17, 19, 22, and 23 pistols, each equipped
 2 standard with 17, 15, 15, and 13-round magazines, respectively, and all marketed as
 3 ideal for personal defense); G19, Glock, <https://eu.glock.com/en/products/pistols/g19>
 4 (last visited Mar. 1, 2018) (marketed as ideal for “concealed carry purpose” and
 5 equipped standard with a 15-round magazine); M&P®9 M2.0™, Smith & Wesson,
 6 <https://www.smith-wesson.com/firearms/mp-9-m20-1> (last visited Mar. 1, 2018)
 7 (marketed as ideal for home and personal protection and equipped standard with a 17-
 8 round magazine); CZ 75 B, CZ-USA, [http://cz-usa.com/product/cz-75-b-9mm-black-](http://cz-usa.com/product/cz-75-b-9mm-black-16-rd-mag/)
 9 [16-rd-mag/](http://cz-usa.com/product/cz-75-b-9mm-black-16-rd-mag/) (last visited Mar. 1, 2018) (equipped standard with 16-round magazine);
 10 Ruger® SR9®, Ruger, <http://www.ruger.com/products/sr9/specSheets/3301.html> (last
 11 visited Mar. 1, 2018) (equipped standard with 17-round magazine); P320 Nitron Full-
 12 Size, Sig Sauer, <https://www.sigsauer.com/store/p320-nitron-full-size.html> (last
 13 visited Mar. 1, 2018) (marketed as ideal for home defense, and equipped standard with
 14 10- to 17-round magazines).

15 34. On or about March 1, 2018, I visited the website www.youtube.com as
 16 well as websites for various firearm manufacturers and viewed videos embedded on
 17 those websites. I am informed and believe that the videos found at the following links
 18 are advertisements produced and distributed by firearm manufacturers that are
 19 directed to consumers. These videos advertise firearms that have magazine capacities
 20 exceeding ten rounds as suitable for self-defense, including within the home. Glock
 21 Ges.m.b.H, Gunny & Glock Wrong Diner, Youtube (Nov. 10, 2011),
 22 [https://www.youtube.com/watch?v=vsVCHE7ayPE&feature=c4-overview&list=](https://www.youtube.com/watch?v=vsVCHE7ayPE&feature=c4-overview&list=UUeeqOv%2085TJigJv6YrLHZhfQ)
 23 [UUeeqOv%2085TJigJv6YrLHZhfQ](https://www.youtube.com/watch?v=vsVCHE7ayPE&feature=c4-overview&list=UUeeqOv%2085TJigJv6YrLHZhfQ); Glock Ges. m.b.H, Gunny & Glock Wrong
 24 House, Youtube (Nov. 13, 2011), <http://www.youtube.com/watch?v=6RNcFs-JwOQ>;
 25 Glock Ges.m.b.H, Gunny & Glock Wrong Girl, Youtube (Jan. 7, 2013),
 26 <http://www.youtube.com/watch?v=a2gCF0taZPo>; Glock Ges.m.b.H, Gunny & Glock
 27 Wrong Convenience Store, Youtube (March 12, 2013), [http://www.youtube.com/](http://www.youtube.com/watch?v=V8WCM_AAAyY)
 28 [watch?v=V8WCM_AAAyY](http://www.youtube.com/watch?v=V8WCM_AAAyY); Glock Ges.m.b.H, Gunny & Glock Wrong Guy,

1 Youtube (Nov. 13, 2011), [https://www.youtube.com/watch?v=gzb7SLsFwtE&list=](https://www.youtube.com/watch?v=gzb7SLsFwtE&list=UUeeqOv85TJigJv6YrLHZhfQ)
 2 [UUeeqOv85TJigJv6YrLHZhfQ](https://www.youtube.com/watch?v=gzb7SLsFwtE&list=UUeeqOv85TJigJv6YrLHZhfQ); Smith & Wesson, Smith & Wesson M&P
 3 Advertisement, Youtube (Dec. 22, 2011), [http://www.youtube.com/ watch?v=TLuN-](http://www.youtube.com/watch?v=TLuN-JrR4_M)
 4 [JrR4_M](http://www.youtube.com/watch?v=TLuN-JrR4_M); Smith & Wesson M&P Advertisement, Youtube.com (Dec. 22, 2011),
 5 <https://www.youtube.com/watch?v=g4jn6ry1pSA>.

6 35. A true and correct copy of pages 73-97 from *The Complete Book of*
 7 *Autopistols: 2013 Buyer's Guide* (2013) is attached as **Exhibit 54**. These pages
 8 identify various models of handguns for sale to the public that come standard with
 9 magazines greater than ten rounds.

10 36. A true and correct copy of Robert A. Sadowski, *The Evolution of Glock*
 11 *Pistols*, Handguns Buyer's Guide Mag. (Nov. 25, 2015), available at
 12 <https://www.personaldefenseworld.com/2015/11/the-evolution-of-glock-pistols/> is
 13 attached as **Exhibit 55**.

14 37. A true and correct copy of pages 87 and 89-90 of Massad Ayoob, *The*
 15 *Complete Book of Handguns* (2013) is attached as **Exhibit 56**.

16 38. A true and correct copy of pages 183-87 *NRA Guide to the Basics of*
 17 *Personal Protection in the Home* (1st ed. 2000) is attached as **Exhibit 57**.

18 [Impact of Magazine Capacity Restrictions]

19 39. On October 6, 2017, Defendants served Plaintiffs with the Expert Report
 20 of Dr. Christopher S. Koper. Attached to Dr. Koper's expert report was a copy of
 21 Christopher S. Koper, Daniel J. Woods & Jeffrey A. Roth, *An Updated Assessment of*
 22 *the Federal Assault Weapons Ban: Impacts on Gun Markets and Gun Violence,*
 23 *1994-2003* (Nat'l Instit. J. 2004). A true and correct copy of *An Updated Assessment*
 24 *of the Federal Assault Weapons Ban*, as appended to Professor Koper's expert report,
 25 is attached hereto as **Exhibit 58**.

26 40. A true and correct copy of *What Should America Do About Gun*
 27 *Violence?* Full Comm. Hr'g Before U.S. Sen. Jud. Comm., 113th Cong. at 11 (2013),
 28 available at <https://www.judiciary.senate.gov/imo/media/doc/1-30-13Kopel>

1 [Testimony.pdf](#) (last visited Mar. 1, 2018) is attached as **Exhibit 59**.

2 41. A true and correct copy of Gary Kleck, *Large-Capacity Magazines and*
3 *the Casualty Counts in Mass Shootings: The Plausibility of Linkage*, 17 J. Research
4 & Pol’y 28 (2016) is attached as **Exhibit 60**.

5 **[Self-Defense]**

6 42. A true and correct copy of U.S. Dept. of Justice, Bureau of Justice
7 Statistics, National Crime Victimization Survey, *Criminal Victimization in the United*
8 *States, 2008 Statistical Tables*, Table 37 (Mar. 2009), available at
9 <https://www.bjs.gov/content/pub/pdf/cvus08.pdf> is attached as **Exhibit 61**. This
10 publication notes statistics of violent crime by type of crime, relationship of offender,
11 and number of offenders.

12 43. A true and correct copy of Massad Ayoob, *Five Gunfighting Myths*
13 *Debunked by Massad Ayoob*, Personal Defense World (Oct. 14, 2014), available at
14 [www.personaldefenseworld.com/2014/10/5-gunfighting-myths-debunked-massad-](http://www.personaldefenseworld.com/2014/10/5-gunfighting-myths-debunked-massad-ayoob/#armed-and-ready)
15 [ayoob/#armed-and-ready](http://www.personaldefenseworld.com/2014/10/5-gunfighting-myths-debunked-massad-ayoob/#armed-and-ready) is attached as **Exhibit 62**. Ayoob provides examples of
16 defensive-gun-uses in response to the claim that “if you can’t do it with six, you can’t
17 do it all.”

18 44. A true and correct copy of Jacob Sullum, *The Threat Posed by Gun*
19 *Magazine Limits* (Jan. 13, 2016), available at [http://reason.com/archives/2013/01/16/](http://reason.com/archives/2013/01/16/the-threat-posed-by-gun-magazine-limits)
20 [the-threat-posed-by-gun-magazine-limits](http://reason.com/archives/2013/01/16/the-threat-posed-by-gun-magazine-limits) is attached as **Exhibit 63**.

21 45. A true and correct copy of Charles Remsberg, *Why One Cop Carries 145*
22 *Rounds of Ammo on the Job*, PoliceOne (Apr. 17, 2013), available at
23 [https://www.policeone.com/patrol-issues/articles/6199620-Why-one-cop-carries-145-](https://www.policeone.com/patrol-issues/articles/6199620-Why-one-cop-carries-145-rounds-of-ammo-on-the-job/)
24 [rounds-of-ammo-on-the-job/](https://www.policeone.com/patrol-issues/articles/6199620-Why-one-cop-carries-145-rounds-of-ammo-on-the-job/) is attached as **Exhibit 64**.


25 46. A true and correct copy of Gus G. Sentementes & Julie Bykowicz,
26 *Documents Detail Cross Keys Shooting*, Balt. Sun (Mar. 21, 2006), available at
27 [http://articles.baltimoresun.com/2006-03-21/news/0603210220_1_beckwith-police-](http://articles.baltimoresun.com/2006-03-21/news/0603210220_1_beckwith-police-documents-robbery)
28 [documents-robbery](http://articles.baltimoresun.com/2006-03-21/news/0603210220_1_beckwith-police-documents-robbery) is attached as **Exhibit 65**.

1 47. A true and correct copy of *Gun Shop Owner Shoots, Kills Man During*
2 *Attempted Robbery*, WIS TV (Aug. 9, 2012), available at
3 [http://www.wistv.com/story/19236842/gun-shop-owner-shoots-kills-man-during-](http://www.wistv.com/story/19236842/gun-shop-owner-shoots-kills-man-during-attempted-robbery)
4 [attempted-robbery](http://www.wistv.com/story/19236842/gun-shop-owner-shoots-kills-man-during-attempted-robbery) is attached as **Exhibit 66**.

5 48. A true and correct copy of Nieson Himmel, *Police Say Watch Shop*
6 *Owner Kills 4th, 5th Suspects*, L.A. Times (Feb. 21, 1992), available at
7 http://articles.latimes.com/1992-02-21/local/me-2663_1_watch-shop-owner is
8 attached as **Exhibit 67**.

9 49. A true and correct copy of *Jewelry Store Burglarized, Scene of Deadly*
10 *1994 Robbery Attempt*, nbc12.com (2012), available at
11 [http://www.nbc12.com/story/16445849/jewelry-store-burglarized-scene-of-deadly-](http://www.nbc12.com/story/16445849/jewelry-store-burglarized-scene-of-deadly-1994-robbery-attempt)
12 [1994-robbery-attempt](http://www.nbc12.com/story/16445849/jewelry-store-burglarized-scene-of-deadly-1994-robbery-attempt) is attached as **Exhibit 68**.

13 I declare under penalty of perjury that the foregoing is true and correct.
14 Executed within the United States on March 5, 2018.

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16 
17 Anna M. Barvir
18 Declarant
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**EXHIBITS
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2	Expert Report of Stephen Helsley	00027-38
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4	Expert Rebuttal Report of Professor Carlisle Moody	00103-167
5	Expert Report of Dr. Christopher S. Koper	00168-195
6	Expert Rebuttal Report of John J. Donohue	00203-241
7	Wikipedia page for “Magazine (firearms)”, https://en.wikipedia.org/wiki/Magazine_(firearms)	00242-249
8	Pages 33-36 of <i>NRA Guide to the Basics of Pistol Shooting</i> (2d ed. 2009)	00250-255
9	Pages 22-36 of John Malloy, <i>Complete Guide to Guns & Shooting</i> (DBI Books, Inc. 1995)	00256-273
10	Pages 95-99 of John Malloy, <i>Complete Guide to Guns & Shooting</i> (DBI Books, Inc. 1995)	00281-288
11	Rick Hacker, <i>Magazine Disconnect</i> , Am. Rifleman (Sept. 11, 2015)	00289-292
12	David B. Kopel, <i>The History of Firearm Magazines and Magazine Prohibitions</i> , 78 Albany L. Rev. 849 (2015)	00293-333
13	Pages 168-70 of Lewis Winant, <i>Firearms Curiosa</i> (2009) (1st pub. 1954)	00334-339
14	<i>16-Shot Wheel Lock</i> , Am.’s 1st Freedom (May 10, 2014)	00340-342

Exhibit	Description	Page(s)
15	Clayton E. Cramer & Joseph Olson, <i>Pistols, Crime, and Public Safety in Early America</i> , 44 Willamette L. Rev. 699 (2008)	00343-366
16	“Defence” Rapid-Fire Gun Patented: 15 May 1718, History Channel	00367-369
17	Pages 91-103 of Jim Garry, <i>Weapons of the Lewis and Clark Expedition</i> (2012)	00370-385
18	Pages 69-70 of John Plaster, <i>The History of Sniping and Sharpshooting</i> (2008)	00386-390
19	Page 31 of Jim Supica, Doug Wicklund & Philip Shreier, <i>Treasures of the NRA National Firearms Museum</i> (2013)	00391-394
20	Wikipedia page for “Girandoni Air Rifle”, https://en.wikipedia.org/wiki/Girandoni_air_rifle	00402-405
21	Page 683 of Norm Flayderman, <i>Flayderman’s Guide to Antique American Firearms and Their Values</i> (9th ed. 2007)	00406-409
22	Page 33 of Jim Supica, Doug Wicklund & Philip Shreier, <i>Treasures of the NRA National Firearms Museum</i> (2013)	00410-413
23	Pages 16, 148-49 and 167 of Jack Dunlap, <i>American British and Continental Pepperbox Firearms</i> (1964)	00414-420
24	Pages 249-50 of Lewis Winant, <i>Firearms Curiosa</i> (2009) (1st pub. 1954)	00421-425
25	Page 66 of <i>Catalogue of Contents: Doe Run Lead Company’s Museum</i> (July 1, 1912)	00426-428
26	Pages 711, 713, and 716 of Norm Flayderman, <i>Flayderman’s Guide to Antique American Firearms and Their Values</i> (9th ed. 2007)	00429-434

Exhibit	Description	Page(s)
27	Pages 9-17, 19-44 of Harold F. Williamson, <i>Winchester: The Gun That Won the West</i> (1952)	00442-479
28	Pages 303-06 of Norm Flayderman, <i>Flayderman's Guide to Antique American Firearms and Their Values</i> (9th ed. 2007)	00480-486
29	Joseph Bilby, <i>The Guns of 1864</i> , in Am. Rifleman (May 5, 2014)	00487-497
30	Page 49 of Harold F. Williamson, <i>Winchester: The Gun That Won the West</i> (1952)	00498-501
31	Pages 11 and 22-35 of R.L. Wilson, <i>Winchester: An American Legend</i> (1991)	00509-526
32	Pages 116-29 of Louis A. Garavaglia & Charles G. Worman, <i>Firearms of the American West</i> (1985)	00527-543
33	Pages 307-12 of Norm Flayderman, <i>Flayderman's Guide to Antique American Firearms and Their Values</i> (9th ed. 2007)	00551-559
34	Pages 137, 1240-41 of the <i>2014 Standard Catalogue of Firearms</i> (Jerry Lee ed. 2013)	00560-565
35	Pages 108-09 of Jim Supica, Doug Wicklund & Philip Shreier, <i>Treasures of the NRA National Firearms Museum</i> (2013)	00566-570
36	Pages 122-23 of Norm Flayderman, <i>Flayderman's Guide to Antique American Firearms and Their Values</i> (9th ed. 2007)	00571-575
37	Pages 60-63, 67-71, 204-208, 244-45 Lewis Winant, <i>Firearms Curiosa</i> (2009) (1st pub. 1954)	00576-594

Exhibit	Description	Page(s)
38	Pages 708-09 of the <i>2014 Standard Catalog of Firearms</i>	00595-599
39	Pages 23, 30-32, 38-39, 54-55, and 272 of John W. Breathed, Jr. & Joseph J. Schroeder, Jr., <i>System Mauser: A Pictorial History of the Model 1896 Self-Loading Pistol</i> (1967)	00600-611
40	John Elliot, <i>A Sweeping History of the Mauser C96 Broomhandle Pistol</i> , Guns.com (Jan. 26, 2012)	00612-624
41	Pages 191-92 of Jim Perkins, <i>American Boys Rifles 1890-1945</i> (1976)	00625-629
42	Page 84 of the <i>2014 Standard Catalogue of Firearms</i> (Jerry Lee ed. 2013)	00630-633
43	Page 104 of Patrick Sweeney, <i>Gun Digest Book of the AR-15</i> (2005)	00641-644
44	Page 294 of <i>Gun Digest 24th Anniversary Deluxe Edition</i> (John T. Amber ed. 1969)	00645-648
45	Page 1102 of the <i>2014 Standard Catalogue of Firearms</i> (Jerry Lee ed. 2013)	00649-652
46	Page 1173 of the <i>2014 Standard Catalogue of Firearms</i> (Jerry Lee ed. 2013)	00653-656
47	Pages 182-83, 432-33 of the <i>2014 Standard Catalogue of Firearms</i> (Jerry Lee ed. 2013)	00657-663
48	Pages 464-65 of the <i>2014 Standard Catalogue of Firearms</i> (Jerry Lee ed. 2013)	00664-668
49	Pages 72-73 of the <i>2014 Standard Catalogue of Firearms</i> (Jerry Lee ed. 2013) and pages 216-17 of Joseph J. Schroeder, Jr., <i>System Mauser: A Pictorial History of the Model 1896 Self-Loading Pistol</i> (1967)	00669-677

Exhibit	Description	Page(s)
50	Page 121 of the <i>2014 Standard Catalogue of Firearms</i> (Jerry Lee ed. 2013)	00678-681
51	Page 184 of the <i>2014 Standard Catalogue of Firearms</i> (Jerry Lee ed. 2013)	00682-685
52	Pages 369-74, 377-78, 380-87, 391, 395-96, 398-99, 401-07, 409-11, 413-14, 438-47, and 454 from <i>Gun Digest</i> 2017 (Jerry Lee ed., 71st ed. 2016)	00693-736, 00744-747
53	Pages from websites of firearm manufacturers advertising firearms	00748-774
54	Pages 73-97 of <i>The Complete Book of Autopistols: 2013 Buyer's Guide</i> (2013)	00775-800
55	Robert A. Sadowski, <i>The Evolution of Glock Pistols, Pistols, Handguns Buyer's Guide Mag.</i> (Nov. 25, 2015)	00801-811
56	Pages 87 and 89-90 of Massad Ayoob, <i>The Complete Book of Handguns</i> (2013)	00819-823
57	Pages 183-87 <i>NRA Guide to the Basics of Personal Protection in the Home</i> (1st ed. 2000)	00824-829
58	Christopher S. Koper, Daniel J. Woods & Jeffrey A. Roth, <i>An Updated Assessment of the Federal Assault Weapons Ban: Impacts on Gun Markets and Gun Violence, 1994-2003</i> (Nat'l Instit. J. 2004)	00830-866
59	<i>What Should America Do About Gun Violence?</i> Full Comm. Hr'g Before U.S. Sen. Jud. Comm., 113th Cong. At 11 (2013)	00867-903
60	Gary Kleck, <i>Large-Capacity Magazines and the Casualty Counts in Mass Shootings: The Plausibility of Linkage</i> , 17 J. Research & Pol'y 28 (2016)	00904-924

Exhibit	Description	Page(s)
61	U.S. Dept. of Justice, Bureau of Justice Statistics, National Crime Victimization Survey, <i>Criminal Victimization in the United States, 2008 Statistical Tables</i> , Table 37 (Mar. 2009)	00925-928
62	Massad Ayoob, <i>Five Gunfighting Myths Debunked by Massad Ayoob</i> , Personal Defense World (Oct. 14, 2014)	00929-938
63	Jacob Sullum, <i>The Threat Posed by Gun Magazine Limits</i> (Jan. 13, 2016)	00939-941
64	Charles Remsberg, <i>Why One Cop Carries 145 Rounds of Ammo on the Job</i> , PoliceOne (Apr. 17, 2013)	00942-946
65	Gus G. Sentementes & Julie Bykowicz, <i>Documents Detail Cross Keys Shooting</i> , Balt. Sun (Mar. 21, 2006)	00947-949
66	<i>Gun Shop Owner Shoots, Kills Man During Attempted Robbery</i> , WIS TV (Aug. 9, 2012)	00950-952
67	Nieson Himmel, <i>Police Say Watch Shop Owner Kills 4th, 5th Suspects</i> , L.A. Times (Feb. 21, 1992)	00953-955
68	<i>Jewelry Store Burglarized, Scene of Deadly 1994 Robbery Attempt</i> , nbc12.com (2012)	00956-958

EXHIBIT 1

Expert Witness Report of James Curcuruto

Duncan, et al. v. Becerra, et al.

United States District Court (S.D. Cal.)

Case No: 3:17-cv-01017-BEN-JLB

October 6, 2017

I. INTRODUCTION

I am James Curcuruto of the National Shooting Sports Foundation. Counsel for plaintiffs in *Duncan v. Becerra* (E.D. Cal. Case No. 3:17-cv-01017-BEN-JLB) have asked me to offer an opinion regarding this case. This report sets forth my qualifications, opinions, and scholarly foundation for those opinions.

II. BACKGROUND & QUALIFICATIONS

I received my associate's degree in business administration from the State University of New York at Cobleskill in 1991 and my bachelor's degree in business management from the University of North Carolina at Wilmington in 1993. My nearly 25-year business work history has focused primarily on sales, marketing, advertising, research, and analysis.

I am currently the Director, Industry Research & Analysis, at the National Shooting Sports Foundation, Inc. (NSSF). I have held this position since November 2009. The NSSF, formed in 1961, is the trade association for the firearms, ammunition, hunting, and recreational shooting sports industry. Its mission is to promote, protect and preserve hunting and the shooting sports. The NSSF has a membership of 10,000 manufacturers, distributors, firearms retailers, shooting ranges, sportsmen's organizations, and publishers.

In my position as Director, Industry Research & Analysis, I am responsible for most of the research activities at NSSF, and I direct the activities of an internal research coordinator as well as several outside companies retained to conduct research and gather market and consumer information useful to NSSF members.

Under my direction, dozens of informational reports and studies focusing on industry topics and trends, including firearms, ammunition, target shooting, and hunting, have been released to the NSSF member base. And many NSSF reports are shared outside the organization as well. Data from these releases has been referenced many times in endemic, non-endemic, online and print newspaper and magazine articles, used in corporate 10K reports, and mentioned in other media. I have authored and provided information for several articles published in trade magazines. I have also been deposed as an expert witness regarding the commonality of magazines capable of holding more than 10 rounds of ammunition.

A. Published Articles

In the past ten years, I have written or contributed to the following published articles:

<i>Firearms Accidents Drop</i>	SHOT Business	June/July 2011
<i>New Study Can Aid Planning</i>	The Range Report	Winter 2011
<i>NSSF Releases Report on Diversity</i>	SHOT Business	April/May 2013
<i>Participation Trends</i>	SHOT Business	Aug/Sept 2013
<i>Industry Research from NSSF</i>	SHOT Business	Dec. 2013
<i>Many Uses, Many Sales</i>	AR Guns and Hunting	May 2014
<i>The Big Bucks of Target Shooting</i>	SHOT Business	June/July 2014
<i>Opening the Clubhouse</i>	SHOT Business	Dec. 2014
<i>Improve Your Knowledge</i>	SHOT Business	Jan. 2015
<i>Executive Privilege</i>	SHOT Business	Dec. 2016
<i>Target Audience</i>	SHOT Business	Oct./Nov. 2017

B. Expert Witness History

In the past four years, I have been deposed and/or testified at trial in the following matters:

- Deposed for *Wilson, et al. v. Cook County, Illinois*, No. 07 CH 4848, In the Circuit of Cook County Illinois County Department, Chancery Division. November 7, 2013 Waterbury, CT 06702.
- Deposed for *Kolbe v. O'Malley*, U.S. District Court for the District of Maryland, January 24, 2014.
- Deposed for *Friedman v City of Highland Park*, May 27, 2014, Windsor Locks, CT 06096.

III. COMPENSATION

I am not receiving compensation from any parties to litigation or their counsel in exchange for my opinions.

IV. ASSIGNMENT

Plaintiffs' counsel has asked me to provide opinion on the prevalence of firearm magazines capable of holding more than ten rounds of ammunition in American society, including rates of ownership of such magazines by law-abiding citizens.

V. SUMMARY OF OPINION

There are at least one hundred million magazines of a capacity of more than ten rounds in possession of American citizens, commonly used for various lawful purposes including, but not limited to, recreational and competitive target shooting, home defense, collecting and hunting.

VI. ANALYSIS

Many NSSF members manufacture, distribute and/or sell firearms and shooting and hunting-related goods and services, and as is usual and customary for trade associations, the NSSF collects and disseminates industry-specific, non-sensitive data reflecting consumer preferences, market trends and other information for use in their business decisions. Among the shooting and hunting-related goods and services manufactured, distributed and sold by NSSF members are ammunition magazines.¹ Research conducted by the NSSF and under my direction demonstrates that detachable ammunition magazines are very popular and are commonly owned by millions of persons in the United States for a variety of lawful purposes, including, but not limited to, recreational and competitive target shooting, home defense, collecting and hunting.

In addition to ammunition magazines accompanying firearms that utilize them at the time of sale, such magazines are also widely available for sale as a stand-alone item to individuals who need a replacement, different-capacity, and/or additional magazines.

I am not aware of any singular public source providing reliable figures identifying exactly how many ammunition magazines are manufactured or imported for sale within the United States each year. There are, however, data available to me from which estimations of the number of magazines that have been sold to the general population, as well as how many of those have a capacity for ammunition exceeding ten rounds, can be calculated within a reasonable degree of certainty.

Using such data, I have, in the normal scope of my duties on behalf of the NSSF, calculated estimations of the total number of magazines possessed by consumers in the United States, as well as how many of those have a standard

¹ A “magazine” is a receptacle for a firearm that holds a plurality of cartridges or shells under spring pressure preparatory for feeding into the chamber. <http://saami.org/glossary/display.cfm?letter=M>, Glossary of Terms, Sporting Arms and Ammunition Manufacturers’ Institute (SAAMI). While magazines take many forms – box, drum, rotary, tubular, etc. and may be fixed or removable – from the materials I considered and firearms industry professionals I consulted, the figures discussed in this declaration generally (if not exclusively) concern detachable, box magazines.

capacity for ammunition exceeding ten rounds. These estimations are published in the NSSF® Magazine Chart attached to this report.

The NSSF® Magazine Chart estimates that 230 million pistol and rifle magazines were in the possession of United States consumers between 1990 and 2015. The data supporting the Chart further shows magazines capable of holding more than 10 rounds of ammunition accounted for approximately 115 million or approximately half of all magazines owned.

Sources used to compile the NSSF® Magazine Chart include the Bureau of Alcohol, Tobacco, Firearms and Explosives (ATF) Annual Firearms Manufacturers and Exports Reports (AFMER), U.S. International Trade Commission (ITC) data, as well as, opinions of firearms industry professionals. To prepare the NSSF® Magazine Chart, only the number of pistols and rifles were used while revolver and shotgun data was excluded as revolvers and the clear majority of shotguns do not utilize magazines.

The ATF AFMER data provide historical figures for pistols by caliber (i.e., the specific ammunition cartridge for which a firearm is chambered) and rifles produced in the United States for consumer purchase. The ITC data provides historical figures for pistol and rifles imported to and exported from the United States for consumer purchase. The total number of firearms available for consumer purchase from 1990 through 2015 was calculated by adding the total U.S. production of firearms with total firearms imported and then subtracting total firearms exported.

The ATF AFMER and ITC data provided estimates of approximately 67.7 million pistols and 42.6 million rifles capable of holding a magazine were available to United States consumers between 1990 and 2015. Firearms industry professionals with knowledge of the pistol and rifle magazine market then allocated magazines to the totals to complete the data provided in the NSSF® Magazine Chart.

It can be assumed that many more such magazines were manufactured in the United States or imported to the United States for sale in the commercial marketplace both prior to 1990 as well as after 2015.

While the figure of 115 million magazines with a capacity greater than 10 rounds in circulation is an estimation based on extrapolation from indirect sources and cannot be confirmed as unequivocally accurate, it is safe to say that whatever the actual number of such magazines in United States consumers' hands is, it is in the tens-of-millions, even under the most conservative estimates.

VII. REFERENCES

- Bureau of Alcohol, Tobacco, Firearms and Explosives (ATF) Annual Firearms Manufacturers and Exports Reports (AFMER).
- U.S. International Trade Commission (ITC) online query system.


VIII. ATTACHMENTS

Attached and made a part of this report is a copy of the NSSF® Magazine Chart (Exhibit 1).

IX. CONCLUSION

Based on the findings listed above, it is my opinion that magazines that are capable of holding more than ten rounds of ammunition are commonly used by millions of law-abiding Americans for a variety of lawful purposes.

Dated: October 6, 2017

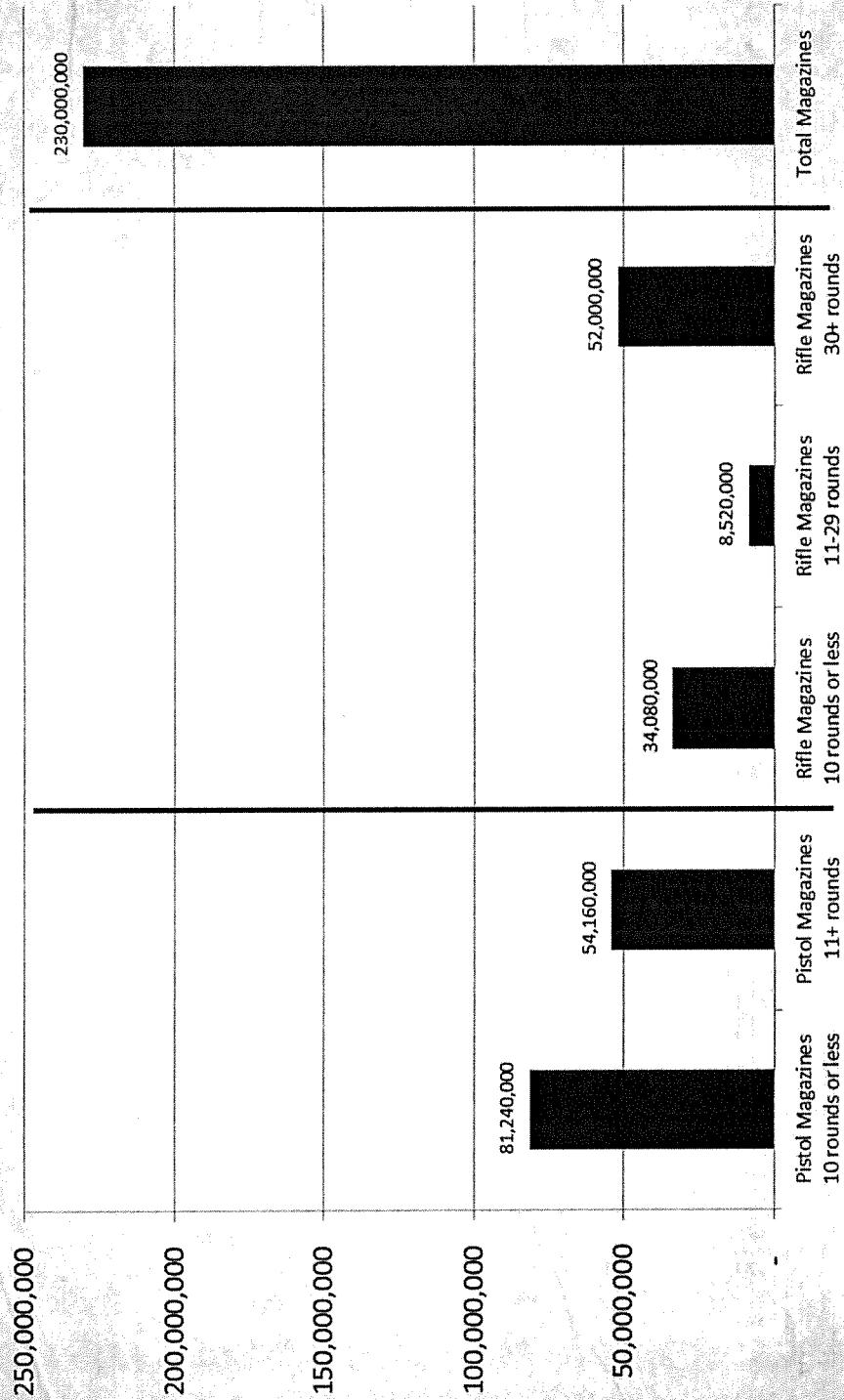


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EXHIBIT 1

NSSF® Magazine Chart

Estimated 230 Million Pistol and Rifle Magazines in U.S.
Consumer Possession 1990 - 2015.



Sources: ATF AFMER, US International Trade Commission figures combined with NSSF and firearms industry estimates.

NSSF.ORG

EXHIBIT 2

Expert Witness Report of Stephen Helsley

Duncan, et al. v. Becerra, et al.

United States District Court (S.D. Cal.)

Case No: 3:17-cv-01017-BEN-JLB

October 6, 2017

I. INTRODUCTION

Counsel for plaintiffs in *Duncan v. Becerra* (E.D. Cal. Case No. 3:17-cv-01017-BEN-JLB) have asked me to offer an opinion regarding this case. This report sets forth my qualifications, opinions, and scholarly foundation for those opinions.

II. BACKGROUND & QUALIFICATIONS

I am Stephen Helsley, a retired peace officer from the California Department of Justice (DOJ). The bulk of that career was in drug enforcement. The last three positions I held were Chief of the Bureau of Narcotic Enforcement, Chief of the Bureau of Forensic Services and, finally, Assistant Director of the Division of Law Enforcement. As Assistant Director, I was responsible for the department's criminal, civil, and controlled substance investigations as well as law enforcement training, intelligence gathering and our forensic laboratory system. In my executive level positions, I had occasion to review special agent-involved shootings and a wide range of homicides involving firearms.

I was the DOJ's principal firearms instructor for many years, and I am an FBI-certified range master. I also participated in the firearm training that was part of the FBI National Academy Program in Quantico, VA. I am a member of the American Society of Arms Collectors and a technical advisor to the Association of Firearm and Tool Mark Examiners. For the past 24 years, I was first a state liaison and, then later, a consultant to the National Rifle Association.

I have co-authored five books on firearms and have authored or co-authored more than fifty firearm-related articles for U.S. and Russian journals. Throughout my adult life, I have been an active participant in handgun, rifle, and shotgun competitions. I have also been a firearm collector and ammunition reloader since the early 1960s.

Finally, I am a collector of firearm-related books—of which I have approximately three thousand. Included in my book collection are approximately 50 different issues of *Gun Digest*, the earliest of which is from 1944. It is a standard resource that is widely used by gun dealers and buyers alike. *Gun Digest* has traditionally provided a comprehensive overview of the firearms and related items available to retail buyers.

The combination of my consulting work, writing and free time activities puts me in constant contact with gun stores, shooting ranges, gun shows and gun owners. I am also in frequent contact with retirees from DOJ and other law enforcement agencies.

I have qualified as an expert in both criminal and civil matters.

A. Published Articles

In the past ten years, I have written or contributed to the following published articles and opinion editorials:

1. Articles

- *Of Birmingham and Belgium*, Double Gun Journal, vol. 18, iss. 2 (2007).
- *The .470 Nitro Express*, Sports Afield (June/July 2007).
- *Readings on the Roots of the .410*, Shooting Sportsman, Nov./Dec. 2007.
- *Hunting in Wales*, Hunting and Fishing (Russia), Dec. 2007.
- *A Pair for a Pair of Friends*, Shooting Sportsman, March/April 2008.
- *A Welsh Fantasy*, Shooting Sportsman, July/Aug. 2008.
- *A Maine Gun Goes Home*, Shooting Sportsman, Sept./Oct. 2008.
- *The Pin Fire Comes Home*, Libby Camps Newsletter, Winter 2008.
- *John Rigby & Co.*, Hunting and Fishing (Russia), July 2008.
- *The All-American Double Rifle*, Safari, Sept./Oct. 2008.
- *Eastern Oregon Odyssey*, Shooting Sportsman, Nov./Dec. 2008.
- *Rigby Marks 275th Anniversary*, Safari, Nov./Dec. 2009.
- *Finding Papa's Guns*, Shooting Sportsman, March/April 2010.
- *The Searcy Stalking Rifle*, Safari, May/June 2010.
- *The Ruggs Riders*, Shooting Sportsman, July/Aug. 2010.
- *Searcy Brings Back the Rising-Bite*, Shooting Sportsman, Sept./Oct. 2010.
- *John Rigby & Co.*, African Hunting Gazette, Fall 2010.
- *The Ageless .416 Rigby*, Safari, Nov./Dec. 2012.
- *J. P. Clabrough*, Shooting Sportsman, March/April 2015.
- *The Mystery of Hemingway's Guns*, Friends and Neighbors, Summer 2015.
- *The Enigma of Hemingway's Guns*, Master Gun (Russia), Sept. 2015.
- *The Mystery of Hemingway's Guns*, CRPA Firing Line, Sept./Oct. 2015.
- *Pistols at Dawn*, CRPA Firing Line, Jan./Feb. 2016.
- *The Silver Star*, CRPA Firing Line, Jan./Feb. 2016.
- *Women Guns & Politics*, CRPA Firing Line, March/April 2016.
- *Hunting the Big Mouse*, CRPA Firing Line, Sept./Oct. 2016.
- *Do Guns Make Heroes? The Congressional Medal of Honor*, CRPA Firing Line, Nov./Dec. 2016.
- *Thumbs-Up Guns*, Shooting Sportsman, Jan./Feb. 2017.
- *Is Your Gun Safely Stored? (Part 1)*, Friends and Neighbors, Summer 2017.
- *History of William Powell and His Patents*, Master Gun (Russia), Aug. 2017.

- *Guns from San Francisco and Birmingham*, Master Gun (Russia), Oct. 2017.
- *Is Your Gun Safely Stored? (Part 2)*, Friends and Neighbors, Autumn 2017.

2. Opinion Editorials

- *It's About Time: State has Eroded Gun Owner's Rights*, Sac. Bee (July 4, 2010).
- *Nevada Views: Is Gun Registration Worth Cost?*, Nev. Rev. J. (Sept. 16, 2012).
- *Gun Roundup Program Has Too Many Flaws*, Sac. Bee (May 3, 2013).

B. Expert Witness History

In the past four years, I have not been deposed in or testified at trial as an expert witness.

III. COMPENSATION

I am not being compensated for my work on this report.

IV. ASSIGNMENT

Plaintiffs' counsel has asked me to provide opinion on the historical existence and prevalence of firearms and/or magazines capable of holding more than ten rounds of ammunition and the reasons law-abiding Americans, including law enforcement and private citizens, so often select such items.

Counsel has also asked that I provide opinion on the utility of firearm magazines with the ability to accept more than ten rounds of ammunition in self-defense, as well as the impact of ten-round magazine limitations on law-abiding citizens.

V. OPINIONS & ANALYSIS

1. *Magazines over ten rounds are, and have historically been, a common choice for self-protection for use in both rifles and handguns.*

The standard magazine for a given firearm is one that was originally designed for use with that firearm, regardless of whether its capacity is six, ten, fifteen, or twenty rounds. Various popular handgun models originally came from the manufacturer standard, free from artificial influences like laws restricting capacity, with magazines exceeding ten rounds. Examples include, but are in no way limited to, the Browning High Power (13 rounds) c.1954, MAB PA-15 (15 rounds) c.1966, Beretta Models 81/84 (12/13 rounds) c.1977, S&W Model 59 (14 rounds) c.1971, L.E.S P-18 (18 rounds) c.1980 aka Steyr GB, Beretta Model 92

(15 rounds) c.1980s, and Glock 17 (17 rounds) c.1986. I know there to be many more examples not listed here.

Firearms with a capacity exceeding 10-rounds date to the ‘dawn of firearms.’ In the late-15th Century, Leonardo Da Vinci designed a 33-shot weapon. In the late 17th Century, Michele Lorenzoni designed a practical repeating flintlock rifle. A modified 18th Century version of Lorenzoni’s design, with a 12-shot capacity, is displayed at the NRA’s National Firearms Museum. Perhaps the most famous rifle in American history is the one used by Lewis and Clark on their ‘Corps of Discovery’ expedition between 1803 and 1806—the magazine for which held twenty-two .46 caliber balls.

Rifles with fixed magazines holding 15-rounds were widely used in the American Civil War. During that same period, revolvers with a capacity of 20-rounds were available but enjoyed limited popularity because they were so ungainly.

In 1879, Remington introduced the first ‘modern’ detachable rifle magazine. In the 1890s, semiautomatic pistols with detachable magazines followed. During WWI, detachable magazines with capacities of 25 to 32-rounds were introduced. As those magazines protruded well below the bottom of the pistol’s frame, they weren’t practical for use with a belt holster—and by extension concealed carry for self-defense.

In 1935, Fabrique Nationale introduced the Model P-35 pistol with its fully internal 13-round magazine. It would become one of the most widely used military pistols of all time. During WWII, magazine capacity for shoulder-fired arms was substantially increased while most pistols (excluding the P-35) remained at 10-rounds or less. In the mid-1950s the P-35 was rebranded the High Power and imported to the US.

This transition of a firearm from military to civilian use for sport or self-defense is very common. The standards of WWI—the 1903 Springfield rifle and the Colt M1911 pistol are but two of many examples. Civilian sales of both increased after the war as a result of the training “doughboys” received before going to France. The Springfield would become the standard for both rifle hunting and target competition. Likewise, the M1911 Colt pistol was a target-shooting standard for a half-century or more and popular for self-defense.

Between the two world wars, double-action semiautomatic pistols like the Walther PPK and P-38 were introduced. The double-action feature allowed the first shot to be fired in a manner similar to a revolver. Law enforcement agencies in the United States had traditionally used revolvers. However, in the early 1970s, a confluence of events changed that: training funds became widely available and so did the first double action semiautomatic pistol (the S&W M59) with a 14-round magazine. Soon major agencies were transitioning to the M59 and the legion of

other makes that followed—CZ, Colt, HK, Sig-Sauer, Glock, Beretta, Ruger, Smith & Wesson, etc. Pistols with magazine capacities as large as 19-rounds quickly replaced the six-shot revolver.

Law enforcement demand for the new generation of semiautomatic pistols helped create an increased demand in the civilian market. Comparing 1986 and 2010 handgun sales, one can see evidence of that change. According to the Bureau of Alcohol Tobacco Firearms and Explosives, in 1986, 663,000 pistols were sold in the United States versus 761,000 revolvers. In 2010, revolver sales had dropped to 559,000, while pistol sales had grown to 2,258,000. *See* United States Department of Justice, Bureau of Alcohol, Tobacco, Firearms and Explosives, *Firearms Commerce in the United States, Annual Statistical Update* (2012), available at <http://www.atf.gov/files/publications/firearms/050412-firearms-commerce-in-the-us-annual-statistical-update-2012.pdf>. The result of almost four decades of sales to law enforcement and civilian clients is millions of semiautomatic pistols with a magazine capacity of more than ten rounds and likely multiple millions of magazines for them. My associates who have such pistols also have a considerable number of spare magazines for them. In my case, I have one 19-round and eight 17-round magazines for my Glock.

The on-duty, uniformed police officer generally will be armed with a service pistol containing a detachable magazine holding more than ten rounds, and generally two spare magazines holding more than ten rounds on the uniform belt. The clear majority of California law enforcement officers carry pistols with double-stack magazines whose capacities exceed those permitted under California Penal Code section 32310.

The home-owner and the concealed weapon permit holder want a pistol that can hold significantly more cartridges than a revolver for the same reason a law enforcement officer or soldier wants one—to increase his or her chances of staying alive. For virtuous citizens buy their guns to protect themselves from the same criminals that police carry guns to protect the citizens, the public, and themselves from. For this reason, armed citizens have historically modeled their choice of firearms on what police carry.

2. *Limiting the law-abiding citizen to a magazine of ten rounds limits their ability to protect themselves from violent criminals in certain situations. Such limits on magazine capacity are likely to impair the ability of citizens to engage in lawful self-defense in those crime incidents necessitating that the victim fire many rounds to stop the aggressive actions of offenders, while having negligible impact on the ability of criminals to carry out violent crimes.*

Based on my experience with and understanding of the customs and practices of citizens licensed to carry guns in public, individuals often carry *only*

the gun, without spare ammunition or magazines. Similarly, most plainclothes police officers do not find it practical to carry multiple handguns.

Likewise, the average homeowner who keeps a defensive firearm is unlikely to have time to gather spare ammunition or magazines. Rather, they are generally limited to one firearm and its magazine capacity. For the homeowner who keeps a defensive firearm and is awakened in the night by an intruder is most unlikely to have time to gather spare ammunition. The sudden and unpredictable nature of such attacks, and their occurring in relatively confined spaces, generally prohibits the gathering of multiple firearms or magazines. Ideally, one hand would be occupied with the handgun and the other with a telephone to call the police. Assuming an individual even had time for a magazine change, most people do not sleep with firearms or magazines attached to their bodies or wearing clothing that would allow them to stow spare magazines or ammunition on their person. They would have only what was in the firearm.

The off-duty officer and the private law-abiding citizen are thus unlikely to have much, if any, spare ammunition on their person or elsewhere readily accessible. They are not likely to be wearing body armor, nor to be in reach of a spare, loaded rifle or shotgun. Their only communication to potential backup will be by phone, relayed through Police Dispatch to responding officers. Thus, for them, the ability to have a pistol already loaded with a significant amount of ammunition is all the more important.

Uniformed police officers who are traditionally armed against the same criminals, on the other hand *are* normally wearing body armor. They generally have immediate access to a loaded shotgun and/or loaded patrol rifle with magazines holding more than ten rounds in the patrol car. And they will have instant radio access to dispatch and fellow officers if backup help is needed. Further, they will generally have both a loaded gun *and* two additional magazines. Each of those magazines would generally hold 17 rounds of 9mm or 15 rounds of .40 caliber cartridges. Collective law enforcement experience has determined this to be critical to allowing the officer to survive a gunfight with armed criminals.

What's more, the average citizen is not trained like law enforcement personnel and is generally not as readily prepared for combat with an armed criminal. As noted, they are likely to have a single firearm loaded with a single magazine available, and they are more susceptible to the psychological effects that naturally occur when faced with the threat of deadly violence and tend to deprive one of the focus and clarity of mind necessary to make accurate shots.

For these reasons, having a magazine over ten rounds at one's disposal certainly could make a difference in self-defense situations, and likely would during home invasions or when facing armed attackers. In my opinion, law-abiding citizens will thus be at a disadvantage in such situations if California enforces its ban on the possession of magazines over ten rounds.

Criminals bent on causing harm, on the other hand, are not likely to be meaningfully affected by California's magazine restrictions. Even assuming they were impeded from obtaining magazines over ten rounds by Penal Code section 32310, they could simply arm themselves with multiple weapons and/or magazines, and they often do. Criminals have time to assess and plan shootings, whereas victims do not. Indeed, it is the attacker who chooses when, where, how, and whom to attack. So, the attacker is not as burdened by the surprise and shock that the victim is and is generally prepared for the confrontation with several firearms and a substantial amount of ammunition.

The virtuous citizen cannot practically be expected to have accessible multiple guns, magazines, or spare ammunition at a moment's notice. The victimized citizen is the one who is, therefore, most deleteriously impacted by the magazine capacity limitation. If he or she must use the gun to protect self and family, they will most likely have only the ammunition in the gun with which to fend off determined, perhaps multiple, attackers.

Supporters of the magazine capacity limitation may point to some firearm expert who is comfortable with an eight- or nine-shot pistol, or even a five- or six-shot revolver. It should be noted, however, that the operative term there is "expert." The individual who has spent a lifetime training in shooting, and may fire hundreds or even thousands of shots on the range per month, has developed a level of skill and confidence that is not practical to expect from the average police officer or the average law-abiding citizen who keeps a firearm in the home or on his person for protection of self and family.

Finally, it is worth noting that it is difficult to say exactly how many private citizens have fired more than ten rounds in a self-defense shooting, because the number of rounds fired in such cases is very often an omitted fact in written accounts of such defensive gun uses. Often the accounts just say, "multiple shots fired." That could mean more or less than ten. This does not seem to be the case with shootings involving police officers, for which, the number of shots fired is generally documented. In my experience researching such shootings, officers often fire more than ten rounds. And cases where an individual officer fired less than ten rounds, but where multiple officers were shooting, can be fairly characterized as involving more than ten rounds, if the multiple officers involved fired over ten rounds in aggregate. Officer-involved shootings are relevant in evaluating private citizen shootings, for the simple reason that private citizens arm themselves for protection against the same criminals the police are armed to deal with.

3. *A firearm equipped with a magazine capable of holding more than ten rounds is more effective at incapacitating a deadly threat and, under some circumstances, may be necessary to do so.*

Gunfights frequently involve a lot of "missing." This can be the result of improper aim or impact with barriers such as vehicles or walls. One would be hard

pressed to find someone who had been in a gunfight that complained about having too much ammunition.

Some believe that anyone defending themselves can just “shoot to wound.” Those who grew up in the 1950s likely watched Roy Rogers shoot the gun out of an evildoers’ hand or—if things got really serious—let loose a grazing wound to the arm to settle matters. Such ideas are a fantasy. Equally as silly is the well-known ‘fact’ that a bullet from a .45ACP cartridge will knock someone to the ground no matter where it strikes them.

The notion that a bullet can “knock-down” a person is a largely Hollywood-inspired myth. Most of us learned in school about Sir Isaac Newton’s *Third Law of Motion* that states—“For every action, there is an opposite and equal reaction.” Put another way: if the recoil of the firearm doesn’t knock you down, neither will the impact of the bullet. Bullets can penetrate skin, cut arteries, break bones or interrupt nerve function to accomplish what is generally described as “stopping power.” A bullet that severs the spine or strikes a certain area of the brain will almost certainly stop an attacker instantly. Bullet design and/or increased velocity may improve performance, but placement is still the most critical factor.

A hit, or even multiple hits, to less vital areas of the body may allow an attacker to continue the assault. This phenomenon is extensively documented in the citations for American heroes who were awarded the Congressional Medal of Honor. Many of these men continued to fight after suffering multiple gunshot wounds, being struck by shrapnel or having an arm or leg severed. *See, e.g., The Congressional Medal of Honor, The Names, The Deeds* 28-29, 52-53, 284-85 (Sharp & Dunnigan 1984). A fighter who has overcome fear and is motivated to continue an attack can be difficult to stop. In the infamous 1986 FBI shoot-out with two Florida bank robbers, one of the suspects, Michael Platt, sustained 12 gunshot wounds before dying. Jamie Frater, *Top 10 Most Audacious Shootouts in US History*, Listserve (October 14, 2009), <http://listverse.com/2009/10/14/top-10-most-audacious-shootouts-in-us-history/>.

“Knockdown” and “Stopping Power” are things I know from personal experience. During my early years as a narcotic agent with the California Department of Justice, I was conducting an undercover investigation of a significant heroin dealer. After purchasing an ounce and a half of heroin from him and the arrest was initiated, he shot me with a .45 first breaking my left arm and severing an artery (Note: I wasn’t “knocked down”) and then bouncing another round off my spine that exited my right leg. From a prone position, I returned fire at the suspect who was mostly concealed by the trunk of his car. My shots that struck the vehicle failed to penetrate sufficiently to reach him. In the exchange that followed I had another round pass through my right leg, while another entered my left side and lodged in the disc between L3 and L4—where it remains today. Having emptied the 8 rounds in my pistol, I tried to reload. However, with a broken arm and temporary paralysis from the waist down, I was unable to reach

my spare magazine in my left rear pants pocket. Fortunately, at that time the suspect quickly surrendered to my converging surveillance team. Very little pain was initially associated with my wounds and I could have “fought on” if more ammunition had been available. A total of 18 rounds were fired.

Four years later, I was making an undercover cocaine purchase with a new member of my team. I had involved myself to evaluate his performance. The three suspects, two of whom were armed (initially unbeknownst to us) had decided that robbery was a better option than delivering the cocaine. The junior agent was taken hostage and was being held in the state undercover car with a sawed-off rifle to the back of his head and a revolver held against his right side. I was across the street in another undercover car with the money the suspects wanted. I informed the surveillance team that I was going to approach the other vehicle to see what I could do. When I got to the car it was difficult to determine what was happening, as it was a dark, rainy night. I told the agent to exit the vehicle and as he opened the car door and dived out, two shots were fired at him—both missed. I returned fire at the area of the muzzle flash inside the car. Of the eight rounds I fired, the automobile glass defeated most. However, one .45 bullet hit the suspect holding the rifle, causing him serious internal injuries. The suspect with the revolver came out of the passenger door and was struck through the shin with a .45 bullet from a member of the surveillance team who had quietly closed-in on the vehicle. After a short pause the suspects were ordered out of the vehicle. Both of those with gunshot wounds came out fighting. A flashlight to the chin produced the ‘stopping power’ for the suspect with the internal wound. The suspect with the leg wound was unaware of his injury until he saw the massive blood loss—whereupon he exclaimed “I’m bleeding” and passed out. Twenty-eight rounds were fired into the vehicle with only two hits. For my actions in this incident I was awarded the department’s Medal of Valor.

The “take away” from these incidents is that serious bullet wounds aren’t necessarily incapacitating and that gunfights can require lots of ammunition.

VII. REFERENCES

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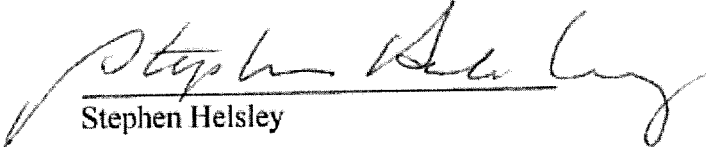
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VIII. CONCLUSION

It is clear to me from my collective experiences and from the analysis described above that firearms and magazines with ammunition capacities exceeding ten rounds have existed and have been in use since at least the 18th Century.

It is also clear that Americans commonly choose and use magazines capable of holding more than ten rounds of ammunition for lawful purposes, including self-defense.

Dated: October 6, 2017


Stephen Helsley

UNITED STATES DISTRICT COURT
SOUTHERN DISTRICT OF CALIFORNIA

VIRGINIA DUNCAN, et al.,

Plaintiffs,

v.

XAVIER BECERRA, in his official
capacity as Attorney General of the State
of California,

Defendant.

Case No: 17-cv-1017-BEN-JLB

CERTIFICATE OF SERVICE

IT IS HEREBY CERTIFIED THAT:

I, the undersigned, declare under penalty of perjury that I am a citizen of the United States over 18 years of age. My business address is 180 East Ocean Boulevard, Suite 200 Long Beach, CA 90802. I am not a party to the above-entitled action.

I have caused service of the following documents, described as: **PLAINTIFFS' DISCLOSURE OF EXPERT WITNESSES**, on the following parties by the following means:

☒ **(BY MAIL)** As follows: I am "readily familiar" with the firm's practice of collection and processing correspondence for mailing. Under the practice it would be deposited with the U.S. Postal Service on that same day with postage thereon fully prepaid at Long Beach, California, in the ordinary course of business. I am aware that on motion of the party served, service is presumed invalid if postal cancellation date is more than one day after date of deposit for mailing an affidavit.

☒ **(BY ELECTRONIC MAIL)** As follows: I served a true and correct copy by electronic transmission. Said transmission was reported and completed without error.

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I declare under penalty of perjury that the foregoing is true and correct. Executed on October 6, 2017, at Long Beach, CA.

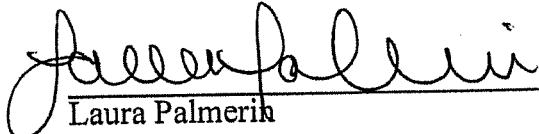

Laura Palmerin

EXHIBIT 3

Expert Witness Rebuttal of Dr. Gary Kleck

Duncan, et al. v. Becerra, et al.

United States District Court (S.D. Cal.)

Case No: 3:17-cv-01017-BEN-JLB

November 3, 2017

I. INTRODUCTION

I am Dr. Gary Kleck, Emeritus Professor of Criminology & Criminal Justice at Florida State University. Counsel for plaintiffs in *Duncan v. Becerra* (S.D. Cal. Case No. 3:17-cv-01017-BEN-JLB) have asked me to offer a rebuttal opinion regarding this case. This report sets forth my qualifications, opinions, and scholarly foundation for those opinions.

II. BACKGROUND & QUALIFICATIONS

I am an emeritus Professor of Criminology and Criminal Justice at Florida State University. I received my doctorate in Sociology from the University of Illinois in 1979, where I received the University of Illinois Foundation Fellowship in Sociology. I was, at the time of my retirement in May 2016, the David J. Bordua Professor of Criminology at Florida State University, where I served on the faculty from 1978 to 2016. My research has focused on the impact of firearms and gun control on violence, and I have been called “the dominant social scientist in the field of guns and crime.” William J. Vizzard, *Shots in the Dark: The Policy, Politics, and Symbolism of Gun Control* 183 (2003).

I have published the most comprehensive reviews of evidence concerning guns and violence in the scholarly literature, which informs and serves as part of the basis of my opinions. I am the author of *Point Blank: Guns and Violence in America*, which won the 1993 Michael J. Hindelang Award of the American Society of Criminology, awarded to the book of the previous several years which “made the most outstanding contribution to criminology.” I also authored *Targeting Guns* (1997) and, with Don B. Kates, Jr., *The Great American Gun Debate* (1997) and *Armed* (2001)—books that likewise addressed the topic of guns and violence.

I have also published scholarly research articles in virtually all the leading professional journals in my field. Specifically, my articles have been published in the *American Sociological Review*, *American Journal of Sociology*, *Social Forces*, *Social Problems*, *Criminology*, *Journal of Criminal Law and Criminology*, *Law & Society Review*, *Journal of Research in Crime and Delinquency*, *Journal of Quantitative Criminology*, *Law & Contemporary Problems*, *Law and Human Behavior*, *Law & Policy Quarterly*, *Violence and Victims*, *Journal of the American Medical Association*, and other scholarly journals.

I have testified before Congress and state legislatures on gun control issues, and worked as a consultant to the National Research Council, National Academy of Sciences Panel on the Understanding and Prevention of Violence, as a member of the U.S. Sentencing Commission's Drugs—Violence Task Force, and as a member of the Institute of Medicine and National Research Council Committee on Priorities for a Public Health Research Agenda to Reduce the Threat of Firearm-Related Violence. I am a referee for over a dozen professional journals, and serve as a grants consultant to the National Science Foundation.

Finally, I have taught doctoral students how to do research and evaluate the quality of research evidence, and have taught graduate courses on research design and causal inference, statistical techniques, and survey research methodology.

My current curriculum vitae, which includes a full list of my qualifications and publications, is attached hereto as **Exhibit 1**.

In the past four years, I have been deposed and/or testified at trial in the following matters:

- *Heller v. District of Columbia*, D.D.C. (deposed July 2, 2013).
- *Cook et al. v. Hickenlooper*, D. Colo. (deposed and testified Mar. or April 2013).
- *Wilson v. Cook County* (deposed Sept. 16, 2013).
- *Kolbe v. O'Malley*, D. Md. (deposed Jan. 2, 2014).
- *Barbra Schlifer Commemorative Clinic v. HMQ Canada* ("Cross-examined" [Canadian term for deposed] Feb. 24, 2014).
- *Friedman v. City of Highland Park* (deposed May or June 2014).
- *Tracy Rifle and Pistol v. Harris*, E.D. Cal. (deposed Nov. 2, 2016).

III. COMPENSATION

I am being compensated for my time in this case at an hourly rate of \$400 per hour. My compensation is not contingent on the results of my analysis or the substance of my testimony.

IV. ASSIGNMENT

Plaintiffs' counsel has asked me to provide an opinion in response to the opinions presented in the expert reports of Dr. Lucy Allen, Dr. Louis Klarevas, and Dr. Christopher Koper submitted by Attorney General Xavier Becerra.

V. OPINIONS & ANALYSIS

A. Response to Dr. Lucy Allen's Expert Report

1. *Allen's Analysis of the NRA Sample of Defensive Gun Uses*

Professor Allen cites data from the "Armed Citizen" column of the National Rifle Association's (NRA) magazine, *American Rifleman*, and concludes that "it is rare for a person, when using a firearm in self-defense, to fire more than ten rounds."¹ She does not confine this conclusion to persons whose defensive gun use (DGU) was reported in the *American Rifleman*, but clearly intends it to apply to Americans in general. The NRA's database of "armed citizen" stories is not a representative sample of DGUs, nor does the NRA even claim it to be so. Allen likewise does not claim that the NRA sample is representative. Indeed, her own remarks indicate the opposite—she acknowledges the possibility of bias in selecting cases "in favor of stories that put use of guns in self-defense in the best possible light."² Therefore, there is no formal basis for generalizing the results of any analysis of this sample to any larger population of DGUs.

The utility of the NRA sample is, however, even worse than merely being unrepresentative of DGUs in a general way. More specifically, there is strong reason to believe that the sample will largely exclude DGU incidents in which the defender fired more than 10 rounds. NRA staff nonrandomly select these incidents from news media-reported cases of DGU, most of them submitted by readers of the "Armed Citizen" feature of *American Rifleman*.³ Based on the content of these stories published in the magazine, it is clear that they are selected to convey the impression that DGU is an extremely legitimate and successful activity, engaged in by law-abiding persons, for clearly legally justifiable purposes, carried out in clearly lawful ways. The reality of the full array of DGUs is considerably more

¹ Expert Report of Dr. Lucy P. Allen at 5, *Duncan v. Becerra*, No. 3:17-cv-01017-BEN-JLB (Oct. 6, 2017) ("Allen Report").

² *Id.*

³ See, e.g., *The Armed Citizen*, Am. Rifleman 10, Nov. 2017 (urging readers to submit news clippings of DGU stories).

diverse, but the NRA has a political agenda to portray DGU in as positive a light as possible.

Thus, Allen is quite right to note that the selection practices of NRA staff are likely to favor inclusion of DGU stories that put DGU “in the best possible light.”⁴ She does not, however, appear to understand how this bias would work regarding stories in which defenders fired large numbers of rounds. It could not serve the NRA’s purposes to disseminate accounts of DGUs in which the defenders appeared to indiscriminately “fling lead,” firing arguably excessive numbers of rounds at their adversaries. The more seemingly excessive the defender’s use of force appears to be, the less likely it is that his actions would appear to a reader to be justifiable. Likewise, the NRA is unlikely to want to disseminate stories in which effective self-defense was difficult and dangerous, requiring the firing of large numbers of rounds. Instead, NRA staff would better serve their political ends by selecting stories of DGUs in which the defenders used the minimum amount of force needed to defend themselves, firing the fewest rounds needed to serve that purpose. This would bias the sample of selected DGUs in the direction of excluding cases in which many rounds were fired.

Even though the NRA sample is not representative of DGUs in general, Allen’s analysis of the NRA sample does nevertheless establish one thing: DGUs in which more than 10 rounds are fired do occur. Her analysis of the NRA sample of identified two incidents in which over 10 rounds were fired, a frequency that Allen characterizes as “rare.”⁵ This is indeed rare in absolute terms, but then so are acts of gun violence with over 10 rounds fired. Data in Reedy and Koper indicated that crimes less than 2% of gun crimes known to the police involve offenders firing over 10 rounds.⁶ Of course, mass shootings are even more rare, and detailed examination of the way mass shootings actually occur indicates that the number of

⁴ Allen Report, *supra* note 1, at 5.

⁵ *Id.* at 12.

⁶ D.C. Reedy & Christopher S. Koper, *Impact of Handgun Types on Gun Assault Outcomes*, 9 Injury Prevention 151-155 (2003).

incidents in which use of “large-capacity magazines”⁷ is likely to have increased the number of victims killed or injured in a typical year may well be zero.⁸

It is therefore worth considering the implications, for example, if just 0.3% of all DGUs involved over 10 rounds being fired, as Allen’s results indicate. National surveys that have specifically asked about DGUs have consistently indicated 0.5-3.5 million DGUs per year,⁹ it would be reasonable to assume an annual average of at least 1 million DGUs. If this were the frequency of all DGUs, a 0.3% share would imply a number of DGU incidents with over 10 rounds fired that was huge in absolute terms—about 3,000 per year. Thus, the LCM percentage does not have to be very large in order for it to imply a huge absolute number of incidents or for that number to greatly exceed the number of crimes in which LCM use increased the harm inflicted on victims. In short, Allen’s own results from the “Armed Citizen” analysis, taken at face value, imply that there are more DGUs each year in which the defender fires over 10 rounds than there are crimes committed in which LCM use increased the harms inflicted.

2. *Allen’s Analysis of 200 DGUs Reported in the News*

DGUs reported in news outlets are no more likely to be representative of all DGUs than the “Armed Citizen” sample. News outlets rarely find out about crimes on their own—they find out about crimes from the police. DGUs that are reported to the police, like the NRA-selected DGUs, are likely to be especially legitimate and justified. Conversely, defenders are less likely to report their DGUs to the police if their actions are likely to appear to the police as involving excessive force or indiscriminate firing of a gun. This means that incidents in which defenders fired over 10 rounds are likely to be rare among DGUs reported to the police and consequently covered by news outlets, regardless of how common such incidents really are.

⁷ California law defines a “large capacity magazine” as, with limited exceptions, “any ammunition feeding device with the capacity to accept more than 10 rounds.” Cal. Penal Code § 16740. I understand that this is not a universally accepted definition. But, for ease of reference, I refer to magazines over ten rounds as “LCMs” throughout this report.

⁸ Gary Kleck, *The Effect of Large-Capacity Magazines on the Casualty Count of Mass Shootings: The Plausibility of Linkages*, 17 Just. Res. & Pol’y 28-47 (2016) (“Kleck 2016”).

⁹ Gary Kleck, *Chapter 6: The Frequency of Defensive Gun Use: Evidence and Disinformation*, in Gary Kleck & Don B. Kates, *Armed: New Perspectives in Gun Control* 213-284 (2001).

Allen uncovered 4,800 news stories of DGUs over a span of six years, but needlessly sampled just 200 of the stories for analysis.¹⁰ Her sample was selected randomly¹¹ and may well be approximately representative of the full set of DGU *news stories*, but since the set of DGUs reported in the news is itself likely to be an unrepresentative sample of all DGUs, Allen's sampling procedures cannot produce a representative sample of DGUs. She therefore has no basis for generalizing the results of this analysis to the entire population of DGUs.

Leaving aside the unrepresentative character of the sample, it is also needlessly small. Allen did not need to sample cases at all, and she certainly did not need to select so few. She does not explain why she sampled at all.¹² Sampling necessarily introduces sampling error as an additional source of error in her analysis, and it is especially severe if so small a sample ($n=200$) was selected. Estimates of the percent of DGUs involving over 10 rounds fired will be needlessly imprecise because of Allen's decision to sample and to select so small a sample. If the results of Allen's analysis are correct and 0.3% of DGUs involve over 10 rounds fired, this would mean that one would expect just 0.6 of a DGU of this type to be found in a sample of 200 DGUs ($.003 \times 200 = 0.6$), so it's not surprising (or especially significant) that the small sample examined in Allen's second analysis did not happen to include any DGUs with over 10 rounds fired.

Indeed, the imprecision of Allen's estimate of this percentage is so great that finding zero DGUs of this type in the *sample* (as Allen did)¹³ is, statistically speaking, perfectly compatible with a *nonzero* percent (such as 0.3%) in the full *population* of all DGUs. Consider, for example, the implications if Allen's estimate of the LCM share derived from her NRA analysis is correct, i.e. that 0.3% of DGUs involve over 10 rounds fired. The 95% confidence interval estimate of this fraction is an estimate that reflects its degree of imprecision due to sampling error and is computed according to this formula:

$$95\% \text{ CI} = p \pm 1.96 [\text{square root of } ([p \times q]/n)], \text{ where}$$

p =the sample estimate of the proportion of DGUs that involved over 10 rounds fired (0.003),

¹⁰ Allen Report, *supra* note 1, at 9.

¹¹ *Id.*

¹² *See id.* at 8-12.

¹³ *Id.* at 11.

q = the sample estimate of the proportion of DGUs that did *not* involve over 10 rounds fired (0.997), and

n = the sample size (200).

The formula yields a 95% confidence interval (CI) estimate of -0.0046 to .0106, which means that we can be 95% confident that the true population proportion of DGUs is between -0.0046 and .0106, or -0.46% and 1.06%.

Since 0% lies within this interval, it means, in plain English, that even if the actual percent of *all* DGUs that involve over 10 rounds fired was 0.3% as indicated by Allen's NRA analysis, one could still easily obtain the 0% *sample estimate* that she obtained in her second analysis from her needlessly small sample of 200 DGUs reported in the news.

Thus, the results of her second analysis are fully compatible with the results of her first analysis, which implied that there are 3,000 or more DGUs each year in the U.S. that involve over 10 rounds fired.

3. *Allen's Claims About the Share of Mass Shootings that Involve LCMs Rely on Sources Known to be Unreliable*

Allen claims that LCMs are "often used in mass shootings."¹⁴ The claim is supported by an analysis of a sample of mass shooting incidents from two sources, *Mother Jones* and The Citizens Crime Commission of New York City,¹⁵ both of which are known to be based on biased samples of mass shootings. The problem with both samples is that they were apparently selected (whether intentionally or not) in a way that favored the inclusion of incidents involving LCMs and disfavored inclusion of incidents not involving LCMs.

Consider the sample analyzed by staff members of *Mother Jones* magazine. Their report purportedly showed that an astounding 86% (31 of 36) of public mass shootings involved an LCM.¹⁶ An unscrupulous analyst could, of course, easily make the LCM share as large as one liked simply by limiting the sample studied to cases already known to involve LCMs, and excluding cases that did not. Therefore, any results based on the *Mother Jones* sample can be trusted only to the extent that

¹⁴ *Id.* at 14.

¹⁵ *Id.*

¹⁶ Mark Follman, Gavin Aronsen & Deanna Pan, *US Mass Shootings, 1982-2017: Data from Mother Jones' Investigation*, Mother Jones, <http://www.motherjones.com/politics/2012/12/mass-shootings-mother-jones-full-data/> (last updated Oct. 18, 2017) ("Mother Jones").

their 36 cases were representative of all mass shootings, or at least all those occurring in public places. The reality, however, is that less than 7% of all mass shootings with 3 or more dead—as distinct from the tiny subset analyzed in the *Mother Jones* study—are known to involve LCMs.¹⁷ *Mother Jones*'s 86% figure was obtained only because their selection procedures somehow excluded nearly all mass shootings that did not involve LCMs. The most comprehensive listing of all mass shootings that is currently available is at the Gun Violence Archive (GVA) website, which relies on news media sources for accounts of mass shootings.¹⁸ For the three complete years for which the website has complete coverage, 2014-2016, the compilers identified 136 incidents with three or more people killed.¹⁹ For the same period, the staff of *Mother Jones*, which advocates for LCM bans, could identify just 6 mass shootings in 2014-2016 that were known to involve LCMs.²⁰

The Violence Policy Center (VPC), which also advocates for LCM bans, could identify just 9 incidents with three or more victims killed in which a shooter was known to have used a magazine with a capacity exceeding ten rounds.²¹ The study by VPC was not limited to mass shootings that occurred in public, but covered all shootings with 3 or more fatalities regardless of their location, yet still uncovered just 9 mass shootings the involved LCMs in 2014-2016—about 3 per year. Thus, less than 7% ($9/136=0.066$) of mass murders in the United States in 2014-2016 were known to have involved use of an LCM. To the extent that even the GVA compilation is incomplete, and the total number of mass murders still larger than their figures indicate, this LCM share would be still smaller.

In sum, the 9 LCM-involved incidents in 2014-2016 claim just 6.6% of the GVA-documented mass shootings with three or more fatalities in that period—a far cry from the 86% share indicated by the *Mother Jones* data.

One could of course speculate that LCM involvement in some mass shootings was not mentioned in any news story and thus went unnoticed by *Mother*

¹⁷ See discussion immediately following.

¹⁸ Gun Violence Archive, *Gun Violence Archive 2017*, <http://www.gunviolencearchive.org> (last visited Nov. 3, 2017).

¹⁹ *Id.* (based on my analysis of GVA's data).

²⁰ *Mother Jones*, *supra* note 16.

²¹ Violence Policy Center, *High-Capacity Ammunition Magazines Are the Common Thread Running Through Most Mass Shootings in the United States* (July 1, 2017), available at <http://gunviolence.issuelab.com/resource/high-capacity-ammunition-magazines-are-the-common-thread-running-through-most-mass-shootings-in-the-united-states.html>.

Jones and VPC staff, but this seems unlikely in light of the intense political and news media interest in LCMs. In any case, I am not aware of any evidence that such cases are common enough to materially affect estimates of the prevalence of LCM use in mass shootings. For the *Mother Jones* estimate of 86% to be even remotely accurate, *Mother Jones* and VPC staffers would have had to have missed huge numbers of LCM-involved mass shootings. Recall that the GVA database identifies, for 2014-2016, 136 mass shootings with 3 or more dead—the cut-off used by *Mother Jones* and VPC staffers to define a mass shooting. If the *Mother Jones* estimate of the share of mass shootings involving LCMs (86%) really was valid and applied to all mass shootings with 3 or more fatalities, there should have been 117 LCM-involved mass shootings (86% of 136) discovered by researchers for the 2014-2016 period. Yet the *Mother Jones* staff managed to discover just 6 public mass shootings with three or more victims killed known to involve LCMs in 2014-2016, and VPC staff discovered only 9 for all locations. If these were indeed the only LCM-involved mass shootings with 3 or more fatalities that could be uncovered by *Mother Jones* and VPC methods, this would mean that those methods captured only about 5% of LCM-involved incidents. The *Mother Jones* and VPC staff were either astoundingly incompetent and their methods extremely ineffective in discovering LCM-involved mass shootings or, more likely, the 86% LCM share estimated in the *Mother Jones* study is simply far too high, and there were actually far fewer than 117 LCM-involved mass shootings to be discovered.

Why, then, did the *Mother Jones* study yield such an extraordinarily high estimate of LCM involvement? The *Mother Jones* study covered only incidents *where magazine capacity could be determined*.²² Unfortunately, news reporters may feel that magazine capacity is a detail worth reporting in their stories only if it is large. If so, the *Mother Jones* estimate of the LCM share reflects nothing more than the degree to which news outlets regard LCM use as newsworthy, but tells us nothing about the actual prevalence of LCM use in all mass shootings. Very likely, LCM use is common in shootings *for which news reporters thought that ammunition capacity was worth mentioning*, but this tells us nothing about how prevalent LCM use is in all mass shootings.

The second source on which relies for her analysis of the prevalence of LCMs in mass shootings, referred to as “The Citizens Crime Commission of New York City,”²³ is afflicted by the exact same problems as the *Mother Jones* sample, so it does not require separate discussion.

²² Expert Report of Dr. Christopher S. Koper at 7, *Duncan v. Becerra*, No. 3:17-cv-01017-BEN-JLB (Oct. 6, 2017) (“Koper Report”).

²³ Allen Report, *supra* note 1, at 13.

4. *Allen's Analysis of Mass Shootings Says Nothing About Whether LCM Use Causes More Harm in Shooting Incidents*

Allen correctly notes that mass shooters who used LCMs inflicted more casualties than those who did not,²⁴ but leaves the impression that LCM use must have somehow *caused* the higher casualty count. She does not mention the obvious alternative explanation for this statistical association—that shooters more intent on hurting many people would prepare to do so by acquiring LCMs and bringing them to the scene of their crime. That is, lethality of intent determines both the choice of weaponry and ammunition and the outcome of the crime. If this completely accounts for the association, it means that the association is spurious, i.e. non-causal. That is, it means the LCM use has no effect of its own on the number of casualties inflicted.

This alternative explanation entails two component assertions:

- (1) Greater lethality of offender intent causes shooters to fire more rounds and inflict more casualties.
- (2) Greater lethality of intent makes it more likely that mass shooters will use weaponry they believe is suited to their deadly intentions.

Regarding assertion (1), it is scarcely credible that the outcomes of mass shootings are not affected by what the shooters intended. While the correspondence between intent and outcome may not be perfect, it surely is strong. To my knowledge, no proponent of LCM bans or scholarly student of LCM effects, including Allen, has ever denied this assertion. Thus, assertion (1) appears to be widely accepted.

Likewise, to my knowledge, no proponent of LCM bans or scholarly student of LCM effects has ever denied that mass shooters commonly plan their attacks well in advance, and that this planning includes obtaining firearms and ammunition. News accounts of mass shootings routinely describe the perpetrators of mass shootings planning their attacks weeks or months in advance, acquiring guns and magazines that they later use to kill and injure.²⁵ Assertion (2) is completely consistent with all evidence about mass shootings known to me or included in Allen's report.

Therefore, the association between (a) LCM use and (b) the numbers of rounds fired and victims hurt in mass shootings, is at least partly (and possibly entirely) spurious, attributable to the effects of (c) shooter lethality of intent on

²⁴ *Id.* at 14.

²⁵ Kleck 2016, *supra* note 8 (collecting examples).

both (a) and (b). If propositions (1) and (2) are correct, the only way to support the claim that the association between (a) and (b) is *not* entirely spurious (and thus is at least partly causal in nature) is to measure and control for (c). Allen has not done this, nor has anyone else, to my knowledge. Thus, Allen has made no affirmative case for the claim that the association between (a) and (b) is even partially causal, or the position that LCM use has any causal effect on the number of casualties in mass shootings.

Allen's implied position that LCM use actually affects the number of casualties would be strengthened if she could cite details of actual mass shootings that indicate that LCMs were necessary for firing many rounds and inflicting many casualties, or that fewer rounds would have been fired and fewer casualties inflicted, had the shooter lacked LCMs. For example, she might have tried to cite substantial numbers of shootings in which the offender used an LCM, but had only one gun and one magazine, since, in such a situation, bystanders would have a better chance of tackling the shooter while he was reloading, and potential victims would have additional time to escape while the shooter was reloading. Allen did not do this, and she could not do it because there are no such known cases. All mass shooters use multiple guns or multiple magazines and therefore could, even if they did not have LCMs, fire many rounds without significant interruption, by either firing additional guns once the first one was emptied or by quickly changing magazines, something that takes generally takes approximately 2-4 seconds.²⁶

5. *Allen's Estimates of Defensive Gun Use Frequency in California*

Allen tries to estimate the frequency of DGUs in the home in California using a method that will inevitably produce a radical underestimate. For unexplained reasons, she arbitrarily limits her estimates to DGUs (a) that occurred in the victim's home, and (b) in which the victims faced a robber armed with a firearm.²⁷ Many Californians can lawfully possess firearms in places other than their homes, and therefore use them in self-defense in nonhome locations. Further, there is no sound reason to exclude cases in which crime victims defended against unarmed offenders or those armed with non-gun weapons. Most robbers commit their crimes without using guns, so this arbitrary limitation is another huge source of underestimation of DGU frequency. For example, the 2008 National Crime Victimization Survey (NCVS) indicated that only 23.7% of all robberies were

²⁶ *Id.* at 41.

²⁷ Allen Report, *supra* note 1, at 16.

committed by offenders with firearms,²⁸ and even Allen's California data confined to robberies known to the police indicate that only 29.1% of California robberies in 2011-2016 involved offenders with guns.²⁹ Thus, this flaw alone implies that there were at least 3 times more robbery victimizations in California than Allen's figures suggest and correspondingly larger numbers of robbery-linked DGUs.

Further, Allen wrongly relies on figures that reflect only crimes known to the police in California, ignoring the fact that only about half of robberies are reported to the police.³⁰ Adjusting for this fact would, all by itself, double Allen's estimates of home robberies in California and thus her estimates of DGUs occurring in connection with those kinds of crimes.

Finally, and most importantly, the source on which Allen relies for the "national rate" at which crime victims use guns for self-defense has been shown to grossly understate DGU frequency, and its estimates have been strongly contradicted by the findings of all other professionally conducted national surveys.³¹ At least 16 national surveys, using probability samples of the U.S. adult population and employing professional interviewers, have found that the annual total of DGUs is anywhere from 0.5 million to 3.5 million, depending on the year the survey was conducted and what subset of DGUs was asked about.³² No survey has ever generated an estimate even remotely close to the supposed estimate of about 0.1 million (100,000) that some have derived from the source on which Allen relies. The true rate of DGU therefore appears to be at least 5-35 times larger than the estimate on which Allen relies, so her estimates of DGU frequency would all have to be multiplied by numbers ranging anywhere from 5 to 35 before they even began to be realistic.

Considering all these enormous sources of underestimation, Allen's estimates of the frequency of DGU in connection with California home robberies cannot be regarded as even remotely accurate, or even of the correct order of

²⁸ U.S. Dep't of Justice, U.S. Bureau of Justice Statistics, *Criminal Victimization in the United States, 2008 Statistical Tables* (2011), tbl. 66, available at <http://www.bjs.gov/content/pub/pdf/cvus0804.pdf>

²⁹ Cal. Dep't of Justice, *Crime in California 2016*, tbl. 6 (2017).

³⁰ U.S. Dep't of Justice, U.S. Bureau of Justice Statistics, *Criminal Victimization in the United States, 2005 Statistical Tables* (2006), tbl. 91, available at <https://www.bjs.gov/content/pub/pdf/cvus05.pdf> ("2005 Tables").

³¹ Kleck 2001, *supra* note 9, at 213-29.

³² *Id.* at 214-29.

magnitude. Consequently, her comparisons of the frequency of DGU with other kinds of events are wildly inaccurate, misleading, and meaningless.³³

B. Response to Dr. Klarevas' Expert Report

1. Klarevas's Qualifications

Among criminologists, and social scientists generally, the “coin of the realm” in assessing scholarly productivity is the number of articles published in refereed journals. Based on his own Curriculum Vitae, Klarevas has never published a single refereed article on firearms and violence generally, or mass shootings specifically, in his life.³⁴ That is, he has never published anything on the topic that had to pass review by experts in the field. Indeed, his only publication of any kind on the topic is a popular book on mass shootings, *Rampage Nation: Securing America from Mass Shootings* (2016), which offers mostly unsystematic descriptions of mass shootings and *non-sequitur* opinions about how to prevent them.

Klarevas seems to suggest that his scholarship for that book is impressive because he “assembled 50 years of data capturing all known gun massacres in the United States” for 1966-2015.³⁵ In fact, he is merely riding on the coattails of Dr. Grant Duwe, who gathered data on every mass murder (not just mass shootings) in the United States for the entire 20th century, 1900-1999.³⁶ All that Klarevas did in his book was to extend Duwe's work to cover the period 2000-2015, and only for a small subset of mass murders. Klarevas is not an expert on this topic.

2. Overheated Rhetoric and Exaggerated Claims of the Threat of “Gun Massacres”

By way of buttressing his opinion that bans on LCMs have the potential to significantly improve the safety of Americans, Klarevas claims that “gun massacres presently pose the deadliest threat to the safety and security of American society,”³⁷ and that they are “the greatest and most credible threat to the safety and

³³ Allen Report, *supra* note 1, at 16-17.

³⁴ Expert Report of Dr. Louis Klarevas at app'x A, *Duncan v. Becerra*, No. 3:17-cv-01017-BEN-JLB (Oct. 6, 2017) (“Klarevas Report”).

³⁵ *Id.* at 5.

³⁶ See Grant Duwe, *Mass Murder in the United States: A History* (2007).

³⁷ Klarevas Report, *supra* note 34, at 4.

security of American society in the present era.”³⁸ Klarevas does not explain what he means by mass shootings posing a threat to “security” as distinct from a threat to safety, so I cannot judge this portion of his claim. Regarding threats to safety, however, Klarevas’s own data contradict his claim.

He documents 113 “gun massacres” (which he defines as incidents involving 6 or more dead), in which 1,009 people were killed, over the period from 1968 through September 2017.³⁹ This is a period of 49 and $\frac{3}{4}$ years, so his own figures imply that an average of 20.3 Americans have been killed in “gun massacres” per year ($1009/49.75=20.28$). To put this number in perspective, 17,250 Americans were killed in criminal homicides of all types in 2016.⁴⁰ Thus, only 1/10th of 1% of all murder victims are killed in “gun massacres.”

Alternatively, we can state the degree of threat to the safety of Americans by computing the fraction who will be killed in a “gun massacre” in a given year. Since there were about 323,127,513 Americans in 2016, the annual average of 20.3 deaths implies that the probability of an American dying in a “gun massacre” is about 0.000000063, or 0.0063 per 100,000 population—about 1 in 15.9 million. As a point of comparison, defense expert Lucy Allen has calculated that the rate of Americans dying because they were struck by lightning is 0.09 per 100,000 population.⁴¹ Thus, the risk of an American being killed in a “gun massacre” is less than 1/14th of the risk of being killed by a bolt of lightning—itself a freakishly rare event. However horrific individual mass shootings may be, it is absurd to describe their threat to the safety of Americans as “the greatest threat ... to the ... safety of American society in the present era.”⁴² This sort of overheated rhetoric is appropriate to propagandists, not to serious scholars.

³⁸ *Id.* at 5.

³⁹ *Id.* at 6.

⁴⁰ U.S. Fed. Bureau of Investigation, Criminal Justice Info. Servs. Div., *Crime in the United States, 2016*, tbl. 1, available at <https://ucr.fbi.gov/crime-in-the-u.s/2016/crime-in-the-u.s.-2016/topic-pages/tables/table-1> (last visited Nov. 3, 2017) (“FBI”).

⁴¹ Allen Report, *supra* note 1, at 16.

⁴² Klarevas Report, *supra* note 34, at 5.

3. *The Frequency of LCM Use in Mass Shootings*

Klarevas claims that many mass shootings involve use of LCMs,⁴³ basing the claim on the information presented in Appendix B, Table 2. It should first be noted how narrow this claim is. Klarevas does not assert that LCMs are often used in violent crime in general, or gun violence in general, or even mass shootings in general. If he had, the claim would clearly have been wrong, since LCMs are rarely used in those sets of incidents.⁴⁴ Instead, this claim only pertains to the very narrow subset of mass shootings that Klarevas labels “gun massacres”—those that involve 6 or more dead. Since such incidents, according to Klarevas’s own data⁴⁵ occur only about 2.27 times per year in the United States, and claim only 1/10th of 1% of murder victims, his claim of LCM involvement is not very significant or relevant to the problem of gun violence in general or even the narrower problem of mass shootings.

More concerning is Klarevas’s questionable factual foundation for his assertion. I have checked out each of the incidents for which Klarevas claims there was LCM use, and found that at least 1/3 of his claims cannot be supported. For 17 cases out of 50 claimed incidents, I could not find any affirmative evidence that LCMs were used, despite extensive searches involving the following steps. First, I found that each of these 17 questionable cases could not be found in the VPC compilation of LCM-involved mass shootings.⁴⁶ VPC is strongly supportive of LCM bans, and their staff is well-motivated to discover as many LCM-involved mass shootings as they can. As explained above, the VPC compilation covers shootings with 3 or more dead, and all of the incidents that Klarevas claims involved LCMs had at least 6 dead, so all of these 17 dubious cases should have shown up in the VPC compilation. Second, I checked the news sources cited for these dubious cases in the GVA compilation of mass shootings (4 or more shot, fatally or nonfatally), which covers the 2013-2017 period, and is the most comprehensive compilation of mass shootings available.⁴⁷ None of the news sources cited as sources in the GVA mentioned any use of LCMs in the dubious cases that occurred in 2013-2017. Finally, I used the NewsBank database of print and broadcast news sources to identify additional news sources on the 17 dubious cases. None of them reported LCM use in any of these cases. Klarevas himself

⁴³ *Id.* at 6 & app’x B, tbl. 2.

⁴⁴ Kleck 2016, *supra* note 8, at 29.

⁴⁵ Klarevas Report, *supra* note 34, at 6.

⁴⁶ Violence Policy Center, *supra* note 21.

⁴⁷ Gun Violence Archive, *supra* note 18.

does not provide, in his expert report, any specific sources to support his claims regarding each of these mass shootings.

The following are the 17 dubious cases I identified, listed by their date of occurrence as shown in Klarevas's Appendix B, Table 2: 12-8-86, 8-9-91, 5-16-93, 7-29-99, 12-20-00, 3-21-05, 3-25-06, 6-21-06, 10-7-07, 2-7-08, 12-24-08, 1-19-10, 7-7-11, 7-9-14, 5-17-15, 10-1-15, and 9-10-17. It is impossible to prove a negative, such as the assertion that no sources exist to support Klarevas's claims, but I can say that I was unable to find, despite extensive efforts, any affirmative evidence of LCM use in these 17 incidents, nor Klarevas does provide any.

To summarize, by including these 17 dubious cases, in addition to 33 genuine cases, Klarevas overstated the number of LCM-involved "gun massacres" by 52%. He covered a period of nearly 50 years, so there was only about 2/3 of an incident of that type per year in the United States. Such incidents are therefore extremely rare by any reasonable standard. Regardless of how horrific these crimes are individually, taken collectively they do not represent a significant threat to the safety of Americans, never mind the "greatest threat."

4. *Klarevas' Beliefs About How LCMs Increase the Harm Done in Mass Shootings*

In his report, Klarevas lays out how he thinks LCM use increases the harm inflicted by "active shooters" (a term he never defines) in "gun massacres."⁴⁸ After noting the uncontroversial facts that shooting victims are more likely to die if struck by more bullets, he builds his case on unsubstantiated and inaccurate personal opinions and speculations that are contradicted by known facts about mass shootings.

He appears to believe that there are 4 ways in which LCM use increases the harm inflicted by mass shooters. First, he claims that, when used in a semiautomatic weapon, "an LCM facilitates the ability of a shooter to fire off rounds at an extremely quick rate."⁴⁹ It is important to stress that Klarevas is *not* alluding to the fact that LCM use reduces the number of times a mass shooter would have to change magazines if he wanted to hurt many people, since that is a separate claim he makes later, on page 9. He is instead claiming that a semiautomatic gun can fire faster when it has a larger magazine in it than when it has a smaller magazine! He does not describe any mechanical reason for this difference or cite any evidence whatsoever to support this remarkable claim, and for good reason. To my knowledge, there is no such evidence—the claim is simply false. Although semiautomatic firearms in general can fire more rapidly than other

⁴⁸ Klarevas Report, *supra* note 34, at 7-11.

⁴⁹ *Id.* at 7.

types of firearms, the use of a larger magazine in a semiautomatic firearm does not add to its rate of fire. The state of California does not ban all semiautomatic guns, so would-be mass shooters in the future will still be able to use such guns in their crimes. And the current case concerns the ban on LCMs. Thus, Klarevas's claim is totally irrelevant to the current case as well as factually inaccurate.

Klarevas appears to have misunderstood the arguments of better-informed advocates of LCM bans as to why LCM use might enable mass shooters to fire more rounds in a given period of time. Defense expert Christopher Koper correctly notes that "[l]arge-capacity magazines allow semiautomatic weapons to fire more than 10 rounds without the need for a shooter to reload the weapon."⁵⁰ Likewise, a spokesperson for VPC, which advocates for LCM bans, explained that "[h]igh-capacity ammunition magazines facilitate mass shootings by giving attackers the ability to fire numerous rounds without reloading."⁵¹ *This* claim is accurate, though of less significance than LCM advocates believe.⁵² It is not, however, the claim that Klarevas was making on page 7. The latter claim is plainly false.

Second, Klarevas asserts that "LCMs also facilitate the ability of a shooter to strike a human target with more than one round."⁵³ While he accurately notes that victims who suffer multiple gunshot wounds are more likely to die than those who suffer a single wound, Klarevas never explains why or how LCM use would increase a shooter's ability to inflict multiple wounds in the first place. LCM use does not increase the shooter's accuracy, nor does Klarevas claim it does. Indeed, if it increased the shooter's rate of fire, as Klarevas argues, it would *reduce* accuracy because shooters would have less time to align their gun's barrel with a given victim. Likewise, LCM use is irrelevant to how many rounds a would-be mass shooter could bring to the scene of the crime and thus how many total rounds he could fire. Three unbanned 10-round magazines and one banned 30-round magazine both contain 30 cartridges and thus allow the exact same total number of shots to be fired. So, use of LCMs cannot increase the number of victims shot multiple times by increasing the total number of cartridges available to the shooter, any more than it improves shooting accuracy.

⁵⁰ Koper Report, *supra* 22, at 4.

⁵¹ Press Release, Violence Policy Center, *High-Capacity Ammunition Magazines: The Common Thread That Runs Through Mass Shootings* (Jan. 11, 2011), available at <http://www.vpc.org/press/press-release-archive/high-capacity-ammunition-magazines-the-common-thread-that-runs-through-mass-shootings/>.

⁵² Kleck 2016, *supra* note 8, at 42-44.

⁵³ Klarevas Report, *supra* note 34, at 7.

Third, Klarevas argues that “if gunmen run out of bullets (sic), there is a lull in the shooting. This previous down-time affords those in the line of fire with a chance to flee, hide, or fight back.”⁵⁴ Klarevas addresses the issue of victims fighting back as a separate point,⁵⁵ so here I will only discuss the claim regarding increased time to flee or hide. Klarevas misunderstands the relevant issue regarding pauses in shooting. Mass shooters always pause their shooting at some point during their crimes, regardless of whether the pauses are related to the sizes of their magazines, and thus some prospective victims always have times when they could flee or hide. This fact does not change if shooters use different size magazines. Thus, the relevant question is whether shooters who were denied LCMs and who instead substituted magazines of a capacity allowed under LCM law, such as a 10-round capacity, would provide *additional time* for victims to flee or hide, due to the additional magazine changes necessitated by the more limited capacity of each magazine.

Nothing Klarevas that presents bears on this issue at all. He does not even appear to understand the issue, given that he thinks it is somehow supportive of his argument to merely cite mass shootings in which victims flee or take cover.⁵⁶ For example, he asserts (based on third- or fourth-hand information⁵⁷) that children in the Sandy Hook school shooting escaped while the shooter was changing magazines. Even if this claim were true, Klarevas says nothing to indicate that the magazine change in question provided any *additional time* for victims to escape beyond the time that elapsed between shots when the shooter was *not* firing.

This distinction is crucial because the best available information indicates that mass shooters generally fire their weapons slowly and deliberately, with substantial intervals between shots. Shooters can easily change detachable magazines in approximately 2-4 seconds depending on the experience of the shooter, but mass shooters nearly all take more than that amount of time between shots anyway, whether changing magazines or not.⁵⁸ Thus, if an LCM ban forced at least a few mass shooters to use smaller magazines and change them more times during their crime, the magazine changes would not add any *additional time* for

⁵⁴ *Id.* at 9.

⁵⁵ *Id.* at 10-11.

⁵⁶ *Id.* at 9-10.

⁵⁷ See Louis Klarevas, *Rampage Nation: Securing America from Mass Shootings* 280 (2016).

⁵⁸ Kleck 2016, *supra* note 8, at 42-44.

prospective victims to flee or hide. None of the mass shootings that Klarevas cites contradict this conclusion or even provide relevant information.

Finally, Klarevas repeats a commonly expressed rationale for LCM bans, asserting that “in recent history there have been numerous instances of active shooters being physically confronted by unarmed civilians while reloading, bringing their gun attacks to an abrupt end.”⁵⁹ The purportedly supporting incidents he cites, however, indicate that once again he misunderstands the relevant issues. Klarevas cites cases in which victims disarmed shooters who were *not* using semiautomatic firearms of the type that can accept LCMs.⁶⁰ He also cites them as “just a sampling of examples,”⁶¹ as if he knows of many more supportive cases he could cite if he wanted to. This is highly unlikely considering how unsupportive the 7 cases he cites are of his claims.

Firearms that are *not* semiautomatic take longer to reload than those that are semiautomatic, so the time during which bystanders could tackle the shooter while reloading is considerably longer with non-semiautomatic firearms that must be reloaded one round at a time than it is with semiautomatic guns equipped with detachable magazines. The California LCM ban does not eliminate guns that are semiautomatic in loading mechanism, nor does it ban guns with the ability to accept detachable magazines; it only restricts the capacity of magazines. Thus, cases of bystanders tackling shooters with firearms of a type other than semiautomatic guns that can accept detachable magazines are totally irrelevant to an assessment of the likely effects of the LCM ban.

Klarevas’s examples of civilians tackling mass shooters while they were reloading are all, without exception, irrelevant to his claims, mischaracterized by Klarevas, or both. It is therefore worth considering each one to illustrate exactly how he padded out his list of supposedly supportive incidents. I list the 7 shootings in the same order as shown in Klarevas’s table on page 11, by date:

12-7-93. The shooter in this incident was in a sense “reloading” when he was tackled by bystanders, but he was not switching one loaded magazine for an emptied one. He had exhausted both of his loaded 15-round magazines, and no bystander tried to tackle him during his exchange of the second 15-round magazine for the first one. Instead, he was finally tackled only when he was trying to reload one round at a time into one of the emptied magazines. Thus, bystander intervention was possible because the shooter brought only 2 loaded magazines, not because he was changing magazines. California law does nothing to cause such

⁵⁹ Klarevas Report, *supra* note 34, at 10.

⁶⁰ *Id.* at 10-11.

⁶¹ *Id.* at 10.

criminals to bring only one or two magazines to a crime scene. Thus, this case does not support a claim that the California ban on LCMs would be likely to increase the frequency of opportunities for bystanders to tackle mass shooters and prematurely end their shooting.

10-30-94. This incident was not a mass shooting—not a single person was shot—and there is no evidence that the shooter was even trying to shoot anyone. The person was firing at a building—the White House. There is no evidence he intended to carry out a mass shooting or even the shooting of a single person.

5-22-98. The shooter in this incident was *not* reloading when he was tackled. Klarevas appears to have uncritically accepted the claims of LCM ban advocates that this was what happened. Instead, the young man who tackled the shooter was shot in the hand while he lunged at the offender—indisputable proof that the shooter was still firing and in possession of a loaded gun, rather than reloading when tackled.⁶²

7-7-09. This incident was not a mass shooting, but in any case, the shooter was *not* stopped because bystanders tackled him while he was reloading. He was tackled by bystanders when *his gun jammed*, which is something that can happen regardless of the size of the magazine with which the gun is equipped.

1-22-10. This incident was not a mass shooting either, nor is there any evidence that the offender was intending to commit one.

1-9-11. This is the incident most widely cited to support Klarevas's claim—the shooting in Tucson, AZ, in which Representative Gabrielle Giffords was wounded—but even this incident does not clearly support that claim. While some bystanders asserted that the shooter was reloading when he was tackled, later police inspection of the magazine the shooter was using at the time revealed that it was defective. Its spring had broken, and the shooter could not have used it to shoot bystanders who tried to tackle him.⁶³ If the shooter actually stopped firing because he was struggling with a broken magazine, rather than because he was reloading, the incident does not support Klarevas's argument that LCM bans can save lives because they force shooters to change magazines more often, and thereby afford bystanders the opportunity to tackle the shooter. Any magazine, regardless of its capacity, can fail to function because of a defect, thereby facilitating bystander interventions, so limits on magazine capacity are irrelevant to

⁶² Kleck 2016, *supra* note 8, at 39.

⁶³ Adam Nagourney, *A Single, Terrifying Moment: Shots, Scuffle, Some Luck*, N.Y. Times A1, Jan. 10, 2011, available at <http://www.nytimes.com/2011/01/10/us/10reconstruct.html>.

how often opportunities for bystander intervention due to magazine failure will occur.⁶⁴

6-6-14. The shooter in this incident was tackled by a bystander while the shooter was reloading a *shotgun*. There was no evidence in Klarevas's source or any news source known to me that the gun was semiautomatic, and certainly none that that shotgun could accept the types of magazines banned by California's LCM ban.

In sum, *none* of Klarevas's cited incidents support his claim that there are "numerous instances" of unarmed civilians stopping mass shooters while they were reloading. Even if all 7 had been supportive, however, 7 cases occurring over the 50-year period studied by Klarevas would be feeble support for a claim that these sorts of interventions are frequent by any reasonable standard. Instead, they appear to be virtually nonexistent.

5. *Klaveras' Claims About the Impact of LCM Restrictions*

K claims that LCM restriction "result in" fewer gun massacres.⁶⁵ This wording is ambiguous as to actual causation, but clearly suggests that restricting magazine capacity *causes* the reduction of the number of "gun massacres." I will respond as if that is he what he was indeed asserting.

Klarevas's support for this claim is the fact that the existence of state LCM bans is *associated with* fewer "gun massacres" and fewer fatalities per incident.⁶⁶ He takes a lot of pages to make this simple point, but all he establishes is that this bivariate association exists. Among serious scholars, establishing a statistical association is only the *beginning* of an effort to assess whether one factor has a causal effect on another—not the entirety of the effort.

Klarevas does nothing to assess whether this association is spurious, i.e. non-causal. He does not test whether there is some third factor that affects both the frequency of gun violence and the enactment of stricter gun laws. For example, the degree to which people support or oppose aggressive behavior varies across individual persons, and so is likely to vary across populations, such as the populations of states. State populations that are, on average, more strongly opposed to violence are obviously less likely to engage in criminal gun violence, including the shooting of multiple victims. This is a virtual tautology—almost true by definition. On the other hand, one would also expect state populations who were

⁶⁴ Kleck 2016, *supra* note 8, at 39-40.

⁶⁵ Klarevas Report, *supra* note 34, at 11.

⁶⁶ *Id.* at 11-16.

more strongly anti-violence to be more supportive of anti-violence policies, such as stricter gun control laws. In short, the average anti-violence sentiment of a state's population will both increase the likelihood of the state enacting LCM bans, and reduce the incidence of mass shootings—even if LCM bans have no effect of their own on mass shootings.

This would produce a spurious association between LCM bans and the rate of mass shooting incidents. To assess whether there is any actual causal effect of LCM bans on mass shootings would require measuring and controlling for (among other factors) the average anti-violence sentiment prevailing in state populations. Klarevas does not do this. He does not control for *any* confounding factors that might generate this sort of spurious association. Consequently, he has no basis for concluding that the association reflects even the slightest causal effect of LCM bans on the harm attributable to mass shootings.

Based on Klarevas's rather sketchy description of his methods, I do not think he even checked whether the incidence of "gun massacres" in any given state decreased after the state implemented LCM bans. Nothing in Appendix B, tables 3 and 4, or in the text on pages 15-16 of Klarevas's report, indicates such comparisons were made. Instead, Klarevas appears to have merely compared states having LCM bans with states that did not. Consequently, as far as Klarevas demonstrates, all the LCM ban states with low rates of mass shooting may have *already* had few mass shootings even *before* the bans went into effect. If so, one can hardly credit the lower incidence of mass shootings to the LCM bans, since causation cannot run backwards—LCM bans passed at a later point in time obviously cannot affect the incidence of mass shootings in any earlier period. Klarevas's failure to even do so simple an analysis as a crude before-and-after comparison of mass-shooting rates is a testament to both his limited knowledge of research methods and his inability to recognize just how weak his evidence really was.

C. Response to Dr. Christopher Koper's Expert Report

Professor Koper's overall conclusion about the California ban on LCMs is so weakly phrased as to be virtually meaningless. He says that the law "has the potential" to produce various public safety benefits.⁶⁷ Any law, no matter how ill-conceived, has some hypothetical "potential" to produce some benefits, even laws that will actually produce no benefits at all. All that is required to say that a law has potential to produce harms is that one be able to imagine scenarios in which benefit might be produced. Thus, based solely on what Koper explicitly states, even he, California's own expert, is not willing to go so far as to explicitly assert that the law is likely to *actually* reduce any harms of gun violence.

⁶⁷ Koper Report, *supra* note 22, at 2.

If, however, we interpret his remarks as merely an ultra-cautious way of saying that he thinks the California law is actually like to produce the various benefits he lists, the following remarks apply.

1. Koper Never Provides a Relevant Rationale for Why or How the California LCM Ban Would Produce the Benefits He Claims the Law Might Yield

Koper claims that the California ban on LCMs “has the potential” to reduce the number of shots fired in gun attacks, reduce the number of gunshot victims in gun crimes, reduce the number of wounds per gunshot victim, and reduce the lethality of gunshot injuries when they do occur.⁶⁸ He does not deny that offenders could substitute other, unbanned magazines for those banned, so he necessarily must believe that even if criminals substitute other magazines (such as magazines holding 10 rounds) for the types of magazines banned by the California LCM ban, the law would still somehow reduce the number of shots fired, number of victims shot, number of victims killed, and so on. He does not, however, provide a logical rationale for *why* such effects should occur. The California law does not prohibit all semi-automatic firearms, or even just all semi-automatic firearms capable of accepting detachable (and potentially large-capacity) magazines. Nor does it ban all detachable magazines that can be quickly switched when a shooter empties a magazine—magazines holding as many as 10 rounds remain legally available. Likewise, nothing in the California law prevents a would-be mass murderer from accumulating hundreds of rounds of ammunition. So why, in this light, would a ban on magazines holding more than 10 rounds produce any of the benefits that Koper forecasts? He does not say.

Other advocates of LCM bans, however, *have* said why they think LCM bans would prevent harm, focusing their arguments almost entirely on mass shootings. They assert that an LCM ban would reduce the casualty count in mass shootings because it would force at least some prospective mass shooters to use smaller capacity magazines, which would in turn force them to change their magazines sooner and more often. This would, they argue, have two benefits. First, it would allow bystanders to tackle the shooter while he was reloading and therefore less dangerous to intervenors, and to do so earlier in the incident. Second, the extra magazine changes would slow the shooter’s rate of fire, providing additional time for potential victims to escape, beyond the time they would otherwise have to do so if the shooter changed magazines less often.⁶⁹

It is perhaps understandable why Koper did not discuss these possible mechanisms by which LCM bans could reduce the casualty count in mass

⁶⁸ *Id.* at 3-4.

⁶⁹ Kleck 2016, *supra* note 8, at 31.

shootings. Given the way mass shootings actually transpire in America, neither mechanism is plausible. First, there was only one mass shooting in the entire United States in the 20-year period from 1994 to 2013 in which bystanders *might* have tackled the shooter while he was reloading (the shooting in which Representative Giffords, discussed above, was shot), and even that unique intervention may have occurred when the shooter was struggling with a defective magazine rather than when he was reloading.⁷⁰ Second, all mass shooters in this period either used multiple guns or multiple magazines (usually both), which means that they would not have needed to significantly pause their shooting for magazine changes, even if they possessed only magazines holding 10 or fewer rounds. They could either (a) continue to fire with additional guns once the first one was emptied or (b) pause only the 2-4 seconds needed to change detachable magazines of the type left unbanned. Third, mass shooters maintain fairly slow rates of fire, usually averaging more than 4 seconds between shots even when not reloading. Thus, a pause of 2-4 seconds to change magazines would not slow the shooter's rate of fire or provide additional time available for victims to escape.⁷¹ Koper does not refute or even address these facts, nor does he offer any alternative mechanisms by which the California ban on LCMs would prevent harm.

2. *Just Like Those of Defense Expert Lucy Allen, Koper's Claims About the Share of Mass Shootings that Involve LCMs Rely on Sources Known to be Unreliable*

Although Koper does not explain why LCM use would affect mass shootings, he nevertheless claims that LCMs are often used in public mass shootings.⁷² His primary support is a propaganda report published by *Mother Jones* magazine, which advocates bans on LCMs.⁷³ That report purportedly showed that an astounding 86% (31 of 36) of public mass shootings involved an LCM.⁷⁴ Koper does not explain why one should only focus on events that occurred in public places, or how the magazine's staff selected their tiny sample of 36 cases. Again, one could, easily make the LCM share as large as one liked simply by limiting the sample studied to cases already known to involve LCMs, and excluding cases that did not. Therefore, the *Mother Jones* findings on which Koper relies can be trusted

⁷⁰ *Id.* at 40.

⁷¹ *Id.* at 42-44.

⁷² Koper Report, *supra* note 22, at 5, 7.

⁷³ *Id.* at 7.

⁷⁴ *Mother Jones*, *supra* note 16.

only to the extent that the sample of 36 cases was representative of all mass shootings, or at least all those occurring in public places.

The reality is that less than 7% of all mass shootings with 3 or more dead—as distinct from the tiny subset analyzed in the *Mother Jones* study—are known to involve LCMs. The most comprehensive listing of all mass shootings that is currently available is at the GVA website, which relies on news media sources for accounts of mass shootings. For the 3 complete years for which the website has complete coverage, 2014-2016, the compilers identified 136 incidents with 3 or more people killed. For the same period, VPC identified just 9 incidents with three or more victims killed in which a shooter was known to have used a magazine with a capacity exceeding ten rounds. Thus, less than 7% ($9/136=0.066$) of mass murders in the United States in 2014-2016 were known to have involved use of an LCM. The study by VPC was not limited to mass shootings that occurred in public, but covered all shootings with 3 or more fatalities regardless of their location, yet still uncovered just 9 mass shootings the involved LCMs in 2014-2016—about 3 per year. To the extent that even the GVA compilation is incomplete, and the total number of mass murders still larger than their figures indicate, this LCM share would be still smaller. In sum, the 9 LCM-involved incidents in 2014-2016 claim just 6.6% of the GVA-documented mass shootings with 3 or more fatalities in that period—a far cry from the 86% share claimed by MJ and uncritically cited by Koper.

One could speculate that LCM involvement in some mass shootings was not mentioned in any news story and thus went unnoticed by *Mother Jones* and VPC staff, but this seems unlikely in light of the intense political and news media interest in LCMs. In any case, I am not aware of any evidence that such cases are common enough to materially affect estimates of the prevalence of LCM use in mass shootings. For the *Mother Jones* estimate on which Koper relies to be even remotely accurate, *Mother Jones* and VPC staffers would have had to have missed huge numbers of LCM-involved mass shootings. Recall that the GVA database identifies, for 2014-2016, 136 mass shootings with 3 or more dead—the cut-off used by *Mother Jones* and VPC staffers to define a mass shooting. If the *Mother Jones* estimate of the share of mass shootings involving LCMs (86%) really was valid and applied to all mass shootings with 3 or more fatalities, there should have been 117 LCM-involved mass shootings (86% of 136) discovered by researchers for the 2014-2016 period. Yet the *Mother Jones* staff managed to discover just 6 public mass shootings with 3 or more victims killed that involved LCMs in 2014-2016, and VPC staff discovered only 9 for all locations. If these were indeed the only LCM-involved mass shootings with 3 or more fatalities that could be uncovered by *Mother Jones* and VPC methods, this would mean that those methods captured only about 5% of LCM-involved incidents. The *Mother Jones* and VPC staff were either astoundingly incompetent and their methods extremely ineffective in discovering LCM-involved mass shootings or, more likely, the 86% LCM share estimated in the *Mother Jones* study is simply far too high, and there were actually far fewer than 117 LCM-involved mass shootings to be discovered.

Why, then, did the *Mother Jones* study yield such an extraordinarily high estimate of LCM involvement? As Koper notes, the *Mother Jones* study covered only incidents *where magazine capacity could be determined*.⁷⁵ Unfortunately, most news outlets may feel that magazine capacity is a detail worth reporting in their stories only if it is large. If so, the *Mother Jones* estimate of the LCM share reflects nothing more than the degree to which news outlets regard LCM use as newsworthy, but tells us nothing about the actual prevalence of LCM use in all mass shootings. Koper also notes that if cases “where magazine capacity could not be determined” are included, then half of cases were known to have involved LCMs.⁷⁶ This observation, however, is meaningless if the *Mother Jones* sample itself excluded almost all the non-LCM cases in the first place. If news stories about shootings that did not involve LCMs made no mention of ammunition capacity, these would be treated by Koper as merely cases “where magazine capacity could not be determined”—not as the non-LCM shootings they actually were. Very likely, LCM use is common in shootings *for which news reporters thought that ammunition capacity was worth mentioning*, but this tells us nothing about how prevalent LCM use is in all mass shootings.

3. *Koper’s Claim that Assault Weapons Are Disproportionately Used for Criminal Purposes Is Both Irrelevant and Unsupported*

Koper asserts that “assault weapons” (AWs) are disproportionately used to commit crimes, relative to their share of the total gun stock in the general population. This entire section of Koper’s expert report is irrelevant to this case, which deals with LCMs, not AWs. Whether AWs are disproportionately used in crime has no bearing on whether a statewide ban on LCMs is likely to impact public safety. In any event, the claim is unsupported.

To support his claim, Koper necessarily must establish the share of the civilian gun stock that are AWs. He does not. He claims that prior to the federal AW ban, there were “approximately 1.5 million privately owned assault weapons in the United States” (p. 15, lines 8-10), citing for support two of his reports on the impact of the federal AW ban. His citation of two supporting sources is somewhat misleading since the first study does not contain any relevant information that was not included in the second one. The more serious problem is that neither study provides any credible support. One must follow a very long chain of indirect citations to finally track down the ultimate basis for his claim. The cited 2004 Koper report relied on two sources, but both of those sources relied in turn on the same two sources: two newspaper articles, one in the *Atlanta Journal Constitution*

⁷⁵ Koper Report, *supra* note 22, at 7.

⁷⁶ *Id.* at 7-8.

and one appearing in the Cox Newspaper chain.⁷⁷ Both articles in turn relied on the same single source of information: an undocumented “estimate” of the AW share by an unnamed informant in the Bureau of Alcohol, Tobacco and Firearms (ATF).⁷⁸

Neither newspaper article explained how this ATF source came up with this estimate, why ATF should be regarded as a source of authoritative information on this topic, or why readers should regard the estimate as anything more than a guess or personal opinion. ATF does gather data on firearms manufactured in the United States, imported from other nations, and exported to other nations, but their data do not provide counts of specific gun models or even counts that distinguish semiautomatic rifles or shotguns from other kinds of rifles or shotguns. Further, these ATF data do not indicate how many guns of any kind, handguns or long guns, have the “military-style” features used to define some AWs. Thus, there are no ATF data that would allow the unnamed ATF informant to produce an evidence-based estimate of the number of AWs in the general civilian population. As far as Koper knows, his 1.5 million “estimate” was nothing more than a wild speculation by an ATF employee pressed by a reporter to toss out a guess on the spur of the moment.

In sum, Koper does not have any idea what the AW share of the general gun stock is, and therefore no basis at all for judging whether the AW share of crime guns is even slightly higher than the AW share of the entire civilian stock of firearms.

4. *Do Criminals “Prefer” Assault Weapons and LCMs?*

Koper nevertheless claims that criminals in some sense “prefer” AWs as crime weapons and that AWs and LCMs “are more attractive to criminals than lawful users.”⁷⁹ His sole support for this claim is his own 2004 report.⁸⁰ Close examination of his cited pages, however, quickly reveals that absolutely nothing there supports a claim that criminals favor AWs or LCMs more than non-criminals, or that even pertains to the issue. Thus, Koper’s claim of empirical support is baseless.

⁷⁷ Christopher S. Koper, et al., *Criminal Use of Assault Weapons and High-Capacity Semiautomatic Firearms: An Updated Examination of Local and National Sources*, J. Urb. Health 10, Oct. 2, 2017 (“Koper 2017”).

⁷⁸ Steward, *supra* note 77; Am. Med. Ass’n, *supra* note 77.

⁷⁹ Koper Report, *supra* note 22, at 7.

⁸⁰ *Id.* at 7 (citing Koper 2017, *supra* note 77, at 17-18).

Leaving aside Koper's dubious citation to an irrelevant source, what does genuinely relevant evidence reveal? One useful way to approach this issue is to ask: when criminals have access to AWs, do they choose to actually use them to commit crimes? A survey of a representative national sample of state prison inmates provided information on both (a) the guns that criminals *owned* in the month before the arrest that lead to their imprisonment, and (b) the guns they actually *used* in their crimes. Of those who owned a handgun of any kind in the preceding month, 71% were armed with a handgun when they committed the crime that got them sent to prison. This is consistent with the uncontroversial claim that criminals prefer to use handguns. However, of those who possessed a "military-type" gun, only 16.7% were armed with such a gun when they committed their crimes.⁸¹ Thus, compared to their availability, AWs were *underrepresented* among these felons' crime guns—some possessed them, but few used them in crime. These results were confirmed with respect to "assault rifles" in particular by surveys of inmates in Virginia prisons in 1992-93, which revealed that although 20% of the offenders had previously possessed "assault rifles," *none* had carried or fired one at their latest crime.⁸² Thus, criminals not only do not "prefer" to use military-style guns to commit crimes, they are strongly *disinclined* to do so, even if they possess one. In sum, under any meaningful interpretation of "preference," criminals do not prefer to use assault weapons.

"Assault rifles" are clearly much larger than the handguns criminals really do favor, and even "assault weapon" handguns such as Uzis are generally larger than other handguns. Since criminals say they favor more concealable handguns (Wright and Rossi 1986, p. 163), this may largely explain why so few criminals prefer to use assault weapons to commit crimes.

5. *What Koper's Evaluation of the Federal Assault Weapon Ban Actually Found*

Koper's summary⁸³ of his findings on the impact of the federal AW/LCM ban⁸⁴ is highly selective and misleading. Here are the major conclusions that he drew in his 2004 report, but omitted from his current expert report:

⁸¹ Computed from U.S. Dep't of Justice, U.S. Bureau of Justice Statistics, *Survey of State Prison Inmates, 1991* at 18-19, 33 (U.S. Gov't Printing Office 1993).

⁸² Commonwealth of Va., Criminal Justice Research Ctr., Dep't of Criminal Justice Servs., *Guns and Violent Crime* 63, Jan. 1994.

⁸³ Koper Report, *supra* note 22, at 14-19.

⁸⁴ Christopher S. Koper, Daniel J. Woods & Jeffrey A. Roth, *An Updated Assessment of the Federal Assault Weapons Ban: Impacts on Gun Markets and*

1. “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.”⁸⁵
2. “There has not been a clear decline in the use of ARs [assault rifles] in crime following implementation of the ban.”⁸⁶
3. “The ban has not yet reduced the use of LCMs in crime.”⁸⁷
4. “We cannot clearly credit the ban with any of the nation’s recent drop in gun violence.”⁸⁸
5. If the ban were renewed, its “effects on gun violence are likely to be small at best and perhaps too small for reliable measurement.”⁸⁹

Conclusions 1, 4, and 5 would seem to be far more important conclusions than any of those stated in Koper’s expert report, since they pertain to the ultimate goals of the federal ban—to reduce gun violence and make it less deadly. In his expert report, Koper chooses to instead stress minor intermediate goals that have no value in and of themselves if they do not lead to reductions in gun violence, such as increases in AW prices,⁹⁰ but completely censors out of his current summary of his findings the fact that he did not detect any effect of the ban on gun violence itself. He also gives undue emphasis to what he had accurately labeled in his 2004 report as “speculation”⁹¹ about what *might* have occurred had the federal

Gun Violence, 1994-2003 (2004), available at <https://www.ncjrs.gov/pdffiles1/nij/grants/204431.pdf> (“Koper 2004”).

⁸⁵ *Id.* at 96.

⁸⁶ *Id.* at 2.

⁸⁷ *Id.*

⁸⁸ *Id.*

⁸⁹ *Id.* at 3.

⁹⁰ Koper Report, *supra* note 22, at 15.

⁹¹ Koper 2004, *supra* note 84, at 98.

ban been renewed after its 2004 expiration, at the expense of the aforementioned evidence-based findings.⁹²

Koper states that “criminal use of assault weapons declined after the federal assault weapons ban was enacted,”⁹³ but this statement is less meaningful than an unwary reader might think. In this context, Koper was defining “assault weapons” narrowly as those specific guns banned by the federal law. He does not claim that there was any decline in criminal use of firearms having the properties that supposedly made AWs especially dangerous or useful for criminal purposes, such as lethality, higher rates of fire, or the ability to accept detachable (potentially large) magazines. Critics of the federal ban did not claim the ban would fail to reduce use of the specific banned guns; rather, they argued that criminals would just substitute other, non-banned gun types with the same crime-relevant properties that the banned guns possessed. And this is precisely what happened, as Koper himself acknowledged in his 2004 report: “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.”⁹⁴

Koper nevertheless claims in his expert report that even if we consider substitution of “post-ban assault-type models” (a vague term he does not define), criminal use of AWs declined.⁹⁵ Even though the federal AW ban applied to the entire nation, Koper has no national data to sustain this claim. He only cites evidence from his 2004 report that was drawn from police files in six non-randomly selected local jurisdictions, which provide no formal basis for generalizing the results to the United States, as a whole. In any case, these findings are essentially beside the point since they do not indicate any decline in criminal use of guns with the aforementioned crime-relevant properties, but rather only declines in use of a narrowly defined subset of specific gun types, those that were banned by the federal law. Merely taking account of certain specific “post-ban assault-type models” did not allow Koper to determine whether criminals were substituting unbanned guns with equally high rates of fire, equal lethality, and equal ability to accept detachable magazines.

Since Koper does not document even the slightest decline in criminal use of guns with these crime-related properties, his assertion that the federal AW ban reduced criminal use of “assault weapons” as he narrowly defined them is irrelevant to the law’s impact on either the volume of gun crime or its deadliness.

⁹² See especially Koper Report, *supra* note 22, at 19-20.

⁹³ *Id.* at 16.

⁹⁴ Koper 2004, *supra* note 84, at 96.

⁹⁵ Koper Report, *supra* note 22, at 49-50.

In particular, his claim that “almost 2,900 murders, robberies, and assaults *with assault weapons* were prevented in 2002” by the AW ban is especially trivial and potentially misleading.⁹⁶ Who cares if the ban reduced use of banned guns if criminals just substituted equally dangerous unbanned guns?

6. *Koper Does Not Establish that the Assault Weapon Ban Caused Fewer Criminals to Use LCMs*

Koper also somehow infers that the AW ban reduced criminal “use” of LCMs despite his complete lack of information on criminals *using* LCMs to commit violent crimes. When describing research on the topic, he uses slippery terms like “LCM firearms,”⁹⁷ “crimes with LCMs,”⁹⁸ and “crime guns equipped with LCMs,”⁹⁹ but he never cites any evidence directly bearing on criminal *use* of LCMs in crimes. He never shows that crimes with more than 10 rounds fired declined after the AW ban was implemented, or increased after it expired. As far as he can show, trends in criminal use of “guns equipped with LCMs” were inconsequential regarding numbers of people killed or injured with guns because criminals virtually never make use of larger magazine capacities by firing more rounds than they could fire with magazines of the capacity left unbanned. Indeed, this is precisely what Koper’s own research published in scholarly journals indicates. Reedy and Koper found that less than 2% of gun crimes reported to the police involved over 10 rounds being fired.¹⁰⁰ Since crime victims are less likely to report less serious crimes to the police, if one included gun crimes not reported to the police in the computation, this percentage would be lower still. Despite its obvious relevance, Koper does not mention this 2003 finding in his current expert report.

It may well be true that a larger share of guns used by criminals were “equipped with” LCMs after the federal AW ban expired, as Koper claims,¹⁰¹ but nothing in Koper’s supposedly supportive evidence shows even a slight increase in criminals firing more than 10 rounds during their crimes. The Virginia study he

⁹⁶ *Id.* at 17 (emphasis added).

⁹⁷ *Id.* at 21.

⁹⁸ *Id.* at 18.

⁹⁹ *Id.*

¹⁰⁰ Reedy & Koper, *supra* note 6, at 154.

¹⁰¹ Koper Report, *supra* note 22, at 18.

cites¹⁰² at best only pertains to trends in LCM *possession* among criminals before, during, and after the period when the ban was in place, not to trends in LCM *use* in crimes. And even trends in LCM possession cannot be reliably inferred from the Virginia police data unless one is willing to assume that the inclination of Virginia police to note the ammunition capacity of recovered crime guns in their reports was constant over time, unaffected by whether officers believed that the “LCM problem” had been to some extent “solved” by the federal ban on LCMs.

The data Koper cites from his own 2017 study is likewise irrelevant to whether criminal *use* of LCMs is frequent or increasing, since, like the Virginia study, it only bears (at best) on criminal *possession* of LCMs.¹⁰³ He discusses evidence supposedly relevant to levels or trends in criminal *use* of LCMs, but a close reading of the 2017 research report reveals that his data actually only pertained to whether recovered crime guns happened to be equipped with LCMs or, worse yet, only whether the guns were “LCM compatible.”

As to the increasing criminal *possession* of guns with LCMs,¹⁰⁴ nothing in Koper’s evidence establishes that this is any more characteristic of criminals than of non-criminals. As far as he can establish, increased criminal possession of guns with magazine capacities exceeding 10 rounds reflects nothing more than the trends prevailing in the general U.S. population as a whole. Semiautomatic guns have become more popular in the general population in recent decades, and it is common for such guns to come equipped with 15-round magazines or similarly sized magazines that would be prohibited by LCM bans. Criminals often get their guns by stealing them from non-criminals,¹⁰⁵ so whatever trends in gun preference that occur among non-criminals are likely to be reflected in the guns acquired by criminals as well, even if criminals have no special preference for using LCMs in their crimes.

¹⁰² *Id.* at 18, 25 (citing David S. Fallis & James V. Grimaldi, *Va. Date Show Drop in Criminal Firepower During Assault Gun Ban*, Wash. Post (Jan. 23, 2011), available at <http://www.washingtonpost.com/wp-dyn/content/article/2011/01/22/AR2011012203452.html> (“Virginia Study”)).

¹⁰³ Koper Report, *supra* note 22 (citing Koper 2017, *supra* note 77).

¹⁰⁴ *Id.* at 22.

¹⁰⁵ James D. Wright & Peter Rossi, *Armed and Considered Dangerous: A Survey of Felons and Their Firearms* (1986); Gary Kleck & Shun-Yung Wang, *The Myth of Big-Time Gun Trafficking and the Overinterpretation of Gun Tracing Data*, 56 UCLA L. Rev. 1233, 1233-1294 (2009).

7. *Koper Does Nothing to Rule Out the Possibility that the Associations He Reported Were Completely Spurious (Non-Causal)*

Koper makes much of the crude bivariate associations between AW/LCM use and the seriousness of gun violence incidents, as measured by numbers of wounded victims, number of wounds per victim, number of fatalities, and the like (pp. 3-4, 8-9). His interpretation of the relevant evidence in his reports on the federal AW/LCM ban, however, ignores the central methodological difficulty of assessing the impact of AWs and LCMs on the outcomes of shootings. He only established that AW and/or LCM use are *associated with* more rounds fired, more victims per incident (e.g., p. 9), i.e. he reports simple two-variable statistical *associations*, but he does not establish whether these associations reflect an actual *causal effect* of AW/LCM use on numbers of shots fired and persons hurt, as opposed to spurious, *non-causal* associations. As even the least experienced researchers know, “correlation is not causation.” More specifically, these associations may merely reflect the common impact of the shooter’s lethality of intentions on both (1) the outcomes of shootings, and (2) the weapons and magazines that shooters choose to use in their crimes.

I know of no one, including Koper, who questions that shooters who want to shoot and kill more people are, on average, more likely to actually do so. That is, although the correlation is not perfect, the stronger the person’s intention to hurt many victims, the more victims they will hurt. Further, given the extensive planning that goes into the more serious mass shootings, one would expect that these same intentions to shoot more victims would also cause the shooter to prepare to do so by selecting weaponry and magazines that they believed (correctly or not) were better suited to this task. As gun control scholar Philip Cook observed long ago, “the assailant’s choice of weapon is a good indicator of his intent in assault offenses.”¹⁰⁶ I also know of no one, including Koper, who denies that criminals planning to hurt many people are more likely to choose weapons and magazines that they believe will be suited to doing so.

These propositions imply, in short, that the lethality of a shooter’s intentions has a positive causal effect on both (a) use of AWs and LCMs, and (b) the number of victims hurt in shootings. This means that lethality of intent will create a spurious (non-causal) positive association between (a) use of AWs or LCMs and (b) the number of victims killed or injured—even if the use of AWs or LCMs had no causal effect of its own on any of these outcomes. Unless an analyst statistically controls for lethality of intent, he will fail to detect the spurious character of the association between (a) and (b), and will erroneously conclude, as Koper apparently did, that the association instead reflected an actual causal effect of (a)

¹⁰⁶ Phillip J. Cook, *The Role of Firearms in Violent Crime*, in *Criminal Violence* 248 (Marvin E. Wolfgang & Neil Alan Weiner, eds. 1982).

on (b). Koper never controlled for lethality of the shooter's intent, and thus did nothing to rule out the possibility that the association between (a) and (b) is entirely spurious. Indeed, to my knowledge, Koper has not even acknowledged this issue at a theoretical or conceptual level; certainly, he does address it in his expert report. Of course, if AW/LCM has no actual causal effect on crime outcomes, restricting AWs or LCMs will not cause a reduction in gun violence or its seriousness.

As previously noted, Koper failed to describe any plausible causal mechanisms by which LCMs would cause mass shooters to fire more total rounds, inflict more wounds per victim, or kill or injure more victims per incidents. In this light, his failure to rule out the likely spurious character of this LCM/harms correlations is especially damaging. As far as Koper or his readers can tell, LCM use has no causal effect at all on any of the measures of harm in mass shootings that Koper discusses, and the associations he reports are purely the result of more lethal offender intentions increasing both harms inflicted and the use of LCMs.

This same critical shortcoming applies with equal force to the unpublished study by Koper's graduate student cited on page 9 and Koper's 2017 study summarized on pages 20-22. Nothing was done in either study to establish that any of the LCM/harm associations reflected a causal effect of LCM use rather being totally spurious associations.

It is worth noting that Koper never explicitly states that LCMs *cause* more harm in gun crimes, such as causing more people to be killed or wounded. Instead, he consistently uses ambiguous words and phrases such "crimes committed with these weapons are *likely to result in* more injuries, and more lethal injuries, than crimes committed with other firearms"¹⁰⁷ or "attacks with ... guns equipped with LCMs *tend to result in*" more harm.¹⁰⁸ The unwary reader is almost certainly likely to interpret a phrase like "result in" as implying causation, but scholars make a sharp distinction between causal effects and spurious associations. The result of attacks by offenders with LCMs may well have, on average, more harmful *results* than attacks without LCMs, but this by itself does not establish that LCM use caused those results. Koper's use of this slippery terminology in this way allows him to strongly hint to readers a conclusion that his research methods cannot back up.

¹⁰⁷ Koper Report, *supra* note 22, at 3.

¹⁰⁸ *Id.* at 8.

VI. REFERENCES

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VIII. ATTACHMENTS

Attached at Exhibit 1 and made a part of this report is a copy of my curriculum vitae, including a list of all my published works from the last ten years.

Dated: November 3, 2017



Dr. Gary Kleck
The Florida State University
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Tallahassee, FL 32302
850-894-1628
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EXHIBIT 1

CURRICULUM VITAE

GARY KLECK

(Updated October 5, 2017)

PERSONAL

Place of Birth: Lombard, Illinois

Date of Birth: March 2, 1951

Address: College of Criminology and Criminal Justice
The Florida State University
314B Eppes Hall
112 S. Copeland Street
Tallahassee, FL 32306-1273

Tallahassee, Florida 32306-1127

Telephone Number: Home: (850) 894-1628

e-mail Address: gkleck@fsu.edu

CURRENT POSITION

David J. Bordua Emeritus Professor of Criminology, Florida State University

COURTESY APPOINTMENT

Courtesy Professor, College of Law, Florida State University

PROFESSIONAL MEMBERSHIPS

American Society of Criminology

Academy of Criminal Justice Sciences

EDUCATION

A.B. 1973 - University of Illinois, with High Honors and with Distinction in
Sociology

A.M. 1975 - University of Illinois at Urbana, in Sociology

Ph.D. 1979 - University of Illinois at Urbana, in Sociology

ACADEMIC HONORS

National Merit Scholar, 1969

Freshman James Scholar, University of Illinois, 1969

Graduated from University of Illinois with High Honors and with Distinction in Sociology, 1973

University of Illinois Foundation Fellowship in Sociology, 1975-76

1993 Winner of the Michael J. Hindelang Award of the American Society of Criminology, for the book that made "the most outstanding contribution to criminology" (for Point Blank: Guns and Violence in America).

Awarded Named Professorship, Florida State University, 2012.

Nominated for University Teaching Award, Florida State University, 2014.

TEACHING POSITIONS

Fall, 1991 to May 2016	Professor, College of Criminology and Criminal Justice, Florida State University
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Fall, 1984 to Spring, 1991	Associate Professor, School of Criminology, Florida State University.
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Fall, 1979 to Spring, 1984	Assistant Professor, School of Criminology, Florida State University.
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Fall, 1978 to Spring, 1979	Instructor, School of Criminology, Florida State University.
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COURSES TAUGHT

Criminology, Applied Statistics, Regression, Introduction to Research Methods, Law Enforcement, Research Methods in Criminology, Guns and Violence, Violence Theory Seminar, Crime Control, Assessing Evidence, Survey Research, Research Design and Causal Inference.

DISSERTATION

Homicide, Capital Punishment, and Gun Ownership: An Aggregate Analysis of U.S. Homicide Trends from 1947 to 1976. Department of Sociology, University of

Illinois, Urbana. 1979.

PUBLICATIONS (sole author unless otherwise noted)

BOOKS

- 1991, Point Blank: Guns and Violence in America. Hawthorne, N.Y.: Aldine de
2005 Gruyter. Winner of the 1993 Michael J. Hindelang award of the American
Society of Criminology. Republished in 2005 in paperback by Transaction
Publishers.

Reviewed in Contemporary Sociology, American Journal of Sociology,
Social Forces, Journal of Criminal Law and Criminology, The
Criminologist, The Public Interest, Criminal Law Forum, Social
Science Review, Criminal Justice Abstracts, Crime, Criminal Justice and
Law Enforcement, Newsletter of Public Policy Currents, Commonweal,
Choice, and others.

- 1997 Targeting Guns: Firearms and their Control. Hawthorne, N.Y.: Aldine de Gruyter.
1997 The Great American Gun Debate: Essays on Firearms and Violence (with Don B.
Kates, Jr.). San Francisco: Pacific Research Institute for Public Policy.
2001 (with Don B. Kates) Armed: New Perspectives on Gun Control. N.Y.:
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Selected to Choice: Current Reviews for Academic Libraries' 39th annual
"Outstanding Academic Title List," awarded for "excellence in scholarship and
presentation, the significance of their contribution to their field, and their value as
an important treatment of their topic." Awarded to less than one percent of
books.

- 2017 (with Brion Sever) Punishment and Crime: The Limits of Punitive Crime Control.
NY: Routledge.

RESEARCH MONOGRAPH

1979 Bordua, David J., Alan J. Lizotte, and Gary Kleck. Patterns of Firearms
Ownership, Use and Regulation in Illinois. A Report to the Illinois Law Enforce-
ment Commission, Springfield, Illinois.

ARTICLES IN PEER-REVIEWED JOURNALS

- 1979 "Capital punishment, gun ownership, and homicide." American Journal of
Sociology 84(4):882-910.

- 1981 "Racial discrimination in criminal sentencing: A critical evaluation of the evidence with additional evidence on the death penalty." American Sociological Review 46(6):783-804.
- 1982 "On the use of self-report data to determine the class distribution of criminal behavior." American Sociological Review 47(3):427-33.
- 1983 (with David Bordua) "The factual foundation for certain key assumptions of gun control." Law and Policy Quarterly 5(3):271-298.
- 1985 "Life support for ailing hypotheses: modes of summarizing the evidence on racial discrimination in criminal sentencing." Law and Human Behavior 9(3):271-285.
- 1986 "Evidence that 'Saturday Night Specials' not very important for crime." Sociology and Social Research 70(4):303-307.
- 1987 "American's foreign wars and the legitimation of domestic violence." Sociological Inquiry 57(3):237-250.
- 1988 "Crime control through the private use of armed force." Social Problems 35(1):1-21.
- 1988 "Miscounting suicides." Suicide and Life-Threatening Behavior 18(3):219-236.
- 1990 (with Susan Sayles) "Rape and resistance." Social Problems 37(2):149-162.
- 1991 (with Karen McElrath) "The effects of weaponry on human violence." Social Forces 69(3):669-92.
- 1993 (with Miriam DeLone) "Victim resistance and offender weapon effects in robbery." Journal of Quantitative Criminology 9(1):55-82.
- 1993 (with E. Britt Patterson) "The impact of gun control and gun ownership levels on violence rates." Journal of Quantitative Criminology 9(3):249-287.
- 1993 "Bad data and the 'Evil Empire': interpreting poll data on gun control." Violence and Victims 8(4):367-376.
- 1995 "Guns and violence: an interpretive review of the field." Social Pathology 1(1):12-47.
- 1995 "Using speculation to meet evidence." Journal of Quantitative Criminology 11(4):411-424.
- 1995 (with Marc Gertz) "Armed resistance to crime: the prevalence and nature of self-

- defense with a gun." Journal of Criminal Law & Criminology 86(1):150-187.
- 1996 "Crime, culture conflict and sources of support for gun control: a multi-level application of the General Social Surveys." American Behavioral Scientist 39(4):387-404.
- 1996 (with Chester Britt III and David J. Bordua) "A reassessment of the D.C. gun law: some cautionary notes on the use of interrupted time series designs for policy impact assessment." Law & Society Review 30(2):361-380.
- 1996 (with Chester Britt III and David J. Bordua) "Avoidance and misunderstanding." Law & Society Review 30(2):393-397.
- 1997 (with Marc Gertz) "The illegitimacy of one-sided speculation: getting the defensive gun use estimate down." Journal of Criminal Law and Criminology 87(4):1446-1461.
- 1997 (with Tomislav Kovandzic and Marc Gertz) "Defensive gun use: vengeful vigilante imagery vs. reality: results from the National Self-Defense Survey." Journal of Criminal Justice 26(3):251-258.
- 1998 (with Marc Gertz) "Carrying guns for protection: results from the National Self-Defense Survey." Journal of Research in Crime and Delinquency 35(2):193-224.
- 1998 "What are the risks and benefits of keeping a gun in the home?" Journal of the American Medical Association 280(5):473-475.
- 1998 (with Charles Crawford and Ted Chiricos) "Race, racial threat, and sentencing of habitual offenders." Criminology 36(3):481-511.
- 1999 (with Michael Hogan) "A national case-control study of homicide offending and gun ownership." Social Problems 46(2):275-293.
- 1999 "BATF gun trace data and the role of organized gun trafficking in supplying guns to criminals." St. Louis University Public Law Review 18(1):23-45.
- 2001 "Can owning a gun really triple the owner's chances of being murdered?" Homicide Studies 5:64-77.
- 2002 (with Theodore Chiricos) "Unemployment and property crime: a target-specific assessment of opportunity and motivation as mediating factors." Criminology 40(3):649-680.
- 2004 "Measures of gun ownership levels for macro-level crime and violence research." Journal of Research in Crime and Delinquency 41(1):3-36.

- 2004 (with Jongyeon Tark) "Resisting crime: the effects of victim action on the outcomes of crimes." Criminology 42(4):861-909.
- 2005 (with Brion Sever, Spencer Li, and Marc Gertz) "The missing link in general deterrence research." Criminology 43(3):623-660.
- 2006 (with Jongyeon Tark and Jon J. Bellows) "What methods are most frequently used in research in criminology and criminal justice?" Journal of Criminal Justice 34(2):147-152.
- 2007 "Are police officers more likely to kill African-American suspects?" Psychological Reports 100(1):31-34.
- 2007 (with Shun-Yung Wang and Jongyeon Tark) "Article productivity among the faculty of criminology and criminal justice doctoral programs, 2000-2005." Journal of Criminal Justice Education 18(3):385-405.
- 2008 (with Jongyeon Tark, Laura Bedard, and Dominique Roe-Sepowitz) "Crime victimization and divorce." International Review of Victimology 15(1):1-17.
- 2009 "The worst possible case for gun control: mass shootings in schools." American Behavioral Scientist 52(10):1447-1464.
- 2009 (with Shun-Yung Wang) "The myth of big-time gun trafficking and the overinterpretation of gun tracing data." UCLA Law Review 56(5):1233-1294.
- 2009 (with Tomislav Kovandzic) "City-level characteristics and individual handgun ownership: effects of collective security and homicide." Journal of Contemporary Criminal Justice 25(1):45-66.
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- 2013 (with Tomislav Kovandzic and Mark Schaffer) "Estimating the causal effect of gun prevalence on homicide rates: A local average treatment effect approach." Journal of Quantitative Criminology 28(4):477-541.
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- 2016 "Large-capacity magazines and the casualty counts in mass shootings: the plausibility of linkages." Justice Research and Policy 17:28-47.
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- 1985 "Policy lessons from recent gun control research." Law and Contemporary

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- 1992 "Assault weapons aren't the problem." New York Times September 1, 1992, p. A15. Invited Op-Ed page article.
- 1993 "The incidence of violence among young people." The Public Perspective 4:3-6. Invited article.
- 1994 "Guns and self-protection." Journal of the Medical Association of Georgia 83:42. Invited editorial.
- 1998 "Using speculation to meet evidence: reply to Alba and Messner." Journal on Firearms and Public Policy 9:13-49.
- 1998 "Has the gun deterrence hypothesis been discredited?" Journal on Firearms and Public Policy 10:65-75.
- 1999 "There are no lessons to be learned from Littleton." Criminal Justice Ethics 18(1):2, 61-63. Invited commentary.
- 1999 "Risks and benefits of gun ownership - reply." Journal of the American Medical Association 282(2):136-136.
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- 2001 "School lesson: armed self-defense works." Wall Street Journal March 27, 2001. Invited opinion article.
- 2001 "Impossible policy evaluations and impossible conclusions: a comment on Koper and Roth." Journal of Quantitative Criminology 17:75-80.
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- 2011 "Mass killings aren't the real gun problem --- how to tailor gun-control measures to common crimes, not aberrant catastrophes." Wall Street Journal January 15, 2011. Invited opinion article.
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- 2015 "Defensive gun ownership is not a myth: why my critics still have it wrong." Politico Magazine, February 17, 2015. Online at Politico.Com.
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- 2018 "Guns and suicide." Handbook on Gun Studies. Edited by Jennifer Carlson, Kristin Goss, and Harel Shapira. NY: Routledge. In press.
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- 1984 "Handgun-only gun control: a policy disaster in the making." Pp. 167-199 in Kates, above.
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- 1996 "Gun buy-back programs: nothing succeeds like failure." Pp. 29-53 in Under Fire: Gun Buy-Backs, Exchanges and Amnesty Programs, edited by Martha R. Plotkin. Washington, D.C.: Police Executive Research Forum.
- 2000 "Firearms and crime." Pp. 230-234 in the Encyclopedia of Criminology and Deviant Behavior, edited by Clifton D. Bryant. Philadelphia: Taylor & Francis, Inc.
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- 2003 "Constricted rationality and the limits of general deterrence." Chapter 13 in Punishment and Social Control: Enlarged Second Edition, edited by Thomas G. Blomberg. New York: Aldine de Gruyter.
- 2004 "The great American gun debate: what research has to say." Pp. 470-487 in The Criminal Justice System: Politics and Policies, 9th edition, edited by George F. Cole, Marc Gertz, and Amy Bunker. Belmont, CA: Wadsworth-Thomson.
- 2008 "Gun control." Article in The Encyclopedia of Social Problems, edited by Vincent N. Parrillo. Thousand Oaks, CA: Sage.
- 2009 "Guns and crime." Invited chapter. Pp. 85-92 in 21st Century Criminology: A Reference Handbook, edited by J. Mitchell Miller. Thousand Oaks, CA: Sage.
- 2012 Kovandzic, Tomislav, Mark E. Schaffer, and Gary Kleck. "Gun prevalence, homicide rates and causality: A GMM approach to endogeneity bias." Chapter 6, pp. 76-92 in The Sage Handbook of Criminological Research Methods, edited by David Gadd, Susanne Karstedt, and Steven F. Messner. Thousand Oaks, CA: Sage.
- 2012 (with Kelly Roberts) "What survey modes are most effective in eliciting self-reports of criminal or delinquent behavior?" Pp. 415-439 in Handbook of Survey Methodology, edited by Lior Gideon. NY: Springer.
- 2013 "An overview of gun control policy in the United States." Pp. 562-579 in The Criminal Justice System, 10th edition, Edited by George F. Cole and Marc G. Gertz. Wadsworth.
- 2014 "Deterrence: actual vs. perceived risk of punishment. Article in Encyclopedia of Criminology and Criminal Justice. Berlin: Springer Verlag.

- 2018 "Gun control." Chapter in The Handbook of Social Control. New York: Springer. Forthcoming.
- 2018 "Guns and suicide." Chapter in Handbook of Gun Studies. NY: Routledge. Forthcoming.

BOOK REVIEWS

- 1978 Review of Murder in Space City: A Cultural Analysis of Houston Homicide Patterns, by Henry Lundsgaarde. Contemporary Sociology 7:291-293.
- 1984 Review of Under the Gun, by James Wright et al. Contemporary Sociology 13:294-296.
- 1984 Review of Social Control, ed. by Jack Gibbs. Social Forces 63: 579-581.
- 1985 Review of Armed and Considered Dangerous, by James Wright and Peter Rossi, Social Forces 66:1139-1140.
- 1988 Review of The Citizen's Guide to Gun Control, by Franklin Zimring and Gordon Hawkins, Contemporary Sociology 17:363-364.
- 1989 Review of Sociological Justice, by Donald Black, Contemporary Sociology 19:261-3.
- 1991 Review of Equal Justice and the Death Penalty, by David C. Baldus, George G. Woodworth, and Charles A. Pulaski, Jr. Contemporary Sociology 20:598-9.
- 1999 Review of Crime is Not the Problem, by Franklin E. Zimring and Gordon Hawkins. American Journal of Sociology 104(5):1543-1544.
- 2001 Review of Gun Violence: the Real Costs, by Philip J. Cook and Jens Ludwig. Criminal Law Bulletin 37(5):544-547.
- 2010 Review of Homicide and Gun Control: The Brady Handgun Violence Prevention Act and Homicide Rates, by J. D. Monroe. Criminal Justice Review 35(1):118-120.

LETTERS PUBLISHED IN SCHOLARLY JOURNALS

- 1987 "Accidental firearm fatalities." American Journal of Public Health 77:513.
- 1992 "Suicide in the home in relation to gun ownership." The New England Journal of Medicine 327:1878.
- 1993 "Gun ownership and crime." Canadian Medical Association Journal 149:1773-

1774.

- 1999 "Risks and benefits of gun ownership." Journal of the American Medical Association 282:136.
- 2000 (with Thomas Marvell) "Impact of the Brady Act on homicide and suicide rates." Journal of the American Medical Association 284:2718-2719.
- 2001 "Violence, drugs, guns (and Switzerland)." Scientific American 284(2):12.
- 2002 "Doubts about undercounts of gun accident deaths." Injury Prevention Online (September 19, 2002). Published online at <http://ip.bmjournals.com/cgi/eletters/8/3/252>.
- 2005 "Firearms, violence, and self-protection." Science 309:1674. September 9, 2005.

UNPUBLISHED REPORT

- 1987 Violence, Fear, and Guns at Florida State University: A Report to the President's Committee on Student Safety and Welfare. Reports results of campus crime victimization survey and review of campus police statistics on gun violence (32 pages).

RESEARCH FUNDING

- 1994 "The Impact of Drug Enforcement on Urban Drug Use Levels and Crime Rates." \$9,500 awarded by the U.S. Sentencing Commission.
- 1997 "Testing a Fundamental Assumption of Deterrence-Based Crime Control Policy." \$80,590 awarded by the Charles E. Culpeper Foundation to study the link between actual and perceived punishment levels.

PRESENTED PAPERS

- 1976 "Firearms, homicide, and the death penalty: a simultaneous equations analysis." Presented at the annual meetings of the Illinois Sociological Association, Chicago.
- 1979 "The assumptions of gun control." Presented at the Annual Meetings of the American Sociological Association, New York City.
- 1980 "Handgun-only gun control: A policy disaster in the making." Presented at the Annual Meetings of the American Society of Criminology, Washington, D.C.
- 1981 "Life support for ailing hypotheses: Modes of summarizing the evidence on racial

- discrimination." Presented at the Annual Meetings of the American Society of Criminology, Toronto.
- 1984 "Policy lessons from recent gun control research." Presented at the Duke University Law School Conference on Gun Control.
- 1985 "Policy lessons from recent gun control research." Presented at the Annual Meetings of the American Society of Criminology, San Diego.
- 1986 "Miscounting suicides." Presented at the Annual Meetings of the American Sociological Association, Chicago.
- 1987 (with Theodore G. Chiricos, Michael Hays, and Laura Myers) "Unemployment and crime: a comparison of motivation and opportunity effects." Annual meetings of the American Society of Criminology, Montreal.
- 1988 "Suicide, guns and gun control." Presented at the Annual Meetings of the Popular Culture Association, New Orleans.
- 1988 (with Susan Sayles) "Rape and resistance." Presented at the Annual Meetings of the American Society of Criminology, Chicago, Ill.
- 1989 (with Karen McElrath) "The impact of weaponry on human violence." Presented at the Annual Meetings of the American Sociological Association, San Francisco.
- 1989 (with Britt Patterson) "The impact of gun control and gun ownership levels on city violence rates." Presented at the Annual Meetings of the American Society of Criminology, Reno.
- 1990 "Guns and violence: a summary of the field." Presented at the Annual Meetings of the American Political Science Association, Washington, D.C.
- 1991 "Interrupted time series designs: time for a re-evaluation." Presented at the Annual Meetings of the American Society of Criminology, New Orleans.
- 1993 (with Chester Britt III and David J. Bordua) "The emperor has no clothes: Using interrupted time series designs to evaluate social policy impact." Presented at the Annual Meetings of the American Society of Criminology, Phoenix.
- 1992 "Crime, culture conflict and support for gun laws: a multi-level application of the General Social Surveys." Presented at the Annual Meetings of the American Society of Criminology, Phoenix.
- 1994 (with Marc Gertz) "Armed resistance to crime: the prevalence and nature of self-defense with a gun." Presented at the Annual Meetings of the American Society

of Criminology, Miami.

- 1995 (with Tom Jordan) "The impact of drug enforcement and penalty levels on urban drug use levels and crime rates." Presented at the Annual Meetings of the American Society of Criminology, Boston.
- 1996 (with Michael Hogan) "A national case-control study of homicide offending and gun ownership." Presented at the Annual Meetings of the American Society of Criminology, Chicago.
- 1997 "Evaluating the Brady Act and increasing the utility of BATF tracing data." Presented at the annual meetings of the Homicide Research Working Group, Shepherdstown, West Virginia.
- 1997 "Crime, collective security, and gun ownership: a multi-level application of the General Social Surveys." Presented at the Annual Meetings of the American Society of Criminology, San Diego.
- 1998 (with Brion Sever and Marc Gertz) "Testing a fundamental assumption of deterrence-based crime control policy." Presented at the Annual Meetings of the American Society of Criminology, Washington, D.C.
- 1998 "Measuring macro-level gun ownership levels." Presented at the Annual Meetings of the American Society of Criminology, Washington, D.C.
- 1999 "Can owning a gun really triple the owner's chances of being murdered?" Presented at the Annual Meetings of the American Society of Criminology, Toronto.
- 2000 "Absolutist politics in a moderate package: prohibitionist intentions of the gun control movement." Presented at the Annual Meetings of the American Society of Criminology, San Francisco.
- 2001 (with Tomislav V. Kovandzic) "The impact of gun laws and gun levels on crime rates." Presented at the Annual Meetings of the American Society of Criminology, Atlanta.
- 2001 "Measures of gun ownership levels for macro-level violence research." Presented at the Annual Meetings of the American Society of Criminology, Atlanta.
- 2001 "The effects of gun ownership levels and gun control laws on urban crime rates." Presented at the Annual Meetings of the American Society of Criminology, Chicago.
- 2003 (with Tomislav V. Kovandzic) "The effect of gun levels on violence rates depends on who has them." Presented at the Annual Meetings of the American Society of

Criminology, Denver.

- 2003 (with KyuBeom Choi) “Filling in the gap in the causal link of deterrence.” Presented at the Annual Meetings of the American Society of Criminology, Denver.
- 2004 (with Tomislav Kovandzic) “Do violent crime rates and police strength levels in the community influence whether individuals own guns?” Presented at the Annual Meetings of the American Society of Criminology, Nashville.
- 2004 (with Jongyeon Tark) “Resisting crime: the effects of victim action on the outcomes of crime.” Presented at the Annual Meetings of the American Society of Criminology, Nashville.
- 2004 (with Jongyeon Tark) “The impact of self-protection on rape completion and injury.” Presented at the Annual Meetings of the American Society of Criminology, Nashville.
- 2004 (with Kyubeom Choi) “The perceptual gap phenomenon and deterrence as psychological coercion.” Presented at the Annual Meetings of the American Society of Criminology, Nashville.
- 2005 (with Jongyeon Tark) “Who resists crime?” Presented at the Annual Meetings of the American Society of Criminology, Toronto.
- 2005 (with Jongyeon Tark and Laura Bedard) “Crime and marriage.” Presented at the Annual Meetings of the American Society of Criminology, Toronto.
- 2006 (with Shun-Yang Kevin Wang) “Organized gun trafficking, ‘crime guns,’ and crime rates.” Presented at the Annual Meetings of the American Society of Criminology, Los Angeles.
- 2006 “Are police officers more likely to kill black suspects?” Presented at the Annual Meetings of the American Society of Criminology, Los Angeles.
- 2007 (with Shun-Yang Kevin Wang) “The myth of big-time gun trafficking.” Presented at the Annual Meetings of the American Society of Criminology, Atlanta.
- 2007 (with Marc Gertz and Jason Bratton) “Why do people support gun control?” Presented at the Annual Meetings of the American Society of Criminology, Atlanta.
- 2008 (with J.C. Barnes) “Deterrence and macro-level perceptions of punishment risks: Is there a ‘collective wisdom?’” Presented at the Annual Meetings of the American Society of Criminology, St. Louis.

- 2009 “The myth of big-time gun trafficking.” Presented at UCLA Law Review Symposium, “The Second Amendment and the Right to Bear Arms After DC v. Heller.” January 23, 2009, Los Angeles.
- 2009 (with Shun-Yung Wang) “Employment and crime and delinquency of working youth: A longitudinal study of youth employment.” Presented at the Annual Meetings of the American Society of Criminology, November 6, 2009, Philadelphia, PA.
- 2009 (with J. C. Barnes) “Do more police generate more deterrence?” Presented at the Annual Meetings of the American Society of Criminology, November 4, 2009, Philadelphia, PA.
- 2010 (with J. C. Barnes) “Article productivity among the faculty of criminology and criminal justice doctoral programs, 2005-2009.” Presented at the annual Meetings of the American Society of Criminology, November 18, 2010, San Francisco, CA.
- 2010 (with Will Hauser) “Fear of crime and gun ownership.” Presented at the annual Meetings of the American Society of Criminology, November 18, 2010, San Francisco, CA.
- 2010 “Errors in survey estimates of defensive gun use frequency: results from national Internet survey experiments.” Presented at the annual Meetings of the American Society of Criminology, November 19, 2010, San Francisco, CA.
- 2010 (with Mark Faber and Tomislav Kovandzic) “Perceived risk, criminal victimization, and prospective gun ownership.” Presented at the annual Meetings of the American Society of Criminology, November 19, 2010, San Francisco, CA.
- 2011 (with Shun-young Wang) “The impact of job quality and career commitment on delinquency: conditional or universal?” Presented at the annual Meetings of the American Society of Criminology, November 17, 2011.
- 2011 (with Moonki Hong) “The short-term deterrent effect of executions on homicides in the United States, 1984-1998.” Presented at the annual Meetings of the American Society of Criminology, November 16, 2011.
- 2011 (with Kelly Roberts) “Which survey modes are most effective in getting people to admit illegal behaviors?” Presented at the annual Meetings of the American Society of Criminology, November 17, 2011.
- 2011 (with Will Hauser) “Pick on someone your own size: do health, fitness, and size influence victim selection?” Presented at the annual Meetings of the American Society of Criminology, November 18, 2011.

- 2011 (with Tomislav Kovandzic) "Is the macro-level crime/punishment association spurious?" Presented at the annual Meetings of the American Society of Criminology, November 18, 2011.
- 2012 (with Dylan Jackson) "Adult unemployment and serious property crime: a national case-control study." Presented at the annual Meetings of the American Society of Criminology, November 15, 2012.
- 2013 (with Will Hauser) "Confidence in the Police and Fear of Crime: Do Police Force Size and Productivity Matter?" Presented at the annual Meetings of the American Society of Criminology, November 22, 2013.
- 2013. (with Dylan Jackson) "Adult unemployment and serious property crime: a national case-control study." Presented at the annual Meetings of the American Society of Criminology, November 22, 2013.
- 2014 (with Dylan Jackson) "Does Crime Cause Punitiveness?" Presented at the annual Meetings of the American Society of Criminology, November 20, 2014.
- 2015 "The effect of large capacity magazines on the casualty counts in mass shootings." Presented at the annual Meetings of the American Society of Criminology, November 18, 2015.
- 2015 (with Bethany Mims) "Article productivity among the faculty of criminology and criminal justice doctoral programs, 2010-2014." Presented at the annual Meetings of the American Society of Criminology, November 20, 2015.
- 2016 "Firearms and the Lethality of Suicide Methods." Presented at the annual Meetings of the American Society of Criminology, November 16, 2016.

CHAIR

- 1983 Chair, session on Race and Crime. Annual meetings of the American Society of Criminology, Denver.
- 1989 Co-chair (with Merry Morash), roundtable session on problems in analyzing the National Crime Surveys. Annual meetings of the American Society of Criminology, Reno.
- 1993 Chair, session on Interrupted Time Series Designs. Annual meetings of the American Society of Criminology, New Orleans.
- 1993 Chair, session on Guns, Gun Control, and Violence. Annual meetings of the American Society of Criminology, Phoenix.
- 1994 Chair, session on International Drug Enforcement. Annual meetings of the

American Society of Criminology, Boston.

- 1999 Chair, Author-Meets-Critics session, More Guns, Less Crime. Annual meetings of the American Society of Criminology, Toronto.
- 2000 Chair, session on Defensive Weapon and Gun Use. Annual Meetings of the American Society of Criminology, San Francisco.
- 2002 Chair, session on the Causes of Gun Crime. Annual meetings of the American Society of Criminology, Chicago.
- 2004 Chair, session on Protecting the Victim. Annual meetings of the American Society of Criminology, Nashville.

DISCUSSANT

- 1981 Session on Gun Control Legislation, Annual Meetings of the American Society of Criminology, Washington, D.C.
- 1984 Session on Criminal Sentencing, Annual Meetings of the American Society of Criminology, Cincinnati.
- 1986 Session on Sentencing, Annual Meetings of the American Society of Criminology, Atlanta.
- 1988 Session on Gun Ownership and Self-protection, Annual Meetings of the Popular Culture Association, Montreal.
- 1991 Session on Gun Control, Annual Meetings of the American Statistical Association, Atlanta, Ga.
- 1995 Session on International Drug Enforcement, Annual Meetings of the American Society of Criminology, Boston.
- 2000 Session on Defensive Weapon and Gun Use, Annual Meetings of the American Society of Criminology, San Francisco.
- 2004 Author-Meets-Critic session on Guns, Violence, and Identity Among African-American and Latino Youth, by Deanna Wilkinson. Annual meetings of the American Society of Criminology, Nashville.
- 2007 Session on Deterrence and Perceptions, University of Maryland 2007 Crime & Population Dynamics Summer Workshop, Aspen Wye River Center, Queenstown MD, June 4, 2007.
- 2009 Session on Guns and Crime, at the DeVoe Moore Center Symposium On

The Economics of Crime, March 26-28, 2009 .

2012 Panel discussion of news media coverage of high profile crimes
Held at the Florida Supreme Court On September 24-25, 2012, sponsored by the
Florida Bar Association as part of their 2012 Reporters' Workshop.

PROFESSIONAL SERVICE

Editorial consultant -

American Sociological Review
American Journal of Sociology
Social Forces
Social Problems
Law and Society Review
Journal of Research in Crime and Delinquency
Social Science Research
Criminology
Journal of Quantitative Criminology
Justice Quarterly
Journal of Criminal Justice
Violence and Victims
Violence Against Women
Journal of the American Medical Association
New England Journal of Medicine
American Journal of Public Health
Journal of Homicide Studies

Grants consultant, National Science Foundation, Sociology Program.

Member, Gene LeCarte Student Paper Committee, American Society of Criminology,
1990.

Area Chair, Methods Area, American Society of Criminology, annual meetings in Miami,
November, 1994.

Division Chair, Guns Division, American Society of Criminology, annual meetings in
Washington, D.C., November, 1998.

Dissertation evaluator, University of Capetown, Union of South Africa, 1998.

Division Chair, Guns Division, American Society of Criminology, annual meetings in
Washington, D.C., November, 1999.

Member of Academy of Criminal Justice Sciences selection committee for Editor of
Justice Quarterly, 2007.

Outside reviewer of Dr. J. Pete Blair for promotion to Full Professor in the School of Criminal Justice at Texas State University, San Marcos, 2014.

UNIVERSITY SERVICE

Member, Master's Comprehensive Examination Committee, School of Criminology, 1979-1982.

Faculty Advisor, Lambda Alpha Epsilon (FSU chapter of American Criminal Justice Association), 1980-1988.

Faculty Senate Member, 1984-1992.

Carried out campus crime survey for President's Committee on Student Safety and Welfare, 1986.

Member, Strategic Planning and Budgeting Review Committee for Institute for Science and Public Affairs, and Departments of Physics and Economics, 1986.

Chair, Committee on Ph.D. Comprehensive Examination in Research Methods, School of Criminology, Summer, 1986.

Member, Committee on Ph.D. Comprehensive Examination in Research Methods, School of Criminology, Summer, 1986 to present.

Chair, Committee on Graduate Assistantships, School of Criminology, Spring, 1987.

Chair, Ad Hoc Committee on Computers, School of Criminology, Fall, 1987.

Member, Recruitment Committee, School of Criminology, Spring, 1988; Spring, 1989; and 1989-90 academic year.

Member, Faculty Senate Committee on Computer-Related Curriculum, Spring, 1988 to Fall, 1989.

Chair, Ad Hoc Committee on Merit Salary Distribution, School of Criminology, Spring, 1988.

Chair, Ad Hoc Committee on Enrollment Strains, Spring, 1989.

Member, Graduate Handbook Committee, School of Criminology, Spring, 1990.

Member, Internal Advisement Committee, School of Criminology Spring, 1990.

University Commencement Marshall, 1990 to 1993.

Member, School of Criminology and Criminal Justice Teaching Incentive Program award committee.

Chair, Faculty Recruitment Committee, School of Criminology and Criminal Justice, 1994-1995.

Chair, Committee on Ph.D. Comprehensive Examination in Research Methods, School of Criminology and Criminal Justice, 1994-1995.

Member, University Computer and Information Resources Committee, 1995-1998.

Member, University Fellowship Committee, 1995 to present.

Member, University Library Committee, 1996 to 1999.

Chair, Electronic Access Subcommittee, University Library Committee, 1998 to 1999.

Member, Ad Hoc Committee on Merit Salary Increase Allocation, School of Criminology and Criminal Justice, 1998-1999.

Member, Academic Committee, School of Criminology and Criminal Justice, 2000-present.

Member, Recruiting Committee, School of Criminology and Criminal Justice, 2000-2001.

Member, Promotion and Tenure Committee, School of Criminology and Criminal Justice, 2000-present.

Chair, Committee on Ph.D. Comprehensive Examination in Research Methods, School of Criminology and Criminal Justice, 2000-2002.

Chair, Promotion and Tenure Committee, School of Criminology and Criminal Justice, 2001-2002.

Faculty Adviser, School of Criminology and Criminal Justice Graduate Student Association, 2001-present.

Member, ad hoc committee on survey research, School of Criminology and Criminal Justice, 2002.

Coordinator of Parts 2 and 4 of the School of Criminology and Criminal Justice Unit Review, 2002.

Chair, Academic Committee, School of Criminology and Criminal Justice, 2002-2003.

Director, Honors Programs, School of Criminology and Criminal Justice, 2002-present.

Member, University Promotion and Tenure Committee, Fall, 2003 to present.

Member of University Graduate Policy Committee, Fall 2003 to present.

Director of Graduate Studies, School (later College) of Criminology and Criminal Justice, April 2004 to May 2011.

Chair, Promotion and Tenure Committee, College of Criminology and Criminal Justice, 2005-2006

Served as major professor on Area Paper by Christopher Rosbough, completed in 2012.

Served as member of dissertation committee of Kristen Lavin, dissertation completed in 2012.

Served as member of dissertation committee of Elizabeth Stupi, dissertation completed in 2013.

Served as outside member on two dissertation committees in 2014-2015: Brian Meehan in the Department of Economics and Adam Weinstein in the English Department. Both dissertations were completed.

Served as major professor on Area Paper on legalization of marijuana for Pedro Juan Matos Silva, Spring 2015. Paper completed.

Currently serving as major professor for two doctoral students, Moonki Hong and Sergio Garduno. Hong is scheduled to finish his dissertation by December 2015, and Garduno will be starting his dissertation in Spring 2016.

PUBLIC SERVICE

Television, radio, newspaper, magazine, and Internet interviews concerning gun control, racial bias in sentencing, crime statistics, and the death penalty. Interviews and other kinds of news media contacts include Newsweek, Time, U.S. News and World Report, New York Times, Washington Post, Chicago Tribune, Los Angeles Times, USA Today, Boston Globe, Wall Street Journal, Kansas City Star, Philadelphia Inquirer, Philadelphia News, Atlanta Constitution, Atlanta Journal, Arizona Republican, San Antonio Express-News, Dallas Morning News, Miami Herald, Tampa Tribune, Jacksonville Times-Union, Womens' Day, Harper's Bazaar, Playboy, CBS-TV (60 Minutes; Street Stories) ABC-TV (World News Tonight; Nightline), NBC-TV (Nightly News), Cable News Network, Canadian Broadcasting Company, National Public Radio, Huffington Post, PolitiFact.com, and many others.

Resource person, Subcommittee on Crime and Justice, (Florida House) Speaker's

Advisory Committee on the Future, February 6-7, 1986, Florida State Capitol.

Testimony before the U.S. Congress, House Select Committee on Children, Youth and Families, June 15, 1989.

Discussant, National Research Council/National Academy of Sciences Symposium on the Understanding and Control of Violent Behavior, April 1-4, 1990, Destin, Florida.

Colloquium on manipulation of statistics relevant to public policy, Statistics Department, Florida State University, October, 1992.

Speech to faculty, students, and alumni at Silver Anniversary of Northeastern University College of Criminal Justice, May 15, 1993.

Speech to faculty and students at Department of Sociology, University of New Mexico, October, 1993.

Speech on the impact of gun control laws, annual meetings of the Justice Research and Statistics Association, October, 1993, Albuquerque, New Mexico.

Testimony before the Hawaii House Judiciary Committee, Honolulu, Hawaii, March 12, 1994.

Briefing of the National Executive Institute, FBI Academy, Quantico, Virginia, March 18, 1994.

Delivered the annual Nettler Lecture at the University of Alberta, Edmonton, Canada, March 21, 1994.

Member, Drugs-Violence Task Force, U.S. Sentencing Commission, 1994-1996.

Testimony before the Pennsylvania Senate Select Committee to Investigate the Use of Automatic and Semiautomatic Firearms, Pittsburgh, Pennsylvania, August 16, 1994.

Delivered lectures in the annual Provost's Lecture Series, Bloomsburg University, Bloomsburg, Pa., September 19, 1994.

Briefing of the National Executive Institute, FBI Academy, Quantico, Virginia, June 29, 1995.

Speech to personnel in research branches of crime-related State of Florida agencies, Research and Statistics Conference, sponsored by the Office of the State Courts Administrator, October 19, 1995.

Speech to the Third Annual Legislative Workshop, sponsored by the James Madison Institute and the Foundation for Florida's Future, February 5, 1998.

Speech at the Florida Department of Law Enforcement on the state's criminal justice research agenda, December, 1998.

Briefing on news media coverage of guns and violence issues, to the Criminal Justice Journalists organization, at the American Society of Criminology annual meetings in Washington, D.C., November 12, 1998.

Briefing on gun control strategies to the Rand Corporation conference on "Effective Strategies for Reducing Gun Violence," Santa Monica, Calif., January 21, 2000.

Speech on deterrence to the faculty of the Florida State University School of Law, February 10, 2000.

Invited address on links between guns and violence to the National Research Council Committee on Improving Research Information and Data on Firearms, November 15-16, 2001, Irvine, California.

Invited address on research on guns and self-defense to the National Research Council Committee on Improving Research Information and Data on Firearms, January 16-17, 2002, Washington, D.C.

Invited address on gun control, Northern Illinois University, April 19, 2002.

Invited address to the faculty of the School of Public Health, University of Alabama, Birmingham, 2004.

Invited address to the faculty of the School of Public Health, University of Pennsylvania, March 5, 2004.

Member of Justice Quarterly Editor Selection Committee, Academy of Criminal Justice Sciences, Spring 2007

Testified before the Gubernatorial Task Force for University Campus Safety, Tallahassee, Florida, May 3, 2007.

Gave public address, "Guns & Violence: Good Guys vs. Bad Guys," Western Carolina University, Cullowhee, North Carolina, March 5, 2012.

Invited panelist, Fordham Law School Symposium, "Gun Control and the Second Amendment," New York City, March 9, 2012.

Invited panelist, community forum on "Students, Safety & the Second Amendment," sponsored by the Tallahassee Democrat.

Invited address at University of West Florida, Department of Justice Studies, titled

“Guns, Self-Defense, and the Public Interest,” April 12, 2013.

Member, National Research Council Committee on Priorities for a Public Health Research Agenda to Reduce the Threat of Firearm-related Violence, May 2013.

Invited address at Davidson College, Davidson, NC, April 18, 2014. Invited by the Department of Philosophy .

OTHER ITEMS

Listed in:

Marquis Who's Who, 2009

Marquis Who's Who in the South and Southwest, 25th edition

Who's Who of Emerging Leaders in America, 1st edition

Contemporary Authors

Directory of American Scholars, 10th edition, 2002

Writer's Directory, 20th edition, 2004.

Participant in First National Workshop on the National Crime Survey, College Park, Maryland, July, 1987, co-sponsored by the Bureau of Justice Statistics and the American Statistical Association.

Participant in Second National Workshop on the National Crime Survey, Washington, D.C., July, 1988.

Participant, Seton Hall Law School Conference on Gun Control, March 3, 1989.

Debater in Intelligence Squared program, on the proposition “Guns Reduce Crime.” Rockefeller University, New York City, October 28, 2008. Podcast distributed through National Public Radio. Further details are available at <http://www.intelligencesquaredus.org/Event.aspx?Event=36>.

Subject of cover story, “America Armed,” in Florida State University Research in Review, Winter/Spring 2009.

Grants reviewer, Social Sciences and Humanities Research Council of Canada, 2010.

Named one of “25 Top Criminal Justice Professors” in the U.S. by Forensics Colleges website (<http://www.forensicscolleges.com/>), 2014.

EXHIBIT 4

Expert Witness Rebuttal of Dr. Carlisle E. Moody

Duncan, et al. v. Becerra, et al.

United States District Court (S.D. Cal.)

Case No: 3:17-cv-01017-BEN-JLB

November 3, 2017

I. INTRODUCTION

I am Dr. Carlisle E. Moody, Professor of Economics at the College of William & Mary. Counsel for plaintiffs in *Duncan v. Becerra* (S.D. Cal. Case No. 3:17-cv-01017-BEN-JLB) have asked me to offer a rebuttal opinion regarding this case. This report sets forth my qualifications, opinions, and scholarly foundation for those opinions.

II. BACKGROUND & QUALIFICATIONS

I am a Professor of Economics at the College of William and Mary in Virginia. I graduated from Colby College in 1965 with a major in Economics. I received my graduate training from the University of Connecticut, earning a Master of Economics degree in 1966 and a Ph.D. in Economics in 1970, with fields in mathematical economics and econometrics.

I began my academic career in 1968 as Lecturer in Econometrics at the University of Leeds, Leeds, England. In 1970 I joined the Economics Department at William and Mary as an Assistant Professor, I was promoted to Associate Professor in 1975 and to full Professor in 1989. I was Chair of the Economics Department from 1997-2003. I am still teaching full time at William and Mary. I teach undergraduate and graduate courses in Econometrics, Mathematical Economics, and Time Series Analysis.

I have published over 40 refereed journal articles and several articles in law journals and elsewhere. Nearly all these articles analyze government policies of various sorts. I have been doing research in guns, crime, and gun policy since 2000. I have published 11 articles directly related to guns and gun policy.

I have also consulted for a variety of private and public entities, including the United States Department of Energy, U.S. General Accountability Office, Washington Consulting Group, Decision Analysis Corporation of Virginia, SAIC Corporation, and the Independence Institute.

A full list of my qualifications, as well as a list of my publications, is attached hereto as **Exhibit 1**.

In the past four years, I have written expert reports, been deposed, or testified at trial in the following matters:

- *Cooke v. Hickenlooper*, U.S. Dist. Ct., Dist. of Colo., Oct. 25, 2013 (submitted expert report, not deposed, did not testify);
- *Rocky Mountain Gun Owners v. Hickenlooper*, Dist. Ct., City and County of Denver, Case No. 2013-CV-33897, May 1, 2017 (testified).
- *William Wiese, et al v. Becerra*, U.S. Dist. Ct., E. Dist. of Cal., Case No. 2:17-cv-00903-WBS-KJN, April 28, 2017 (submitted expert report, not deposed, did not testify)

III. COMPENSATION

I am being compensated for my time in this case at an hourly rate of \$250 per hour. My compensation is not contingent on the results of my analysis or the substance of my testimony.

IV. ASSIGNMENT

Plaintiffs' counsel has asked me to provide an opinion in response to the opinions presented in the expert reports submitted by Attorney General Xavier Becerra—specifically those of Dr. Louis Klarevas and Dr. Christopher S. Koper.

V. SUMMARY OF OPINIONS

The defense's experts posit that magazines over ten rounds increase the number of shots fired in mass shooting incidents and other violent crimes leading to more deaths and injuries. The conclusion they come to is that a ban on such magazines has the potential to reduce deaths and injuries sustained in such events. The defense's experts, however, provide no relevant evidence showing that California's ban would reduce deaths or injuries.

Koper presents evidence concerning the federal weapons ban in effect from 1994-2004, a nationwide ban on (among other things) magazines over ten rounds. His opinion regarding the effectiveness of that ban is largely irrelevant here because the challenged law is limited to California. Koper presents no evidence at all concerning the effectiveness of California's magazine ban, specifically, or statewide bans, more generally.

Klarevas presents some weak evidence that states with magazine bans have had fewer incidents of mass shootings and fewer people killed in mass shootings than states without such bans. He does not present any evidence that the California ban has had any effect, thereby rendering his report irrelevant.

It is my professional opinion, based on my training in economics, econometrics, and policy analysis, my expertise relevant to gun policy, including

bans on “large capacity magazines,”¹ as well as my review and analysis of the relevant data that: (1) California’s current ban on acquiring magazines over ten rounds² has not had any statistically significant impact on violent crime, including mass shootings, in California; (2) legally possessed magazines over ten rounds (i.e., those that were “grandfathered in” after the state banned acquisition) are not commonly used in mass shootings in California; and (3) bans on such magazines have no effect on violent crime, as illustrated by the results of the Washington Post study of firearms recovered by Virginia law enforcement.

In short, it is my expert opinion that California’s acquisition ban has not and will not, even when paired with a possession ban, result in any statistically significant reduction in the number or lethality of mass shooting incidents in California or violent crime rates in general.

VI. OPINIONS & ANALYSIS

A. California’s LCM Acquisition Ban Has Had No Statistically Significant Impact on Violent Crime in California

1. A Primer on Policy Analysis Using Regression Models³

A regression model estimates the possible linear relationship between the dependent (outcome) variable, say the California murder rate, and a set of explanatory variables such as the 1994 assault weapon ban and the California LCM ban. The law variables are so-called “dummy” variables which equal one in those years the law was in effect, zero otherwise. I also include a trend consisting of the numbers 1,2,3, etc. for the years in the sample. The coefficient on the trend shows by how much the murder rate changes each year due to all other factors that affect the murder rate aside from the variables included in the regression model. These

¹ California law defines a “large capacity magazine” as, with limited exceptions, “any ammunition feeding device with the capacity to accept more than 10 rounds.” Cal. Penal Code § 16740. I understand that this is not a universally accepted definition. But, for ease of reference, I refer to magazines over ten rounds as “large capacity magazines” or “LCMs” throughout this report.

² It is my understanding, and I have assumed for purposes of this study, that California has prohibited the manufacture, importation, sale, giving, lending, buying, and receiving of magazines over ten rounds since the enactment of Senate Bill 23 (“SB 23”), which is codified at California Penal Code section 32310(a) and took effect on January 1, 2000. I refer to this prohibition as California’s “acquisition ban” throughout this report.

³ Readers who are familiar with statistical methodology applied to policy analysis can skip this section.

factors include changes in trauma treatment that turn potential murders into assaults, the advent of 911 calls, cell phones, DNA, the national fingerprint directory, ubiquitous security cameras, smartphones with cameras, body cameras on police officers, etc. etc. If the trend is omitted, these influences on crime which are separate and distinct from the effect of any law, will be incorrectly attributed to the LCM ban. I also include a dummy variable for the years 1994-2004 to estimate the effect of the national LCM ban due to the Federal assault weapon ban. If that variable is omitted, the effect of the national ban is incorrectly attributed to the state ban. I also include some variables that are routinely included in almost any crime model: the proportion of the population between 15 and 29, the unemployment rate, income per capita, and a dummy variable for the years of the crack epidemic, 1984-1991.

The coefficient on the California LCM acquisition ban variable estimates the change in the dependent variable, e.g., the murder rate, due to the implementation of the acquisition ban, holding constant the effects of the national ban, the effects of the factors captured by the trend, and the effects of the crack epidemic, income, and unemployment. If the California acquisition ban has been effective in reducing murder, we would expect a negative and significant coefficient on the LCM ban dummy variable indicating a reduction in murder as a result of the ban.

Even if an estimated coefficient is negative, it does not mean the law necessarily had a beneficial effect. If the law had no effect, the coefficient on the law dummy variable could be negative just by chance. In fact, we would expect it to be negative 50 percent of the time. How do we know when an estimated coefficient is significantly different from zero? Answer: when it is so far from zero that we can conclude beyond a reasonable doubt that it is not zero.

A significance test is used for this. Tests for significance are made up of two hypotheses: the null hypothesis (that the law had no effect or equivalently the coefficient is actually zero) and the alternative hypothesis that the law did have an effect (that the coefficient is truly nonzero). We construct a t-statistic consisting of the estimated coefficient divided by its standard deviation (standard deviations are called "standard errors" in the context of a regression coefficient). The larger the value of the estimated coefficient, the more likely that it is not zero. However, given the standard deviation, we would expect some variation around zero even if the true value is zero (i.e., the null hypothesis is true). If the estimated coefficient is distributed according to the normal distribution (the famous bell curve), which is the usual assumption, then it would be quite unusual for an estimated coefficient to be twice as large as its standard error. How unusual? It would only happen 5% of the time if the true value of the coefficient was zero. Therefore, we reject the null hypothesis that the California acquisition ban had no effect if the t-statistic is greater than two.

The usual standard for significance is the 5 percent level, where there is only a five percent chance of a t-statistic that large if in fact the law had no effect on the

murder rate. This is the statistical equivalent of a “reasonable doubt.” Sometimes researchers use the 10 percent level, which is considered “marginally significant.” I do not use this criterion. Whether the coefficient is significant can be seen by examining the “p-value”, which indicates the probability of rejecting the null hypothesis, given the t-statistic. If the p-value is less than .05 there is a smaller than 5% probability that we could have estimated a coefficient this large if it is truly zero (implying significance). If the t-statistic has a p-value greater than .05, then we cannot reject the null hypothesis that there is no relationship between the explanatory variable and the dependent variable.

Since the data for California from 1977 to 2017 is a time series, we have to consider the possibility that the continuous variables (violent crime rate, murder rate, firearm homicide rate) are so-called “random walks.” If they are random walks, then the regression must be done in first differences: $Dx(t)=x(t)-x(t-1)$. There are tests for random walks, called “unit root” tests, the most powerful of which is the DFGLS test, which I used to test whether to use first differences.⁴ It turns out that all three of the California crime series are random walks, so I report the results of the regressions in first differences. However, in the Appendix below, I report all the results, including the results of estimating the regressions in levels instead of first differences.⁵ Note that the effect of the trend is captured by the constant (intercept) in the first difference regression.

In the following tables, the outcome variable is listed first, then names of the independent variables, the corresponding estimated coefficients, t-statistics, and p-values. For convenience, p-values less than .05 are indicated with an asterisk. For the California acquisition ban to have been successful in saving lives, the coefficient on the variable called “LCM ban” must be negative with a p-value less than .05 (or with an asterisk).⁶

⁴ Graham Elliot, Thomas J. Rothenberg & James H. Stock, *Efficient Tests for an Autoregressive Unit Root*, 64 *Econometrica* 813-836 (July 1996), available at <https://ideas.repec.org/a/ecm/emetrp/v64y1996i4p813-36.html>.

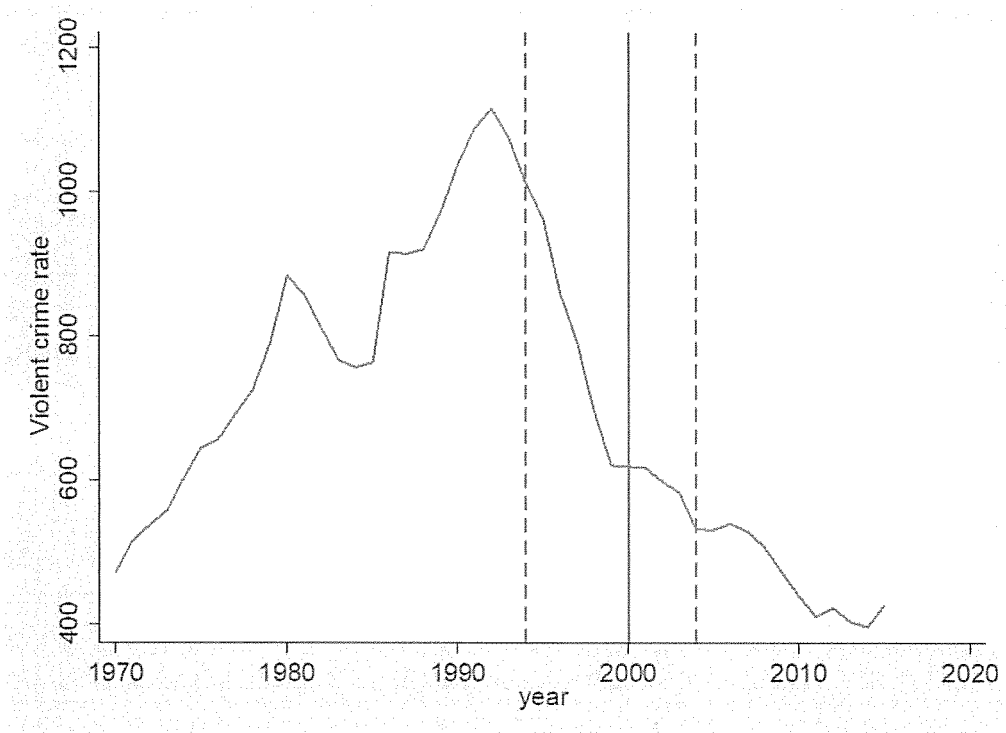
⁵ I also test for serial correlation. There is no significant serial correlation in any of my regressions.

⁶ For count data like the number of people killed in mass shootings, the number of incidents of mass shootings, and the number of police officers killed in the line of duty, the data is not distributed normally. For these data, I use the negative binomial model, a generalization of the Poisson model. The negative binomial is the standard model for count data.

2. California's Violent Crime Rate

The California violent crime rate is shown in Figure 1. The dotted vertical lines correspond to the years of the federal assault weapons ban and corresponding national LCM ban. The single solid vertical line corresponds to the California LCM acquisition ban. If the California acquisition ban successfully reduces violent crime, we should see a discontinuity (also called a “break”) at or after the solid vertical line.

Figure 1: Violent crime rate, California, 1970-2015



Crime was generally rising until 1991, the last year of the crack epidemic, then generally declining. The downturn came before the federal LCM ban, so it is unlikely to have been caused by the national ban. There is no break at or after 2000, the downward trend just continues. We test these observations in Table 1 below. The violent crime rate includes murders and assaults, including gun assaults. If the California acquisition ban has been successful in reducing violent crime, it will have a negative and significant coefficient in Table 1 below.

Table 1: Violent crime rate, California, 1970-2015

Outcome	Variable	Coefficient	T-ratio	P-value
Violent crime rate	LCM ban	44.844	0.95	0.35

Federal assault weapons ban	-31.547	-1.00	0.32
Percent population 15-29	8.984	0.43	0.67
Crack epidemic 1984-1991	2.645	0.08	0.94
Income per capita	-1.000	-0.04	0.97
Unemployment rate	-2.653	-0.33	0.75
Violent crime rate, lagged	0.605	4.12*	0.00
Constant	-0.345	-0.04	0.97

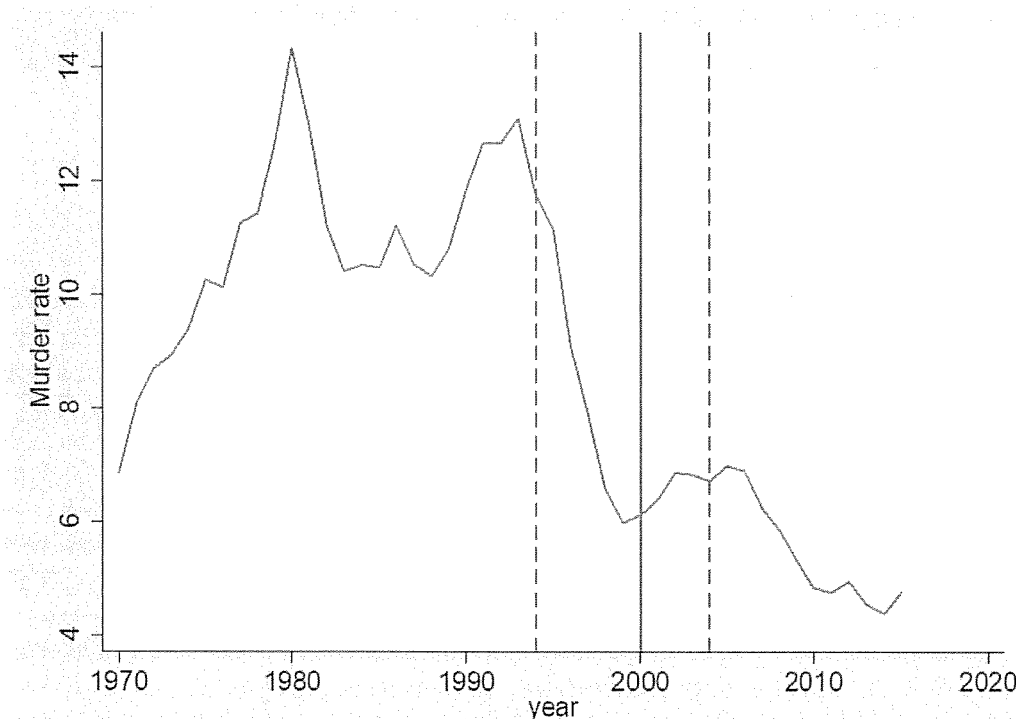
Notes: first differences, trend coefficient estimated by constant; * $p < 0.05$

Unfortunately, the coefficient on the California LCM ban dummy is neither negative nor significant. The federal ban dummy is also not significant. Neither the state nor the federal LCM ban had any significant effect on the violent crime rate.

3. California's Murder Rate

The murder rate in California for 1970-2015 is shown in Figure 2.

Figure 2: Murder rate, California, 1970-2015



The murder rate also begins to decline in 1991, before the federal LCM ban, it increases from 1999-2005, then generally declines for the next 10 years. The regression model is shown in Table 2 below.

Table 2: Murder rate, California, 1970-2015

Outcome	Variable	Coefficient	T-ratio	P-value
Murder rate	LCM ban	0.586	0.73	0.47
	Federal assault weapons ban	-0.884	-1.61	0.12
	Percent population 15-29	0.225	0.60	0.55
	Crack epidemic 1984-1991	0.360	0.61	0.54
	Income per capita	-0.288	-0.64	0.52
	Unemployment rate	-0.056	-0.39	0.70
	Murder rate, lagged	0.452	2.97*	0.01
	Constant	0.047	0.31	0.76

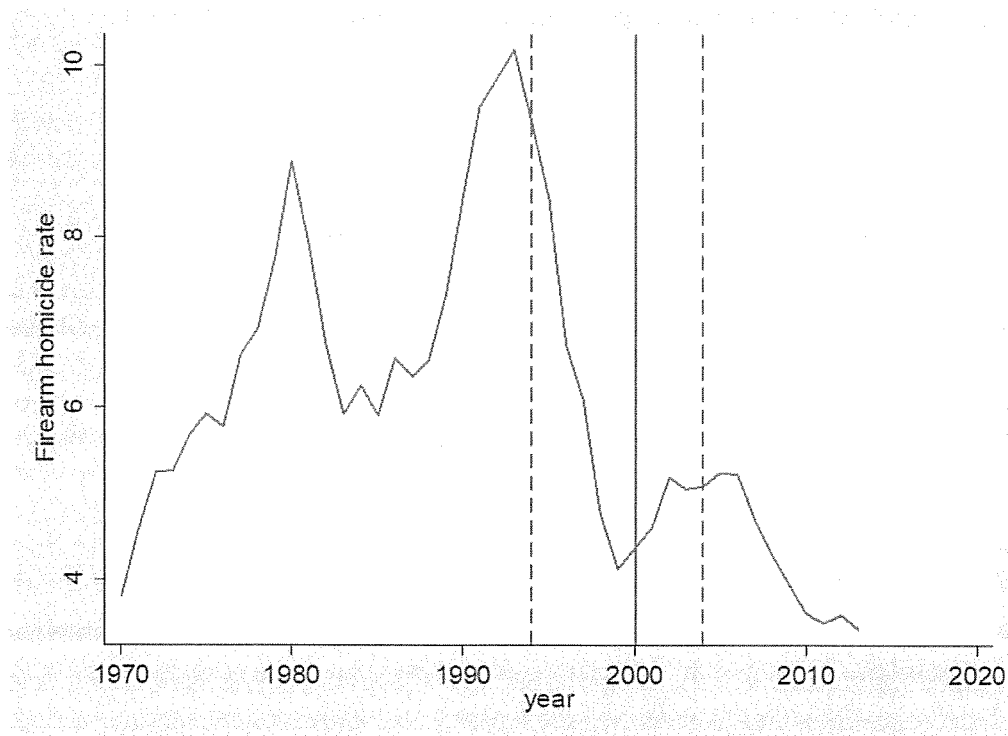
Notes: first differences, trend coefficient estimated by constant; * $p < 0.05$.

Again, the coefficient on the LCM ban is neither negative nor significant. The federal ban also had no significant effect.

4. California Firearm Homicide Rate

The firearm homicide rate is more likely to be affected by a LCM ban than the violent crime rate or the overall murder rate. The firearm homicide rate in California for 1970-2015 is shown in Figure 3.

Figure 3: Firearm homicide rate, California, 1970-2015



The firearm homicide series follows the general murder rate very closely. As we see below, the results are the same.

Table 3: Firearm homicide rate, California, 1970-2015

Outcome	Variable	Coefficient	T-ratio	P-value
Firearm homicide rate	LCM ban	0.844	1.29	0.21
	Federal assault weapons ban	-0.606	-1.39	0.17
	Percent population 15-29	0.104	0.35	0.73
	Crack epidemic 1984-1991	0.472	0.99	0.33
	Income per capita	-0.355	-0.92	0.37
	Unemployment rate	-0.064	-0.56	0.58
	Firearm homicide rate, lagged	0.545	3.64*	0.00
	Constant	0.056	0.46	0.65

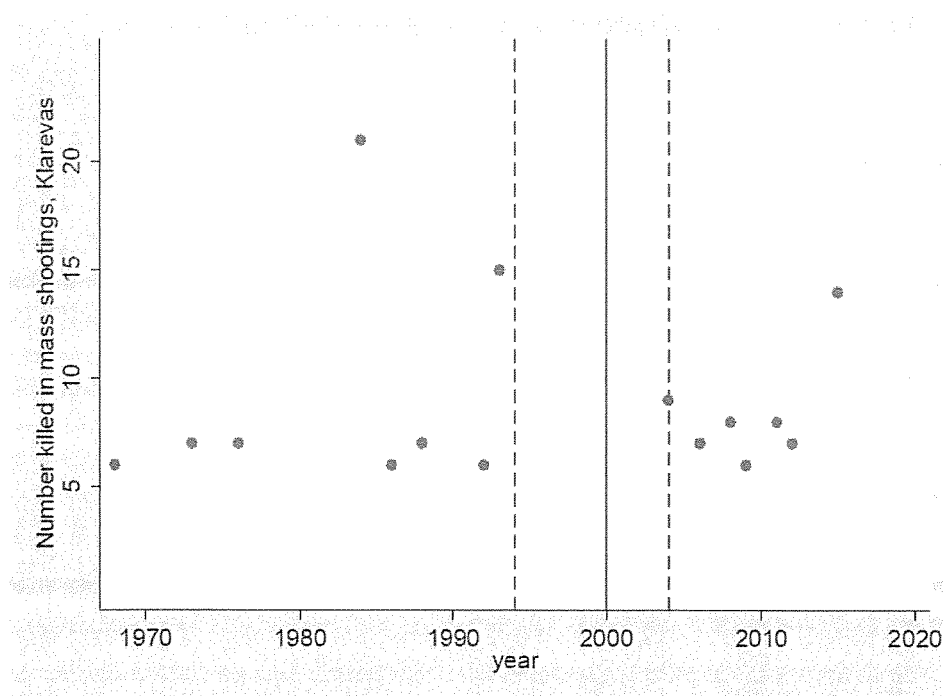
Notes: first differences, trend coefficient estimated by constant; * $p < 0.05$.

There is no significant effect of either the state or the federal LCM ban on the gun homicide rate.

5. Number of People Killed in California Mass Shootings

The number of deaths due to mass shootings in California from 1968-2015, as pulled from the data presented by Klarevas, is shown in Figure 4.

Figure 4: Deaths due to mass shootings, California, 1968-2015 (Klarevas data)



The regression analysis is reported in Table 4 below.

Table 4: Mass shooting deaths, California, 1970-2015

Outcome	Variable	Coefficient	T-ratio	P-value
Mass shooting deaths	LCM ban	-2.025	-0.53	0.59
	Federal LCM ban	-0.914	-0.62	0.53
	Trend	-0.701	-1.60	0.11
	Percent population 15-29	-1.046	-1.41	0.16
	Crack epidemic 1984-1991	3.037	1.62	0.10
	Income per capita	3.232	1.52	0.13
	Unemployment rate	1.219	1.60	0.11
	Constant	-19.890	-0.78	0.43

Notes: negative binomial model, income and unemployment data start in 1970, data from Klarevas, * $p < 0.05$

There is no significant effect of either the federal or the state LCM ban on the number of mass shooting deaths in California.

6. Number of Mass Shootings in California

According to Klarevas, between 1968 and 1999 there were 9 incidents of mass shootings in California. Between 2000 and 2015, there were 7 incidents. The regression analysis is presented in Table 5 below.

Table 5: Incidents of mass shootings, California, 1970-2015

Outcome	Variable	Coefficient	T-ratio	P-value
Mass shooting incidents	LCM ban	-2.386	-1.16	0.25
	Federal LCM ban	-1.439	-1.07	0.29
	Trend	-0.235	-1.18	0.24
	Percent population 15-29	-0.380	-1.16	0.25
	Crack epidemic 1984-1991	0.491	0.50	0.61
	Income per capita	1.343	1.33	0.18
	Unemployment rate	0.409	1.42	0.15
	Constant	-11.043	-0.82	0.41

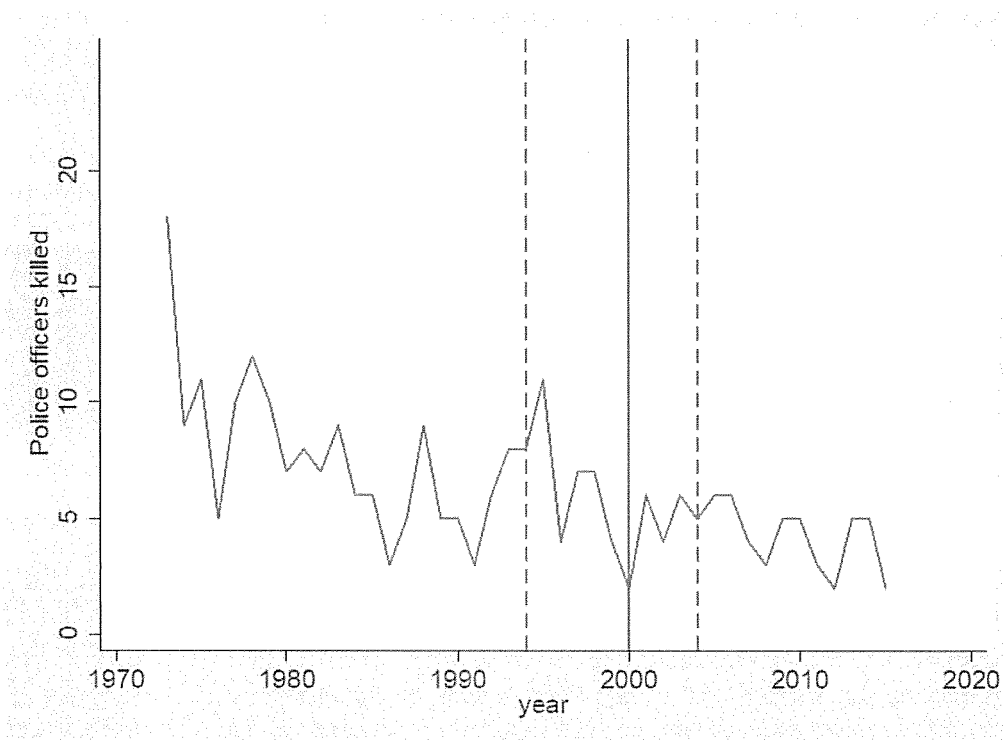
Notes: negative binomial model, income and unemployment data start in 1970, data from Klarevas, * $p < 0.05$

There is no significant effect of either the federal or the state LCM ban on the number of incidents of mass shootings in California.

7. Number of Police Officers Killed in the Line of Duty in California

Koper notes that assault weapons and LCMs are overrepresented in killings of police officers. The implication is that a ban would reduce the number of police officers killed. The data are shown in Figure 5.

Figure 5: Police officers killed in line of duty, California, 1973-2015



The number of officers killed has been declining since 1973. However, the mean before the California LCM ban is 7.5 while the mean after the ban is 4.3. The question is whether this difference is significant. The test is presented in Table 6 below.

Table 6: Police officers killed in the line of duty, California, 1973-2015

Outcome	Variable	Coefficient	T-ratio	P-value
Police officers killed	LCM ban	0.056	0.14	0.89
	Federal LCM ban	-0.232	-0.89	0.37
	Trend	-0.029	-0.69	0.49
	Percent population 15-29	-0.089	-1.23	0.22
	Crack epidemic 1984-1991	-0.405	-1.93	0.05
	Income per capita	-0.078	-0.35	0.72
	Unemployment rate	-0.033	-0.48	0.63

Constant	6.453	1.83	0.07
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Notes: negative binomial model, * $p < 0.05$

Neither the state ban nor the national ban had any significant effect on the number of police officers killed in the line of duty in California.

8. Summary and Conclusions

From the statistical analysis of the effects of the state and federal LCM bans presented above, I conclude that the California LCM acquisition ban had no significant effect on violent crime, murder, firearm homicide, the number of people killed in mass shootings, the number of incidents of mass shootings, or the number of police officers killed in the line of duty.

Similarly, I find that the federal assault weapons law and its national LCM ban had no effect on the California violent crime rate, murder rate, gun murder rate, the number of people killed in mass shootings, the number of incidents of mass shootings, or the number of police officers killed in the line of duty.

B. Lawfully Possessed (or Grandfathered) Magazines Over Ten Rounds Are Not Commonly Used in Mass Shootings in California, So Banning Possession of Such Magazines Will Not Reduce the Number or Lethality of Such Incidents

Until the enactment of California Penal Code section 32310(c), the law did not prohibit the possession of LCMs lawfully acquired before January 1, 2000. Therefore, an indeterminate but substantial number of gun owners in California have owned, and continued to own, what I refer to herein as “pre-acquisition-ban” or “grandfathered” LCMs.

Adding a possession ban to California’s current acquisition ban might be expected to save lives if it could be shown that grandfathered, pre-acquisition-ban LCMs are regularly used in mass shootings and can be shown to be responsible for death and injury of Californians. Since magazines over ten rounds in California cannot be legally manufactured, sold, transferred, or imported, the only harm they represent is their use by their lawful owner in criminal shootings.⁷

As an expert witness in another case (*Wiese v. Becerra*, E.D. Cal. No. 2:17-cv-00903-WBS-KJN), I conducted a comprehensive study of California mass

⁷ This argument also requires the assumption that any possession ban would have an appreciable effect on the number of pre-acquisition-ban LCMs used in criminal shootings.

shooting incidents.⁸ In doing so, I reviewed the www.massshootingtracker.com data set, which represents an exhaustive list of mass shooting incidents, as the site defines it.⁹ From that data set, I found 185 incidents reported for California between January 1, 2013 and June 5, 2017.¹⁰ Of these 185 cases, only three could be shown to involve the use of LCMs.¹¹ Between June 5 and October 30, 2017, there were 22 more mass shooting incidents in California as reported by www.massshootingtracker.com.¹²

I also reviewed the mass shooting cases reported in Klarevas's *Rampage Nation*, covering the years 1966-2016,¹³ as well as his declaration in this case which includes, in his Appendix B, mass shooting cases for the years 1968-2017.¹⁴ Klarevas conveniently lists the presence of LCMs in those cases. In addition, I have reviewed the cases listed in the *Mother Jones* data set, which spans the years 1982-2017, and the Violence Policy Center mass shooting list.¹⁵

⁸ Declaration of Carlisle E. Moody in Support of Plaintiffs' Motion for Issuance of a Temporary Restraining Order and Preliminary Injunction at 4, *Weise v. Becerra*, No. 2:17-cv-00903-WBS-KJN (June 10, 2017) ("Moody Declaration").

⁹ Massshootingtracker.org defines mass shootings within its database as "a single outburst of violence in which four or more people are shot," including the perpetrator. Mass Shooting Tracker, www.massshootingtracker.org (last visited Oct. 25, 2017).

¹⁰ Moody Declaration, *supra* note 8, at 5.

¹¹ *Id.*

¹² Mass Shooting Tracker, <https://massshootingtracker.org/data> (last visited Oct. 30, 2017) ("MST Data").

¹³ Louis Klarevas, *Rampage Nation: Securing America from Mass Shootings* 71-86 (2016).

¹⁴ Expert Report of Dr. Louis Klarevas, *Duncan v. Becerra*, No. 3:17-cv-01017-BEN-JLB (Oct. 6, 2017) ("Klarevas Report").

¹⁵ Mother Jones, *US Mass Shootings, 1982-2017: Data from Mother Jones' Investigation*, <http://www.motherjones.com/politics/2012/12/mass-shootings-mother-jones-full-data/> (last updated Oct. 18, 2017); Violence Policy Center, *High-Capacity Ammunition Magazines Are the Common Thread Running Through Most Mass Shootings in the United States* (July 1, 2017), available at <http://gunviolence.israelab.com/resource/high-capacity-ammunition-magazines->

From all these data, I have been presented with an accurate picture of the California mass shooting incidents since the acquisition ban took effect in 2000. I have determined that pre-acquisition-ban LCMs are simply not used in such incidents.

All the California mass shooting incidents involving LCMs since 2000 are discussed below.

1. Analysis of www.massshootingtracker.com Data, 1/1/2013-6/5/2017

6/7/13 Santa Monica, CA: 6 killed including shooter, 4 injured. The perpetrator used a .223 rifle which he assembled from parts. The parts were legally acquired, but the finished rifle was illegal. He was reported to have 40 LCMs with him during the incident. The recent construction of the gun and the age of the shooter (23) indicates that he did not use pre-acquisition-ban LCMs.¹⁶ It is also unlikely that he stored 40 legal LCMs for over 13 years for a rifle that did not exist.

11/3/13 LAX: 1 killed, 4 injured including shooter. The perpetrator, armed with what police say was an assault rifle and carrying materials expressing anti-government sentiment, opened fire at Los Angeles International Airport. He killed one person before being chased down himself. He was reported to have used LCMs. However, at 23 he was too young to legally own pre-acquisition-ban LCMs. He was also living out of state before SB 23 was passed.¹⁷

12/2/15 San Bernardino, CA: 16 killed including both shooters, 22 injured. The perpetrators reportedly used LCMs. However, the shooters were children or living outside the country when SB 23 was passed. Also, an accomplice served as a

[are-the-common-thread-running-through-most-mass-shootings-in-the-united-states.html](http://www.massshootingtracker.com).

¹⁶ Samantha Tata, *Santa Monica shooter Built Illegal Weapon After Govt Denied Him Firearm*, NBC Los Angeles (June 14, 2013) <http://www.nbclosangeles.com/news/local/Santa-Monica-Shooting-Police-News-Conference-Watch-Live-211492801.html>

¹⁷ Greg Botelho & Michael Martinez, *FBI: 23-Year-Old L.A. Man Is Suspect in Airport Shooting that Kills TSA Officer*, CNN.com (Nov. 1, 2013), http://www.cnn.com/2013/11/01/us/lax-gunfire/index.html?hpt=hp_t1.

straw purchaser. The weapons were acquired in 2011 and 2012, long after the passage of SB 23.¹⁸

Of these three incidents, it is a reasonable inference that these incidents did not involve pre-acquisition-ban magazines given media reports involving: (1) the age of the shooter; (2) the illegal assembly of weapons; and/or (3) the illegal acquisition of weapons generally from out of state. And in these three incidents, the shooter would have ignored or flouted existing California law that already prohibits the manufacture or import of LCMs. It is therefore reasonable to infer that an additional ban on the possession of such firearm parts would not have further deterred or prevented the perpetrator from carrying out the shootings.

2. Analysis of www.massshootingtracker.com Data, 6/6/2017-10/30/2017

As of October 30, 2017, there have been 22 mass shootings in California since June 5, 2017, according to www.massshootingtracker.com.¹⁹ News reports mention LCMs in only one of these incidents:

6/14/17 San Francisco, CA: 4 killed including shooter, 2 injured. A United Parcel Service worker who killed three of his fellow delivery drivers and then himself in San Francisco used a MAC-10-style “assault pistol” with a 30-round magazine that had been stolen in Utah. He also carried a second handgun that had been stolen in Napa, but did not fire it. The shooter also had a black backpack with a box of bullets inside, which was recovered along with the guns.²⁰ The LCM used in this incident was illegally imported into California. It was not a pre-acquisition-ban LCM.

Of note is an incident from June 6, 2017, that left three dead and one injured in Fresno. There, the 30-year-old victim of a home invasion involving multiple attackers used an AR-15 rifle to defend himself.²¹ Although such a weapon can

¹⁸ Mike McIntire, *Weapons in San Bernardino Shootings Were Legally Obtained*, NY Times (Dec. 3, 2015), <https://www.nytimes.com/2015/12/04/us/weapons-in-san-bernardino-shootings-were-legally-obtained.html>

¹⁹ MST Data, *supra* note 12.

²⁰ Vivian Ho, *UPS Shooter in San Francisco Used Stolen Gun with 30-round Magazine*, S.F. Gate (June 23, 2017), <http://www.sfgate.com/crime/article/UPS-shooter-in-San-Francisco-used-stolen-gun-with-11243414.php>.

²¹ Jim Guy, *Gunfight at East-central Fresno Home Leaves Three Dead, One Wounded*, Fresno Bee (June 6, 2017), <http://www.fresnobee.com/news/local/article/154583549.html>.

accept an LCM, there is no mention of an LCM in the news reports and the owner would have been too young (13) to have purchased a legal LCM before January 1, 2000.

3. Analysis of Remaining Mass Shooting Incidents in California Since 2000

1/30/2006 Goleta Postal Shooting, Goleta, CA: 6 killed. Jennifer San Marco purchased the firearm, a 9 mm Smith & Wesson model 915 handgun equipped with a 15-round magazine, from a pawn shop in Grants, NM in 2005.²² The magazine was then illegally imported into California. It was not a pre-acquisition-ban magazine.

12/24/2008 Christmas Party Killings, Covina, CA: 9 killed. Bruce Jeffrey Pardo, dressed as Santa Clause invaded a Christmas party at his former in-laws' house. He used four, 13-round capacity handguns and a homemade flamethrower. Police found five empty boxes for semiautomatic handguns at his house.²³ The empty boxes indicate that the pistols were probably newly acquired and were therefore not likely to be fitted with pre-acquisition-ban LCMs.

1/27/2009 Los Angeles, CA: 6 killed. Ervin Lupoe killed his wife and five children in their home and then killed himself. No LCMs were used.²⁴

3/21/2009 Oakland, CA: 4 killed. Lovelle Mixon, 26, killed two motorcycle police officers with a semiautomatic handgun after a traffic stop, then fled to his sister's apartment where he had stored a SKS carbine. He killed two police officers with the carbine. Mixon was on parole after serving prison time for armed robbery, thereby in possession of firearms illegally. Although the SKS carbine can accept box magazines of any size, the standard configuration is a 10-round magazine.²⁵ In any case, Mixon was 16 years old in 1999, making it unlikely that he owned pre-acquisition-ban LCMs.

²² Associated Press, *Postal Killer Believed She Was Target of a Plot*, NBCNews.com (Feb. 3, 2006), <http://www.nbcnews.com/id/11167920/#.WfE1fGhSyUk>.

²³ Wikipedia.com, *Covina Massacre* (last updated Oct. 29, 2017), https://en.wikipedia.org/wiki/Covina_massacre.

²⁴ Klarevas Report, *supra* note 14, App. B at 3.

²⁵ Wikipedia.com, *SKS* (last updated Oct. 28, 2017), <https://en.wikipedia.org/wiki/SKS>.

10/12/2011 Seal Beach Shootings, Seal Beach, CA: 8 killed. Scott Dekraai invaded the Salon Meritage hair salon carrying two semiautomatic pistols and a revolver. No LCMs were used.²⁶

4/2/2012 Oikos University Killings, Oakland, CA: 7 killed. One L. Goh opened fire on the campus of Oikos University using a semiautomatic handgun and four 10-round magazines. No LCMs were used.²⁷

2/20/2012 Alturas Tribal Shootings, Alturas, CA: 4 killed. Cherie Rhodes opened fire during an eviction hearing at the Cederville Rancheria tribal headquarters. She was armed with a 9-mm handgun and a knife.²⁸ No LCMs were used.

5/23/2014 Isla Vista Mass Murder, Isla Vista/Santa Barbara, CA: 6 killed. Elliot Rodger, 22, used three handguns, all legally purchased in California, all with 10-round magazines. Another 41 loaded 10-round magazines were found with his body in his car. No LCMs were used.²⁹

4/18/2017 Fresno Downtown Shooting, Fresno, CA: 3 killed. Kori Ali Muhammad, 39, opened fire walking along a street in downtown Fresno, killing three people randomly in an alleged hate crime prior to being apprehended by police. Over the span of about a minute, Muhammad fired 16 bullets from a .357-caliber revolver over several blocks, killing three white men at random, police said. When he was finally stopped by officers, he acknowledged he was a wanted man.³⁰ No LCMs were used.

²⁶ Klarevas Report, *supra* note 14, App. B at 3.

²⁷ *Id.*

²⁸ *Id.*

²⁹ Sossy Dombourian, Elisha Fieldstadt & Zoya Taylor, *California Gunman Still Had Hundreds of Rounds: Sheriff*, NBC News (May 24, 2014), <https://www.nbcnews.com/storyline/isla-vista-rampage/california-gunman-still-had-hundreds-rounds-sheriff-n113961>

³⁰ Matthew Haag, *Gunman, Thought to Be Targeting Whites, Kills 3 in Fresno, Police Say*, N.Y. Times (April 18, 2017), https://www.nytimes.com/2017/04/18/us/fresno-shooting-rampage-kori-ali-muhammad.html?_r=0.

4. Summary and Conclusions

Thus, after reviewing over 200 mass shooting incidents in California since January 1, 2000, I find that: (1) large capacity magazines were known to be used in only six cases and might have been used in two more; and (2) of the eight cases in which LCMs were, or could have been used, the characteristics of the shooter (age, residence, time of acquisition, etc.) make it extremely unlikely that pre-acquisition-ban LCMs were used in any of these incidents.

In summary, there is no evidence that legally possessed, pre-acquisition-ban LCMs were involved in any in mass shooting incident in California since 2000. It is thus my professional opinion that pre-acquisition-ban LCMs present no significant danger to the citizens of California and a possession ban would have no effect other than turning a large number of law-abiding citizens into criminals.

C. The Washington Post Report on LCMs Recovered by Law Enforcement in Virginia Does Not Show that the Federal Ban Had Any Effect on Murders or Gun Homicides

As Koper's expert report notes, in 2011 the Washington Post published the results of its study of a little-known database on weapons recovered by local law enforcement officers in Virginia.³¹ The Criminal Firearms Clearinghouse, maintained by the Virginia State Police, contains detailed information regarding "all firearms seized, forfeited, found or otherwise coming into the possession of any state or local law-enforcement agency of the Commonwealth [of Virginia] which are believed to have been used in the commission of a crime."³² It includes information on the circumstances of each firearm's recovery and each firearm's physical characteristics, including magazine capacity.

The Washington Post study found that, "[t]he 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

³¹ Expert Report of Dr. S. Christopher Koper at 18-19 & n.22, *Duncan v. Becerra*, No. 3:17-cv-01017-BEN-JLB (Oct. 6, 2017) ("Koper Report"); David S. Fallis & James V. Grimaldi, *Va. Data Show Drop in Criminal Firepower During Assault Gun Ban*, Wash. Post (Jan. 23, 2011), available at <http://www.washingtonpost.com/wp-dyn/content/article/2011/01/22/AR2011012203452.html>.

³² Virginia State Police, *Firearms Transaction Center (FTC)*, Crim. Jus. Info. Servs. (CJIS) Div. Newsletter 1, July 2013, available at http://www.vsp.state.va.us/downloads/CJIS_Newsletters/CJIS-Newsletter-July-2013.pdf.

was lifted in late 2004”³³ This, according to Koper, implies that the federal ban was effective in reducing the number of LCMs used by criminals. “Maybe the federal ban was finally starting to make a dent in the market by the time it ended,” the Washington Post reported Koper as claiming.³⁴

Garen Wintemute, head of the Violence Prevention Research Program at the University of California at Davis, was also quoted as saying “[t]he 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.” He continued:

“Many people, me included, were skeptical about the chances that the magazine ban would make a difference back in 1994” “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.”³⁵

Wintemute’s comment about the “striking” increase of LCMs recovered in Virginia since the lapse of the federal ban is somewhat alarming. Did this “striking” increase in LCM use by criminals increase homicide in Virginia? The proportion of recovered firearms in the Criminal Firearms Clearinghouse with magazine capacity greater than 10 is shown in Figure 6 along with the corresponding murder and gun murder rate for Virginia from 1993 to 2013.³⁶

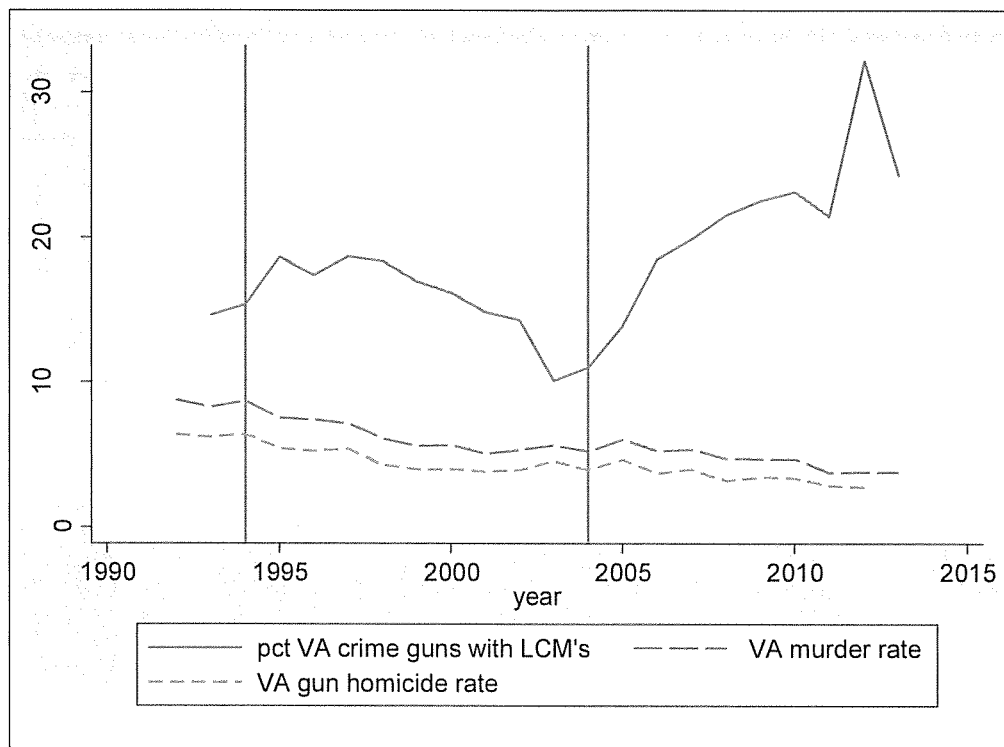
³³ Fallis, *supra* note 30, at 1.

³⁴ *Id.*

³⁵ *Id.*

³⁶ Murder data is taken from the Uniform Crime Reports. Gun homicide is taken from the CDC Wonder data base.

Figure 6: Proportion of crime guns with LCMs and homicide in Virginia



The proportion of crime guns with LCMs initially rose from 1994-1997, the first three years of the federal ban, then declined steadily to 2004, only to rise again after the ban was lifted. On the other hand, the murder rate and the gun homicide rate in Virginia have both declined steadily, revealing no apparent connection between gun homicides and the use of LCM's by criminals.

This observation can be tested by regressing the Virginia gun homicide rate and overall murder rate on the proportion of crime guns with LCMs and a trend term for 1993-2013. Because the time series could be a random walk, which could lead to a spurious regression, I also used first differences. The results are reported below.

Table 7: Proportion of crime guns with LCMs and homicide in Virginia

Variable	Percent LCM		Trend		Autocorrelation	
	Coeff	T-ratio	Coeff	T-ratio	Rho	T-ratio
Gun homicide rate	-0.109	-2.54**			0.713	5.15***
with trend	-0.008	-0.03	-0.151	-6.53***	0.417	1.78*

First differences	-0.027	-0.07	-0.158	-1.23	-0.552	-2.56**
Log gun homicide rate	-0.028	-3.03***			0.694	4.52***
with trend	-0.006	-1.03	-0.033	-6.86***	0.299	1.21
First differences	-0.006	-0.67	-0.037	-1.26	-0.593	-2.58**
Murder rate	-0.140	-2.48**			0.774	6.03***
with trend	-0.021	-0.67	-0.217	-8.49***	0.583	2.79**
First differences	-0.004	-0.12	-0.221	-1.83*	-0.411	-1.87*
Log murder rate	-0.027	-2.91***			0.744	4.96***
with trend	0.000	-0.06	-0.036	-8.86***	0.480	2.16**
First differences	0.006	0.10	-0.039	-1.84*	-0.459	-2.03*
Gun murders	-0.021	-3.03***				
with trend	-0.007	-1.20	-0.021	-4.73***		
Murders	-0.019	-2.78***				
with trend	-0.001	-0.16	-0.024	-6.33***		

Notes: *** significant at .01, ** significant at .05, * significant at .10, two-tailed. Percent LCM is the proportion of Virginia crime guns with LCMs. In the first difference model, the trend is estimated by the intercept. Gun murders and murders are estimated using a negative binomial model. See Appendix 2 for details.

If I omit the trend, the estimated coefficient on the proportion of LCMs is negative and highly significant, reflecting the fact that crime in Virginia continued its decline while the proportion of crime guns with LCMs increased substantially.³⁷

³⁷ Table 7 also reports the Breusch-Godfrey test for autocorrelation. The regressions in levels show significant positive serial correlation, except for the log of the gun homicide rate, indicating that the t-ratios are likely to be overstated in those cases. In first differences, the serial correlation is negative, indicating that the t-ratios are underestimated. We estimated the regression in both levels and first differences because unit root tests were inconclusive.

However, when I include the trend, which is negative and highly significant, the proportion of LCMs is never significant.

Using a negative binomial model, appropriate for count data, I also regressed the number of gun homicides and murders in Virginia on the LCM proportion and a trend. The results are the same. There is no relationship between the proportion of crime guns with LCMs and either the number of murders or the number of gun homicides. (See Appendix 2 for complete results.)

There is no relationship between the number of public shooting victims and the proportion of LCMs because Virginia had only one such event, the Virginia Tech shooting in 2007, in which the shooter used both standard- and large-capacity magazines holding 10 and 15 rounds.

I conclude that, using data from the Virginia Firearms Clearinghouse, which counts the number of confiscated crime guns with LCMs, I am unable to find any effect of LCMs or the LCM ban on murders or gun homicides. More criminals using more guns with LCMs apparently do not cause more homicides. LCMs appear to have nothing to do with homicide.

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VIII. APPENDIX AND ATTACHMENT

Attached as **Appendix 1** is a true and correct copy of the complete output of the Stata program used to generate the results reported in Section VI.A. above.

Attached as **Appendix 2** is a true and correct copy of the complete output of the Stata program used to generate the results reported in Section VI.C above.

Attached at **Exhibit 1** and made a part of this report is a copy of my curriculum vitae, including a list of all my published works from the last ten years.

IX. CONCLUSION


Based on the findings listed above, it is my opinion that the California acquisition ban on LCMs has had no significant effect on the California murder rate, gun homicide rate, the number of people killed in mass shootings, the number of incidents of mass shootings, or the number of police officers killed in the line of duty.

Similarly, I find that the federal assault weapons law and its national LCM ban had no effect on the California violent crime rate, murder rate, gun murder rate, the number of people killed in mass shootings, the number of incidents of mass shootings, or the number of police officers killed in the line of duty.

The ineffectiveness of the acquisition ban is not due to the fact that possession of LCMs was not prohibited. A comprehensive examination of the incidents of mass shootings indicates that no grandfathered, pre-acquisition-ban LCMs have been used in any mass shootings in California.

It is thus my professional opinion that California's acquisition ban has not and will not, even when paired with a possession ban, result in any statistically significant reduction in the number or lethality of mass shooting incidents in California or violent crime rates in general.

Dated: November 2, 2017



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APPENDIX 1

Complete output of the Stata program used to generate the results reported in Section 3.

```
-----  
-----  
      name: <unnamed>  
      log: C:\Users\cemood\Box Sync\California\report.log  
      log type: text  
      opened on: 18 Oct 2017, 09:33:51  
  
.  
. *set more off  
.  
. tsset year  
      time variable: year, 1968 to 2017  
      delta: 1 unit  
  
. gen trend=year-1967  
  
. gen fedban=(year>1993)*(year<2005)  
  
. gen pp1529=pp1519+pp2024+pp2529  
(4 missing values generated)  
  
. gen crack=(year>=1984)*(year<=1991)  
  
.  
. gen dcrviopc=D.crviopc  
(3 missing values generated)  
  
. gen dcrmurpc=D.crmurpc  
(3 missing values generated)  
  
. gen dgunhomrate=D.gunhomrate  
(5 missing values generated)  
  
. gen dlcmban=D.lcmban  
(1 missing value generated)  
  
. gen dfedban=D.fedban  
(1 missing value generated)  
  
. gen dpp1529=D.pp1529  
(5 missing values generated)  
  
. gen drtpipc=D.rtpipc  
(3 missing values generated)  
  
. gen dunrate=D.unrate  
(5 missing values generated)  
  
. gen dcrviopc_1=LD.crviopc  
(3 missing values generated)  
  
. gen dcrmurpc_1=LD.crmurpc  
(3 missing values generated)
```

```
. gen dgunhomrate_1=LD.gunhomrate
(5 missing values generated)

. gen dcrack=D.crack
(1 missing value generated)

.
.
. label var crviopc "Violent crime rate"

. label var crmurpc "Murder rate"

. label var gunhomrate "Firearm homicide rate"

. label var lcmбан "LCM ban"

. label var fedбан "Federal LCM ban"

.
. label var dcrviopc "Violent crime rate"

. label var dcrmurpc "Murder rate"

. label var dgunhomrate "Firearm homicide rate"

. label var dlcmбан "LCM ban"

. label var dfedбан "Federal LCM ban"

.
. label var dcrviopc_1 "Violent crime rate, lagged"

. label var dcrmurpc_1 "Murder rate, lagged"

. label var dgunhomrate_1 "Firearm homicide rate, lagged"

. label var crack "Crack epidemic 1984-1991"

. label var dcrack "Crack epidemic 1984-1991"

. label var dpp1529 "Percent population 15-29"

. label var dunrate "Unemployment rate"

. label var drtpipc "Income per capita"

. label var pp1529 "Percent population 15-29"

. label var unrate "Unemployment rate"

. label var rtpipc "Income per capita"

. label var trend "Trend"

. label var polkil "Police officers killed"

. label var killed "Mass shooting deaths, Klarevas"

. label var incidents "Mass shooting incidents, Klarevas"

.
```

```
.
. /* violent crime and the LCM ban */
.
. twoway (line crviopc year) if year>1969, xline(1994,lpattern(dash)) xline(2000)
xline(2004,lpattern(dash))
```

```
.
. dfgls crviopc
```

DF-GLS for crviopc Number of obs = 38
Maxlag = 9 chosen by Schwert criterion

[lags]	DF-GLS tau Test Statistic	1% Critical Value	5% Critical Value	10% Critical Value
9	-1.402	-3.770	-2.723	-2.425
8	-1.022	-3.770	-2.783	-2.490
7	-1.045	-3.770	-2.850	-2.559
6	-1.581	-3.770	-2.921	-2.630
5	-1.375	-3.770	-2.994	-2.701
4	-1.189	-3.770	-3.066	-2.769
3	-1.239	-3.770	-3.133	-2.833
2	-1.224	-3.770	-3.195	-2.889
1	-1.171	-3.770	-3.247	-2.937

Opt Lag (Ng-Perron seq t) = 9 with RMSE 36.79024
Min SC = 7.686171 at lag 1 with RMSE 42.40895
Min MAIC = 7.625905 at lag 1 with RMSE 42.40895

```
. regress dcrviopc dlcmban dfedban dpp1529 dcrack drtpipc dunrate dcrviopc_1
```

Source	SS	df	MS	Number of obs	=	45
Model	37953.3085	7	5421.90122	F(7, 37)	=	2.89
Residual	69380.1786	37	1875.13996	Prob > F	=	0.0163
				R-squared	=	0.3536
				Adj R-squared	=	0.2313
Total	107333.487	44	2439.39744	Root MSE	=	43.303

dcrviopc	Coef.	Std. Err.	t	P>|t|	[95% Conf. Interval]
dlcmban	44.84434	46.96038	0.95	0.346	-50.30644 139.9951
dfedban	-31.54718	31.61965	-1.00	0.325	-95.61467 32.52031
dpp1529	8.983775	21.06671	0.43	0.672	-33.70144 51.66899
dcrack	2.645099	33.32475	0.08	0.937	-64.87727 70.16747
drtpipc	-.999542	25.79697	-0.04	0.969	-53.26916 51.27008
dunrate	-2.65343	8.150656	-0.33	0.747	-19.16823 13.86137
dcrviopc_1	.6052954	.146779	4.12	0.000	.3078928 .9026979
_cons	-.3448009	8.790083	-0.04	0.969	-18.1552 17.4656

```
. outreg using table1 , starlevels(5) ctitles(Variable,Coefficient, T-ratio, P-value)
varlabels replace stats(b t p) nosubstat
```

Variable	Coefficient	T-ratio	P-value
LCM ban	44.844	0.95	0.35
Federal LCM ban	-31.547	-1.00	0.32
Percent population 15-29	8.984	0.43	0.67
Crack epidemic 1984-1991	2.645	0.08	0.94

Income per capita	-1.000	-0.04	0.97
Unemployment rate	-2.653	-0.33	0.75
Violent crime rate, lagged	0.605	4.12*	0.00
Constant	-0.345	-0.04	0.97

* p<0.05

. test dpp1529 dcrack drtpipc dunrate

(1) dpp1529 = 0
(2) dcrack = 0
(3) drtpipc = 0
(4) dunrate = 0

F(4, 37) = 0.11
Prob > F = 0.9790

. regress dcrviopc dlcmban dfedban dcrviopc_1

Source	SS	df	MS	Number of obs	=	46
Model	37434.0285	3	12478.0095	F(3, 42)	=	7.46
Residual	70204.9891	42	1671.54736	Prob > F	=	0.0004
Total	107639.018	45	2391.97817	R-squared	=	0.3478
				Adj R-squared	=	0.3012
				Root MSE	=	40.885

dcrviopc	Coef.	Std. Err.	t	P>|t|	[95% Conf. Interval]	
dlcmban	45.16038	42.50885	1.06	0.294	-40.62595	130.9467
dfedban	-34.9102	28.91836	-1.21	0.234	-93.26981	23.44942
dcrviopc_1	.5888778	.1279103	4.60	0.000	.3307443	.8470113
_cons	-1.334702	6.09661	-0.22	0.828	-13.63816	10.96875

. estat bgodfrey, lags(1) small

Breusch-Godfrey LM test for autocorrelation

lags(p)	F	df	Prob > F
1	0.718	(1, 41)	0.4016

H0: no serial correlation

. *twoway (line dcrviopc year) if year>1969, xline(1994,lpattern(dash)) xline(2000)
xline(2004,lpattern(dash))
. more

. /* murder */

. twoway (line crmurpc year) if year>1969, xline(1994,lpattern(dash)) xline(2000)
xline(2004,lpattern(dash))

. dfqls crmurpc

DF-GLS for crmurpc
Maxlag = 9 chosen by Schwert criterion

Number of obs = 38

[lags]	DF-GLS tau Test Statistic	1% Critical Value	5% Critical Value	10% Critical Value
9	-1.014	-3.770	-2.723	-2.425
8	-0.786	-3.770	-2.783	-2.490
7	-0.968	-3.770	-2.850	-2.559
6	-1.172	-3.770	-2.921	-2.630
5	-1.317	-3.770	-2.994	-2.701
4	-1.334	-3.770	-3.066	-2.769
3	-1.410	-3.770	-3.133	-2.833
2	-1.671	-3.770	-3.195	-2.889
1	-1.707	-3.770	-3.247	-2.937

Opt Lag (Ng-Perron seq t) = 1 with RMSE .686063
Min SC = -.5621197 at lag 1 with RMSE .686063
Min MAIC = -.5328976 at lag 1 with RMSE .686063

. regress dcrmurpc dlcmban dfedban dpp1529 dcrack drtpipc dunrate dcrmurpc_1

Source	SS	df	MS	Number of obs	=	45
Model	8.14377879	7	1.16339697	F(7, 37)	=	2.07
Residual	20.8393118	37	.563224644	Prob > F	=	0.0723
Total	28.9830906	44	.658706605	R-squared	=	0.2810
				Adj R-squared	=	0.1450
				Root MSE	=	.75048

dcrmurpc	Coef.	Std. Err.	t	P>|t|	[95% Conf. Interval]
dlcmban	.5863887	.8065601	0.73	0.472	-1.047857 2.220635
dfedban	-.8840157	.5505488	-1.61	0.117	-1.999534 .2315022
dpp1529	.2253544	.3744847	0.60	0.551	-.5334237 .9841324
dcrack	.3602601	.586199	0.61	0.543	-.8274918 1.548012
drtpipc	-.2878104	.4464038	-0.64	0.523	-1.19231 .6166895
dunrate	-.0560486	.1434289	-0.39	0.698	-.3466631 .234566
dcrmurpc_1	.4516491	.152137	2.97	0.005	.1433902 .759908
_cons	.0467065	.1517945	0.31	0.760	-.2608583 .3542713

. outreg using table2 , starlevels(5) ctitles(Variable,Coefficient, T-ratio, P-value)
varlabels replace stats(b t p) nosubstat

Variable	Coefficient	T-ratio	P-value
LCM ban	0.586	0.73	0.47
Federal LCM ban	-0.884	-1.61	0.12
Percent population 15-29	0.225	0.60	0.55
Crack epidemic 1984-1991	0.360	0.61	0.54
Income per capita	-0.288	-0.64	0.52
Unemployment rate	-0.056	-0.39	0.70
Murder rate, lagged	0.452	2.97*	0.01
Constant	0.047	0.31	0.76

* p<0.05

. predict e, resid
(5 missing values generated)
. estat bgodfrey, lags(1) small

Breusch-Godfrey LM test for autocorrelation

lags(p)	F	df	Prob > F
1	0.004	(1, 36)	0.9515

H0: no serial correlation

. more

```
.
. /* gun homicide rate */
.
. twoway (line gunhomrate year) if year>1969, xline(1994,lpattern(dash)) xline(2000)
xline(2004,lpattern(dash))

. dfgls gunhomrate
```

DF-GLS for gunhomrate Number of obs = 36
Maxlag = 9 chosen by Schwert criterion

[lags]	DF-GLS tau Test Statistic	1% Critical Value	5% Critical Value	10% Critical Value
9	-0.875	-3.770	-2.716	-2.412
8	-0.697	-3.770	-2.775	-2.477
7	-0.957	-3.770	-2.843	-2.549
6	-1.083	-3.770	-2.917	-2.623
5	-1.254	-3.770	-2.994	-2.698
4	-1.425	-3.770	-3.070	-2.771
3	-1.600	-3.770	-3.142	-2.840
2	-2.155	-3.770	-3.208	-2.901
1	-1.931	-3.770	-3.264	-2.952

Opt Lag (Ng-Perron seq t) = 1 with RMSE .5520979
Min SC = -.9889755 at lag 1 with RMSE .5520979
Min MAIC = -.9030688 at lag 1 with RMSE .5520979

```
. regress dgunhomrate dlcmaban dfedban dpp1529 dcrack drtpipc dunrate dgunhomrate_1
```

Source	SS	df	MS	Number of obs	=	43
Model	6.75439422	7	.96491346	F(7, 35)	=	2.70
Residual	12.5292156	35	.357977588	Prob > F	=	0.0241
Total	19.2836098	42	.459133567	R-squared	=	0.3503
				Adj R-squared	=	0.2203
				Root MSE	=	.59831

dgunhomrate	Coef.	Std. Err.	t	P>|t|	[95% Conf. Interval]
dlcmaban	.8436859	.6538369	1.29	0.205	-.4836736 2.171045
dfedban	-.6063146	.437159	-1.39	0.174	-1.493795 .2811653
dpp1529	.1036157	.2944184	0.35	0.727	-.4940854 .7013167
dcrack	.4721783	.4757592	0.99	0.328	-.4936642 1.438021
drtpipc	-.3549564	.3873536	-0.92	0.366	-1.141326 .4314131
dunrate	-.0643103	.1157443	-0.56	0.582	-.2992837 .1706632
dgunhomrate_1	.5453604	.1500127	3.64	0.001	.2408184 .8499024
_cons	.0556823	.1222048	0.46	0.651	-.1924066 .3037712


```
. outreg using table3 , starlevels(5) ctitles(Variable,Coefficient, T-ratio, P-value)
varlabels replace stats(b t p) nosubstat
```

Variable	Coefficient	T-ratio	P-value
LCM ban	0.844	1.29	0.21
Federal LCM ban	-0.606	-1.39	0.17
Percent population 15-29	0.104	0.35	0.73
Crack epidemic 1984-1991	0.472	0.99	0.33
Income per capita	-0.355	-0.92	0.37
Unemployment rate	-0.064	-0.56	0.58
Firearm homicide rate, lagged	0.545	3.64*	0.00
Constant	0.056	0.46	0.65

* p<0.05

```
. estat bgodfrey, lags(2) small
```

Breusch-Godfrey LM test for autocorrelation

lags(p)	F	df	Prob > F
2	0.829	(2, 33)	0.4452

H0: no serial correlation

```
. *twoway (line gunhomrate year) if yhat ~=., xline(1994) xline(2000) xline(2004)
. more
```

```
. /* number killed in mass public shootings Klarevas data */
```

```
. gen kkilled=killed
```

```
. replace kkilled=. if killed==0
(35 real changes made, 35 to missing)
```

```
. label var kkilled "Number killed in mass shootings, Klarevas"
```

```
. twoway (scatter kkilled year) if year>1967, ysc(r(0 25)) xline(1994,lpattern(dash))
xline(2000) xline(2004,lpattern(dash))
```

```
. nbreg killed lcmбан fedбан trend pp1529 crack rtpipc unrare, nolog
```

Negative binomial regression	Number of obs	=	46
	LR chi2(7)	=	7.35
Dispersion = mean	Prob > chi2	=	0.3932
Log likelihood = -74.530257	Pseudo R2	=	0.0470

killed	Coef.	Std. Err.	z	P>|z|	[95% Conf. Interval]
lcmбан	-2.025035	3.791376	-0.53	0.593	-9.455996 5.405925
fedбан	-.9139186	1.468685	-0.62	0.534	-3.792489 1.964652
trend	-.7012929	.4384203	-1.60	0.110	-1.560581 .157995
pp1529	-1.045867	.7400789	-1.41	0.158	-2.496395 .404661
crack	3.036672	1.870139	1.62	0.104	-.628732 6.702076
rtpipc	3.231676	2.1214	1.52	0.128	-.9261921 7.389545

```

      unrate |   1.218783   .7615005   1.60   0.109   -.273731   2.711296
      _cons |  -19.88964  25.47565   -0.78   0.435  -69.82099  30.04172
-----+-----
      /lnalpha |   1.717326   .3556229                1.020318   2.414334
-----+-----
      alpha |   5.569614   1.980682                2.774076   11.18232
-----+-----
LR test of alpha=0: chibar2(01) = 159.74          Prob >= chibar2 = 0.000

```

```

. /***** note: Poisson rejected by likelihood ratio test on alpha *****/
.
. outreg using table4 , starlevels(5) ctitles(Outcome,Variable,Coefficient, T-ratio, P-
value) varlabels replace stats(b t p) nosubstat

```

Outcome	Variable	Coefficient	T-ratio	P-value
Mass shooting deaths, Klarevas	LCM ban	-2.025	-0.53	0.59
	Federal LCM ban	-0.914	-0.62	0.53
	Trend	-0.701	-1.60	0.11
	Percent population 15-29	-1.046	-1.41	0.16
	Crack epidemic 1984-1991	3.037	1.62	0.10
	Income per capita	3.232	1.52	0.13
	Unemployment rate	1.219	1.60	0.11
	Constant	-19.890	-0.78	0.43
lnalpha	Constant	1.717	4.83*	0.00

* p<0.05

```

.
. more
.
.
. /* number of incidents of mass murder, Klarevas data */
.
. gen x=incidents
.
. replace x=. if x==0
(35 real changes made, 35 to missing)
.
. label var x "Number of incidents of mass shootings, Klarevas"
.
. twoway (scatter x year), xline(1994,lpattern(dash)) xline(2000) xline(2004,lpattern(dash))
.
. nbreg incidents lcmban fedban trend pp1529 crack rtpipc unrate, nolog

```

```

Negative binomial regression          Number of obs   =          46
                                   LR chi2(7)          =          8.53
Dispersion      = mean               Prob > chi2       =         0.2881
Log likelihood = -28.2365            Pseudo R2        =         0.1312

```

incidents	Coef.	Std. Err.	z	P>|z|	[95% Conf. Interval]
lcmban	-2.385524	2.061694	-1.16	0.247	-6.42637 1.655323
fedban	-1.439191	1.348343	-1.07	0.286	-4.081894 1.203512
trend	-.2348308	.1984285	-1.18	0.237	-.6237436 .154082
pp1529	-.379523	.3268173	-1.16	0.246	-1.020073 .2610272

```

      crack | .4911215 .9752547 0.50 0.615 -1.420343 2.402586
      rtpipc | 1.3435 1.007087 1.33 0.182 -.6303553 3.317355
      unrate | .4089753 .2875448 1.42 0.155 -.154602 .9725527
      _cons | -11.04284 13.46766 -0.82 0.412 -37.43896 15.35328

```

```

-----
      /lnalpha | -35.09767 . . .
-----
      alpha | 5.72e-16 . . .
-----

```

LR test of alpha=0: chibar2(01) = 0.00 Prob >= chibar2 = 1.000

. outreg using table5 , starlevels(5) ctitles(Outcome,Variable,Coefficient, T-ratio, P-value) varlabels replace stats(b t p) nosubstat

```

-----
Outcome                               Variable                               Coefficient  T-ratio  P-value
-----
Mass shooting incidents, Klarevas LCM ban          -2.386      -1.16    0.25
      Federal LCM ban          -1.439      -1.07    0.29
      Trend          -0.235      -1.18    0.24
      Percent population 15-29  -0.380      -1.16    0.25
      Crack epidemic 1984-1991  0.491       0.50    0.61
      Income per capita        1.343       1.33    0.18
      Unemployment rate        0.409       1.42    0.15
      Constant          -11.043      -0.82    0.41
      lnalpha                               Constant          -35.098
-----

```

* p<0.05

. poisson incidents lcmban fedban trend pp1529 crack rtpipc unrate, nolog

```

Poisson regression                               Number of obs   =      46
                                                LR chi2(7)      =      8.53
                                                Prob > chi2     =     0.2881
Log likelihood =  -28.2365                    Pseudo R2      =     0.1312

```

```

-----
incidents |      Coef.   Std. Err.   z   P>|z|   [95% Conf. Interval]
-----+-----
      lcmban | -2.385524   2.061694   -1.16  0.247   -6.42637   1.655323
      fedban | -1.439191   1.348343   -1.07  0.286   -4.081894   1.203512
      trend  | -.2348308   .1984286   -1.18  0.237   -.6237436   .154082
      pp1529 | -.379523   .3268173   -1.16  0.246   -1.020073   .2610272
      crack   | .4911215   .9752547    0.50  0.615   -1.420343   2.402586
      rtpipc  | 1.3435     1.007087    1.33  0.182   -.6303553   3.317355
      unrate  | .4089753   .2875448    1.42  0.155   -.154602    .9725527
      _cons   | -11.04284  13.46766   -0.82  0.412   -37.43896   15.35328
-----

```

. more

```

.
. /* police officers killed in line of duty */
. drop x

```

. nbreg polkil lcmban fedban trend pp1529 crack rtpipc unrate, nolog

```

Negative binomial regression                               Number of obs   =      43
                                                LR chi2(6)      =     31.87
Dispersion      = mean                               Prob > chi2     =     0.0000

```

Log likelihood = -89.637301 Pseudo R2 = 0.1510

polkil	Coef.	Std. Err.	z	P>|z|	[95% Conf. Interval]	
lcmban	.056078	.4088831	0.14	0.891	-.7453181	.8574741
fedban	-.2321364	.2598886	-0.89	0.372	-.7415086	.2772359
trend	-.0290026	.0421929	-0.69	0.492	-.1116993	.053694
pp1529	-.0893957	.0726395	-1.23	0.218	-.2317665	.052975
crack	-.4051925	.2096658	-1.93	0.053	-.81613	.005745
rtpipc	-.0784565	.2221189	-0.35	0.724	-.5138015	.3568885
unrate	-.0327168	.0676716	-0.48	0.629	-.1653507	.0999171
_cons	6.453041	3.518096	1.83	0.067	-.4423013	13.34838
/lnalpha	-34.79069	.	.	.	.	.
alpha	7.77e-16	.	.	.	.	.

LR test of alpha=0: chibar2(01) = 0.00 Prob >= chibar2 = 1.000

. outreg using table6 , starlevels(5) ctitles(Outcome,Variable,Coefficient, T-ratio, P-value) varlabels replace stats(b t p) nosubstat

Outcome	Variable	Coefficient	T-ratio	P-value
Police officers killed	LCM ban	0.056	0.14	0.89
	Federal LCM ban	-0.232	-0.89	0.37
	Trend	-0.029	-0.69	0.49
	Percent population 15-29	-0.089	-1.23	0.22
	Crack epidemic 1984-1991	-0.405	-1.93	0.05
	Income per capita	-0.078	-0.35	0.72
	Unemployment rate	-0.033	-0.48	0.63
	Constant	6.453	1.83	0.07
lnalpha	Constant		-34.791	

* p<0.05

. test pp1529 rtpipc unrate

(1) [polkil]pp1529 = 0
(2) [polkil]rtpipc = 0
(3) [polkil]unrate = 0

chi2(3) = 2.08
Prob > chi2 = 0.5569

. poisson polkil lcmban fedban trend pp1529 crack rtpipc unrate, nolog

Poisson regression Number of obs = 43
LR chi2(7) = 35.30
Prob > chi2 = 0.0000
Log likelihood = -89.637301 Pseudo R2 = 0.1645

polkil	Coef.	Std. Err.	z	P>|z|	[95% Conf. Interval]	
lcmban	.0560784	.4088831	0.14	0.891	-.7453177	.8574745
fedban	-.2321364	.2598886	-0.89	0.372	-.7415086	.2772359
trend	-.0290025	.0421929	-0.69	0.492	-.1116991	.0536941

```

pp1529 | -.0893956 .0726395 -1.23 0.218 -.2317664 .0529752
crack | -.4051925 .2096658 -1.93 0.053 -.81613 .005745
rtppic | -.078457 .2221189 -0.35 0.724 -.5138019 .356888
unrate | -.0327168 .0676716 -0.48 0.629 -.1653507 .099917
_cons | 6.453043 3.518097 1.83 0.067 -.4423001 13.34839

```

```

. gen x=polkil if polkil~=0
(7 missing values generated)

```

```

. label var x "Police officers killed"

```

```

. twoway (line x year) if year>1972, ysc(r(0 25)) xline(1994,lpattern(dash)) xline(2000)
xline(2004,lpattern(dash))

```

```

. mean polkil if year<=1999

```

```

Mean estimation          Number of obs   =          27

```

```

-----+-----
          |      Mean   Std. Err.   [95% Conf. Interval]
-----+-----
polkil |   7.518519   .6233134     6.23728     8.799758
-----+-----

```

```

. mean polkil if year>1999

```

```

Mean estimation          Number of obs   =          16

```

```

-----+-----
          |      Mean   Std. Err.   [95% Conf. Interval]
-----+-----
polkil |    4.3125   .3732599     3.516915    5.108085
-----+-----

```

```

.
. /* regressions in levels instead of first differences */
.
. regress crviopc lcmban fedban pp1529 crack rtpipc unrate L.crviopc

```

```

Source |      SS      df      MS      Number of obs   =      46
-----+-----
Model | 1911311.24      7 273044.462      F(7, 38)      = 216.16
Residual | 48000.0767     38 1263.15991      Prob > F      = 0.0000
-----+-----
Total | 1959311.31     45 43540.2514      R-squared     = 0.9755
Adj R-squared = 0.9710
Root MSE   = 35.541

```

```

-----+-----
crviopc |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-----+-----
lcmban | 52.97421   33.32976     1.59  0.120   -14.49837   120.4468
fedban | -52.17283  19.85951    -2.63  0.012   -92.37631  -11.96935
pp1529 | 2.42715   4.805705     0.51  0.616   -7.301492   12.15579
crack | 33.79697  18.29422     1.85  0.072   -3.237745   70.83169
rtppic | -10.19981  6.295427    -1.62  0.113   -22.94424    2.544612
unrate | -8.285666  3.407783    -2.43  0.020   -15.18436   -1.38697
crviopc
L1. | .9796338   .0422401    23.19  0.000    .8941232    1.065144
_cons | 178.0654  210.7171     0.85  0.403   -248.509    604.6398
-----+-----

```

. estat bgodfrey, lags(1) small

Breusch-Godfrey LM test for autocorrelation

lags(p)	F	df	Prob > F
1	0.326	(1, 37)	0.5713

H0: no serial correlation

. regress crmurpc lcmбан fedбан pp1529 crack rtpipc unrate L.crmurpc

Source	SS	df	MS	Number of obs	=	46
Model	340.195397	7	48.5993424	F(7, 38)	=	98.40
Residual	18.7677972	38	.493889399	Prob > F	=	0.0000
				R-squared	=	0.9477
				Adj R-squared	=	0.9381
Total	358.963194	45	7.97695987	Root MSE	=	.70277

crmurpc	Coef.	Std. Err.	t	P>|t|	[95% Conf. Interval]
lcmбан	1.005674	.6305389	1.59	0.119	-.2707855 2.282133
fedбан	-.6778448	.3865627	-1.75	0.088	-1.4604 .1047104
pp1529	-.003023	.0970217	-0.03	0.975	-.1994331 .1933871
crack	.3856919	.3425114	1.13	0.267	-.3076861 1.07907
rtpipc	-.2482905	.1239648	-2.00	0.052	-.4992442 .0026632
unrate	-.1237299	.0670494	-1.85	0.073	-.2594643 .0120046
crmurpc					
L1.	.9153736	.0655541	13.96	0.000	.7826663 1.048081
_cons	5.672326	4.142842	1.37	0.179	-2.71442 14.05907

. estat bgodfrey, lags(1) small

Breusch-Godfrey LM test for autocorrelation

lags(p)	F	df	Prob > F
1	3.304	(1, 37)	0.0772

H0: no serial correlation

. regress gunhomrate lcmбан fedбан pp1529 crack rtpipc unrate L.gunhomrate

Source	SS	df	MS	Number of obs	=	44
Model	130.524965	7	18.6464235	F(7, 36)	=	56.08
Residual	11.9699041	36	.332497336	Prob > F	=	0.0000
				R-squared	=	0.9160
				Adj R-squared	=	0.8997
Total	142.494869	43	3.31383416	Root MSE	=	.57663

gunhomrate	Coef.	Std. Err.	t	P>|t|	[95% Conf. Interval]
lcmбан	1.219866	.5469665	2.23	0.032	.1105663 2.329165

fedban	|	-.6035338	.319288	-1.89	0.067	-1.25108	.0440122
pp1529	|	-.0490334	.0777201	-0.63	0.532	-.206657	.1085902
crack	|	.602306	.2905786	2.07	0.045	.0129852	1.191627
rtpipc	|	-.248543	.1099859	-2.26	0.030	-.4716047	-.0254813
unrate	|	-.102815	.055463	-1.85	0.072	-.2152991	.009669
gunhomrate	|						
L1.	|	.9880207	.0668339	14.78	0.000	.8524753	1.123566
_cons	|	5.857603	3.459172	1.69	0.099	-1.157922	12.87313

. estat bgodfrey, lags(1) small

Breusch-Godfrey LM test for autocorrelation

lags(p)	|	F	df	Prob > F
1	|	4.477	(1, 35)	0.0415

H0: no serial correlation

```
.
. log close
  name: <unnamed>
  log: C:\Users\cemood\Box Sync\California\report.log
  log type: text
  closed on: 18 Oct 2017, 09:34:02
```

APPENDIX 2

Complete output of the Stata program used to generate the results reported in Section VI.C.

```
name: <unnamed>

log: C:\Users\cemood\Box Sync\California\Virginia\va.log

log type: text

opened on: 26 Oct 2017, 08:52:43


. use va.dta, clear;


. tsset year;

time variable: year, 1990 to 2013

delta: 1 unit


. rename lgunhomrate gun_hom_rate;


. rename lcrmurpc murder_rate;


. /* gun homicide */
> dfgls gun_hom_rate;


DF-GLS for gun_hom_rate                                Number of obs =    14

Maxlag = 8 chosen by Schwert criterion


DF-GLS tau      1% Critical      5% Critical      10% Critical
```

[lags]	Test Statistic	Value	Value	Value
8	-1.659	-3.770	-4.084	-3.139
7	-1.735	-3.770	-3.465	-2.719
6	-1.855	-3.770	-3.116	-2.510
5	-1.993	-3.770	-2.981	-2.468
4	-2.328	-3.770	-3.009	-2.548
3	-2.103	-3.770	-3.143	-2.705
2	-1.796	-3.770	-3.332	-2.896
1	-1.405	-3.770	-3.521	-3.075

Opt Lag (Ng-Perron seq t) = 0 [use maxlag(0)]

Min SC = -4.374397 at lag 1 with RMSE .0929491

Min MAIC = -4.070523 at lag 1 with RMSE .0929491

. regress gun_hom_rate pctlcm;

Source |	SS	df	MS	Number of obs	=	20
-----+-----				F(1, 18)	=	9.21
Model |	.359084435	1	.359084435	Prob > F	=	0.0071
Residual |	.701959689	18	.038997761	R-squared	=	0.3384
-----+-----				Adj R-squared	=	0.3017
Total |	1.06104412	19	.055844428	Root MSE	=	.19748

gun_hom_rate |	Coef.	Std. Err.	t	P>|t|	[95% Conf. Interval]
--------------	-------	-----------	---	------	----------------------

```
-----+-----
      pctlcm |  -.0282314  .0093037  -3.03  0.007  -.0477778  -.0086851
      _cons |   1.928703  .1727546  11.16  0.000   1.565759   2.291647
-----+-----
```

```
. regress gun_hom_rate pctlcm trend;
```

```
Source |      SS      df      MS      Number of obs  =      20
-----+----- F(2, 17)      =      39.91
      Model |  .874730451      2  .437365225  Prob > F      =      0.0000
      Residual |  .186313673     17  .010959628  R-squared     =      0.8244
-----+----- Adj R-squared  =      0.8037
      Total |  1.06104412     19  .055844428  Root MSE     =      .10469
```

```
-----+-----
gun_hom_rate |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-----+-----
      pctlcm |  -.0060742   .0058958    -1.03   0.317    -.0185132    .0063648
      trend |  -.0332869   .0048528   -6.86   0.000    -.0435255   -.0230483
      _cons |   1.947032   .0916205   21.25   0.000    1.75373    2.140335
-----+-----
```

```
. estat bgodfrey, lags(1) small;
```

```
Breusch-Godfrey LM test for autocorrelation
```

```
-----+-----
```

lags(p)	F	df	Prob > F
1	1.700	(1, 16)	0.2108

H0: no serial correlation

. estat hettest;

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity

Ho: Constant variance

Variables: fitted values of gun_hom_rate

chi2(1) = 0.49

Prob > chi2 = 0.4822

. regress D.gun_hom_rate D.pctlcm;

Source	SS	df	MS	Number of obs	=	19
Model	.006849736	1	.006849736	F(1, 17)	=	0.45
Residual	.260889351	17	.015346432	Prob > F	=	0.5130
				R-squared	=	0.0256
				Adj R-squared	=	-0.0317
Total	.267739087	18	.014874394	Root MSE	=	.12388

D. |

```

gun_hom_rate |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-----+-----
      pctlcm |
          D1. |   -.0062635   .0093753    -0.67   0.513    -.0260436    .0135166
              |
          _cons |   -.0374536   .0297062    -1.26   0.224    -.1001283    .0252211
-----+-----

```

```

. predict e, resid;

(5 missing values generated)

. estat bgodfrey,lags(1) small;

```

Breusch-Godfrey LM test for autocorrelation

```

-----+-----
      lags(p) |           F              df              Prob > F
-----+-----
          1   |           6.520          ( 1, 16 )           0.0213
-----+-----

```

H0: no serial correlation

```

. regress e L.e D.pctlcm;

```

```

      Source |           SS              df            MS      Number of obs   =           18
-----+-----
                                F(2, 15)              =           4.05
      Model |   .089776188              2   .044888094      Prob > F              =           0.0392

```



```

Residual | .166197694      15 .011079846  R-squared      =    0.3507
-----+-----
Total    | .255973881      17 .015057287  Root MSE      =    .10526

```

```

-----
e |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-----+-----
e |
L1. |  -.5928103   .208259   -2.85   0.012   -1.036704   -.1489167
|
pctlcm |
D1. |  -.0014458   .0079844   -0.18   0.859   -.0184641   .0155725
|
_cons |  -.0045456   .0258962   -0.18   0.863   -.0597421   .0506509
-----

```

```
. newey D.gun_hom_rate D.pctlcm, lag(1);
```

```

Regression with Newey-West standard errors      Number of obs      =          19
maximum lag: 1                                F( 1,          17) =          0.55
                                              Prob > F              =          0.4683

```

```

-----
D.          |      Newey-West
gun_hom_rate |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-----+-----

```

```
pctlcm |
      D1. | -.0062635 .0084435 -0.74 0.468 -.0240778 .0115508
      |
      _cons | -.0374536 .0224824 -1.67 0.114 -.0848873 .0099801
-----
```

```
. /* UCR murder rate */
```

```
> drop e;
```

```
. dfgls murder_rate;
```

DF-GLS for murder_rate Number of obs = 15

Maxlag = 8 chosen by Schwert criterion

	DF-GLS tau	1% Critical	5% Critical	10% Critical
[lags]	Test Statistic	Value	Value	Value
8	-1.274	-3.770	-3.702	-2.892
7	-1.468	-3.770	-3.257	-2.604
6	-1.768	-3.770	-3.024	-2.482
5	-2.542	-3.770	-2.960	-2.489
4	-2.651	-3.770	-3.021	-2.590
3	-2.528	-3.770	-3.163	-2.748
2	-1.553	-3.770	-3.343	-2.927
1	-1.483	-3.770	-3.517	-3.091

Opt Lag (Ng-Perron seq t) = 3 with RMSE .0627365

Min SC = -4.815476 at lag 3 with RMSE .0627365

Min MAIC = -4.549201 at lag 1 with RMSE .0764065

. regress murder_rate pctlcm;

Source	|	SS	df	MS	Number of obs	=	21
-----+-----					F(1, 19)	=	8.48
Model	|	.354364145	1	.354364145	Prob > F	=	0.0089
Residual	|	.793680104	19	.041772637	R-squared	=	0.3087
-----+-----					Adj R-squared	=	0.2723
Total	|	1.14804425	20	.057402212	Root MSE	=	.20438

murder_rate	|	Coef.	Std. Err.	t	P>|t|	[95% Conf. Interval]	
-----+-----							
pctlcm	|	-.0269564	.0092551	-2.91	0.009	-.0463276	-.0075852
_cons	|	2.205412	.1746858	12.63	0.000	1.839791	2.571034

. regress murder_rate pctlcm trend;

Source	|	SS	df	MS	Number of obs	=	21
-----+-----					F(2, 18)	=	60.74
Model	|	.999887087	2	.499943544	Prob > F	=	0.0000
Residual	|	.148157162	18	.008230953	R-squared	=	0.8709

```
-----+-----
                        Adj R-squared   =   0.8566
Total |   1.14804425      20   .057402212   Root MSE      =   .09072
```

```
-----
murder_rate |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-----+-----
pctlcm |   -.0002804   .0050943    -0.06   0.957    - .0109831    .0104223
trend |   -.0359031   .0040542   -8.86   0.000    - .0444205   -.0273856
_cons |    2.185345   .0775751   28.17   0.000     2.022365    2.348324
-----
```

```
. estat bgodfrey, lags(1) small;
```

Breusch-Godfrey LM test for autocorrelation

```
-----
lags(p) |      F              df              Prob > F
-----+-----
1      |      4.657          ( 1, 17 )          0.0455
-----
```

H0: no serial correlation

```
. estat hettest;
```

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity

Ho: Constant variance

Variables: fitted values of murder_rate

chi2(1) = 0.11

Prob > chi2 = 0.7351

. regress D.murder_rate D.pctlcm;

Source	|	SS	df	MS	Number of obs	=	20
-----+-----					F(1, 18)	=	0.01
Model	|	.000081479	1	.000081479	Prob > F	=	0.9241
Residual	|	.157061195	18	.008725622	R-squared	=	0.0005
-----+-----					Adj R-squared	=	-0.0550
Total	|	.157142674	19	.008270667	Root MSE	=	.09341

D.	|					
murder_rate	|	Coef.	Std. Err.	t	P>|t|	[95% Conf. Interval]
-----+-----						
pctlcm	|					
D1.	|	.0005721	.0059201	0.10	0.924	-.0118656 .0130098
_cons	|	-.0388827	.0210796	-1.84	0.082	-.0831694 .0054039

. predict e, resid;

(4 missing values generated)

```
. estat bgodfrey,lags(1) small;
```

Breusch-Godfrey LM test for autocorrelation

lags(p)	F	df	Prob > F
1	3.877	(1, 17)	0.0655

H0: no serial correlation

```
. regress e L.e D.pctlcm;
```

Source	SS	df	MS	Number of obs	=	19
				F(2, 16)	=	2.07
Model	.030759281	2	.01537964	Prob > F	=	0.1589
Residual	.118985178	16	.007436574	R-squared	=	0.2054
				Adj R-squared	=	0.1061
Total	.149744459	18	.008319137	Root MSE	=	.08624

e	Coef.	Std. Err.	t	P>|t|	[95% Conf. Interval]
e					
L1.	-.4590299	.2257132	-2.03	0.059	-.9375206 .0194608
pctlcm					


```

D1. | -.0029138 .0056386 -0.52 0.612 -.0148671 .0090396
      |
_cons | -.0040169 .0199469 -0.20 0.843 -.0463025 .0382688
-----

```

```
. newey D.murder_rate D.pctlcm, lag(1);
```

```

Regression with Newey-West standard errors      Number of obs      =          20
maximum lag: 1                                F( 1,          18) =          0.02
                                                Prob > F              =          0.9027
-----

```

```

D.          |              Newey-West
murder_rate |      Coef.   Std. Err.      t    P>|t|    [95% Conf. Interval]
-----+-----
pctlcm |
D1. |      .0005721   .0046124      0.12   0.903    -.0091182    .0102623
      |
_cons |     -.0388827   .0167536     -2.32   0.032    -.0740808    -.0036846
-----

```

```
. nbreg crmur pctlcm;
```

Fitting Poisson model:

```
Iteration 0:  log likelihood = -176.04004
```

Iteration 1: log likelihood = -176.04004

Fitting constant-only model:

Iteration 0: log likelihood = -147.583

Iteration 1: log likelihood = -118.99564

Iteration 2: log likelihood = -118.69212

Iteration 3: log likelihood = -118.68877

Iteration 4: log likelihood = -118.68877

Fitting full model:

Iteration 0: log likelihood = -115.89173

Iteration 1: log likelihood = -115.44161

Iteration 2: log likelihood = -115.43209

Iteration 3: log likelihood = -115.43209

Negative binomial regression	Number of obs	=	21
	LR chi2(1)	=	6.51
Dispersion = mean	Prob > chi2	=	0.0107
Log likelihood = -115.43209	Pseudo R2	=	0.0274

	Coef.	Std. Err.	z	P>|z|	[95% Conf. Interval]
crmur |					
pctlcm |	-.018751	.0067401	-2.78	0.005	-.0319614 -.0055406

```

      _cons |   6.364963   .1266425   50.26   0.000   6.116748   6.613178
-----+-----
      /lnalpha |  -3.995576   .3466636                -4.675024   -3.316128
-----+-----
      alpha |   .0183968   .0063775                .0093253   .0362931
-----+-----

LR test of alpha=0: chibar2(01) = 121.22                Prob >= chibar2 = 0.000

```

. nbreg crmur pctlcm trend;

Fitting Poisson model:

Iteration 0: log likelihood = -113.64944

Iteration 1: log likelihood = -113.64944

Fitting constant-only model:

Iteration 0: log likelihood = -147.583

Iteration 1: log likelihood = -118.99564

Iteration 2: log likelihood = -118.69212

Iteration 3: log likelihood = -118.68877

Iteration 4: log likelihood = -118.68877

Fitting full model:

Iteration 0: log likelihood = -110.86745

```
Iteration 1:  log likelihood = -107.26037
Iteration 2:  log likelihood = -106.58883
Iteration 3:  log likelihood = -104.99581
Iteration 4:  log likelihood = -104.2693
Iteration 5:  log likelihood = -104.26131
Iteration 6:  log likelihood = -104.2613
```

```
Negative binomial regression      Number of obs   =      21
                                LR chi2(2)            =      28.85
Dispersion      = mean           Prob > chi2       =      0.0000
Log likelihood = -104.2613       Pseudo R2        =      0.1216
```

```
-----
      crmur |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-----+-----
      pctlcm |   -.000778   .0048192    -0.16   0.872    - .0102235    .0086674
      trend  |   -.0236072  .0037308    -6.33   0.000    - .0309194   -.0162949
      _cons   |    6.337044   .0737494   85.93   0.000     6.192498     6.48159
-----+-----
      /lnalpha |  -5.347352   .4648032                -6.25835    -4.436355
-----+-----
      alpha   |    .0047607   .0022128                .0019144     .011839
-----+-----
```

```
LR test of alpha=0: chibar2(01) = 18.78           Prob >= chibar2 = 0.000
```

```
. nbreg gunhomicides pctlcm;
```

Fitting Poisson model:

Iteration 0: log likelihood = -139.64638

Iteration 1: log likelihood = -139.64638

Fitting constant-only model:

Iteration 0: log likelihood = -134.6247

Iteration 1: log likelihood = -107.73181

Iteration 2: log likelihood = -107.37966

Iteration 3: log likelihood = -107.37576

Iteration 4: log likelihood = -107.37576

Fitting full model:

Iteration 0: log likelihood = -104.25441

Iteration 1: log likelihood = -103.65453

Iteration 2: log likelihood = -103.64182

Iteration 3: log likelihood = -103.64181

Negative binomial regression	Number of obs	=	20
	LR chi2(1)	=	7.47
Dispersion = mean	Prob > chi2	=	0.0063
Log likelihood = -103.64181	Pseudo R2	=	0.0348

```

-----
gunhomicides |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-----+-----
      pctlcm |   -.0208157   .0068776    -3.03   0.002    -.0342956   -.0073358
      _cons |    6.098731   .1269795    48.03   0.000     5.849856    6.347606
-----+-----
      /lnalpha |  -4.079971   .3734793                -4.811977   -3.347965
-----+-----
      alpha |    .016908   .0063148                .0081318    .0351558
-----+-----

LR test of alpha=0: chibar2(01) = 72.01                Prob >= chibar2 = 0.000

```

```
. nbreg gunhomicides pctlcm trend;
```

Fitting Poisson model:

Iteration 0: log likelihood = -105.02403

Iteration 1: log likelihood = -105.02402

Fitting constant-only model:

Iteration 0: log likelihood = -134.6247

Iteration 1: log likelihood = -107.73181

Iteration 2: log likelihood = -107.37966

Iteration 3: log likelihood = -107.37576

Iteration 4: log likelihood = -107.37576

Fitting full model:

Iteration 0: log likelihood = -100.6319
 Iteration 1: log likelihood = -96.977163
 Iteration 2: log likelihood = -96.162899
 Iteration 3: log likelihood = -96.134374
 Iteration 4: log likelihood = -96.134321
 Iteration 5: log likelihood = -96.134321

Negative binomial regression	Number of obs	=	20
	LR chi2(2)	=	22.48
Dispersion = mean	Prob > chi2	=	0.0000
Log likelihood = -96.134321	Pseudo R2	=	0.1047

```

-----
gunhomicides |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-----+-----
      pctlcm |   -.0066636   .0055574    -1.20   0.231    -.017556    .0042288
      trend |   -.0210376   .0044435    -4.73   0.000    -.0297468   -.0123285
       _cons |    6.10229    .086847    70.26   0.000     5.932073    6.272507
-----+-----
      /lnalpha |  -5.069808   .4764139                -6.003562   -4.136053
-----+-----
      alpha |    .0062836   .0029936                .0024699    .0159858
-----
    
```

LR test of alpha=0: chibar2(01) = 17.78

Prob >= chibar2 = 0.000

. log close;

name: <unnamed>

log: C:\Users\cemood\Box Sync\California\Virginia\va.log

log type: text

closed on: 26 Oct 2017, 08:52:44

EXHIBIT 1

Curriculum Vita of Carlisle E. Moody

Department of Economics
College of William and Mary
Williamsburg, VA 23187-8795
Email: cemood@wm.edu
Phone: (757) 221-2373

Education

B.A., Colby College, Waterville, Maine, 1965 (Economics)
M.A., University of Connecticut, Storrs, Connecticut, 1966 (Economics)
Ph.D., University of Connecticut, Storrs, Connecticut, 1970 (Economics)

Experience

Professor of Economics, College of William and Mary, 1989-
Chair of the Department of Economics, College of William and Mary 1997- 2003
Associate Professor of Economics, College of William and Mary, 1975-1989.
Assistant Professor of Economics, College of William and Mary, 1970-1975.
Lecturer in Econometrics, University of Leeds, Leeds, England, 1968-1970.

Consultant

Stanford Research Institute
Virginia Marine Resources Commission
U.S. General Accounting Office
U.S. Department of Transportation
U.S. Department of Energy
National Center for State Courts
Oak Ridge National Laboratory
Justec Research.
The Orkand Corporation
Washington Consulting Group

Decision Analysis Corporation of Virginia
SAIC Corporation
West Publishing Group
Independence Institute

Research and Teaching Fields

Law and Economics
Econometrics
Time Series Analysis

Honors

National Defense Education Act Fellow, University of Connecticut, 1965-1968.
Bredin Fellow, College of William and Mary, 1982.
Member, Methodology Review Panel, Prison Population
Forecast, Virginia Department of Planning and Budget, 1987-1993.
Notable Individuals, Micro Computer Industry, 1983.
Speaker, Institute of Medicine and National Research Council Committee of
Priorities for a Public Health Research Agenda to Reduce the Threat of Firearm-
related Violence, National Academies of Science, Washington, DC, April 23, 2013

Refereed Publications

"Firearms and the Decline in Violence in Europe 1201-2010," *Review of European Studies*, 9(2) 2017

"The Impact of Right-to-Carry Laws on Crime: An Exercise in Replication," (with T.B. Marvell, P.R. Zimmerman and Faisal Alemante) *Review of Economics and Finance*, 4(1) 2014, 33-43.

"Did John Lott Provide Bad Data to the NRC? A Note on Aneja, Donohue, and Zhang," (with J.R. Lott and T.B. Marvell) *Econ Journal Watch*, January 2013.

"On the Choice of Control Variables in the Crime Equation," (with T.B. Marvell) *Oxford Bulletin of Economics and Statistics*, 72(5) 2010, 696-715

"The Debate on Shall-Issue Laws, Continued," (with T.B. Marvell) *Econ Journal Watch*, 6(2) March 2009, 203-217.

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"Can and Should Criminology Research Influence Policy? Suggestions for Time-Series Cross-Section Studies" (with T.B. Marvell) *Criminology and Public Policy* 7(1) August, 2008, 359-364.

"Guns and Crime," (with T.B. Marvell), *Southern Economic Journal*, 71(4), April, 2005, 720-736.

"When Prisoners Get Out," (with Kovandzic, Marvell and Vieraitis), *Criminal Justice Policy Review*, 15, 2004, 212-228.

"The Impact of Right-to-Carry Concealed Firearms Laws on Mass Public Shootings," (with Tomislav Kovandzic and Grant Duwe), *Homicide Studies*, 6, 2002, 271-296.

"Testing for the Effects of Concealed Weapons Laws: Specification Errors and Robustness," *Journal of Law and Economics*, 44 (PT.2), 2001, 799-813.

"The Lethal Effects of Three-Strikes Laws," (with T.B. Marvell), *Journal of Legal Studies*, 30, 2001, 89-106.

"Female and Male Homicide Victimization Rates: Comparing Trends and Regressors," (with T. B. Marvell), *Criminology*, 37, 1999, 879-902.

"The Impact of Out-of-State Prison Population on State Homicide Rates: Displacement and Free-Rider Effects," (with T.B. Marvell), *Criminology*, 30, 1998, 513-535.

"The Impact of Prison Growth on Homicide," (with T.B. Marvell) *Homicide Studies*, 1, 1997, 215-233.

"Age Structure, Trends, and Prison Populations," (with T.B. Marvell) *Journal of Criminal Justice*, 25, 1997, 114-124.

"Police Levels, Crime Rates, and Specification Problems," (with T.B. Marvell) *Criminology*, 24, 1996, 606-646.

"A Regional Linear Logit Fuel Demand Model for Electric Utilities," *Energy Economics*, 18, 1996, 295-314.

"The Uncertain Timing of Innovations in Time Series: Minnesota Sentencing Guidelines and Jail Sentences," (with T.B. Marvell) *Criminology*, 34, May, 1996.

"Determinant Sentencing and Abolishing Parole: the Long Term Impacts on Prisons and Crime," (with T.B. Marvell), *Criminology*, 34, 1996.

"The Impact of Enhanced Prison Terms for Felonies Committed with Guns" (with T.B. Marvell) *Criminology*, Vol. 33, 1995.

"Prison Population Growth and Crime Reduction." (with T.B. Marvell) *Journal of Quantitative Criminology*, 10, 1994, 109-140.

"Alternative Bidding Systems for Leasing Offshore Oil: Experimental Evidence." *Economica*, 61, 1994, 345-353.

"Forecasting the Marginal Costs of a Multiple Output Production Technology." (with G. Lady), *Journal of Forecasting*, 12, 1993, 421-436.

"Volunteer Attorneys as Appellate Judges." (with T.B. Marvell) *The Justice System Journal*, 16, 1992, 49-64.

"Age Structure and Crime Rates: Conflicting Evidence." (with T.B. Marvell) *Journal of Quantitative Criminology*, 7, 1991, 237-273.

"OCS Leasing Policy and Lease Prices." (with W.J. Kruvant) *Land Economics*, 66, February 1990, 30-39.

"The Effectiveness of Measures to Increase Appellate Court Efficiency and Decision Output." (with T.B. Marvell) *Michigan Journal of Law Reform*, 21, 1988, 415- 442.

"Joint Bidding, Entry, and OCS Lease Prices" (with W.J. Kruvant) *Rand Journal of Economics*, 19, Summer 1988, 276-284.

"Appellate and Trial Caseload Growth: A Pooled Time Series Cross Section Approach" (with T.B. Marvell) *Journal of Quantitative Criminology*, 3, 1987.

"The Impact of Economic and Judgeship Changes on Federal District Court Filings" (with T.B. Marvell) *Judicature*, Vol. 69, No. 3, Oct./Nov. 1985, 156.

"The GAO Natural Gas Supply Model" (with P.A. Valentine and W.J. Kruvant) *Energy Economics*, January 1985, 49-57.

"Strategy, Structure and Performance of Major Energy Producers: Evidence from Line of Business Data" (with A.T. Andersen and J.A. Rasmussen) *Review of Industrial Organization*, Winter, 1984: 290-307.

"Quality, Price, Advertising and Published Quality Ratings" (with R.A. Archibald and C.A. Haulman) *Journal of Consumer Research*, Vol. 4, No. 4, March 1983, 347-56.

"Sources of Productivity Decline in U.S. Coal Mining" (with W. Kruvant and P. Valentine) *The Energy Journal*, Vol. 3, No. 3, 1982, 53-70.

"Seasonal Variation in Residential Electricity Demand: Evidence from Survey Data," (with R.A. Archibald and D.H. Finifter), *Applied Economics*, Vol. 14, No. 2, April 1982, 167-181.

"The Subsidy Effects of the Crude Oil Entitlements Program," *Atlantic Economic Review*, Vol. 8, No. 2, July, 1980, 103.

"Industrial Generation of Electricity in 1985: A Regional Forecast," *Review of Regional Studies*, Vol. 8, No. 2, 1980, 33-43.

"The Measurement of Capital Services by Electrical Energy," *Oxford Bulletin of Economics and Statistics*, February 1974.

"Air Quality, Environment and Metropolitan Community Structure" (With Craig Humphrey), *Review of Regional Studies*, Winter 1973.

"Productivity Change in Zambian Mining" (With Norman Kessel), *South African Journal of Economics*, March 1972.

Other Publications

Heller, McDonald and Murder: Testing the More Guns=More Murder Thesis," (with Don Kates), *Fordham Urban Law Review*, Vol. 39, No. 5, 2012.

Brief for the International Law Enforcement Educators and Trainers Association (ileeta), International Association of Law Enforcement Firearms Instructors (ialefi), Southern States Police Benevolent Association, Texas Police Chiefs Association, Law Enforcement Alliance of America, Congress of Racial Equality, the Claremont Institute, Professors Carlisle E. Moody, Roy T. Wortman, Raymond Kessler, Gary Mauser, Dr. Sterling Burnett, and the Independent Institute in support of petitioners," Supreme Court of the United States, no. 08-1521, Otis D. McDonald, et. al. vs. City of Chicago, et. al., December 2009

"Firearms and homicide" in B. Benson and P. Zimmerman (eds.), *Handbook on the Economics of Crime*, Edward Elgar, Northampton, MA 2010, 432-451.

"Is there a relationship between guns and freedom? Comparative results from 59 nations." (with David B. Kopel and Howard Nemerov), *Texas Review of Law and*

"Brief of Academics as Amici Curiae in Support of Respondent." Supreme Court of the United States, No. 07-290, District of Columbia vs. Dick Anthony Heller, February, 2008.

"Econometric research on crime rates: prisons, crime, and simultaneous equations" in Mark Cohen and Jacek Czabanske, *Ekonomiczne, podejscie do przestepczosci*, Ius et Lux, Warsaw, 2007, 235-258.

"Simulation Modeling and Policy Analysis," *Criminology & Public Policy*, 1, 2002, 393-398.

"Game Theory and Football" (with David Ribar), *Access: The Journal of Microcomputer Applications*, Vol. 4, No. 3, Nov./Dec. 1985, 5-15.

"Reasons for State Appellate Caseload Growth" (with T. Marvell) Bureau of Justice Statistics, Department of Justice, 1985.

"State Appellate Caseload Growth: Documentary Appendix." (with Marvell, et. al.) National Center for State Courts, Williamsburg, VA, 1985.

"Model Documentation for the Mini-Macroeconomic Model: MINMAC" Washington, D.C., Energy Information Administration, 1984.

"Neighborhood Segregation." (with E.S. Dethlefsen.) *Byte, The Small Systems Journal*, Vol. 7, No. 7, July 1982, 178-206.

"Technological Progress and Energy Use," Proceedings of the Third Annual University of Missouri, Missouri Energy Council Conference on Energy, October, 1976.

"Technological Change in the Soviet Chemical Industry," Technical Note SSC-TN-2625-8 Stanford Research Institute, 1975 (With F.W. Rushing).

"Feasibility Study of Inter-City Transit Via Southern Railway R/W, Norfolk and Virginia Beach Corridor" (With R.H. Bigelow, S.H. Baker and M.A. Garrett), U.S. Department of Transportation, 1974.

"Productivity Growth in U.S. Manufacturing," in 1973 Proceedings of the Business and Economic Statistics Section, American Statistical Association.

EXHIBIT 5

1 XAVIER BECERRA
Attorney General of California
2 TAMAR PACHTER
Supervising Deputy Attorney General
3 NELSON R. RICHARDS
ANTHONY P. O'BRIEN
4 Deputy Attorneys General
ALEXANDRA ROBERT GORDON
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State Bar No. 207650
6 455 Golden Gate Avenue, Suite 11000
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7 Telephone: (415) 703-5509
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8 E-mail:
Alexandra.RobertGordon@doj.ca.gov
9 *Attorneys for Defendant*
Attorney General Xavier Becerra

10
11 IN THE UNITED STATES DISTRICT COURT
12 FOR THE SOUTHERN DISTRICT OF CALIFORNIA
13
14

15 **VIRGINIA DUNCAN, et al.,**

16 Plaintiffs,

17 v.
18

19 **XAVIER BECERRA, in his official**
20 **capacity as Attorney General of the**
State of California, et al.,

21 Defendants.
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24
25
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27
28

17-cv-1017-BEN-JLB

**EXPERT REPORT OF
DR. CHRISTOPHER S. KOPER**

Judge: Hon. Roger T. Benitez
Action Filed: May 17, 2017

EXPERT REPORT OF DR. CHRISTOPHER S. KOPER (17-cv-1017-BEN-JLB)

EXPERT REPORT OF DR. CHRISTOPHER S. KOPER

I. ASSIGNMENT

I was retained by counsel for Defendant California Attorney General Xavier Becerra for the purpose of preparing an expert report on the potential efficacy of California's new ban on possession of large capacity ammunition magazines.

II. QUALIFICATIONS AND BACKGROUND

I am an Associate Professor for the Department of Criminology, Law and Society at George Mason University, in Fairfax, Virginia and the principal fellow of George Mason's Center for Evidence-Based Crime Policy. I have been studying firearms issues since 1994. My primary areas of focus are firearms policy and policing issues. My credentials, experience, and background are stated in my curriculum vitae, a true and correct copy of which is attached as Exhibit A.

In 1997, my colleague Jeffrey Roth and I conducted a study on the impact of Title XI, Subtitle A of the Violent Crime Control and Law Enforcement Act of 1994 (hereinafter the "federal assault weapons ban" or the "federal ban"), for the United States Department of Justice and the United States Congress.¹ I updated the original 1997 study in 2004² and briefly revisited the issue again by re-examining my 2004 report in 2013.³ To my knowledge, these are the most comprehensive studies to have examined the efficacy of the federal ban on assault weapons and ammunition feeding devices holding more than ten rounds of ammunition

¹ Jeffrey A. Roth & Christopher S. Koper, *Impact Evaluation of the Public Safety and Recreational Firearms Use Protection Act of 1994: Final Report* (1997), attached hereto as Exhibit B (hereinafter, "Impact Evaluation").

² Christopher S. Koper, *An Updated Assessment of the Federal Assault Weapons Ban: Impacts on Gun Markets and Gun Violence, 1994-2003* (2004), attached hereto as Exhibit C (hereinafter, "Updated Assessment of the Federal Assault Weapons Ban").

³ Christopher S. Koper, *America's Experience with the Federal Assault Weapons Ban, 1994- 2004: Key Findings and Implications*, ch. 12, 157-171, in *Reducing Gun Violence in America: Informing Policy with Evidence* (Daniel S. Webster & Jon S. Vernick eds. 2013), attached hereto as Exhibit D (hereinafter "America's Experience with the Federal Assault Weapons Ban").

(hereinafter referred to as “large-capacity magazines” or “LCMs”).⁴ My 1997 study was based on limited data, especially with regard to the criminal use of large-capacity magazines. As a result, my conclusions on the impact of the federal ban are most accurately and completely set forth in my 2004 and 2013 reports.

This report summarizes some of the key findings of those studies regarding the federal ban and its impact on crime prevention and public safety. I also discuss the results of a new research study I directed that investigated current levels of criminal activity with high capacity semiautomatic weapons as measured in several local and national data sources.⁵ Based upon my findings, I then provide some opinions on the potential impact and efficacy of prohibitions and restrictions on large-capacity magazines, like those contained in California Penal Code section 32310 (hereinafter, “Section 32310”).

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

III. RETENTION AND COMPENSATION

I am being compensated for my time on this case on an hourly basis at a rate of \$150 per hour. My compensation is not contingent on the results of my analysis or the substance of my testimony.

⁴ As discussed below, there have been some additional academic and non-academic studies that have examined more limited aspects of the ban’s effects.

⁵ Christopher S. Koper et al., *Criminal Use of Assault Weapons and High Capacity Semiautomatic Firearms: An Updated Examination of Local and National Sources*, Journal of Urban Health (October 2, 2017) DOI 10.1007/s11524-017-0205-7, available at http://em.rdcu.be/wf/click?upn=KP7O1RED-2BID0F9LDqGVeSCtPCwMbqH-2BMWBUHgPpsN5I-3D_aLASUIDI3T0TZ55mA5wcKyxIF1pNAQ-2FS0QcxHHbBP65v2wnicdu8DEAbXOHNYJipa4WGEYqVQvkFcdtrFEsYjZAuWYuv7oZRI5azzY-2B5kRSTavg1BTwrdrnUNdQZVTcHVKQjHpPzJRCNjuQtSjVJuN-2F-2BNTasWPxQOVbf1pq1NLGA3TvS1NOwbCbQHSILbi3GAhoVkr0iwOlRLg8INPZXWLjKU6PJ-2F84jalWCxLaJiY74BdpLrwOkfJQ3Cvy-2F04YQt1UhIlsfJNdtP7DBeGw-3D-3D (last visited Oct. 5, 2017).

IV. BASES FOR OPINION AND MATERIAL COVERED

The opinions I provide in this expert report are based solely on the findings of the materials cited in the footnotes and text, as well as the materials attached as exhibits to this report.

V. OPINION

A. Summary of Findings

Based on my research, I found, among other things, that assault pistols are used disproportionately in crime in general, and that assault weapons more broadly were disproportionately used in murder and other serious crimes in some jurisdictions for which there was data. I also found that assault weapons and other firearms with large capacity magazines are used in a higher share of mass public shootings and killings of law enforcement officers.

The evidence also suggests that gun attacks with semiautomatics—especially assault weapons and other guns equipped with large capacity magazines—tend to result in more shots fired, more persons wounded, and more wounds per victim, than do gun attacks with other firearms. There is evidence that victims who receive more than one gunshot wound are substantially more likely to die than victims who receive only one wound. Thus, it appears that crimes committed with these weapons are likely to result in more injuries, and more lethal injuries, than crimes committed with other firearms.

In addition, there is some evidence to suggest that assault weapons are more attractive to criminals, due to the weapons' military-style features and particularly large magazines. Based on these and other findings in my studies discussed below, it is my considered opinion that California's recently enacted ban on large capacity magazines, which is in some ways stronger than the federal ban that I studied, is likely to advance California's interest in protecting public safety. Specifically, it has the potential to: (1) reduce the number of crimes committed with firearms with large capacity magazines; (2) reduce the number of shots fired in gun crimes; (3)

1 reduce the number of gunshot victims in such crimes; (4) reduce the number of
2 wounds per gunshot victim; (5) reduce the lethality of gunshot injuries when they
3 do occur; and (6) reduce the substantial societal costs that flow from shootings.

4 **B. Criminal Uses and Dangers of Large-Capacity Magazines**

5 Large-capacity magazines allow semiautomatic weapons to fire more than 10
6 rounds without the need for a shooter to reload the weapon.⁶ Large-capacity
7 magazines come in a variety of sizes, including but not limited to 17-round
8 magazines, 25- or 30-round magazines, and drums with the capacity to accept up to
9 100 rounds.

10 The ability to accept a detachable magazine, including a large-capacity
11 magazine, is a common feature of guns typically defined as assault weapons.⁷ In
12 addition, LCMs are frequently used with guns that fall outside of the definition of
13 an assault weapon.

14 LCMs are particularly dangerous because they facilitate the rapid firing of
15 high numbers of rounds. This increased firing capacity thereby potentially
16 increases injuries and deaths from gun violence. *See Updated Assessment of the*
17 *Federal Assault Weapons Ban* at 97 (noting that “studies ... suggest that attacks
18 with semiautomatics—including [assault weapons] and other semiautomatics with
19 LCMs—result in more shots fired, persons wounded, and wounds per victim than
20 do other gun attacks”).

21 ⁶ A semiautomatic weapon is a gun that fires one bullet for each pull of the trigger
22 and, after each round of ammunition is fired, automatically loads the next round and
23 cocks itself for the next shot, thereby permitting a faster rate of fire relative to non-
24 automatic firearms. Semiautomatics are not to be confused with fully automatic
25 weapons (*i.e.*, machine guns), which fire continuously so long as the trigger is
depressed. Fully automatic weapons have been illegal to own in the United States
without a federal permit since 1934. *See Updated Assessment of the Federal*
Assault Weapons Ban, at 4 n.1.

26 ⁷ Although the precise definition used by various federal, state, and local statutes
27 has varied, the term “assault weapons” generally includes semiautomatic pistols,
28 rifles, and shotguns with military features conducive to military and potential
criminal applications but unnecessary in shooting sports or for self-defense.

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

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

- 11 • On July 18, 1984, James Huberty killed 21 persons and wounded 19 others in
12 a San Ysidro, California McDonald's restaurant, using an Uzi carbine, a
13 shotgun, and another semiautomatic handgun, and equipped with a 25-round
14 LCM;
- 15 • On January 17, 1989, Patrick Purdy used a civilian version of the AK-47
16 military rifle and a 75-round LCM to open fire in a Stockton, California
17 schoolyard, killing five children and wounding 29 other persons;
- 18 • On September 14, 1989, Joseph Wesbecker, armed with an AK-47 rifle, two
19 MAC-11 handguns, a number of other firearms, and multiple 30-round
20 magazines, killed seven and wounded 15 people at his former workplace in
21 Louisville, Kentucky;
- 22 • On October 16, 1991, George Hennard, armed with two semiautomatic
23 handguns with LCMs (and reportedly a supply of extra LCMs), killed 22
24 people and wounded another 23 in Killeen, Texas;
- 25 • On July 1, 1993, Gian Luigi Ferri, armed with two Intratec TEC-DC9 assault
26 pistols and 40- to 50-round magazines, killed nine and wounded six at the
27 law offices of Pettit & Martin in San Francisco, California; and
- 28 • 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.

1 See *Updated Assessment of the Federal Assault Weapons Ban* at 14.⁸

2 More recently, in the years since the expiration of the federal ban in 2004,
3 there has been another well-publicized series of mass shooting incidents involving
4 previously banned assault weapons and/or LCMs. Some of the more notorious of
5 these incidents include:

- 6 • On April 16, 2007, Seung-Hui Cho, armed with a handgun and multiple
7 LCMs, killed 33 (including himself) and wounded 23 on the campus of
8 Virginia Tech in Blacksburg, Virginia;
- 9 • On January 8, 2011, Jared Loughner, armed with a handgun and multiple
10 LCMs, killed 6 and wounded 13, including Congresswoman Gabrielle
11 Giffords, in Tucson, Arizona;
- 12 • On July 20, 2012, James Holmes, armed with a Smith & Wesson M&P 15
13 assault rifle, 100-round LCMs, and other firearms, killed 12 and wounded 58
14 in a movie theater in Aurora, Colorado;
- 15 • On December 14, 2012, Adam Lanza, armed with a Bushmaster AR-15-style
16 assault rifle, two handguns, and multiple LCMs, killed 26 (20 of whom were
17 young children) and wounded 2 at Sandy Hook Elementary School in
18 Newtown, Connecticut;
- 19 • On December 2, 2015, Syed Rizwan Farook and Tashfeen Malik, armed with
20 2 AR-15 style rifles, semiautomatic handguns, and LCMs, killed 14 and
21 injured 21 at a workplace party in San Bernardino, California; and

22 ⁸ Additional details regarding these incidents were obtained from: Violence Policy
23 Center, *Mass Shootings in the United States Involving High-Capacity Ammunition*
24 *Magazines*, available at http://www.vpc.org/fact_sht/VPCshootinglist.pdf
(hereinafter, "Violence Policy Center Report"); Mark Follman, Gavin Aronsen &
25 Deanna Pan, *US Mass Shootings, 1982-2012: Data from Mother Jones'*
26 *Investigation*, updated Feb. 27, 2013, available at [http://www.motherjones.com/](http://www.motherjones.com/politics/2012/12/mass-shootings-mother-jones-full-data)
27 [politics/2012/12/mass-shootings-mother-jones-full-data](http://www.motherjones.com/politics/2012/12/mass-shootings-mother-jones-full-data) (hereinafter, "Follman,
28 Aronsen & Pan 2013"); and Mark Follman, Gavin Aronsen & Jaeah Lee, *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-](http://www.motherjones.com/politics/2013/02/assault-weapons-highcapacity-magazines-mass-shootings-feinstein)
[weapons-highcapacity-magazines-mass-shootings-feinstein](http://www.motherjones.com/politics/2013/02/assault-weapons-highcapacity-magazines-mass-shootings-feinstein) (hereinafter, "Pollman,
Aronsen & Lee 2013").

- On June 12, 2016, Omar Mateen, armed with a Sig Sauer MCX rifle, a Glock 17 semiautomatic handgun, and LCMs, killed 49 and injured 53 in a nightclub in Orlando, Florida.⁹

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* at 17-18. 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* at 14- 19, 87.

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 6 or more persons were killed or a total of 12 or more were wounded. *See Updated Assessment of the Federal Assault Weapons Ban* at 14.¹⁰

More recently, a *Mother Jones* 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

⁹ For details on these incidents, see Marc Follman et al., *US Mass Shootings, 1982-2017: Data from Mother Jones' Investigation*, Mother Jones (June 14, 2017) available at <http://www.motherjones.com/politics/2012/12/mass-shootings-mother-jones-full-data/>.

¹⁰ These figures are based on tabulations conducted by my research team and me using data reported in Gary Kleck, *Targeting Guns: Firearms and Their Control* (1997) at 124-26.

1 all cases, including those where magazine capacity could not be determined, exactly
2 half of the cases (31 of 62) are known to have involved an LCM.¹¹

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

6 Prior to the federal assault weapons ban, for example, guns with LCMs were
7 used in roughly 13-26% of most gun crimes (as opposed to somewhere between
8 about 1% and 8% for assault weapons alone). *See Updated Assessment of the*
9 *Federal Assault Weapons Ban* at 15, 18-19; *see also America's Experience with the*
10 *Federal Assault Weapons Ban* at 161-62. More recent data discussed below
11 suggest that guns with LCMs now represent an even higher share of guns used in
12 crime.

13 It also appears that guns with LCMs have been used disproportionately in
14 murders of police. Specifically, data from prior to the federal ban indicated that
15 LCMs were used in 31% to 41% of gun murders of police in contrast to their use in
16 13-26% of gun crimes overall. *See Updated Assessment of the Federal Assault*
17 *Weapons Ban* at 18; *see also America's Experience with the Federal Assault*
18 *Weapons Ban* at 162. More recent data discussed below also show a similar pattern
19 of guns with LCMs being more common among weapons used in gun murders of
20 police.

21 In addition, the available evidence suggests that gun attacks with
22 semiautomatics—including both assault weapons and guns equipped with LCMs—
23 tend to result in more shots fired, more persons wounded, and more wounds
24 inflicted per victim than do attacks with other firearms. *See Updated Assessment of*

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

1 *the Federal Assault Weapons Ban* at 97; *see also America's Experience with the*
2 *Federal Assault Weapons Ban* at 166-67.

3 For example, in mass shooting incidents that resulted in at least 6 deaths or at
4 least 12 total gunshot victims from 1984 through 1993, offenders who clearly
5 possessed assault weapons or other semiautomatics with LCMs wounded or killed
6 an average of 29 victims in comparison to an average of 13 victims wounded or
7 killed by other offenders. *See Updated Assessment of the Federal Assault Weapons*
8 *Ban* at 85-86; *see also America's Experience with the Federal Assault Weapons*
9 *Ban* at 167.

10 Working under my direction, Luke Dillon, a graduate student at George
11 Mason University, recently analyzed the *Mother Jones* data from 1982 through
12 2012 for his Master's thesis, and compared the number of deaths and fatalities of
13 the 62 mass shootings identified therein to determine how the presence of assault
14 weapons and LCMs impacted the outcome.¹² With respect to LCMs, Mr. Dillon
15 compared cases where an LCM was known to have been used (or at least possessed
16 by the shooter) against cases where either an LCM was not used or not known to
17 have been used. He found that the LCM cases (which included assault weapons)
18 had significantly higher numbers of fatalities and casualties: an average of 10.19
19 fatalities in LCM cases compared to 6.35 fatalities in non-LCM/unknown cases.
20 Mr. Dillon also found an average of 12.39 people were shot but not killed in public
21 mass shootings involving LCMs, compared to just 3.55 people shot in the non-
22 LCM/unknown LCM shootings. These findings reflect a total victim differential of
23 22.58 killed or wounded in the LCM cases compared to 9.9 in the non-

24
25
26 ¹² *See* Luke Dillon, *Mass Shootings in the United States: An Exploratory Study of*
27 *the Trends from 1982 to 2012 (2013)* (unpublished M.A. thesis, George Mason
28 *University, Department of Criminology, Law and Society).*

1 LCM/unknown LCM cases.¹³ All of these differences were statistically significant
2 and not a result of mere chance.

3 Similarly, a study of handguns attacks in Jersey City, New Jersey during the
4 1990s found that the average number of victims wounded in gunfire incidents
5 involving semiautomatic pistols was 15% higher than in those involving revolvers.
6 The study further found that attackers using semiautomatics to fire more than ten
7 shots were responsible for nearly 5% of all gunshot victims and that 100% of these
8 incidents involved injury to at least one victim. *See Updated Assessment of the*
9 *Federal Assault Weapons Ban* at 84-86, 90-91; *see also America's Experience with*
10 *the Federal Assault Weapons Ban* at 167.¹⁴

11 Similar evidence comes from other local studies. Between 1992 and 1995,
12 gun homicide victims in Milwaukee who were killed by guns with LCMs had 55%
13 more gunshot wounds than those victims killed by non-LCM firearms. Further, a
14 study of gun homicides in Iowa City (IA), Youngstown (OH), and Bethlehem (PA)
15 from 1994 through 1998 found gun homicide victims killed by pistols averaged 4.5
16 gunshot wounds as compared to 2 gunshot wounds for those killed by revolvers.
17 *See Updated Assessment of the Federal Assault Weapons Ban* at 86.

18 And, in an analysis I conducted of guns recovered by police in Baltimore, I
19 also found LCMs to be associated with gun crimes that resulted in more lethal and
20 injurious outcomes. For instance, I found, among other things, that guns used in
21 shootings that resulted in gunshot victimizations were 17% to 26% more likely to

22
23 ¹³ The patterns were also very similar when comparing the LCM cases against just
24 those cases in which it was clear that an LCM was not used (though this was a very
25 small number).

26 ¹⁴ Note that these data were collected in the 1990s during the years of the federal
27 LCM ban and in a city that was also subject to state-level LCM restrictions on
28 magazines holding more than 15 rounds. Hence, these findings may not generalize
well to other locations and the current timeframe. More specifically, given recent
increases in the use of firearms with LCMs as discussed below, the Jersey City
results may understate the current share of gunshot victimizations resulting from
incidents with more than 10 shots fired.

1 have LCMs than guns used in gunfire cases with no wounded victims, and guns
2 linked to murders were 8% to 17% more likely to have LCMs than guns linked to
3 non-fatal gunshot victimizations. *See Updated Assessment of the Federal Assault*
4 *Weapons Ban* at 87.

5 In short, while tentative, the available evidence suggests more often than not
6 that attacks with semiautomatics, particularly those equipped with LCMs, result in
7 more shots fired, leading both to more injuries and injuries of greater severity.
8 Such attacks also appear to result in more wounds per victim. This is significant
9 because gunshot victims who are shot more than once are more than 60% more
10 likely to die than victims who receive only one gunshot wound. *See Updated*
11 *Assessment of the Federal Assault Weapons Ban* at 87 (citing studies showing 63%
12 increase and 61% increase, respectively, in fatality rates among gunshot victims
13 suffering more than one wound).

14 In addition, diminishing the number of victims of shootings by even a small
15 percentage can result in significant cost savings because of the significant social
16 costs of shootings, as discussed herein.

17 **C. Effects of the 1994 Federal Assault Weapons Ban**

18 **1. Provisions of the Federal Assault Weapons Ban**

19 Enacted on September 13, 1994—in the wake of many of the mass shootings
20 described above—the federal assault weapons ban imposed prohibitions and
21 restrictions on the manufacture, transfer, and possession of both certain
22 semiautomatic firearms designated as assault weapons and certain LCMs. Pub. L.
23 No. 103-322, tit. XI, subtit. A, 108 Stat. 1796, 1996-2010 (codified as former
24 18 U.S.C. § 922(v), (w)(1) (1994).

25 The federal assault weapons ban was to expire after ten years, unless renewed
26 by Congress. Pub. L. No. 103-322, tit. XI, § 110105(2). Congress did not renew
27
28

1 the ban, and thus, by its own terms, the federal ban expired on September 13,
2 2004.¹⁵

3 **a. Banned Assault Weapons and Features**

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

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

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

23 Second, the federal assault weapons ban contained a “features test” provision
24 that generally prohibited other semiautomatic guns having two or more military-

25 ¹⁵ I understand that California prohibited assault weapons in 1989, before the
26 federal ban, but grandfathered most existing assault weapons; and that California
27 prohibited large-capacity magazines in 2000 but grandfathered existing LCMs. I
28 am not aware of any specific studies of the effects of these California laws on gun
markets or gun violence.

1 style features. Examples of such features include pistol grips on rifles, flash
2 suppressors, folding rifle stocks, threaded barrels for attaching silencers, and the
3 ability to accept detachable magazines. This “features test” of the federal ban is
4 described more fully in Table 2-2 of the *Updated Assessment of the Federal Assault*
5 *Weapons Ban* at 6, and in Table 12-1 of *America’s Experience with the Federal*
6 *Assault Weapons Ban* at 160.

7 **b. Banned Large-Capacity Magazines**

8 The federal ban also prohibited most ammunition feeding devices holding
9 more than ten rounds of ammunition (which I have referred to herein as “large-
10 capacity magazines” or “LCMs”). The federal ban on LCMs extended to LCMs or
11 similar devices that had the capacity to accept more than ten rounds of ammunition,
12 or that could be “readily restored or converted or to accept” more than ten rounds of
13 ammunition.¹⁶

14 **c. Exemptions and Limitations to the Federal Ban**

15 The 1994 federal assault weapons ban contained several important exemptions
16 that limited its potential impact, especially in the short-term. *See Updated*
17 *Assessment of the Federal Assault Weapons Ban* at 10-11.

18 First, assault weapons and LCMs manufactured before the effective date of the
19 ban were “grandfathered” in and thus legal to own and transfer. Estimates suggest
20 that there may have been upward of 1.5 million assault weapons and 25-50 million
21 LCMs thus exempted from the federal ban. Moreover, an additional 4.8 million
22 pre-ban LCMs were imported into the country from 1994 through 2000 under the
23 grandfathering exemption. Importers were also authorized to import another 42
24 million pre-ban LCMs, which may have arrived after 2000. *See Updated*

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

1 *Assessment of the Federal Assault Weapons Ban* at 10; see also *America's*
2 *Experience with the Federal Assault Weapons Ban* at 160-61.

3 Furthermore, although the 1994 law banned “copies or duplicates” of the
4 named firearms banned by make and model, federal authorities emphasized exact
5 copies in enforcing this provision. Similarly, the federal ban did not apply to a
6 semiautomatic weapon possessing only one military-style feature listed in the ban’s
7 features test provision.¹⁷ Thus, many civilian rifles patterned after military
8 weapons were legal under the ban with only slight modifications. See *Updated*
9 *Assessment of the Federal Assault Weapons Ban* at 10-11.¹⁸

10 **D. Impact of the Federal Assault Weapons Ban**

11 This section of my report discusses the empirical evidence of the impact of the
12 federal assault weapons ban. I understand that the Plaintiffs in this litigation
13 contend that California’s prohibition on the possession of LCMs will not have an
14 effect on crime or gunshot victimization because criminal users of firearms will not
15 comply with California’s ban. In my opinion, that contention misunderstands the
16 effect of possession bans. The issue is not only whether criminals will be unwilling
17 to comply with such laws, though this could be an important consideration
18 depending on the severity of penalties for possession or use. The issue is also how
19 possession bans affect the availability of weapons for offenders. Examining the

20
21 ¹⁷ It should be noted, however, that any firearms imported into the country must
22 still meet the “sporting purposes test” established under the federal Gun Control
23 Act of 1968. In 1989, the federal Bureau of Alcohol, Tobacco, Firearms and
24 Explosives (“ATF”) determined that foreign semiautomatic rifles having any one of
25 a number of named military features (including those listed in the features test of
26 the 1994 federal assault weapons ban) fail the sporting purposes test and cannot be
27 imported into the country. In 1998, the ability to accept an LCM made for a
28 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 assault weapons
ban, but not meet the sporting purposes test for imports. See *Updated Assessment*
of the Federal Assault Weapons Ban at 10 n.7.

¹⁸ 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 at 5.

1 effects of the federal ban on LCMs could cast some light on how a state or local
2 prohibition on possession of LCMs may diminish their availability for offenders. It
3 is difficult, however, to assess trends in LCM use because of limited information.
4 *See infra* at 20. For that reason, this section discusses the impacts of the federal ban
5 both on LCM use, for which information is limited, and on ownership and use of
6 assault weapons, for which there is more information.

7 **1. Assault Weapons**

8 Prior to the federal ban, the best estimates are that there were approximately
9 1.5 million privately owned assault weapons in the United States (less than 1% of
10 the total civilian gun stock). *See America's Experience with the Federal Assault*
11 *Weapons Ban* at 160-61; *see also Updated Assessment of the Federal Assault*
12 *Weapons Ban* at 10.

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

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

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

1 This analysis of local data is consistent with patterns found in the national data
2 on guns recovered by law enforcement agencies around the country and reported to
3 the ATF for investigative gun tracing.¹⁹ Specifically, although the interpretation is
4 complicated by changes in tracing practices that occurred during this time, the
5 national gun tracing data suggests that use of assault weapons in crime declined
6 with the onset of the 1994 federal assault weapons ban, as the percentage of gun
7 traces for assault weapons fell 70% between 1992-93 and 2001-02 (from 5.4% to
8 1.6%). And, notably, this downward trend did not begin until 1994, the year the
9 federal ban was enacted. *See Updated Assessment of the Federal Assault Weapons*
10 *Ban* at 2, 39-46, 51-52; *see also America's Experience with the Federal Assault*
11 *Weapons Ban* at 163.²⁰

12 In short, the analysis that my research team and I conducted indicates that the
13 criminal use of assault weapons declined after the federal assault weapons ban was
14 enacted in 1994, independently of trends in gun crime. *See Updated Assessment of*
15 *the Federal Assault Weapons Ban* at 51-52; *see also America's Experience with the*
16 *Federal Assault Weapons Ban* at 163.

17 This decline in crimes with assault weapons was due primarily to a reduction
18 in the use of assault pistols. Assessment of trends in the use of assault rifles was
19 complicated by the rarity of crimes with such rifles and by the substitution in some
20 cases of post-ban rifles that were very similar to the banned models. In general,
21 however, the decline in assault weapon use was only partially offset by substitution

22
23 ¹⁹ A gun trace is an investigation that typically tracks a gun from its manufacture to
24 its first point of sale by a licensed dealer. It is undertaken by the ATF, upon request
25 by a law enforcement agency. The trace is generally initiated when the requesting
26 law enforcement agency provides ATF with a trace request including identifying
27 information about the firearm, such as make, model and serial number. For a full
28 discussion of the use of ATF gun tracing data, see section 6.2 of *Updated*
Assessment of the Federal Assault Weapons Ban at 40-46.

²⁰ 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 at 44 n.43.

1 of post-ban assault weapon-type models. Even counting the post-ban models as
2 assault weapons, the share of crime guns that were assault weapons fell 24% to
3 60% across most of the local jurisdictions studied. Patterns in the local data
4 sources also suggested that crimes with assault weapons were becoming
5 increasingly rare as the years passed. *See Updated Assessment of the Federal*
6 *Assault Weapons Ban* at 46-52; *see also America's Experience with the Federal*
7 *Assault Weapons Ban* at 163-64.

8 Thus, while developing a national estimate of the number of assault weapons
9 crimes prevented by the federal ban is complicated by the range of estimates of
10 assault weapon use and changes therein derived from different data sources,
11 tentatively, it appears that the federal ban prevented a few thousand crimes with
12 assault weapons annually. For example, using 2% as the best estimate of the share
13 of gun crimes involving assault weapons prior to the ban, and 40% as a reasonable
14 estimate of the post-ban drop in this figure, implies that almost 2,900 murders,
15 robberies, and assaults with assault weapons were prevented in 2002. *See Updated*
16 *Assessment of the Federal Assault Weapons Ban* at 52 n.61.²¹ If this tentative
17 conclusion is correct, then contrary to Plaintiffs' contention, prohibitions like the
18 federal ban do have an impact on criminal users of guns.

19 **2. Large-Capacity Magazines**

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

23 It was possible, nonetheless, to examine trends in the use of guns with LCMs
24 in four jurisdictions: Baltimore, Milwaukee, Anchorage, and Louisville. In all four
25

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

1 jurisdictions, the overall share of crime guns equipped with LCMs rose or remained
2 steady through at least the late 1990s. This failure to reduce overall LCM use for at
3 least several years after the federal ban was likely due to the immense stock of
4 exempted pre-ban magazines, which, as noted, was enhanced by post-ban imports.
5 *See Updated Assessment of the Federal Assault Weapons Ban* at 68-79; *see also*
6 *America's Experience with the Federal Assault Weapons Ban* at 164.

7 My studies did show that crimes with LCMs may have been decreasing by the
8 early 2000s, but the available data in the four cities I investigated were too limited
9 and inconsistent to draw any clear overall conclusions in this regard. *See America's*
10 *Experience with the Federal Assault Weapons Ban* at 164; *Updated Assessment of*
11 *the Federal Assault Weapons Ban* at 68-79.

12 However, a later investigation by *The Washington Post* of LCM use in
13 Virginia, analyzing data maintained by the Virginia State Police as to guns
14 recovered in crimes by local law enforcement officers across the state, suggests that
15 the ban may have had a more substantial impact on the supply of LCMs to criminal
16 users by the time it expired in 2004. In Virginia, the share of recovered guns with
17 LCMs generally varied between 13% and 16% from 1994 through 2000 but fell to
18 9% by 2004. Following expiration of the federal ban in 2004, the share of Virginia
19 crime guns with an LCM rose to 20% by 2010. *See America's Experience with the*
20 *Federal Assault Weapons Ban* at 165.²² These data suggest that the federal ban

21 ²² The results of *The Washington Post's* original investigation (which are what are
22 conveyed in *America's Experience with the Federal Assault Weapons Ban* at 165)
23 are reported in David S. Fallis & James V. Grimaldi, *Va. Data Show Drop in*
Criminal Firepower During Assault Gun Ban, Wash. Post, Jan. 23, 2011, available
24 at [http://www.washingtonpost.com/wp-dyn/content/article/2011/01/22/](http://www.washingtonpost.com/wp-dyn/content/article/2011/01/22/AR2011012203452.html)
25 [AR2011012203452.html](http://www.washingtonpost.com/wp-dyn/content/article/2011/01/22/AR2011012203452.html), and attached as Exhibit E to this report. In early 2013,
26 *The Washington 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
28 rifles with large-capacity tubular magazines, which were not subject to the federal
ban (and which are similarly not subject to California'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
[https://www.washingtonpost.com/investigations/data-point-to-drop-in-high-](https://www.washingtonpost.com/investigations/data-point-to-drop-in-high-capacity-magazines-during-federal-gun-ban/2013/01/10/d56d3bb6-4b91-11e2-)
[capacity-magazines-during-federal-gun-ban/2013/01/10/d56d3bb6-4b91-11e2-](https://www.washingtonpost.com/investigations/data-point-to-drop-in-high-capacity-magazines-during-federal-gun-ban/2013/01/10/d56d3bb6-4b91-11e2-)
(continued...)

1 may have been reducing the use of LCMs in gun crime by the time it expired in
2 2004, and that it could have had a stronger impact had it remained in effect.

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

4 The federal ban's exemption of millions of pre-ban assault weapons and
5 LCMs meant that the effects of the law would occur only gradually—and that those
6 effects were still unfolding when the ban expired in 2004. Nevertheless, while the
7 ban did not appear to have a measurable effect on overall gun crime during the
8 limited time it was in effect, as just discussed, my studies and others do appear to
9 show a significant impact on the number of gun crimes involving assault weapons
10 and a possibly significant impact (based on *The Washington Post's* analysis of
11 Virginia data, see Fallis, *supra*, at Exhibits E & F) on those crimes involving
12 LCMs.²³

13 Moreover, as set forth in my 2013 book chapter, there is evidence that, had the
14 federal ban remained in effect longer (or were it renewed), it could conceivably
15 have yielded significant additional societal benefits as well, potentially preventing
16 hundreds of gunshot victimizations annually and producing millions of dollars of

17 (...continued)
18 a6a6-aabac85e8036_story.html?utm_term=.44aa13f8e442, and attached as Exhibit
F to this report. This updated data is reported above.

19 ²³ In our initial 1997 study on the impact of the federal assault weapons ban, Jeffrey
20 Roth and I also estimated that gun murders were about 7% lower than expected in
21 1995 (the first year after the ban), adjusting for pre-existing trends. See *Impact*
22 *Evaluation* at 6, 79-85. However, the very limited post-ban data available for that
23 study precluded a definitive judgment as to whether this drop was statistically
24 meaningful. My later findings on LCM use made it difficult to credit the ban with
25 this effect, however, and I did not update it for the 2004 report. See *Updated*
26 *Assessment of the Federal Assault Weapons Ban* at 92 n.109. Other national
27 studies of trends in gun violence have failed to find an effect of the federal ban on
28 gun murders (which is consistent with my conclusions in the 2004 report but must
also be interpreted in light of the ban's limitations and delayed effects as discussed
above), though they also suggest that the ban may have reduced fatalities and
injuries from public mass shootings. Mark Gius, *An Examination of the Effects of*
Concealed Weapons Laws and Assault Weapons Bans on State-Level Murder
Rates, 21 Applied Econ. Letters 265, 265-267 (Nov. 26, 2013) (hereinafter, "Gius
2013"); Mark Gius, *The Impact of State and Federal Assault Weapons Bans on*
Public Mass Shootings, 22 Applied Econ. Letters 281, 281-84 (Aug. 1, 2014)
(hereinafter, "Gius 2014").

1 cost savings per year in medical care alone. Indeed, reducing shootings by even a
2 very small margin could produce substantial long term savings for society,
3 especially as the shootings prevented accrue over many years. *See America's*
4 *Experience with the Federal Assault Weapons Ban* at 166-67; *see also Updated*
5 *Assessment of the Federal Assault Weapons Ban* at 100 n.118. Some studies have
6 shown that the lifetime medical costs for gunshot injuries are about \$28,894
7 (adjusted for inflation). Thus, even a 1% reduction in gunshot victimizations at the
8 national level would result in roughly \$18,781,100 in lifetime medical costs savings
9 from the shootings prevented each year. *See America's Experience with the*
10 *Federal Assault Weapons Ban* at 166-67; *see also Updated Assessment of the*
11 *Federal Assault Weapons Ban* at 100 n.18.

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

20 **E. More Recent Research on Criminal Use of Large Capacity**
21 **Magazines**

22 To provide an updated examination of the assault weapons and LCM issue,
23 my colleagues and I recently investigated current levels of criminal activity with
24 assault weapons and other high capacity semiautomatic firearms in the United
25 States using several local and national data sources.²⁴ I focus here on the results
26 pertaining to the use of guns with LCMs overall. Sources for this portion of the

27 ²⁴ See Koper et al., *supra* note 5.
28

1 analysis included guns recovered by police in eight large cities (Hartford, CT;
2 Syracuse, NY; Baltimore, MD; Richmond, VA; Minneapolis, MN; Milwaukee, WI;
3 Kansas City, MO; and Seattle, WA), guns used in murders of police throughout the
4 nation, and guns used in firearm mass murder incidents in which at least four
5 people were murdered with a firearm (irrespective of the number of additional
6 victims shot but not killed). The use of guns with LCMs was measured precisely
7 for the Syracuse, Baltimore, and Richmond analyses, which were based on data
8 sources having an indicator for magazine capacity, and some of the mass murder
9 incidents. For other analyses, use of guns with LCMs was approximated based on
10 recoveries of semiautomatic firearm models that are commonly manufactured and
11 sold with LCMs. I refer to these guns collectively as LCM firearms.

12 In short, the findings of this study reinforce many of the points made above
13 based on my earlier research. In the police databases, which covered varying time
14 periods from 2008 through 2014, LCM firearms generally accounted for 22-36% of
15 crime guns, with some estimates upwards of 40% for cases involving shootings.²⁵
16 Although these estimates may overstate LCM use somewhat (since some estimates
17 were based on measurement of LCM compatible firearms that may not all have
18 been equipped with LCMs), they suggest that LCMs are used in a substantial share
19 of gun crimes. Consistent with prior research, we also found that LCM firearms are
20 more heavily represented among guns used in murders of police and mass murders.
21 For the period of 2009 through 2013, LCM firearms constituted 41% of guns used
22 in murders of police, with annual estimates ranging from 35% to 48%. Further, our
23 analysis of a sample of 145 mass murders that occurred from 2009 through 2015
24 suggested that LCM firearms were involved in as many as 57% of these incidents

25 ²⁵ An exception is that crime guns were least likely to be equipped with LCMs in
26 Syracuse (14.6%). This may be attributable to New York State LCM restrictions
27 that have been in effect since the early 2000s, but our study did not address this
28 question.

1 based on cases for which a definitive determination could be made (as a caveat,
2 precise data on the guns and magazines used were not available for most cases).
3 The identified LCM cases typically occurred in public locations (80%) and resulted
4 in more than twice as many people shot on average as did other incidents—a
5 statistically significant difference that is not likely due to chance (13.7 victims on
6 average for LCM cases versus 5.2 for other cases).

7 Our study also revealed that LCM firearms have grown substantially as a share
8 of guns used in crime since the expiration of the federal LCM ban. This conclusion
9 is based on guns used in murders of police nationally (2003-2013) as well as guns
10 recovered by police in Baltimore (2004-2014), Richmond (2003-2009), and
11 Minneapolis (2006-2014).²⁶ For these data sources and time frames, the percentage
12 of guns that were LCM firearms increased (in relative terms) by 33-49% in the
13 Baltimore, Minneapolis, and national data, and by 112% in the Richmond data.²⁷

14 This upward trend in criminal use of LCM firearms implies possible increases
15 in the level of gunfire and injury per gun attack since the expiration of the federal
16 LCM ban. Consistent with this inference, national data that we compiled from the
17 federal Centers for Disease Control and Prevention and the Federal Bureau of
18 Investigation show that gun homicides and assault-related non-fatal shootings rose
19 by about 29% relative to the level of overall reported violent gun crimes
20 (homicides, assaults, and robberies) between 2003-2005 and 2010-2012.²⁸

21
22 ²⁶ Note that Maryland restricted LCMs with more than 20 rounds throughout this
period and extended these restrictions to LCMs with more than 10 rounds in 2013.

23 ²⁷ For example, the share of guns used in police murders that were LCM firearms
24 rose from 30.4% for the 2003-2007 period to 40.6% for the 2009-2013 period (a
relative increase of 33.6%). In the Richmond data, LCM firearms increased from
25 10.4% of guns recovered by police for the 2003-2004 period to 22% for the 2008-
2009 period (a relative increase of 111.5%).

26 ²⁸ See Koper et al., *supra* note 5. This trend was driven by assault-weapon-related
27 non-fatal shootings, which have been trending upward since the early 2000s and
recently reached their highest rates since 1995. See Katherine A. Fowler et al.,
28 *Firearm Injuries in the United States*, 79 Preventive Med. 5, 5-14 (Oct. 2015).

1 Although the correlation of these trends does not prove causation, they suggest the
2 possibility that greater use of LCM firearms has contributed to higher levels of
3 shootings in recent years.

4 **VI. SECTION 32310 -- CALIFORNIA'S LARGE-CAPACITY MAGAZINE**
5 **PROHIBITION**

6 **A. The LCM Ban**

7 On July 1, 2016, the State of California enacted Senate Bill No. 1446 (2015-
8 2016 Reg. Sess.), which prohibited the possession of LCMs (defined under Section
9 16740 as "a feeding device with the capacity to accept more than 10 rounds")
10 beginning on July 1, 2017. Cal. Stats. 2016, ch. 58 (SB 1446) § 1. SB 1446, which
11 went into effect on January 1, 2017, amended Section 32310 to state that, beginning
12 on July 1, 2017, any person possessing an LCM, with exemptions not relevant here,
13 would be guilty of an infraction punishable by a fine starting at \$100 for the first
14 offense. Cal. Stats. 2016, ch. 58 (S.B. 1446) § 1 (amending Section 32310 to add a
15 new subdivision (c)). The law also provided that anyone possessing an LCM may,
16 prior to July 1, 2017, dispose of the magazine by any of the following means: (1)
17 removing it from the state; (1) selling it to a licensed firearms dealer; (3) destroying
18 it; or (4) surrendering it to a law enforcement agency for destruction. Cal. Stats.
19 2016, ch. 58 (S.B. 1446) § 1 (amending Section 32310 to add a new subdivision
20 (d)). The Senate Bill Analysis noted that the amendments were necessary because
21 the prior version of the law, which did not prohibition possession of LCMs, was
22 "very difficult to enforce." Sen. Bill No. 1446, 3d reading Mar. 28, 2016 (2015-
23 2016 Reg. Sess.) (Cal. 2016)).

24 On November 8, 2016, California voters passed Proposition 63, the "Safety for
25 All Act of 2016." Prop. 63, § 1, as approved by voters (Gen. Elec. Nov. 8, 2016)).
26 The measure included several provisions—including amendments to Section
27 32310—intended to close "loopholes that leave communities throughout the state
28 vulnerable to gun violence and mass shootings." Prop. 63, § 2, ¶ 5. The

1 amendments to Section 32310 largely mirror the same amendments made under
2 SB 1446. Both provisions prohibit the possession of LCMs on or after July 1,
3 2017, and list options for the disposal of LCMs before that date. Prop. 63 also
4 increased the potential consequence for violations of the possession ban, from an
5 infraction to an infraction or a misdemeanor. Prop. 63, § 6.1. References to
6 Section 32310 in this brief are to the statute as amended by Proposition 63.

7 **B. The Potential Impact and Efficacy of California's Ban on**
8 **Possession of LCMs**

9 California's ban on possession was only recently passed, and I have not
10 undertaken any study or analysis of this law. Nevertheless, it is my considered
11 opinion that, based on the similarities of Section 32310 to the federal ban, the
12 impacts of the federal ban and the ways in which Section 32310 address some of
13 the weaknesses of the federal ban, Section 32310 is likely to advance California's
14 interest in protecting public safety.²⁹

15
16 ²⁹ A few studies of state-level assault weapon and LCM bans have examined the
17 effects of these laws on gun violence and other crimes. In those studies that have
18 examined gun homicides and other shootings (the crimes that are logically most
19 likely to be affected by LCM bans), evidence has been mixed. Although states with
20 assault weapon and LCM laws tend to have lower gun murder rates, this association
21 is not statistically significant when controlling for other social and policy factors.
22 However, other evidence from these studies suggests these laws may produce
23 statistically significant reductions in fatalities from public mass shootings. See
24 Gius 2013 at 265-67; see also Gius 2014 at 281-84; Eric W. Fleegler et al., *Firearm*
25 *legislation and firearm-related fatalities in the United States*, 173 JAMA Internal
26 Med. 732, 732-40 (2013); Christopher S. Koper & Jeffrey A. Roth, *The Impact of*
27 *the 1994 Federal Assault Weapon Ban on Gun Violence Outcomes: an Assessment*
28 *of Multiple Outcome Measures and Some Lessons for Policy Evaluation*, 17 Journal
of Quantitative Criminology 33-74 (2001); see also *Updated Assessment of the*
Federal Assault Weapons Ban at 81 n.95. Nonetheless, it is difficult to draw
definitive conclusions from these studies for several reasons including the
following. For one, there is little evidence on how state LCM bans affect the
availability and use of LCMs over time. Further, studies have not generally
accounted for important differences in state assault weapons laws—most notably,
whether they include LCM bans—and changes in these provisions over time.
Perhaps most importantly, to the best of my knowledge, there have not been any
studies examining the effects of LCM laws that ban LCMs without grandfathering,
as done by the new California statute. Hence, these studies have limited value in
assessing the potential effectiveness of California's new law.

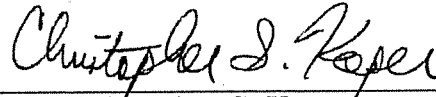
1 California's LCM ban is more robust than the expired federal ban, and may be
2 more effective more quickly due to its elimination of grandfathering for previously
3 owned LCMs. While the LCM ban was arguably the most important feature of the
4 1994 federal ban (given that LCMs are the key feature contributing to an assault
5 weapon's firepower, and that the reach of the LCM ban was much greater than the
6 assault weapons ban as many semiautomatic guns that were not banned could still
7 accept LCMs), my studies as to the effects of the federal ban indicated that the
8 LCM ban was likely not as efficacious in reducing the use of these magazines in
9 crime as it otherwise might have been because of the large number of pre-ban
10 LCMs which were exempted from the ban. *The Washington Post's* investigation of
11 recovered guns with LCMs in Virginia, which showed an increasing decline in the
12 number of recovered guns with LCMs the longer the ban was in effect, similarly
13 suggests that the grandfathering of pre-ban LCMs delayed the full impact of the
14 federal ban. See Fallis, *supra*, attached as Exhs. E & F. In my opinion, eliminating
15 the grandfathering of pre-ban LCMs, as done by California's new law, would have
16 improved the efficacy of the federal ban.

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

24 Through Section 32310 (c) and (d), California has enacted a ban on the
25 possession of LCMs. Like federal restrictions on fully automatic weapons and
26 armor piercing ammunition, I believe this measure has the potential to help prevent
27 the use and spread of particularly dangerous weaponry, and is a reasonable and
28

1 well-constructed measure that is likely to advance California's interest in protecting
2 its citizens and its police force.

3 Respectfully Submitted,

4 
5

6 Dr. Christopher S. Koper
7 October 5, 2017
8 Ashburn, Virginia
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