

HFG RESEARCH AND POLICY IN BRIEF

# Mass Shootings Causes and Prevention

MARK OBBIE

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## Introduction

Since 1966, the United States has experienced nearly three dozen high-fatality rampage shootings in public places, a phenomenon that has gained momentum and notoriety over the past decade. In this half-century span, several hundred “mass shootings,” by nearly any definition, have occurred. The most alarming of these — high-casualty attacks on random strangers in public places — have sparked a recurring policy debate in which political adversaries resort to familiar talking points, fueled by ideology rather than science, about what engenders and what can prevent such violence.

In April of 2019, Daniel Nagin, former editor of *Criminology & Public Policy*, and the current editors, Christopher Koper and Cynthia Lum, helmed a workshop at the Center for Evidence-Based Crime Policy at George Mason University, funded by the National Science Foundation, to prepare a set of papers for that journal that would review the leading research on the causes of these mass-violence incidents and policies to prevent them. A congressional briefing, supported by NSF and The Harry Frank Guggenheim Foundation, followed in September. The polished papers, by scholars in criminology and a wide range of other fields – public policy, law, public health, psychiatry and psychology, emergency medicine, epidemiology, geography, and data science – were published in February 2020 in a special issue of *C&PP*, “Countering Mass Violence in the United States,” edited by Nagin, Koper, and Lum. Sixteen articles by 40 researchers addressed what the editors called “one of the most alarming and defining crime issues of the twenty-first century.”

This *HFG Research and Policy in Brief* reviews those conclusions on the nature of the problem and the evidence-informed solutions that could prevent such incidents, reduce their frequency, or at least minimize their casualties.

The findings are grouped into five categories of “the most urgent and actionable” policy recommendations — following the typology formulated by Nagin, Koper, and Lum. The measures range from firearm regulations to threat assessments and from emergency medical responses to a system of tracking relevant data.

First, it’s necessary to define terms. As Nagin, Koper, and Lum note, “mass violence takes many forms — family massacres, terrorist attacks, shootings related to other crimes (like robbery), gang violence, and other incidents in which offenders attack targeted individuals and/or random strangers.”

The studies they rely upon for their policy recommendations, like the broader universe of scholarship, media reports, and both government and private efforts to track mass violence incidents, do not share a common definition, or even a common nomenclature. There are valid arguments for this cacophony. Lin Huff-Corzine and Jay Corzine, who lay out a plan for more comprehensive data collection in part 5 below, argue in their paper that “imposing a standard definition for mass violence at this time would be counterproductive and may stifle research and associated policy implications.” But imprecision

can lead to confusion over what types of violence are on the rise, or not, and exactly which problem a given policy is aimed at.

The key elements of the FBI's definition of an "active shooter incident" include any "mass killing" (four or more deaths not including the shooter) in a public place that is not part of another criminal act. Researchers often apply these criteria when referring to "mass public shootings" (or "high-fatality mass public shootings," those with eight or more victims) – shooting sprees aimed at strangers who happen to be at the wrong place at the wrong time.

But any of these criteria can be adjusted to mean different things and to yield very different incident counts. A "mass shooting" could mean an incident with mainly nonfatal casualties, a domestic-violence incident in a private home, a workplace shooting, or a crime with other motives mixed in (robbery, hostage-taking, gang and drug violence, political terrorism).

For their part, Nagin, Koper, and Lum avoid committing to a precise definition when crafting their policy recommendations, specifying only that they are most concerned with "the phenomenon of indiscriminate mass public violence, often directed at strangers," because that generally describes the violence "that has generated the most public alarm in recent years."

That alarm, Grant Duwe notes in "Patterns and Prevalence of Lethal Mass Violence," stems in part from the public's ability to relate to the victims more readily. Unlike in family murders or "felony-related massacres," Duwe writes, the victims of random public attacks not only are killed or wounded in much greater numbers but also symbolize "a morality play involving pure, innocent victims and offenders who seemingly went 'berserk' in a public setting."

Duwe counted 845 mass shootings in the U.S. from 1976 to 2018: any gun homicides in which four or more died, regardless of location or circumstance. The most frightening cases — public shootings — constituted fewer than one in five of that total: 158 incidents, or an average of 3.7 per year. But, while overall mass shootings have declined in frequency from their high point 20 years ago, mass public shootings have increased over the last decade. Adam Lankford and James Silver pinpoint 2010 as an "inflection point" for "high-fatality attacks" (at least eight fatalities), with the average number of victims killed per incident growing 47 percent since then. Between 1966 and 2019, 34 incidents meet their "high-fatality" threshold.

Policy recommendations depend, of course, on the nature and severity of the problem. The 16 articles listed on page 11 cover a broad range of problems related to mass violence. But around the narrower question of mass public shootings, research suggests five policy areas that offer the greatest promise for prevention or mitigation: regulating high-capacity guns, restricting access to guns by high-risk people, creating effective early-warning systems, taking steps that could reduce fatalities and casualties overall, and establishing more robust data-collection system.

## 1. Restricting the Growth of High-Capacity Firearms

It is “no surprise,” Lankford and Silver conclude, “that attackers who want to kill large numbers of victims often increase their lethality by arming themselves with a semi-automatic rifle or assault weapon and/or obtaining multiple firearms.” They note that this motive, in which shooters “view body counts as a competition,” is not universal but is common enough to have resulted in horrific casualties in recent years. “Not all public mass shooters with powerful weapons seem to care about producing high death tolls,” they conclude, “but public mass shooters who want to produce high death tolls seem to care about having powerful weapons.”

That reality often prompts calls for banning the sale of assault-style weapons: semi-automatic guns, usually rifles, with detachable magazines and other features typical of military weapons. Nine states have taken this step, and it was enacted in federal law in 1994 but allowed to expire in 2004.

Fatalities are about two-thirds greater when large-capacity magazines are used, and the total casualty counts (including wounded) are two- to three-times higher with LCMs.

But the authors of two papers argue that the strongest evidence favors restrictions on large-capacity ammunition magazines (LCMs) rather than on the rifles themselves. According to Koper, the research consensus is that fatalities are about two-thirds greater when LCMs are used, and the total casualty counts (including wounded) are two- to three-times higher with LCMs. The best estimates, he writes, are that deaths and injuries in public mass shootings would decline by between one-third and one-half with LCM restrictions. Likewise, Daniel Webster and colleagues conclude from the available evidence that LCM bans are among the most effective laws at reducing the numbers of mass shooting incidents and their fatalities. “We found that LCM bans were associated with significant reductions in the incidence of fatal mass shootings but that bans on assault weapons had no clear effects on either the incidence of mass shootings or on the incidence of victim fatalities from mass shootings.”

Koper cautions that more research is needed to avoid overstating the likely outcomes, and that LCM policies — while not a cure-all for mass shootings — represent “modest” potential to reduce the numbers of mass shootings and their severity “over time.”

The editors' conclusion: restrictions on large-capacity magazines constitute “the most important” line of attack on military-style weapons associated with mass shootings. They recommend limiting magazines to 10 rounds, with a ban on existing inventory or at least requiring registration as a means of restricting further legal sales, along with bans on bump stocks and trigger cranks — devices that cause semi-automatics to approximate the rapid fire of fully automatic machine guns.

## 2. Keeping Guns Away from Dangerous People

Reactions to mass shootings often revolve around competing policy prescriptions: from the political left, assault weapon bans and expanded background checks; from the right and gun-rights advocates, “right to carry” laws that relax restrictions on concealed carrying of handguns. These policies, the Webster team found, “do not seem to be associated” with an effect on the number of fatal mass shootings. But from their study of 604 such shootings from 1984 to 2017 and those shootings' relationship to changes in state gun laws, the researchers concluded that, in contrast, laws requiring licenses to purchase guns do rest on solid evidence of effectiveness. Such laws, the study found, “are likely to reduce overall firearm availability within a state as well as reduce firearm availability to high-risk individuals.” They continue: “This study provides evidence that firearm purchaser or ownership licensing with fingerprinting reduce the risk of fatal mass shootings in addition to firearm homicides more broadly.”

In mass shootings between 2014 and 2017, more than one-third of shooters were prohibited from owning guns because of felony or domestic violence convictions.

They caution that there have been no rigorous studies on licensing's specific effects on mass shooting incidents. They also noted that their study excluded some states because of problems with data provided to the FBI. But other research does connect a substantial percentage of mass shooters to the weaknesses in a different category of gun-access restrictions. In their review of mass shootings between 2014 and 2017, April Zeoli and Jennifer Paruk found more than one-third of shooters were prohibited from owning guns because of felony or domestic violence convictions — many of whom escaped detection thanks to “exit points” in the screening process. Their study, which focused on domestic violence histories among mass shooters, noted the prevalence of family murders among mass shootings and research showing how the presence of guns increases the risk of homicide in domestic violence incidents.

Four things must happen, Zeoli and Paruk say, to prevent domestic abusers from turning to mass murder: Domestic violence is reported to police and charges are filed or is the subject of a restraining order petition; charges result in conviction or a restraining order is granted; the case qualifies for firearm restrictions under federal or state law; and those restrictions are enforced. “Our results show that mass shooters with histories of domestic violence exited this pathway at several points during these four stages,” they write. “These exit points represent opportunities for possibly preventing mass shootings.”

Nearly 80 percent of mass shooters in 2017 and 2018 made explicit threats or gave other indications of intent to carry out an attack.

Extreme-risk protection orders — popularly known as “red flag laws” — are another potential solution that has been inspired by missed opportunities to intervene before a mass shooting. In their study of California’s program of identifying and targeting high-risk firearm owners to prevent violence of all types, Hannah Laqueur and Garen Wintemute cite the U.S. Secret Service’s National Threat Assessment Center finding that nearly 80 percent of mass shooters in 2017 and 2018 made explicit threats or gave other indications of intent to carry out an attack. While there have been, to date, no “systematic, controlled data on the effectiveness of GVROs (gun violence restraining orders) in preventing mass shootings,” the researchers observe, a randomized study is underway to test the effectiveness of California’s Armed and Prohibited Persons program, a systematic approach to confiscating weapons from gun owners prohibited from possessing them. That approach, they conclude, could improve detection of stockpiling of guns and ammunition by would-be mass shooters. They note, for example, that the Orlando nightclub shooter who killed 49 people and wounded 53 had opened six new credit card accounts in the eight months before his 2016 attack and spent close to \$20,000 on weapons and ammunition in the 12 days leading to the attack.

Nagin, Koper, and Lum recommend using extreme risk protection orders to disarm dangerous people and enabling a longer list of interested parties to request such orders; a universal background check system that is tied to a system of licensing and permits for gun ownership; tighter restrictions on the gun rights of convicted domestic violence offenders; stronger enforcement of gun bans for people prohibited from possessing guns; and closer monitoring of high-volume purchases of guns and ammunition.

### 3. Better Early-Warning Systems

Before dangerous people's access to weapons can be restricted, we must be better able to spot who is dangerous. To inform these recommendations, a number of researchers focus on the characteristics of mass shooters, the tendency toward "leakage" of their often-elaborate attack plans, tools to assess threats in comprehensive ways, and mental illness as a factor.

Since 2010, shooters have shown "a clear increase in fame- and attention-seeking motives," Lankford and Silver write. One certain way to achieve notoriety is by running up body counts. A common aspiration among mass shooters, before and after their attacks, is their quest to be known for how many victims they left behind and an implicit or explicit competition with other mass shooters, phenomena that have grown alongside the variety and ubiquity of media platforms.

A qualitative study of ten mass shooters by Peter Langman, across a variety of attacks, does not provide a representative sample from which confident generalizations can be drawn. But, he writes, the patterns can be significant. He cites "identity issues" rooted in insecurity about body image, psychology (psychoses and trauma reactions), and social failures as among the potential violence triggers, and as potential points of intervention. "They were people who felt severely damaged, presumably to the point of shame — not for something they had done but for who they were," Langman observes. "They responded to their sense of personal insignificance by seeking to make themselves powerful, famous, and/or heroes." Several of them shared a fascination with Nazi and hypermasculine imagery and had developed extreme hatred of women and themselves over their failed love lives.

To Duwe, an important common thread is mental illness. His study of mass shooters since 1976 found that more than 60 percent had been shown to be seriously mentally ill and often suicidal, and at least 37 percent had made some sort of violent threat.

However, Jennifer Skeem and Edward Mulvey caution, that does not prove a causal link. They found that the mere association between violence and mental illness, much less evidence of a causal connection, is "weaker than the public imagines or the media portrays." While most mass shooters do fall somewhere on the spectrum of mental illness, defined broadly, that's merely a testament to how common mental illness is. Making assumptions about causation, based on informal hunches and piecemeal reports, "would pathologize millions" who would not turn violent. It also would fail to pinpoint the truly dangerous among us.

When those with mental illness commit violence, it is usually for the same reasons as do people without mental illness: demographics (young males), histories of emotional and physical trauma, substance abuse, and poor anger and impulse controls. "Mass violence is caused by multiple social, situational, and psychological factors that interact with one another in complex ways that are poorly understood

and difficult to predict in advance,” Skeem and Mulvey state. With “little empirical guidance,” we need more research and more training of mental health care professionals to get better at risk assessment, they conclude.

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On that last point, many of the researchers agree. There’s extensive evidence that threat assessments — the systematic identification of threats, weighing which ones are critical, and managing potential shooters off their “pathway to violence” — are effective in preventing mass shootings, Silver reports in his review of this research. Not enough study has been made of foiled attacks. But it is clear, he says, what can foil an effective threat-assessment strategy: lack of universal adoption and bystanders’ reluctance to report potential attacks. On the latter point, “social norms strategies,” intended to promote the belief that coming forward is widely practiced by others, have been shown to convince potential tipsters that coming forward is safe and necessary.

Dewey Cornell, focusing mainly on school shootings, agrees that properly conducted threat assessments offer an alternative to costly school security measures or punitive approaches to ordinary youthful behavior that capture too many students in their net. He argues that threat assessments are a public health approach that does less harm while doing good. “Even if an individual is not actively planning or preparing to carry out an attack, an effort to address the underlying conflict or problem can prevent the situation from escalating. The provision of threat assessment services can have a preventive effect even if it is not possible to predict which individuals might have carried out a threat.” One promising model comes from the University of Virginia’s system of responding in a “layered” approach, starting with counseling and reserving punitive responses for only “the most serious and tangible threats.”

Another approach, discussed by Joshua Freilich, Steven Chermak, and Brent Klein, is “situational crime prevention.” It seeks to neutralize the situations that present opportunities to mass shooters. Through “hard” or “soft” interventions — making an attack physically impossible, say, or removing provocations that trigger thoughts of attack — this approach borrows from anti-terrorism strategies but without as much emphasis on attacks targeting iconic places. Most mass shooters, they found, seek a crowded, accessible place chosen on the basis of glory-seeking or other personal issues rather than its political or symbolic significance.

Lankford and Silver's study of perpetrators' motives and methods suggests eliminating a specific category of provocative stimuli. Noting growing calls to deny shooters the notoriety they crave, they challenge news media to severely curtail publishing names and photos of the shooters and announce those intentions loudly. "If this approach is implemented nationwide, it could result in deterring a substantial proportion of fame- and attention-seekers from committing public mass shootings, while removing the incentive for them to kill large numbers of victims to forge a legacy."

Because the most feared sorts of mass shootings are rare, relative to crimes of violence overall, and the various forms they take can spring from widely differing risk factors, they are difficult to predict and to study systematically. Richard Berk and Susan Sorenson contend that this challenge calls for new predictive tools. They have developed one such instrument based on another relatively rare form of violence — "very high risk" intimate partner violence (meaning, repeat offenses inflicting injury or death). Using data from a metropolitan police department, Berk and Sorenson developed a statistical analysis with three machine-learning algorithms to predict who would inflict serious injury on an intimate partner. Though theoretical and "highly provisional," they suggest their novel approach could point the way toward new ways to forecast mass violence.

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This approach, they argue, can solve the needle-in-a-haystack problem of predicting particular incidents of mass violence. Take school shootings, for example. Using 2018 data, the likelihood that any specific school would be targeted was infinitesimal, with a probability of .00017. "It is hard to imagine that any forecasting procedure with risk factors could do better," Berk and Sorenson write. "If one proceeded nevertheless with standard statistical tools, it is likely that no useful risk factors would be identified." So why bother? "The answer lies in the costs of mass violence. Although mass violence is rare, it can have devastating consequences."

Nagin, Koper, and Lum recommend strengthening threat-detection systems by encouraging reporting to authorities and better training of those screening the reports; better monitoring of social media

(“a government-funded crash program to develop such monitoring technology” to ease reliance on surveillance by humans); and developing better threat-assessment techniques to sort genuine threats from the “large numbers of angry, frustrated, and/or mentally ill people” who never take steps to act on their words.

## 4. Reducing Fatalities When Threats Are Carried Out

The 2017 mass shooting at a concert in Las Vegas, in which 59 were killed and more than 400 wounded, posed “one of the most profound tests” of a local medical and law enforcement system in history. But less notorious mass shootings are unfortunately commonplace enough in everyday street violence that much is already known about saving the lives of severely injured gunshot victims, Paul Reeping and his co-authors observe. Their survey of 65 articles since 1999 on rapid-response protocols for emergency medical professionals and other first responders yielded a set of practices aimed at improving the odds of survival. These include training exercises for hospitals and EMS personnel to respond more effectively in chaotic circumstances, rapid transport of the wounded to hospitals with advanced trauma-care capabilities, improved active-shooter tactics for police, and quicker means of stanching hemorrhages by equipping and training more first responders in the use of tourniquets. Based on the best available evidence, they recommend “large-scale trainings” in hemorrhage control, “integrated command centers” at shooting scenes, bringing EMS crews into dangerous scenes sooner, and improving communications between personnel in the field and hospitals about impending rushes of victims.

Freilich, Chermak, and Klein note that because of the Boston Marathon bombing, police in Las Vegas already had a large supply of tourniquets in their police cars but still ran out because of the unprecedented number of victims. They also recommend drills to teach office building occupants how to escape.

In their recommendations, Nagin, Koper, and Lum emphasize learning from detailed data on past mass shootings, speeding up medical treatment, and training more people in emergency first aid, including hemorrhage-control training for law enforcement and school personnel. Speedy treatment also requires, they note, “that law enforcement neutralizes the shooter(s) by whatever means necessary as quickly as possible.” In addition, trauma-center medical personnel and first responders “should routinely drill” on responding to mass shootings and more police should be trained to transport victims to hospitals when that is quicker than waiting for ambulances (a response called “scoop and run”).

## 5. Better Tracking of Mass Violence

In cataloging the muddle of mass-violence definitions and their overlapping and competing sources, Duwe finds that news accounts tend to be more detailed and accurate than limited and problematic FBI data. But inconsistencies in terminology and news judgments also limit the accuracy and completeness of news data, he notes, citing gaps in popular databases maintained by *Mother Jones* magazine and the Gun Violence Archive (<https://www.gunviolencearchive.org/>).

As for the government's role as a hub of data tracking, Huff-Corzine and Corzine note that the FBI's Uniform Crime Report's Supplementary Homicide Reports track incidents by numbers of dead, victim-offender relationship, and weapon used, but not by location and details of the situation. These gaps and more could be filled by the next-generation crime data effort by the Department of Justice, the National Incident-Based Reporting System (NIBRS), which is scheduled for completion in 2021 but still only collects data from fewer than half of law enforcement agencies. NIBRS will track location, injured victims, foiled attempts, motives, arrests, and all crimes charged (not just the lead charge, which is currently the practice). When complete, with more comprehensive data on any incident with at least two victims, "mapping mass violence, especially mass murder, and statistically analyzing the maps could lead to a more comprehensive understanding of these murders," Huff-Corzine and Corzine suggest.

Researchers' ideal data set, they conclude, would include incidents in which

- two or more victims were killed in a private/family event;
- three or more victims were killed in a public mass violence event;
- three or four persons were injured;

and each entry would include

- any history of an offender's mental illness, criminal record, or record of domestic violence;
- all weapons used to injure or kill victims.

Another kind of data is the focus of Arie Croitoru and his collaborators, who examine the relationship between news coverage and the public response to public mass shootings. Studying five such shootings in a nine-month span in 2017-2018, they look at how the public seeks information online, how the media cover such incidents, and how the incidents are then discussed on Twitter. Noting that victims' activism after the Parkland, Florida, school shooting sustained interest in that incident for a longer-than-typical interval, the researchers write that across the other incidents, "the public's interest in mass shooting events can vary considerably, from a loss of interest shortly after an event to renewed reoccurring interest in the months afterward." This, in turn, affects the policy debate.

Nagin, Koper, and Lum echo the spirit of the Huff-Corzine and Corzine work in their call for the Bureau of Justice Statistics at the U.S. Department of Justice to track more data — on victims, weapons, circumstances, and shooters — to inform better research on what works to prevent mass shootings. (After the publication of this special issue of *Criminology & Public Policy*, the National Institute of Justice, the research arm of the U.S. Department of Justice, on April 6, 2020, published the findings of its staff’s systematic review of mass-shootings research — 44 studies from 1997 through 2016 — and recommended development of a uniform definition of mass shootings and comprehensive databases of facts essential to understanding them. See Lopez, Crimmins, and Haskins 2020.)

## Conclusion

The key policy recommendations from this compendium of research, informed by hundreds of studies, boil down to this list:

- 1. Ban large-capacity ammunition magazines**

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- 2. Ban bump stocks and trigger cranks**

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- 3. Expand the use of extreme-risk protection orders (red flag laws)**

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- 4. Enact a universal background check system tied to licensing and permits for gun ownership**

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- 5. Tighten restrictions on gun rights of convicted domestic violence offenders**

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- 6. Strengthen enforcement of gun bans for people prohibited by law from possessing guns**

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- 7. Tighten monitoring of gun and ammunition stockpiling**

- 8. Improve detection of “leaked” attack plans by encouraging tips and expanding social-media monitoring**

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- 9. Strengthen systems to assess and respond to genuine threats**

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- 10. Improve emergency responses to mass shootings by improving study of past shootings**

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- 11. Speed up medical treatment of wounded**

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- 12. Train more people in emergency first aid, including hemorrhage control**

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- 13. Institute regular practice, by emergency responders and medical personnel, in responding to mass shootings**

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- 14. Train more police to transport shooting victims to trauma centers**

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- 15. Develop an official, national data system to track mass shootings more comprehensively**

The last point ties into the overarching purpose of all of the research discussed here: to learn more about this problem in order to prevent more shootings and mitigate the harm from those that do occur. “There are many important areas of research and policy development underway on this topic,” Nagin, Koper, and Lum observe. “Our recommendations, however, reflect issues that we believe are most urgent and actionable based on the evidence available at this time.”

They hope that better data will yield additional insights that save lives and improve safety. But much is already known. “There is no easy solution or quick fix for these horrific events. Mass shootings have plagued our country, and they will continue to do so for the foreseeable future. There are, however, measures that we can take to limit the harm and damage caused by these violent incidents as well as to prevent some shootings from ever taking place.”

**Mark Obbie** is a freelance [journalist](#) whose work focusing on violent crime and other aspects of criminal justice policy has been published at *The Atlantic*, *Longreads*, *The New York Times*, and *Slate*. He is the criminal justice specialist at [Solutions Journalism Network](#), the former executive editor of *The American Lawyer*, and a former associate professor of magazine journalism at Syracuse University's S.I. Newhouse School of Public Communications.

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An aerial, high-angle photograph of a busy city street. The image is slightly blurred, showing a mix of cars and pedestrians. A dark blue car is prominent in the upper center, and a white car is in the lower left. Pedestrians are scattered across the sidewalk and crosswalks. The overall scene conveys a sense of urban activity and movement.

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