BUYING THE RIGHT TO HARM

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ABSTRACT

Looking to curb potential liability and comply with regulatory standards, many large-scale injurers offer nearby residents to purchase their property and help them relocate to safer areas. Because the relocation of potential victims reduces the risk of harm and saves litigation costs, buyouts have been viewed favorably by commentators and have been supported by state and government agencies. In contrast to this favorable perception of buyouts, this Article shows that buyouts may be used by injurers to exploit victims and reduce social welfare. When injurers' activities are subject to cost-benefit standards, buying out potential victims may enable injurers to avoid taking socially desirable precautions. We show that injurers could increase their profits—and further reduce social welfare—by adopting a divide-and-conquer strategy and by fostering competition among victims. The Article concludes by considering ways for identifying and preventing exploitative buyouts.

I. INTRODUCTION

Since their emergence in the 1970s, "buyout" agreements between injurers and victims have become a common practice in the United States.[1]

1. Dian Cappiello & Dan Feldstein, *In the Buffer Zone,* HOUS. CHRON., Jan. 20, 2005, at A1 (describing the widespread use of buyout programs by large-scale injurers in the United States); Joe Mathews, *Chemical Plant to Help Move Neighborhood: Condea Vista Offers Funds to Relocate Wagner's Pt. Residents*, BALT. SUN, Nov. 26, 1998, at 1B ("Buyouts and relocations of neighborhoods and towns near petrochemical plants have become . . . common . . . ."); Keith Schneider, *Chemical Plants Buy Up Neighbors for Safety Zone*, N.Y. TIMES, Nov. 28, 1990, at A1 (quoting a consultant stating that buyouts are a "new trend in the chemical and oil industries"); Lolly Bowean, *Marathon, Cargill Plants Offer to Buy Out Homes*, TIMES PICAYUNE (May 4, 2004), http://waltzerwiygul.com/wp-

Under these agreements, injurers purchase the property of potential victims and help them relocate, thereby reducing the risk of causing harm. Oil giants such as Exxon Mobile, Shell Oil, Citgo, and Marathon Petroleum, for example, now regularly offer to purchase the land and houses of residents who live adjacent to their facilities.[2] Other large scale injurers, such as airports, factories, mining, and utility companies, similarly propose to buy properties of nearby residents to reduce their potential liability.[3]

Some policymakers and commentators have endorsed the use of buyouts for making both injurers and victims better off.[4] Because injurers are under no legal duty to purchase adjoining land, they will offer to buy out victims only if their buyout payments are lower than what they will otherwise have to pay in taking more precautions. Given that victims are similarly free to reject injurers' offers, they will sell their land only if what they are offered is (at least) commensurate with the value of their property. Buyout agreements, according to this favorable perception, will therefore be entered into only if they improve the welfare of injures and victims alike. In addition, because buyouts reduce the likelihood of harm, they

content/uploads/2010/10/Times-Picayune-5-4-04-Marathon-Buyout.pdf ("In recent years, more and more industrial plants have offered to buy out residential property along their fence lines . . . ."). For a historical review of major early buyout programs, see Geoffrey L. Buckley, Nancy R. Bain & Donald L. Swan, *When the Lights Go Out in Cheshire*, 95 GEOGRAPHICAL REV. 537, 539–41 (2005).

    2.   Cindy Horswell, *Exxon Refinery Offers Buyout to Homeowners in Baytown*, HOUS. CHRON., Aug. 4, 1991, at 1 (discussing Exxon's buyout of homes and land near its refinery in Busch Terrace); Tina Susman, *Bittersweet Victory for La. Town / Shell Buys Homes near Chemical Plant*, NEWSDAY, July 13, 2002, at A04 (reporting Shell's major buyout program near its refinery in Norco); John Tedesco, *Pollution Suit Nets $6 Million; Residents Want Funds to Move Away from Corpus Refineries*, SAN ANTONIO EXPRESS-NEWS, Mar. 7, 2000, at 01A (describing Citgo's fourteen million dollar buyout of homeowners near its plants in Oak Park); John Gallagher, *Marathon Offers to Buy Out Detroit Homeowners near Refinery Amid $2.2B Expansion*, DETROIT FREE PRESS (Nov. 2, 2011, 1:40 PM), http://www.freep.com/article/20111102/BUSINESS06/111102038/Marathon-offers-buy-out-Detroit-homeowners-near-refinery-amid-2-2B-expansion (discussing a buyout program of over four hundred homes near Marathon's refinery in southwest Detroit).

    3.   Fred Bayles, *Power Plant Gets Neighborly*, USA TODAY, May 16, 2002, at 3A (describing a buyout by American National Power—a utility company—of fifty-two houses near Blackstone, Massachusetts); Deborah Belgum, *2 Firms to Buy Out Homes near Toxic Site Environment: Dow, Shell Tentatively Agree to Purchase 65 Houses near Old Rubber Plant. Residents Have Been Displaced for Three Years by Cleanup Efforts*, L.A. TIMES, Feb. 24, 1997, at B1 (describing a buyout by Shell Oil and Dow Chemical of sixty-five houses in Los Angeles County); Karen Samples, *Residents near Airport Question Buyout Plan*, S. FLA. SUN-SENTINEL (July 3, 1988), http://articles.sun-sentinel.com/1988-07-03/news/8802080978_1_mobile-homes-housing-colan (discussing the buyout of over 2200 homes around Fort Lauderdale-Hollywood International airport).

    4.   *See, e.g*., Gallagher, *supra* note 2 (quoting Michigan State Representative Rashida Tlaib for applauding Marathon Petroleum's move "to relocate residents from the district [through the buyout of their houses]"); Amy Wold, *City to Show Buyout Plan,* ADVOCATE (Baton Rouge) (Nov. 2, 2011), http://theadvocate.com/home/1222737-125/city-to-show-buyout-plan.html (quoting a Baton Rouge official stating that a planned buyout near a waste treatment facility "just makes it better for everyone").

avoid costly litigation between injurers and victims. Although buyout negotiations are not cost-free, litigation costs, in the event harm does occur, are usually significantly higher. Consequently, buyouts save the parties (and therefore society) the difference between litigation and negotiation costs.

In accordance with this view, buyout agreements between injurers and victims seem to enjoy a wide support.[5] Federal agencies and states take an increasingly active role in encouraging large-scale injurers to offer buyouts for potential victims. The Federal Aviation Administration, for example, invests millions of dollars annually to help finance buyouts of people who reside near U.S. airports.[6] The Environmental Protection Agency and local states have similarly supported buyout programs designed to relocate residents who live adjacent to polluting factories, refiners, and waste sites.[7] Environmental groups, concerned with the protection of "fenceline" communities, have called on polluters to offer buyout programs to residents who are exposed to environmental risks.[8] Finally, potential victims have also sought buyouts once they learn about the existence of nearby injurers.[9]

Contrary to this favorable view of buyouts, this Article shows that injurers may use buyouts to exploit victims, and thereby reduce social welfare. Under the rules and regulations that govern harmful activities, injurers are usually required to take care if the cost of their precautions is less than the corresponding reduction in victims' expected harm. For example, both negligence and nuisance—the tort system's dominant

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5. For a representative example of the widespread support buyout programs garner from different stakeholders, see generally STEVE LERNER, DIAMOND: A STRUGGLE FOR ENVIRONMENTAL JUSTICE IN LOUISIANA'S CHEMICAL CORRIDOR (2005) (reviewing the joint efforts by residents, environmental activities, politicians, and industry officials to bring about the buyout of hundreds of houses near a Shell refinery in Norco, Louisiana).

6. *See, e.g.*, Kirk Carapezza, *Airport Buyout Program Empties South Burlington Neighborhood*, VT. PUB. RADIO (May 7, 2012, 5:30 PM), www.vpr.net/news_detail/94412/airport-buyout-program-empties-south-burlington-ne (noting the massive federal support in airport buyout programs).

7. *See, e.g.*, Liz Halloran, *Polluters Offer to Buy Out Residents' Houses*, HARTFORD COURANT, Feb. 25, 1993, at B1 (reporting a buyout funded jointly by a city, Hartford, Connecticut, and local polluting factories); Mathews, *supra* note 1 (reporting a buyout of over 200 people in Wagner's Point that was funded by a combination of federal, state, and local factories' money).

8. *See, e.g.*, Schneider, *supra* note 1 (citing top environmental officials expressing support for buyout programs as a solution for fenceline communities).

9. James Bruggers, *Activists Focus on Rubbertown: Meetings to Seek Reduced Emissions or Home Buyouts*, COURIER J. (Mar. 14, 2003), http://www.gcmonitor.org/article.php?id=210 (discussing Louisville residents' call for a buyout of houses in a community located near chemical plants); James M. O'Neill, *Worried Homeowners Want Bailout from DuPont*, NORTHJERSEY.COM (Jan. 10, 2011, 11:11 AM), www.northjersey.com/news/113186944_In_tainted_area__some_hope_for_a_bailout.html (discussing Pompton Lake residents' demand for a buyout following findings of groundwater contamination caused by a nearby DuPont factory).

doctrines for land-related harms—contain rules which condition injurers' liability on failures to take cost-effective precautions. Similarly, regulatory agencies set safety requirements which injurers must comply with by comparing the costs and benefits of different technologies. However, as we show in this Article, injurers may evade the duty to take socially desirable precautions by buying out victims.

Under a cost-benefit regime, injurers' required level of care increases in proportion to the number of potential victims. Buying out victims, therefore, reduces the burden of precaution injurers must meet to avoid liability or comply with the regulatory standard. Injurers can profit from buyouts—even if they attach no value to the property they buy—so long as their payments to victims are lower than their corresponding savings in precaution costs. While buyouts under such circumstances increase injurers' profits, victims excluded from the bargain are worse off. Because buyouts enable injurers to take fewer precautions, remaining victims are exposed to a higher level of risk. Thus, although buyouts make injurers better off, they may nevertheless reduce social welfare.

The following example illustrates how a single-victim buyout enables an injurer to exploit victims:

Example 1: One Victim Buyout. Suppose that a new factory will harm three neighboring homeowners (A, B, and C), each of whom values the uninterrupted use of her property at 20 per year. Suppose further that the factory can take two alternative precautions: it can maintain a filter at an annual cost of 15, or maintain a smokestack at an annual cost of 40. A filter reduces the homeowners' harm by half (from 60 to 30), whereas a smokestack entirely prevents the harm. Finally, suppose that the factory attaches no value to the homeowners' property.[10]

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10.   The following table summarizes total social costs as a function of the factory's level of care:

TABLE A.

Level of Care	Factory's Cost	Homeowners' Harm	Total Social Cost
No precaution	0	60 (3 × 20)	60
Filter	15	30 (3 × 10)	45
Smokestack	40	0	40

Note: The cost function of the factory's precaution is consistent with the law of diminishing marginal returns. The cost of preventing the victims' entire harm through a smokestack (40) is more than twice the cost of preventing half of the victims' harm through a filter (15). The law of diminishing marginal returns reflects the fact that production processes become increasingly less profitable (that is, yield a lower rate of return) as any one factor of production increases (holding fixed other factors of

Under a regime that requires injurers to take welfare-enhancing precautions, the factory must maintain a smokestack rather than a filter. The additional annual profit from a smokestack relative to a filter is 30 (half of the homeowners' harm), whereas its additional annual cost is only 25 (the difference between the cost of a smokestack and the cost of a filter). Thus, given a duty to take efficient care, the factory will incur an annual cost of 40 in precaution, and the homeowners will consequently suffer no harm.

Now suppose that, rather than maintaining a smokestack, the factory offers homeowner A to sell her property and relocate in exchange for an annual payment of 20 (or slightly more).[11] Because A obtains an annual utility of 20 from her property, she will accept the factory's offer. With only two homeowners left (B and C), the factory is not required to maintain a smokestack because it is no longer socially desirable. In particular, the additional benefit from a smokestack is now only half of the remaining two homeowners' harm (20), which is less than the additional cost of maintaining a smokestack over a filter (25). The buyout of homeowner A thus saves the factory 5. Rather than spending 40 on a smokestack, the factory pays 20 to A and incurs a cost of 15 in maintaining a filter, for a total cost of 35.

Although the buyout is profitable for the factory and homeowner A, it nevertheless reduces social welfare. To understand why, consider the annual gains and losses of the different parties. Homeowner A is as well off with the buyout as without it (or is just slightly better off), and as shown, the factory saves 5. The buyout thus creates a net surplus of 5 for the contracting parties. The buyout of homeowner A, however, renders the remaining two homeowners (B and C) worse off. Because the factory maintains a filter rather than a smokestack, B and C now suffer jointly a harm of 20. Thus, although the buyout is profitable for the factory and homeowner A, it reduces social welfare by 15.

As this example illustrates, precautions often have a public-good property, which means that the social benefit from care increases with every additional potential victim. Thus, if an injurer must take cost-

production). In accordance with this law, the rate of return on a filter is 100 percent (because investment of 15 saves 30), whereas the rate of return on a smokestack is only 50 percent (because investment of 40 saves 60). *See* WILLIAM J. BAUMOL & ALAN S. BLINDER, MICROECONOMICS: PRINCIPLES AND POLICY 131–32 (11th ed. 2009) (explaining the meaning of, and rationale for, the law of diminishing marginal returns).

11.   The factory, of course, could make homeowners a one-time payment equal to the present value of the annual payments.

effective precautions, the presence of more victims requires the injurer to raise its level of care. This implies that the buyout of a single victim (A) creates a negative externality for the remaining victims (B and C). Because the buyout enables the injurer to take fewer precautions (a filter instead of a smokestack), the remaining victims suffer a greater expected harm.

Example 1 assumes that the factory negotiates with only one victim. As the analysis in this Article shows, injurers can increase their profits even more—and thereby further reduce social welfare—by negotiating with multiple victims. By extending buyout offers to many potential victims, strategic injurers can play victims off against each other. Because purchasing victims' property enables injurers to reduce their level of care, each victim's welfare is dependent upon other victims' decisions whether to accept their buyout offers. If other victims accepted their offers and relocated, the property value of victims who rejected their offer would decline due to the higher risk of harm. As more victims sell their property, remaining victims will face greater pressure to accept their buyout offers as well. Accordingly, victims are induced to accept buyout offers that they would have declined had other victims not sold their property.

Extending the basic analysis in Example 1 to multiple-victim buyouts, we use game-theoretic reasoning to show that strategic injurers can pursue two bargaining approaches to maximize their profits. Under the first approach, injurers adopt a "divide-and-conquer" strategy, which involves making simultaneous offers to victims.[12] While all victims are offered the option of selling their property at the same time, different victims receive offers of decreasing value. This differential treatment of victims is designed to engender a Domino Effect: victims who are offered a high buyout payment accept their offers, which causes victims who receive offers of intermediate value to follow suit, leaving victims who receive low offers with no choice but to concede to the injurer as well. As compared to a single-victim buyout, this differential treatment of victims allows injurers to more fully take advantage of the vulnerability of cost-benefit standards to buyouts.

Under the second bargaining strategy, injurers negotiate with one victim at a time. By extending buyout offers sequentially, injurers are able to foster competition among victims. Victims who are approached early on

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12. Game theory literature uses the term "divide-and-conquer" to describe a situation whereby a single actor exploits coordination problems among a class of affiliated actors by making discriminatory offers or discriminatory threats. *See generally* Eric A. Posner, Kathryn E. Spier & Adrian Vermeule, *Divide and Conquer,* 2 J. LEGAL ANALYSIS 417 (2010) (providing a taxonomy of divide-and-conquer mechanisms).

realize that if they reject their offers, the injurer would make subsequent higher buyout offers to other victims, which would be sufficient to induce those victims to sell their property. Fearing of being left out of the bargain, the victims that are approached first will agree to sell their property for low amounts. Once these victims have been bought out, the injurer can proceed to buy out the subsequent victims for the same low amounts. Relative to simultaneous negotiations, the competition among victims stimulated by the sequential bargaining further increases injurers' profits.

This Article unfolds as follows. Part II presents the main legal regimes that govern activities that expose victims to land-related harms (negligence, nuisance, and regulatory standards). It shows the common emphasis of these regimes on inducing injurers to take socially desirable precautions. Against this background, Part III highlights the risk of injurers using buyouts to evade their duty to take cost-effective precautions. It expands the analysis by considering the case in which injurers can negotiate with multiple victims and shows that injurers can adopt a divide-and-conquer strategy to further exploit victims' vulnerability. It also shows that injurers' ability to exploit victims through buyouts increases if they can negotiate with victims sequentially and when victims as well can take precautions. Part IV presents anecdotal evidence consistent with a strategic use of buyouts by injurers. Part V examines three alternative approaches to preventing strategic buyouts and protecting victims from injurers' exploitation. Finally, Part VI, the conclusion, discusses the broader implications of our analysis for understanding the significance of injurers' and victims' ability to negotiate with one another.

II. THE LAW OF LAND-RELATED HARMS

This part presents the dominant legal regimes that govern activities that expose victims to land-related harms: negligence, nuisance, and regulatory standards. It shows that although they differ in several respects, all three regimes require injurers to take precautions only when the prevention of harm is socially desirable.

A. NEGLIGENCE

Whether injurers are liable for the harm they cause often depends on the reasonableness of their behavior. Under negligence—the dominant liability standard of the tort system—injurers who fail to take reasonable care and consequently inflict harm, must compensate their victims. Lawsuits involving claims for land-related harms thus commonly revolve

around the sufficiency of injurers' precautions.[13]

Courts applying the standard of negligence regularly follow the Hand formula.[14] Under this formula, injurers' costs of taking additional precautions are balanced against the benefit they provide for victims. If the additional benefit from precautions exceeds their additional cost, injurers must take these precautions to avoid liability.[15] Negligence thus serves to align injurers' incentives with the maximization of social welfare.[16]

As courts often highlight, whether injurers' conduct is negligent is highly dependent on the specific circumstances of the case.[17] Any change in the factors considered under the Hand formula can affect the determination of the reasonableness of injurers' conduct. In the same vein, because negligence is decided by comparing the costs and benefits of taking additional precautions, the analysis under the Hand formula focuses on the time in which the alleged negligent activity took place.[18] Whether a driver's decision to speed was reasonable, for example, is determined in light of the conditions of the road at the time the driver accelerated. Whether the road was dry or wet at any previous time usually bears no effect on the reasonableness of the driver's decision.

The contingent nature of the Hand formula, and its emphasis on welfare maximization, renders the determination of negligence highly dependent on the number of victims who might be harmed by the injurer's activity. While a certain behavior can be deemed unreasonable in the presence of multiple potential victims (high expected harm), it may be

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13. JESSE DUKEMINIER & JAMES E. KRIER, PROPERTY, 748–51 (4th ed. 1998) (highlighting the role of negligence in land-related lawsuits).

14. United States v. Carroll Towing Co., 159 F.2d 169, 173 (2d Cir. 1947); RICHARD A. EPSTEIN, TORTS 129 (1999) ("In . . . appellate discussions, the modern tendency is to resort quickly to the general cost-benefit Hand formula . . . ."); JAMES A. HENDERSON, JR., RICHARD N. PEARSON & JOHN A. SILICIANO, THE TORTS PROCESS 179 (5th ed. 1999) ("The proper balancing of costs and benefits suggested by Learned Hand in *Carroll Towing* has come to be recognized as the central inquiry in determining whether an actor has been negligent."). The new Restatement of Torts also endorses the use of the formula to determine negligence. RESTATEMENT (THIRD) OF TORTS: LIAB. FOR PHYSICAL & EMOTIONAL HARM § 3 cmt. e (2010).

15. *E.g.*, *Carroll Towing*, 159 F.2d at 173.

16. *See* ROBERT COOTER & THOMAS ULEN, LAW & ECONOMICS 349 (5th ed. 2008) (explaining the efficiency of the Hand formula). For a comprehensive discussion, see John Prather Brown, *Learned Hand Rule*, in 2 THE NEW PALGRAVE DICTIONARY OF ECONOMICS AND THE LAW 514, 514–16 (Peter Newman ed., 1998) (demonstrating parties' incentives for optimal care under the Hand formula).

17. RESTATEMENT (THIRD) OF TORTS: LIAB. FOR PHYSICAL & EMOTIONAL. HARM § 3 cmt. e (providing that liability under negligence is determined based on balancing the actual costs and benefits of the defendant's conduct).

18. *Id.* § 3 cmt. g ("To establish the actor's negligence, it is not enough that there be a likelihood of harm; the likelihood must be foreseeable to the actor at the time of conduct.").

considered reasonable if it only exposes a small number of victims to risk of harm (low expected harm).[19] As noted, courts' evaluations of injurers' activity focuses on the time in which the injurer engaged in its activity. It is thus immaterial how many victims were present prior to when the injurer's activity commenced. Rather it is the actual number of potential victims present at the time the injurer's activity took place that will affect courts' decisions as to whether or not the injurers' behavior was reasonable.

B. Nuisance

When the alleged tortious activity is related to land, victims may also sue under nuisance law. Victims who claim that the injurer's activity constitutes a nuisance are conventionally required to show that the interference with their land is "unreasonable" and results in "substantial" inconvenience.[20] Upon determination that the injurer's activity is a nuisance, victims are entitled to compensation, and if the magnitude of their harm is especially high, they can seek to enjoin the continuance of the activity.[21]

Under the prevailing legal approach, as reflected in the Restatement, injurers' liability in nuisance is not dependent on an outright cost-benefit standard.[22] Although section 826 provides that in deciding whether an activity is unreasonable, courts should balance the "gravity of the harm" against the "utility of the actor's conduct," it also emphasizes that "the invasion is unreasonable not only when the gravity of the harm outweighs the utility of the conduct, but also when the utility outweighs the gravity— provided the financial burden of compensating . . . would not render it unfeasible to continue conducting the activity."[23] Therefore, compared to negligence, nuisance seems to endorse a broader duty to compensate which may arise even if injurers' activity enhances welfare and harm prevention is socially undesirable.

Nevertheless, as commentators have noted, liability for nuisance often depends on whether harm prevention is cost-effective. Despite the broad language of section 826, section 827 states that liability will be determined in light of "the suitability of the particular use or enjoyment invaded to the

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19.   COOTER & ULEN, *supra* note 16, at 350–51.

20.   DAN B. DOBBS, THE LAW OF TORTS 1325–30 (2000); W. PAGE KEETON ET AL., PROSSER AND KEETON ON THE LAW OF TORTS § 88 (5th ed. 1984).

21.   DOBBS, *supra* note 20, at 1338.

22.   *Id.*

23.   RESTATEMENT (SECOND) OF TORTS: NUISANCE § 826 cmt. f (1979). *See also* DOBBS*, supra* note 20, at 1339.

character of the locality."[24] As the commentary to section 827 further explains, "Sound public policy demands that the land in each locality be used for purposes suited to the character of that locality,"[25] and what might be considered nuisance in a predominantly residential community may be a reasonable activity in a more industrial area. The "locality doctrine" therefore creates a direct relationship between the number of victims and injurers' liability. The greater the number of victims and thus the benefit from care, the more precaution injurers will have to take to avoid liability for nuisance.

As in the case of negligence, nuisance law focuses on the number of victims at the time in which the alleged interfering activity occurs. In the commentary to section 827, the Restatement notes that "[t]he character of a particular locality is, of course, subject to change over a period of time and therefore the suitability of a particular use of land to the locality will also vary with the passage of time," and thus "the suitability of the particular use or enjoyment invaded must be determined as of the time of the invasion rather than the time when the use or enjoyment began."[26]

The nature of the locality and its population density are key factors in a court's decision whether to impose liability in nuisance.[27] The Restatement itself notes that "[t]he suitability of the use or enjoyment of land that is invaded is one of the important factors" in determining injurers' liability.[28] One commentator has even suggested that "of all the possible factors, time and locality are given the greatest weight in determining whether noise is a nuisance."[29] Against this background, two leading authorities in property law have concluded that "the fact that many activities can be said to constitute a nuisance only in certain . . . places helps explain the movement in nuisance law toward a more negligence-like standard."[30]

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24.   RESTATEMENT (SECOND) OF TORTS: NUISANCE § 827(d).

25.   *Id.* § 827 cmt. g.

26.   *Id*.

27.   *See, e.g*., Escobar v. Cont'l Baking Co., 596 N.E.2d 394, 397 (Mass. App. Ct. 1992) ("In determining whether a nuisance exists, the 'character of the locality is a circumstance of great importance.'" (quoting Kasper v. H.P. Hood & Sons, Inc., 196 N.E. 149, 150–51 (Mass. 1935))).

28.   RESTATEMENT (SECOND) OF TORTS: NUISANCE § 831 cmt. c.

29.   David G. Cotter, *Shooting Sports Versus Suburban Sprawl—Is Peaceful Coexistence Possible?*, 15 T.M. COOLEY L. REV. 21, 30 (1998). *See* John Dwight Ingram, *Coming to the Nuisance: Nor Shall Private Property Be Taken Without . . . ,* 5 N. ILL. U. L. REV. 181, 185 (1985) ("Most courts, in determining whether the defendant's activities constitute a nuisance as to the plaintiff, will look first to see what is the 'natural' use of the area involved.").

30.   Thomas W. Merrill & Henry E. Smith, Essay, *What Happened to Property in Law and Economics?*, 111 YALE L.J. 357, 397 (2001).

C. REGULATORY STANDARDS

Harmful activities do not only give rise to potential tort liability, but are often also subject to extensive regulation.[31] Such regulation commonly conditions the right to engage in risky activities on compliance with predetermined safety standards set by federal and state agencies. Injurers subject to these safety standards must take the required care before engaging in their activity.

As scholars have pointed out, the regulatory system has undergone a significant change over the years.[32] In the early stages, regulatory agencies (particularly those in charge of environmental risks) largely relied on "command and control" regulation. Such regulation "commanded" injurers to reduce the harm they created (for example, air pollution) and "controlled" how this reduction be achieved (for example, installation of specific pollution control devices). Most important, under the command and control approach, regulatory standards were applied across the board, setting industry-wide safety requirements. The "first generation" of regulations, therefore, subjected injurers to uniform safety standards that accorded little significance to variation among them.[33]

However, the popularity of uniform, one-size-fits all, regulatory standards has been steadily in decline.[34] By the mid-1990s, one commentator observed that "virtually everyone . . . agree[d] that our historical command-and-control approach [was] inefficient and inadequate by itself to carry us where we still need to go."[35] As critics have emphasized, command-and-control regulations "are not cost-effective, for their insistence on national uniformity fails to take account of the

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31.   As rich literature has shown, given the different ways in which they are designed and applied, regulation and liability often complement one another. *See generally* Charles D. Kolstad, Thomas S. Ulen & Gary V. Johnson, *Ex Post Liability for Harm vs. Ex Ante Regulation: Substitutes or Complements?*, 80 AM. ECON. REV. 888 (1990) (discussing the benefits of combining liability and regulation); Steven Shavell, *Liability for Harm Versus Regulation of Safety*, 13 J. LEGAL STUD. 357 (1984) (same). For an excellent collection of recent essays on the interplay between liability and regulation, see REGULATION VS. LITIGATION: PERSPECTIVES FROM ECONOMICS AND LAW (Daniel Kessler ed., 2011).

32.   *See generally* Richard B. Stewart, *A New Generation of Environmental Regulation?*, 29 CAP. U. L. REV. 21 (2001) (discussing changes in environmental regulation).

33.   *Id.* at 21–27.

34.   Daniel H. Cole & Peter Z. Grossman, *When is Command-and-Control Efficient? Institutions, Technology, and the Comparative Efficiency of Alternative Regulatory Regimes for Environmental Protection*, 1999 WIS. L. REV. 887, 887–92 (examining the decline of command-and-control regulation).

35.   Barton H. Thompson, Jr., Foreword, *The Search for Regulatory Alternatives*, 15 STAN. ENVTL. L.J viii, viii (1996).

'variations among plants and industries in the cost of reducing pollution,' as well as 'geographic variations in pollution effects.'"[36]

The inefficiency of rigid, industry-wide standards has led the regulatory system to adopt a more nuanced approach ("second generation regulation"), which takes into account the idiosyncrasies of injurers and victims. Rather than uniformly mandating injurers to adhere to particular harm-prevention technologies, regulatory agencies have increasingly incorporated cost-benefit analysis to "fine tune" their safety standards. Thus agencies now often compare the actual costs and benefits of precautions in deciding the level of care that injurers are required to take. Injurers whose activities result in significant harm are accordingly subject to more stringent regulatory standards (and therefore must raise their care level) than injurers who engage in similar activities but inflict lesser harm.[37]

The extensive use of cost-benefit analysis by regulatory agencies to determine injurers' required care level has recently been upheld by the Supreme Court's decision in *Entergy v. Riverkeeper*.[38] The petitioners—environmental groups, states, and industry associations—challenged the Environmental Protection Agency's ("EPA") regulatory regime with regard to "cooling water intake structures."[39] Pursuant to the Clear Water Act ("CWA"), the EPA established nationwide standards which obligated existing plants to adopt costly technologies to reduce the environmental harm caused by cooling structures. The EPA's policy, however, exempted facilities that could demonstrate either that "the costs of compliance are 'significantly greater than' the costs considered by the agency in setting the standards," or that the "cost of compliance 'would be significantly greater than the benefits of complying with the applicable performance standards."[40] The petitioners claimed that the EPA's policy was incompatible with the CWA language, which requires that "cooling water

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36. Deepa Varadarajan, Note, *Billboards and Big Utilities: Borrowing Land-Use Concepts to Regulate "Nonconforming" Sources Under the Clean Air Act*, 112 YALE L.J. 2553, 2584 (2003) (quoting Bruce A. Ackerman & Richard B. Stewart, Comment, *Reforming Environmental Law*, 37 STAN. L. REV. 1333, 1335 (1985)). *See also* Cass R. Sunstein, *Administrative Substance*, 1991 DUKE L.J. 607, 627–31 (explaining that failure of command-and-control strategies to account for "enormous differences among plants, industries, and geographical areas" makes them "wildly inefficient").

37. *See, e.g.*, Henry N. Butler, *A Defense of Common Law Environmentalism: The Discovery of Better Environmental Policy*, 58 CASE W. RES. L. REV. 705, 706 (2008) ("Widespread dissatisfaction with centralized command-and-control environmental regulation has led to . . . some policy changes . . . [that] include . . . greater reliance on cost-benefit analysis . . . .").

38. Entergy Corp. v. Riverkeeper, Inc., 566 U.S. 208 (2009).

39. *Id*. at 217.

40. *Id.* at 216 (quoting 40 C.F.R. § 125.94(a)(5)(i)–(ii) (2013)).

intake structures reflect the best technology available for minimizing the adverse environmental impact."[41] As the petitioners contended, the standard of "best technology available" ("BTA") precluded the EPA from taking into account any efficiency considerations.

Finding in favor of the EPA, the Supreme Court ruled that the agency's use of cost-benefit analysis is permissible as long as the language of the applicable statute does not explicitly forbid it.[42] Thus even if Congress remained silent and did not mention efficiency as a relevant factor, the agency may nevertheless give weight to efficiency concerns in its decision. The Court further refused to interpret the language of the CWA (and its BTA standard) as posing a restriction on the EPA's practice of exempting plants on a cost-benefit basis.[43] While the Supreme Court's decision centers on the EPA and the CWA, it provides support for similar use of cost-benefit analysis by other agencies as well.[44]

The efficiency advantages of cost-benefit rules help to explain their widespread use in the regulation of harmful activities. Despite their many advantages, however, the next part demonstrates that cost-benefit rules may perform poorly in the common case in which injurers' activity harms many victims.

III. DIVIDE, CONQUER, AND HARM

This part argues that injurers can evade the duty to take cost-effective precautions by offering to buy potential victims' property. Extending the argument laid out in Part I, we consider the implications of buyouts in cases in which injurers can negotiate with more than one potential victim. Using a game-theoretic framework, Section A shows that simultaneous negotiations enhance injurers' ability to exploit victims by adopting a divide-and-conquer strategy. Section B shows that injurers can increase their profits even further by negotiating with victims sequentially. Section C extends the analysis to cases in which not only injurers, but victims as well, can take precautions. Building on the analysis in the first three sections, Section D then discusses the main conditions for strategic buyouts.

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41. *Id.* at 213 (quoting 33 U.S.C. § 1326(b) (2006)).

42. *Id.* at 223.

43. *Id*. at 219–27.

44. *See* Paul N. Singarella & Marc T. Campopiano, *The Role of Economics in Environmental, Health, and Safety Regulation After* Entergy, 35 ENVIRONS 101, 139–43 (2011) (showing the likely implications of *Entergy* for other regulatory agencies).

A. SIMULTANEOUS BUYOUT NEGOTIATIONS

Example 1, discussed in Part I, examined the implications of a single-victim buyout. In practice, however, injurers may offer to buy the property of multiple potential victims. Under a duty to take cost-effective precautions, the buyout of every additional victim further reduces injurers' required level of care. Injurers who negotiate with multiple victims can accordingly increase their profits by adopting a divide-and-conquer strategy. Because each buyout exposes the remaining victims to a greater expected harm, the injurer can offer victims a menu of decreasing buyout offers. Under this menu, some victims accept high buyout offers, whereas others settle for lower offers.

Although the buyout of multiple victims increases injurers' profits, it results in an even greater loss of social welfare. Because buyouts enable injurers to evade their duty to take cost-effective care, their profits from buyouts (saving in precaution cost less buyout payments) are necessarily lower than the loss to the remaining victims (rise in the expected harm). Thus the more victims the injurers buy out, the greater the loss of social welfare.

We illustrate these results by revisiting Example 1. Recall that in our original example, the factory negotiated only with homeowner A. We now remove this restriction and examine the implications of buyouts when the factory can negotiate with all three homeowners.

Example 2: Multiple-Victim Buyout. As in Example 1, suppose that a new factory will harm three neighboring homeowners (A, B, and C), each of whom values the uninterrupted use of her property at 20 per year. The factory can either maintain a filter or a smokestack. The annual cost of a filter, which reduces harm by half, is 15, whereas that of a smokestack, which completely prevents harm, is 40. As opposed to Example 1, however, suppose now that the factory can simultaneously negotiate with all three homeowners.

Recall that if injurers are required to take cost-effective precautions, the factory must maintain a smokestack, which entirely prevents the homeowners' harm. Suppose that, instead of maintaining a smokestack, the factory now makes two simultaneous take-it-or-leave-it buyout offers: an offer of 20 to homeowner A and an offer of 10 to homeowner B.[45]

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45. Because homeowners must decide simultaneously whether to accept or reject the factory's offer, their decisions should constitute a Nash equilibrium ("NE"). A NE is a collection of strategies, or a strategy profile, such that no one player can profitably deviate from her equilibrium strategy, given the equilibrium strategies of all other players. *See* MARTIN J. OSBORNE & ARIEL RUBINSTEIN, A

Consider first homeowner A's response to the factory's offer. Because each homeowner derives an annual utility of 20 from her property, homeowner A will accept the offer and relocate. Note that A's decision, given that she receives a buyout payment that is fully commensurate with the value of her property, is unaffected by the decisions of other homeowners.[46] Thus A's decision to accept the factory's offer is independent of whether or not B accepts her respective buyout offer.

Consider next homeowner B's decision. As shown in Example 1, the buyout of homeowner A reduces the factory's required level of care. Yet the factory is not entirely relieved of its duty to take precautions. With two homeowners left, the total expected harm from the factory's activity is 40 (2×20). By maintaining a filter at a cost of 15, the factory can reduce the joint harm to the two remaining homeowners by 20. Thus under a regime that mandates taking socially desirable precaution, the factory must maintain a filter. Because the filter prevents only half of the harm caused by the factory's activity, however, each of homeowners B and C now expect to derive an annual utility of only 10 from their properties. Consequently, homeowner B would accept the factory's buyout offer of 10. Following the buyouts of homeowners A and B, homeowner C is the only remaining victim. In the presence of a single homeowner, the benefit of maintaining a filter (10) is smaller than its cost (15). As a result, the factory is no longer required to maintain a filter. The buyouts of homeowners A and B therefore allow the factory to fully evade the duty to take socially desirable precautions.[47]

Looking at the parties' payoffs in the aggregate, the factory's multiple buyouts further reduce social welfare. Recall from Example 1 that the buyout of homeowner A saves the factory 5 and results in a social loss of 15. The buyout of homeowner B costs the factory 10 in buyout payment, but saves it an additional 15 in precaution costs (cost of maintaining a filter). Thus the buyout of homeowner B increases the factory's profits by 5 ($15 - 10$). This buyout, however, creates an additional harm of 10 for homeowner C (her utility decreases from 10 to 0). In the final tally, therefore, the buyout of homeowner B results in a net social loss of 5 (5 −

COURSE IN GAME THEORY 14–15 (1994) (presenting Nash equilibrium strategies).

46.   Homeowner A thus has a "dominant strategy" to accept the factory's offer. *See id*. at 63 (discussing dominance solvable games).

47.   The factory's divide-and-conquer strategy requires that each homeowner be aware of the offers extended to her fellow homeowners. The factory can let each homeowner know of the offers extended to other homeowners by publicly announcing its various proposed payments under the buyout program, as injurers often do. *See, e.g*., Gallagher, *supra* note 2 (describing Marathon's public announcement regarding its offer to buy homeowners' property near its facility).

10).[48]

Example 2 illustrates the advantage that buyouts provide for injurers whose activities expose multiple victims to the risk of harm. By extending high buyout offers to some victims, remaining victims are induced to accept unfavorable offers that they would have rejected had other victims retained their property. In our example, the buyout of homeowner A not only enables the factory to lower its level of care, but also causes homeowner B—who knows that the factory will buy out homeowner A—to accept a buyout offer that is lower than the utility she derives from her property. The buyout of homeowner B makes things even worse for homeowner C. Because only one homeowner remains, taking precaution is no longer cost effective and the factory can consequently operate with no care. Furthermore, because the factory is not required to take precaution, it has no incentive to make homeowner C a buyout offer. Thus, while homeowner B receives at least a partial compensation for her property, homeowner C obtains no compensation for her loss.

B. SEQUENTIAL BUYOUT NEGOTIATIONS

In the previous section we assumed that while the factory can negotiate with multiple homeowners, it could only extend simultaneous buyout offers. Injurers, however, can often choose to approach victims one after the other. In such sequential bargaining, injurers make some victims buyout offers after having concluded buyout agreements with other victims. We now show that sequential bargaining increases injurers' ability to exploit victims in two respects.[49] First, negotiating with each victim at a

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48. The homeowners' decisions to accept the factory's buyout offers of 10 and 20 thus constitute a Nash equilibrium: given that one homeowner accepts her buyout offer, the other homeowner cannot profitably deviate by rejecting her offer. The buyout offers of 10 and 20, however, are not the lowest offers the factory could make that the homeowners accept in equilibrium. For example, the factory could offer homeowners A, B, and C to buy their property for a penny each. If two homeowners accept their respective offers, the third homeowner is better off accepting her offer as well. However, an equilibrium in which each homeowner accepts a buyout offer of a penny is not "coalition proof." This means that any coalition of two homeowners, or a coalition of all of them, can increase each coalition member's payoff by jointly rejecting the factory's offers. In contrast, the equilibrium outcome in which the injurer makes buyout offers of 10 and 20 cannot be similarly ruled out, because homeowner A prefers her buyout offer over no buyout for any strategy of homeowner B (a similar argument applies to homeowner B). Buyout offers of 10 and 20 are accordingly the lowest offers the factory could make that the homeowners accept in a coalition-proof equilibrium. The notion of coalition-proof equilibrium was introduced in B. Douglas Bernheim, Bezalel Peleg & Michael D. Whinston, *Coalition-Proof Nash Equilibria I. Concepts*, 42 J. ECON. THEORY 1, 2 (1987).

49. The significance of bargaining protocols has also been examined in the context of settlement and litigation. Che and Spier have shown that in inducing plaintiffs to accept settlements in class actions, a defendant can strengthen her bargaining position by approaching plaintiffs one after the other.

time reduces the amounts injurers have to pay victims for their property. Second, sequential negotiations enable injurers to use buyouts (and thereby exploit victims) in cases in which simultaneous negotiations fail to induce victims to sell their property.

The underlying rationale for this result is that victims who are approached early on ("early victims") know that if they reject their buyout offer, the injurer will make subsequent victims higher buyout offers, which those victims will accept. Because the buyout of subsequent victims reduces the injurer's required level of care, early victims stand to lose even more if they reject the injurer's offer. Looking to avoid this outcome, early victims will choose to sell their land to the injurer. Once early victims accept their buyout offers, subsequent victims are now concerned that later victims will sell their land as well. This dynamic replicates itself until all victims choose to sell their land to avoid the risk of being left out of the deal.

The following example illustrates this dynamic by reconsidering Example 1, given that the factory now negotiates with each homeowner at a time. The key to the analysis is proceeding "backward" along the negotiation process, from the last to the first round. Because early victims know that the injurer will later approach other victims, their decisions are made in the shadow of the anticipated negotiation outcomes between the injurer and subsequent victims. Thus, assessing the results of the negotiations in the last rounds and then using backward induction reveal what early victims' decisions would be. Once the decisions of early victims are determined, later victims' decisions also become clear.[50]

Example 3: Sequential Negotiations. Consider the facts of Example 1. Suppose now that the factory first makes a take-it-or-leave-it buyout offer to homeowner A, then to homeowner B, and finally to homeowner C. Each homeowner observes whether previous homeowners have accepted or rejected their respective offers before deciding whether to accept or reject her own offer.

Yeon-Koo Che & Kathryn E. Spier, *Exploiting Plaintiffs Through Settlement: Divide and Conquer*, 164 J. INSTITUTIONAL & THEORETICAL ECON. 4, 5, 14–15 (2008). Our analysis suggests that when injurers are subject to cost-benefit rules, sequential bargaining maximizes their profits even if the victims may sue individually.

50. Because the strategic interaction between the factory and the homeowners unfolds in stages, the Nash equilibrium of the game must be "subgame perfect." This refinement means that, although the factory moves first by making buyout offers, homeowners cannot threaten to reject an offer that they would rather accept. *See* OSBORNE & RUBINSTEIN, *supra* note 45, at 97 (discussing the notion of subgame perfection in sequential games).

Recall again, that under a regime that requires injurers to take cost-effective precautions, the factory must maintain a smokestack in the presence of three homeowners. As in the simultaneous negotiations case, the factory can evade the duty to take precautions by buying out homeowners. Unlike the simultaneous-negotiations case, however, the factory's buyout offers to homeowners B and C now depend on earlier homeowners' decisions in previous negotiation rounds.

To see how the factory's buyout offers to later homeowners depend on earlier homeowners' decisions, suppose the factory has reached homeowner C. If homeowners A and B previously rejected their respective offers, then, as in Example 1, the factory will make homeowner C a buyout offer of 20 (or slightly more), which homeowner C will accept. If one of homeowners A and B rejected the factory's offer and the other accepted, then by the time the factory has reached homeowner C it is only required to maintain a filter (recall that in the presence of two homeowners, the factory is required to maintain a filter, but not a smokestack). Given that the factory maintains a filter, each remaining homeowner derives a utility of 10 from her property. The factory, consequently, will make homeowner C a buyout offer of 10 (or slightly more), which homeowner C will accept. Finally, if both homeowners A and B accepted their respective offers, the factory is no longer required to take precautions (recall that in the presence of one homeowner, the cost of a filter is greater than its benefit). The factory therefore will make no buyout offer to homeowner C. The following table summarizes the factory's buyout offer to homeowner C as a function of homeowner A's and homeowner B's earlier decisions whether to accept or reject their respective offers:

TABLE 1.

Homeowners A's and B's decisions	*Factory's offer to Homeowner C*
Both accept	0
One accepts, one rejects	10
Both reject	20

The factory's buyout offer to homeowner B similarly depends on homeowner A's decision. If homeowner A rejects the factory's buyout offer, then homeowner B will obtain 10 if she rejects her respective offer. This is because, if homeowner B rejects the factory's offer, the factory will proceed to buy out homeowner C for 20. Given that the factory buys out

one homeowner (homeowner C), it is only required to maintain a filter. Homeowner B's utility from her property, if she rejects the factory's offer, will accordingly be 10. Homeowner B will consequently accept a buyout offer of 10 (or slightly more). If, on the other hand, homeowner A accepts the factory's buyout offer, then homeowner B will obtain no utility if she rejects her respective offer. This is because, if homeowner B rejects her offer, the factory will proceed to buy out homeowner C for 10. Given that the factory buys out homeowners A and C, it is no longer required to take precautions. Homeowner B's utility if she rejects the factory's offer will accordingly be nil. Homeowner B will consequently accept a buyout offer of zero (or slightly more). The following table summarizes the factory's buyout offer to homeowner B as a function of homeowner A's preceding decision whether to accept or reject her respective offer:

TABLE 2.

Homeowner A's decision	Factory's offer to Homeowner B
Accept	0
Reject	10

It is now evident that homeowner A will accept a buyout offer of zero (or just slightly more). Should homeowner A reject the factory's offer of zero, the factory will proceed to buy out homeowners B and C for 10 each and will no longer be required to take precautions. Homeowner A's utility if she rejects the factory's offer will accordingly be zero. Now, given that homeowner A accepts the factory's buyout offer, homeowner B will accept a buyout offer of zero (or slightly more) as well. If homeowner B rejected the factory's buyout offer of zero, the factory will proceed to buy out homeowner C for 10 and will no longer be required to take precautions. Finally, given that both homeowners A and B accept the factory's buyout offer, the factory is not required to take precautions and therefore need not make any buyout offer to homeowner C.

Example 3 illustrates the significance of sequential negotiations for injurers' ability to exploit victims through buyouts. Victims' fear that rejecting a low buyout offer will only cause the injurer to contract with subsequent victims induces them to sell their property at unfavorable terms. Note that here buyouts render all victims worse off. While under simultaneous negotiations some victims sell their property for its true value (homeowner A) and others are at least partially compensated (homeowner B), buyouts under sequential bargaining equally harm all victims.

Negotiating sequentially not only increases injurers' profits at the expense of victims, but also expands the scope of cases in which injurers may use buyouts strategically. If injurers must buy out more victims to reduce their level of care, exploitation of victims might occur only under sequential bargaining. This result stems from injurers' ability under sequential bargaining to "sink" some of their buyout payments before approaching subsequent victims.[51] The following example illustrates how sequential bargaining enables injurers to exploit victims in a situation in which such exploitation is unfeasible if negotiations are simultaneous.

Example 4: Simultaneous Versus Sequential Negotiations. Consider the facts of Example 1, but suppose now that there are four (A, B, C, and D) rather than three neighboring homeowners. The factory can negotiate with homeowners simultaneously or sequentially.

Because each homeowner's property yields an annual utility of 20, the presence of a fourth homeowner increases victims' harm from 60 to 80. This rise in victims' harm from the factory's activity renders a smokestack even more cost-effective than a filter. While the additional cost of the smokestack remains 25 (the difference between the cost of a smokestack and the cost of a filter) its additional benefit now increases from 30 to 40 (four homeowners, rather than three, suffer no harm).

Suppose first that the factory, looking to use buyouts strategically, negotiates with the homeowners simultaneously. To carry out a divide-and-conquer strategy, the factory must make two homeowners a buyout offer of 20 each, and a third homeowner a buyout offer of 10. To see why, recall that the factory can maintain a filter instead of a smokestack when there are only two homeowners. Accordingly, the factory can induce homeowner C to accept a buyout offer of 10 only if homeowners A and B both agree to sell their properties. This in turn requires the factory to pay homeowners A and B an amount equal to the actual value of their properties. The factory's total buyout payments under this program (50 = 20 + 20 + 10), however, are greater than its savings in precaution costs (40). Under simultaneous negotiations, therefore, the factory would not find it profitable to buy out any homeowner.

This result changes, however, once the factory negotiates with homeowners sequentially. Suppose that the factory makes homeowner A a

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51. For a similar argument involving exclusionary contracts made by Ilya Segal and Michael Whinston, see Ilya R. Segal & Michael D. Whinston, *Naked Exclusion: Comment*, 90 AM. ECON. REV. 296, 301 (2000) (considering the conditions under which an incumbent firm that negotiates sequentially with customers can induce them to sign exclusionary contracts).

buyout offer of 20 (or slightly more). Because the proposed buyout payment is equal to A's benefit, she will accept the offer. Following the buyout of A, only three homeowners are left. As we show in Example 3 (Sequential Bargaining), the factory can now proceed to buy out the three remaining homeowners at no (or minimal) cost and thereby evade the duty to take precautions. Under sequential negotiations, therefore, the factory can save precaution costs of 40 by spending 20 in buyout payments (the cost of buying out homeowner A).

Example 4 shows injurers' second advantage from sequential bargaining. Under simultaneous negotiations, injurers might have to make some victims (homeowners A and B) high buyout offers to induce other victims (homeowner C) to accept lower offers. The costs of buying out this "critical mass" of victims can make the total buyout payment greater than the injurers' savings in precaution costs. Approaching victims sequentially shrinks the critical mass of victims that injurers must buy out to induce the remaining victims to accept low buyout offers. This is because, in deciding whether to accept or reject the injurer's offer under sequential bargaining, victims look to future rounds of negotiations. If it is profitable for the injurer to buy out subsequent victims, early victims will rather sell their property than be exposed to an even greater harm. The profitability of the injurer's buyouts of subsequent victims is independent of any "sunk payments" made in previous negotiation rounds. Consequently, under sequential negotiations, injurers can induce victims to accept unfavorable offers by buying out fewer victims.

C. Victims' Precautions

Our analysis thus far has examined the consequences of buyouts under the assumption that injurers alone can take care. In many cases, however, victims as well may take precautions to reduce their harm. This section shows that when victims, in addition to injurers, can take care, the scope of strategic buyouts may further expand.

Although victims' and injurers' precautions are often substitutes, they differ in their effects on harm prevention. Because the risk of harm stems from injurers' activity, making it less harmful (that is, raising their level of care) has a global effect on victims' harm. In contrast, victims who take precautions usually reduce their own harm but not the harm of other victims. Consider, for example, a pollution case in which the injurer can reduce harm by elevating its factory's smokestack, and victims (homeowners) can reduce harm by using pollution-resistant paint. Whereas the reduction in the probability of harm from a higher smokestack benefits

all victims (global precaution), the benefit from pollution-resistant paint is limited to each victim (local precaution).

If victims can also take precautions, buying victims' property can be particularly profitable for injurers. Because buyouts reduce victims' expected harm, they render local precautions more efficient and global precautions less so. By buying out victims, injurers subject to a cost-benefit standard can thus shift the burden of care onto the remaining victims. Consequently, compared to the case in which victims cannot take care, in cases when victims can take precautions, injurers' profits from strategic buyouts may significantly increase. The next example, which is a slight variation of Example 1, illustrates the implications of victims' precautions on the incentives of injurers to engage in strategic buyouts. It shows that even if injurers could not profit from buying out victims when they alone can take care, they may still find buyouts profitable if victims as well can take measures to reduce their harm.

Example 5: Victims' Precautions. As in Example 1, suppose that a new factory will harm three neighboring homeowners, each of whom values the uninterrupted use of her property at 20 per year. In contrast to Example 1, however, suppose that the factory can only maintain a smokestack, which entirely prevents the homeowners' harm, at an annual cost of 35. Further suppose that each homeowner can prevent half of her own harm by coating her property with a pollution-resistant paint at an annual cost of 5.

To see the significance of victims' precautions, consider initially a similar case in which only the factory can take care. If the homeowners could not prevent harm on their own (that is, no pollution-resistant paint), the factory would be required to maintain a smokestack, as its cost is less than the harm it prevents ($35 < 3 \times 20$). Note that in contrast to Example 1, the factory is now required to maintain the smokestack even in the presence of two homeowners, because the benefit of a smokestack for two homeowners (2×20) is still more than its cost (35). Consequently, the factory would not find it profitable to buy out one homeowner. Only in the presence of a single homeowner will the factory no longer be required to maintain a smokestack (if one homeowner is left, the benefit of a smokestack (20) is lower than its cost (35)). The required buyout payments to two homeowners (2×20), however, exceed the cost of a smokestack (35). Thus if the factory alone can take precautions, it would not find it profitable to buy out any homeowner.

Consider now Example 5, in which the homeowners as well can take

precautions. In the presence of three homeowners, the factory's smokestack remains the socially optimal precaution. Although the smokestack is more costly than the homeowners' paint, its additional benefit (3×10) is greater than its additional cost (20, the difference between the cost of a smokestack (35) and the cost of the homeowners' paint (3×5)). Thus, under a cost-benefit standard, the factory must incur 35 in precaution costs and the homeowners suffer no harm. Suppose, however, that the factory makes one homeowner a buyout offer of 20 (or slightly more). Because this offer is equal to that homeowner's benefit, she will accept it. With only two homeowners left, the harm the factory causes decreases. Given that each of the two remaining homeowners can reduce half of her harm at a cost of 5, a smokestack is no longer socially desirable. Whereas the additional cost of a smokestack is 25 ($35 - 2 \times 5$), its additional benefit is only 20 (half of the remaining homeowners' harm). Thus, following the buyout of one homeowner, the factory will no longer be required to maintain a smokestack.

As with other instances of strategic buyouts, this buyout as well decreases victims' profits and reduces social welfare. Although the factory saves 15—the difference between its savings in precaution costs (35) and its buyout payments (20)—the two remaining homeowners lose 30 (each spends 5 on painting and suffers a harm of 10). Social welfare accordingly decreases by 15.

As this example illustrates, victims who may take measures to reduce their harm are more vulnerable to strategic buyouts. By contracting with victims, injurers can shift the burden of taking precautions onto remaining victims, thereby avoiding the need to take care at their expense. Injurers' profits from strategic buyouts increase even if some, but not all, victims can reduce their harm. Thus, in Example 5, imagine that only two of the homeowners can paint their property. While this change affects the factory's decision as to which homeowners should be bought out, the parties' payoffs remain the same. If all homeowners may take care, as in Example 5, the factory is indifferent as to which homeowner to buy out. If only two of the homeowners can take care, the factory will contract with the homeowner who cannot reduce her harm on her own (so that the remaining homeowners will be required to take care). In both cases, however, the factory buys out one homeowner at 20, and the remaining homeowners spend 5 on pollution-resistant paint.

D. The Conditions for Strategic Buyouts

Building on the examples in the previous sections, we will now

examine the conditions for strategic buyouts. We show that injurers' ability to exploit victims through buyouts depends on the nature of their precaution technology, as well as on victims' inability to act collectively to disrupt the injurer's strategic negotiations. (Readers who are interested in a more technical analysis are invited to read the Appendix).

1. Precaution Technology

Injurers' ability to exploit victims through buyouts is contingent on the interplay between the cost of greater care and the resulting reduction in the expected harm. Strategic buyouts become more probable as injurers stand to gain more (in saving precaution costs) from reducing victims' expected harm. If a modest decrease in victims' harm allows the injurer to significantly scale back on the precaution he must take, then strategic buyouts will maximize the injurer's profits. In Example 1, the buyout of homeowner A reduces the expected harm by 20, but decreases the factory's required cost of care by 25 (as it can now maintain a filter rather than a smokestack). Similarly, the buyout of homeowner B reduces the expected harm by an additional 10, but further decreases the factory's required cost of care by 15 (as it no longer needs to take care). It is thus the difference between the reduction in victims' expected harm and the corresponding savings in the factory's precaution costs which renders the buyout of each homeowner profitable for the factory. (We more precisely define the conditions for a single-victim buyout in the Appendix.)[52]

Cases in which injurers can employ only one cost-effective measure of precaution most clearly illustrate the risk of strategic buyouts. If the costs of buying out a sufficient number of victims to render the (single) precaution inefficient are lower than the costs of the precaution itself, injurers can increase their profits by strategically bargaining with victims. Thus, in Example 1, if the factory causes harm of 60, but can only maintain a smokestack that entirely prevents harm at a cost of 45, the buyout of a single homeowner would allow it to externalize the harm onto the remaining homeowners. Our examples show, however, that injurers can

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52.   A necessary, but not sufficient, condition for an injurer to buy out more than one victim is that the injurer's additional costs of precautions be increasing at a decreasing rate. To illustrate this condition, consider the costs of precautions in Example 1. Although the factory's additional cost of precautions—that is, the additional cost of a filter over no precautions and that of a smokestack over a filter—is increasing from 15 to 25, it is increasing at a decreasing rate; from 0 to 15 (15), and then from 15 to 25 (10). Thus, a necessary condition for the factory to profitably buy out two homeowners is that the additional cost of a smokestack over a filter be lower than 30; or, equivalently, that the cost of maintaining a smokestack be lower than 45. Thus, so long as maintaining a smokestack costs less than 45, but more than 30, the additional cost of the factory's precaution is increasing at a decreasing rate.

similarly exploit victims even in cases in which they can employ various precautions and take different levels of care. Strategic buyouts may thus occur irrespective of whether injurers choose from a narrow or wide range of precautions.

Not only does the relationship between the expected harm and the costs of care affect the profitability of buyouts, but also the number of victims who are exposed to the injurer's activity. As harm is spread over more victims, injurers can calibrate their buyouts to fine tune the reduction in the expected harm that would maximize their profits. Accordingly, even if a buyout does not pay off with fewer victims, it might become profitable as the number of victims increases. To see the effect of the number of victims on the profitability of buyouts, suppose that, instead of three homeowners in Example 1, there were only two, each exposed to a harm of 30 (so that total expected harm remains 60). Although the buyout of one homeowner would reduce the factory's cost of precautions—as it would no longer be required to maintain a smokestack—the buyout payment (30) would exceed the factory's saving in precaution costs (25), thereby rendering the buyout unprofitable. As Example 1 shows, however, in the presence of three homeowners, the factory can better align the magnitude of the buyout (20) with its corresponding saving in precaution costs (25).

2. No Collective Bargaining Among Victims

Injurers may not use buyouts strategically if victims can negotiate among themselves and make side payments to one another. Consider again Example 2 (simultaneous bargaining). Suppose that after the factory makes its buyout offers, the homeowners negotiate with each other before deciding whether to accept or reject their offers. Homeowners B and C, trying to avert their unfavorable buyouts, could jointly pay 20 (or slightly more) to homeowner A in exchange for rejecting her buyout offer. If homeowner A refuses to sell her property, homeowner B would reject her respective buyout offer as well, thereby saving herself 10. The no-buyout agreement with A (and B's consequent rejection of her buyout), similarly saves homeowner C a loss of 20. The total savings of homeowners B and C (30) exceeds their payment to A (20), thus increasing the homeowners' joint payoff.

Although cooperation improves the homeowners' position, it will often be hindered by prohibitive transaction costs. As their numbers increase, cooperation among victims becomes more costly and thus less profitable. This point becomes evident by considering how the presence of an additional victim affects each of the parties. For the injurer, this requires

negotiation with one more victim. In contrast, if the victims wish to act collectively, each of the original victims now must bargain with this additional victim, thus increasing significantly the number of negotiations. This asymmetry between the injurer and the victims becomes more prominent as the number of victims increases. The cost of collective action by victims thus rises rapidly as more victims are exposed to the injurer's harmful activity.

Not only negotiation costs, but also attempts at "free riding" are likely to prevent victims from cooperating. In Example 2, even if homeowners B and C can negotiate at no cost, they may still disagree on how to divide the no-buyout payment to homeowner A. Each homeowner might refuse to pay her share of the payment, expecting the other victim to pay a greater share. As the number of victims increases, more victims might attempt to free ride.

More generally, buyouts share the strategic properties of other legal contexts involving a "one-against-many" structure.[53] For example, when individual victims suffer only a small harm, they often fail to bring their meritorious claim to court as a result of a collective-action problem.[54] Although suing the injurer jointly would increase victims' total profit, negotiation costs as well as free-riding often impede the filing of such a joint lawsuit. The legal system acknowledges this concern and allows victims, in appropriate cases, to sue through a class action.[55] As our examples illustrate, buyouts involve a similar strategic structure. Although victims can increase their joint profit by collectively rejecting the injurer's buyout offers, prohibitive transaction costs render such cooperation unlikely.

IV. INJURERS AND STRATEGIC BUYOUTS

This part reviews several common practices that suggest that injurers use buyouts strategically. Consistent with the arguments in Part III, Section A shows the use among injurers of sequential bargaining and discriminatory buyout offers. Section B sheds light on the seeming puzzle of injurers' preference for buyouts over liability waivers. Although liability

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53.   *See* Oren Bar-Gill & Omri Ben-Shahar, *The Prisoners' (Plea Bargain) Dilemma*, 1 J. LEGAL ANALYSIS 737, 766–69 (2009) (reviewing the one-against-many literature).

54.   *See* Charles Silver, *Class Actions—Representative Proceedings*, *in* 5 ENCYCLOPEDIA OF LAW AND ECONOMICS 194, 206–07 (Boudewijn Bouckaert & Gerrit De Geest eds., 2000) (highlighting the significance of transaction costs and free-riding in preventing victims from filing joint lawsuits).

55.   *Id.* (showing how class actions resolve both concerns and allow individual victims to sue without the need to cooperate).

waivers are less costly for injurers, especially if they attach little value to victims' property, they do not provide injurers the strategic advantage that buyouts do. Section C argues that the prospect of buying out victims helps to explain injurers' search for areas where victims are less likely to organize.

A. STRATEGIC BUYOUTS NEGOTIATIONS

As the preceding examples have illustrated, injurers who seek to increase their profits from buyouts may employ two strategies. Recall that sequential bargaining minimizes injurers' total buyout payments as well as extends the scope of cases in which buyouts can be used to exploit victims.[56] To maximize their profits, injurers may thus first attempt to negotiate with victims one after the other. Second, if they cannot bargain with victims sequentially, injurers may still profit from buyouts by discriminating among victims, making high buyout offers to some victims and low offers to others.

Anecdotal evidence suggests that injurers prefer to avoid negotiating with all property owners at the same time. Rather, buyout programs commonly unfold over a prolonged period of time, enabling the injurer to approach victims in stages. For example, Exxon Mobil's buyout program of property in the vicinity of its Baytown, Texas, refinery lasted over twelve years.[57] As Warren Dold, a retired senior adviser for Exxon Mobile admitted in an interview, the company's strategy with regard to its buyout program has been to "grow it bit by bit. We go to the community closest to the existing plant first."[58] Once the fenceline houses are bought out, the next houses in line are targeted until all the land is cleared. Other companies have acknowledged applying a similar approach. As a 2005 study that examined buyout agreements in Texas concluded,

> Regardless of the locale, the modus operandi for company buyout programs is much the same. Starting with the blocks closest to processing units, the purchasing spreads out in circular waves, moving farther and farther from the plant like ripples in a pond. Every couple of years, letters are delivered to properties the company is interested in buying . . . .[59]

As noted, simultaneous negotiations involving discriminatory buyout payments enable injurers to decrease the total amount paid to victims.

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56. *See supra* Part III.B.
57. *See* Cappiello & Feldstein, *supra* note 1 (discussing Exxon's buyout program in Baytown).
58. *Id.*
59. *Id.*

Although buyout agreements usually include nondisclosure provisions,[60] anecdotal evidence suggests that companies use discriminatory offers. In the clearest manifestation of this practice, injurers offer some victims high buyout payments and no payments to other similarly situated victims. Thus, although some victims end up selling their property at a fair price, other victims—in what seems to follow the injurer's arbitrary decision—are left out of the deal.

Exploitation of victims through a divide-and-conquer strategy may explain, for example, the selective buyout of properties around the Galvin plant in Cheshire, Ohio—one of the largest electricity power plants in the country.[61] Following continual complaints about the environmental harm caused by the plant, AEP—the plant's owner—offered to buy the property of nearby residents and to help them relocate.[62] This buyout offer, however, was extended only to residents living on the northern side of the facility. Other residents, although owning similar properties and equally exposed to the environmental risks resulting from the plant's activity, were not included in the offer.[63] Following the buyout of the residents on the northern side of the facility, the remaining residents who considered suing the plant for the harm it caused dropped their claims for compensation.[64]

Other large-scale injurers seem to have adopted a similar strategy to take advantage of victims' collective action problem. After a lawsuit was filed against its major facility in Freeport, Texas, Dow Chemical approached nearby residents individually and offered to buy their land.[65] The residents, apparently concerned that other residents would accept their respective offers, thereby lowering the chance of winning the lawsuit, decided to sell their land to Dow. As one of the residents explained, "A lot of people got scared that they weren't going to get anything. Some families took a buyout . . . . I think they are trying to break our lawsuit down. They

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60. *See* Mary Beth Lane, *Bought-Out Cheshire Village Lives on*, COLUMBUS DISPATCH, June 24, 2012, at 1A ("The settlements with individual property owners were confidential. This fueled village gossip about which residents were getting paid what amounts for their homes.").

61. For an overview of the negotiations between AEP and Cheshire residents, see Gideon Parchomovsky & Peter Siegelman, *Selling Mayberry: Communities and Individuals in Law and Economics*, 92 CALIF. L. REV. 75, 85–92 (2004).

62. Michael Hawthorne, *AEP Agrees to Buy Out Entire Town*, COLUMBUS DISPATCH, Apr. 17, 2002, at 01A.

63. Spencer Hunt, *AEP Pollution Doesn't Stop at Cheshire Line, Suit Says*, COLUMBUS DISPATCH, May 13, 2004, at 01A.

64. *AEP, Citizens Group Settle Over Emissions Claim*, COLUMBUS BUS. FIRST (Dec. 7, 2006, 5:01 PM), http://www.bizjournals.com/columbus/stories/2006/12/04/daily29.html.

65. Cappiello & Feldstein, *supra* note 1.

try to divide and conquer."[66] In a relatively short period of time, Dow was able to buy out 110 of the 241 houses in the area despite opposition from residents.[67]

Injurers' use of discriminatory buyout offers has been encouraged by victims' failures to convince courts to intervene and disapprove of this practice. In *Maranatha Temple v. Enterprise Products Co.*,[68] for example, the plaintiff—a local church—challenged the selective buyout program offered by the owners of a nearby petrochemical facility.[69] The church, which was not included in the program, claimed that the discriminatory buyout program constitutes "a negligent act" on the part of the facility owners.[70] In denying the claim, the court ruled that the facility owners were under no duty to extend the buyout offers to additional property owners and had no obligation to justify their decision to apply the program selectively.[71]

Injurers' use of sequential bargaining and discriminatory offers may explain why victims, despite their reluctance, nevertheless accept unfavorable buyout offers. Property owners have called buyouts "extortion,"[72] and "manipulat[ive]."[73] Although expressing frustration on the part of victims, one may still wonder if these complaints are merely a tactical negotiation tool, intended to prod injurers to raise their buyout offers. However, a comprehensive survey, which examined the effects of a large buyout program in Detroit, found that nearly 39 percent of those who accepted the buyout offers indicated that the payment they received was insufficient to cover the costs of alternative housing.[74] As the survey took

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66.   *Id*. (quoting a homeowner who refused a buyout offer) (internal quotation marks omitted). *See also* Jason Schultz, *Out of Flight Path, into Tough Home Market*, PALM BEACH POST, Oct. 21, 2006, at 1A (describing Witham Field Airport's extensive buyout program and residents' "fear that if they refuse the county's first offers, they could end up getting less money").

67.   Cappiello & Feldstein, *supra* note 1.

68.   Maranatha Temple v. Enter. Prods. Co., 893 S.W.2d 92 (Tex. Ct. App. 1994).

69.   *Id.* at 95–96.

70*.   Id.* at 104.

71.   *See id.* at 104–05.

72.   Schultz, *supra* note 66 (quoting a former homeowner who was bought out) (internal quotation marks omitted).

73.   Christy Scattarella, *Holdouts Haunt Ghost Town—Homeowners Reject Port's Buyout Offer Near Sea-Tac Airpot*, SEATTLE TIMES , Feb. 18, 1992, at A1.

74.   Jenny Nolan, *Auto Plant vs. Neighborhood: The Poletown Battle*, DETROIT NEWS (Jan. 27, 2000), http://www.upa.pdx.edu/IMS/currentprojects/TAHv3/Content/PDFs/Poletown_Battle_Detroit_ News.pdf (describing a buyout program followed by a condemnation hearing). *See also* Peggy McKenzie, *Area Around Airport Picks up the Pieces After the Buyout*, COMMERCIAL APPEAL, Nov. 26, 1992, at N1 (reporting that of those who sold their property in a large buyout plan near Memphis International Airport "[m]any are finding it difficult to find comparable homes . . . for the money they [were] given"); Schultz, *supra* note 66 (reporting that homeowners who have accepted their buyout

illustrate this potential advantage of waivers over buyouts. Suppose that the victim's utility from her land is 20, and that the injurer's tortious activity decreases it by 5. The injurer, on its part, ascribes no value to the victim's property. While both a buyout and a waiver enable the injurer to avoid future liability, their relative costs are significantly different. Given the victim's utility from her land, she will refuse to sell for less than 20. Because the injurer does not derive any profits from the land itself, its net buyout cost is therefore 20. Using a waiver, in contrast, requires the injurer to pay the victim only 5 (her expected loss from the injurer's activity). The difference between the costs of a buyout and a waiver (15) stems from the fact that the victim's land is valueless for the injurer. By using a waiver instead of a buyout, the injurer avoids overpaying for a property it often does not intend to utilize. Injurers' widespread use of buyouts (rather than waivers) may thus seem to be inconsistent with their own interests.

Our analysis suggests, however, that buyouts provide injurers a significant advantage over liability waivers. Under the current regulatory and liability rules, buying out victims not only prevents these victims from bringing suit against the injurer, but also affects the ability of the remaining victims to establish their claim. This is so because the buyout of every additional victim decreases total harm and therefore further reduces injurers' required level of care. This dynamic, as shown, permits injurers to use buyouts strategically. Liability waivers, in contrast, do not reduce total harm. Although victims who sign waivers can no longer sue the injurer, they still remain on their land. Accordingly, if other victims bring suit against the injurer, total harm—including the harm to the "waiving" victims—may require the injurer to take greater care. Put differently, liability waivers do not create the externality among victims that enables the type of exploitation by injurers that our examples discuss. Thus, in the final tally, although they cost more than liability waivers, buyouts allow injurers to maximize their profits.

The externality that buyouts create can explain injurers' common demand that following the sale of their property, victims relocate to a different area.[78] If victims move to locations in which they are still influenced by the injurer's activity, a buyout may prove unprofitable. Because total harm does not change when victims relocate within their original area, injurers' required level of care would remain the same despite

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78.   *See, e.g.*, Ken Ward, *Buying Blair: Arch Coal Found Way to Move Residents Away*, CHARLESTON GAZETTE (Nov. 22, 1998), http://www.wvgazette.com/News/MiningtheMountains/ 200906050368 (residents accepting Arch Coal's buyout offer were required to commit "never to live or own property in a 25-square-mile-region around Arch Coal's Logan County mining complex").

the buyout. Conditioning the buyout on victims' relocation to places sufficiently farther from the injurer's activity prevents this outcome. Once the bought-out victims are no longer exposed to the risk of harm, injurers can reduce their level of care at the expense of remaining victims.

C. TARGETING VULNERABLE COMMUNITIES

Injurers searching for a place to operate may often choose from several potential sites. A rich literature has examined what considerations affect injurers' location decisions. This literature suggests that one of the important factors injurers consider is the level of cooperation among communities' residents. Injurers largely avoid areas where residents are considered cooperative and therefore are likely to act collectively.[79]

Injurers' own accounts reveal the significant weight they accord to the possibility of cooperation among residents. For example, waste management firms have admitted employing consultant companies to identify communities which are less likely to collectively oppose their operation. As one study reports, "The largest company in the hazardous waste industry has gone beyond relying on publicly available demographic and historical indicators to predict opposition; it now conducts surveys in communities before it files plans for a new facility, in order to gauge likely opposition."[80]

Empirical studies have similarly found a correlation between injurers' location and communities' potential for collective action. James Hamilton has used communities' voter turnout as a measure of residents' potential to engage in collective action against polluters.[81] Previous studies have established that the percentage of a county's population who vote in presidential elections is a reliable proxy for residents' likelihood to cooperate for the benefit of the community at large. Based on the results of his regression analysis, Hamilton shows that "the higher the actual voter turnout in the county, the less likely the county is to be targeted."[82] Furthermore, residents' voter turnout was shown to be a better predictive measure for injurers' location than other variables, such as residents' income and education.[83]

The existing literature has rationalized injurers' costly search for

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79.   James T. Hamilton, *Politics and Social Costs: Estimating the Impact of Collective Action on Hazardous Waste Facilities*, 24 RAND. J. ECON. 101, 115–18 (1993).

80.   *Id.* at 107 (citation omitted).

81.   *Id*. at 108–14.

82.   *Id*. at 115.

83.   *Id*.

noncooperative communities by their desire to lower the risk of litigation. Because challenging local polluters in court often requires considerable resources, it is less likely that a single victim, or a small group of victims, will be able to effectively oppose the injurer. As a leading environmental scholar has explained, "Because local protest can be costly . . . siting decision makers often take the path of least resistance—choosing sites in neighborhoods that are least likely to protest effectively."[84] Identifying noncooperative communities, where residents are not inclined to join forces, thus enables injurers to reduce the likelihood of litigation. This theory presupposes that high litigation costs indeed prohibit individual victims from taking their case to court. However, this theory fails to explain injurers' incentives to locate in noncooperative communities when litigation costs are lower than individual victims' harm. In such cases, because victims' individual stakes outweigh their litigation costs, they will choose to file suit even if they act alone.

While the conventional theory assumes that high litigation costs prevent individual lawsuits, an assumption which may not hold in many cases, our analysis highlights the strategic advantage injurers enjoy when they operate in noncooperative communities. Even if individual victims have sufficient incentives to sue on their own, injurers can still frustrate their lawsuits through buyouts when they cannot act cooperatively. Recall that in Example 1, it is in each homeowner's interest to individually sue the factory, regardless of whether other homeowners join the lawsuit. If the homeowners do not jointly resist the factory, however, they will end up selling their property for a price lower than its actual value. Injurers' evident preference for noncooperative communities can thus be explained on a broader basis than the conventional explanation suggests. In addition to facing lower prospects of litigation, injurers operating in such communities are in a better position to overcome potential lawsuits.

V. ADDRESSING THE RISK OF STRATEGIC BUYOUTS

In this part we evaluate three solutions for preventing inefficient buyouts and thereby protecting victims from exploitation by injurers. We first examine the consequences of subjecting injurers to strict liability. We then consider a more centralized approach, under which buyouts must be scrutinized and approved by public bodies, such as states, cities, or local municipalities. Finally, based on the previous analysis, we consider

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84.   Vicki Been, *What's Fairness Got to Do With It? Environmental Justice and the Siting of Locally Undesirable Land Uses*, 78 CORNELL L. REV. 1001, 1002 (1993).

modified cost-benefit rules that are sensitive to injurers' potential strategic use of buyouts.

As the analysis in Part III has shown, injurers' ability to use buyouts to the detriment of victims stems from the susceptibility of cost-benefit standards to strategic manipulation. A possible solution to strategic buyouts, therefore, is replacing cost-benefit rules with strict liability. Under a strict liability regime, injurers cannot evade their duty to take efficient precautions by contracting with victims.

To illustrate the inability of injurers subject to strict liability to benefit from buyouts at victims' expense, consider again Example 1. Recall that by buying out one homeowner, the factory saves the difference between the cost of a smokestack and the cost of a filter. Because a filter is the socially optimal precaution in the presence of only two homeowners, under cost-benefit standards the factory escapes liability. Under strict liability, in contrast, the factory must compensate victims even if its care level is efficient. Thus, under strict liability, the factory's total costs, which include the buyout payment to one homeowner (20), the cost of a filter (15), and the compensation to the remaining homeowners (2×10), amount to a total of 55. As maintaining a smokestack costs the factory only 40, attempting to strategically buy homeowners' property actually decreases its profits. The factory thus cannot profit from strategic buyouts under strict liability.

Although subjecting injurers to strict liability dulls the sting of buyouts, it fails to provide a comprehensive solution and involves several shortcomings. First, because strict liability requires injurers to compensate victims irrespective of whether or not their activity is socially desirable, it may reduce social welfare. Requiring injurers to pay damages when their activity enhances social welfare merely constitutes a transfer from injurers to victims, but does not create social surplus. Thus while strict liability can help prevent strategic buyouts, it unduly raises the cost of injurers' activity. Second, when victims' available remedies include injunctions, strict liability may prevent injurers from engaging in socially desirable activities. Under a strict-liability regime of nuisance law, for example, injurers can no longer avoid liability by using the "locality doctrine" to show that their activity is socially desirable.[85] Consequently, nearby residents could enjoin injurers' activity even when it takes place in industrial areas and actually enhances social welfare. Last, strict liability removes the risk of strategic buyouts only under tort liability. In the regulatory context, however, because administrative agencies must determine injurers' required level of

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85.   *See supra* text accompanying notes 23–30.

care in advance, utilizing cost-benefit analysis is indispensable.

A second approach to resolving the risk of strategic buyouts is to level the playing fields between injurers and victims. Buyouts enable the exploitation of victims because of their "one-against-many" structure. This implies that reconfiguring the structure of buyouts to "one-against-one" will undercut injurers' strategic advantage. Although victims' collective-action problem is hard to resolve directly, an alternative solution is to have a representative act on behalf of victims as a group. An injurer who seeks to buy out victims will have to obtain the representative's approval prior to approaching individual property owners. Unlike victims, this representative need not coordinate its decisions with others, allowing it to only approve buyouts that offer victims adequate compensation for their property.

Although victims themselves can sometimes appoint representatives to act on their behalf,[86] a more general solution would be to delegate the approval authority of buyouts to public bodies, such as states, cities, and municipalities. Because they are subject to reelection, the interests of these public bodies are usually aligned with those of their constituents. Furthermore, as mentioned earlier, states and cities are already involved in buyout programs, providing them political and financial support.[87] Under this proposed solution, therefore, these public bodies will be involved not only in assisting injurers in carrying out buyout programs, but also in ensuring that such programs increase social welfare.

This proposal shares the features of the legal solution to the collective-action problem of dispersed plaintiffs. In a class action suit, the plaintiff who files the claim serves as a representative of all other plaintiffs, thereby avoiding the need for coordinating his actions with other plaintiffs. Applying a similar solution to buyouts thus merely extends the use of a delegated representative to the prelitigation stage. Furthermore, in a class action, the representative plaintiff is awarded a greater percentage of the damages at the expense of the remaining plaintiffs. This higher compensation is required to incentivize individual plaintiffs (each of whom suffers only a small harm) to act on behalf of the entire group. In the context of buyouts, in contrast, because the proposed representatives are already motivated by electoral concerns, such a monetary compensation at

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86.   *See* Michael Janofsky, *Town Relocating to Escape Jet Noise*, N.Y. TIMES, Apr. 9, 1999, at A14 (reporting the story of Minor Lane Heights, Kentucky, where residents who were offered a buyout by Louisville International Airport insisted on a collective buyout that would preserve their community).

87.   *See, e.g.*, Mathews, *supra* note 1 (describing a buyout funded by injurers, the federal government, and the state government).

the expense of property owners is unnecessary.

Making buyouts subject to pre-approval by public authorities is not without costs, however. First, the pre-approval requirement may hinder nonstrategic injurers from contracting with victims. If injurers must incur significant costs to prove the efficiency of their buyout program (and lack of strategic incentives), they may give up on buyouts that are socially efficient. Second, elected bodies may not always satisfy the interests of their constituents if they can obtain a sufficiently high gain from serving others. Deep-pocketed injurers may thus attempt to influence the judgment of the officials in charge. Because injurers' profits from strategic buyouts can be particularly significant, this risk might not be negligible.

A third solution, which may avoid these drawbacks, is to modify the application of the current cost-benefit standards. Under the present approach, courts and regulators compare injurers' costs of precautions vis-à-vis victims' prospective harm. This comparison is conducive for optimal harm prevention so long as injurers and victims cannot contract with one another. If injurers can negotiate with victims, however, the prospective nature of the existing cost-benefit standards induces strategic buyouts by injurers. A possible solution is thus to extend the scope of cost-benefit analysis. Rather than only examining victims' prospective harm, courts and regulators should also consider victims' harm prior to injurers' buyouts. Specifically, if evidence suggests that buyouts are strategic, the prebuyout harm, rather than victims' prospective harm, should be the benchmark for the assessment of injurers' required level of care.[88] Balancing the costs of precaution against the prebuyout harm will eliminate injurers' benefit from strategically contracting with victims.

Whether courts and regulators are able to detect strategic buyouts is a question that remains to be answered. Yet, strategic behavior among injurers is a concern that courts and regulators have successfully addressed in other related contexts. For example, various tort doctrines require injurers to "rescue" victims who fail to take proper care.[89] Although these

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88.   To see the significance of whether or not the injurer's buyout is strategic, consider Example 1 but suppose now that the factory attaches an independent value of 100 to homeowner A's property (say by using it for storage). In this case, because the purchase of A's property is socially efficient, requiring the factory to maintain a smokestack in the presence of only two homeowners would actually reduce social welfare. More generally, resorting to the prebuyout harm in determining injurers' optimal level of care would undo the benefit from (and thus deter) strategic buyouts. When buyouts are socially efficient, however, taking account of the prebuyout harm would only impose on injurers excessive costs of care.

89.   *See, e.g.*, RESTATEMENT (SECOND) OF TORTS § 314A (1965) (requiring common carriers to assist those harmed on their carriers).

doctrines induce injurers to efficiently prevent harm when victims can no longer do so, they undermine victims' incentives to take optimal precautions in the first place. For instance, because drivers are required to slow down when pedestrians carelessly cross the street, pedestrians have less incentives to take due care when crossing the street. As tort scholarship has shown, however, courts "have limited the doctrine of compensating precaution [that is, injurers' duty to take additional precaution to compensate for victims' lack of care] in ways that reduce strategic behavior."[90] Courts have ruled that injurers' duty would be waived when evidence suggests that victims' improper behavior was deliberate and intended to shift the cost of precaution to the injurer.[91] Deterring strategic behavior by injurers and victims is thus not an unfamiliar challenge to courts and regulators.

Furthermore, our analysis provides some guidelines that may facilitate the identification of strategic buyouts. Under simultaneous negotiations, as noted, injurers can exploit victims by using discriminatory offers. Requiring injurers to justify such discrimination (in contrast to the court's approach in *Maranatha Temple*) may help to reveal their true intentions in buying victims' property. Second, because injurers maximize their profits if they negotiate with victims sequentially, courts and regulators should be particularly alert to buyouts which unfold over a prolonged period of time for no apparent reason. Finally, for the reasons discussed above, courts and regulators should be suspicious when buyouts involve communities which are less likely to engage in collective action.

VI. CONCLUSION

As the preceding analysis has shown, although buyouts are voluntary transactions, they nevertheless enable injurers to exploit victims. Understanding the implications of buyouts does not only illuminate their socially undesirable effects, but also sheds light on the significance of bargaining in the shadow of harmful activities. We conclude this Article by showing how the strategic nature of buyout agreements challenges conventional arguments concerning the distribution of power between prospective acquirers and landowners, as well as the desirability of agreements involving victims and injurers.

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90.   Mark F. Grady, *Common Law Control of Strategic Behavior: Railroad Sparks and the Farmer*, 17 J. LEGAL STUD. 15, 18 (1988). *See also* THOMAS J. MICELI, ECONOMICS OF THE LAW 58–70 (1997) (demonstrating how courts have limited the application of the duty to take compensatory precautions only to cases in which risk was created inadvertently).

91.   *See* Grady, *supra* note 90, at 23–28, 34.

Legal and economics scholarship, examining the bargaining power of parties negotiating property transactions, has emphasized the relative disadvantage of a land purchaser who must negotiate with multiple property owners.[92] As this scholarship has shown, a purchaser of land owned by numerous proprietors is vulnerable to "holdout" attempts. Every additional parcel of land which the purchaser acquires increases his stakes in buying the remaining tracts of land.[93] Landowners approached toward the end of the purchasing process thus enjoy a greater bargaining power and are therefore likely to insist on a price that exceeds the actual value of their land. If landowners are aware of the purchaser's intentions to buy multiple parcels, each of them—cognizant of the possibility of holding out—will strive to be the last to negotiate with the purchaser. Consequently, prospective acquirers and landowners may fail to reach an agreement even if doing so will make all of them better off.

Our analysis shows, however, that the tables may turn when the purchaser is a nearby injurer whose activity is regulated by a cost-benefit standard. The presence of multiple victims, who cannot coordinate their decisions, enables the injurer to induce victims to accept unfavorable buyout offers. Contrasting the different distribution of bargaining power in situations involving holdouts with those involving buyouts highlights the importance of both the legal protection of property-owners' rights as well as the underlying economic interests of land purchasers. Purchasers are exposed to holdouts when they attach independent value to the land they aspire to buy, and landowners' interests are protected by a property rule. In contrast, when purchasers are injurers who attach no independent value to the land they intend to acquire, and landowners' rights are protected only by a liability (or regulatory) rule predicated on cost-benefit analysis, the balance of power switches.[94]

The strategic advantage that injurers enjoy in buyout negotiations also suggests that one of the basic insights of the Coase theorem should be interpreted with caution. As Coase has famously shown, if injurers and victims can costlessly negotiate, then irrespective of the legal rule, they will

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92. *See* RICHARD A. POSNER, ECONOMIC ANALYSIS OF LAW 62–63, 76 (7th ed. 2007) (highlighting the risk of holdouts when a purchaser of land must negotiate with multiple property owners). *See generally* Wolfgang Eckart, *On the Land Assembly Problem*, 18 J. URBAN ECON. 364 (1985) (same).

93. Eckart, *supra* note 92, at 366.

94. The distinction between property and liability rules was introduced in Guido Calabresi & A. Douglas Melamed, *Property Rules, Liability Rules, and Inalienability: One View of the Cathedral,* 85 HARV. L. REV. 1089, 1105–10 (1972).

reach an agreement that maximizes their joint welfare.[95] Because victims' loss from socially undesirable activities exceeds injurers' benefit, if the law permits injurers to inefficiently inflict harm, victims will be able to "bribe" injurers to either avoid their activity or take efficient precaution. Similarly, if the law prohibits injurers from engaging in socially desirable activities— activities which yield injurers a benefit that is greater than victims' harm— injurers will "bribe" victims to allow them to carry out the risky activity. Accordingly, independent of the legal standard that governs harmful activities, incentives for efficient behavior will always be restored through voluntary negotiations.

This Article shows, however, that when an injurer harms multiple victims and is subject to a cost-benefit standard, buyout negotiations between the injurer and the victims can actually reduce social welfare. Such negotiations allow the injurer to take suboptimal care while still complying with the required regulatory or liability standard. Thus, so long as victims cannot cooperate to jointly reject the injurer's buyout offers, it is precisely the bargaining between the injurer and the victims that frustrates the attainment of the socially desirable outcome.

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95.   Ronald H. Coase, *The Problem of Social Cost*, 3 J.L. & ECON. 1, 2–6 (1960).

APPENDIX

This Appendix considers the condition under which a single-victim buyout produces gains from trade in the case in which the injurer's precautions are continuous.[96]

Consider one injurer and $n \geq 2$ potential victims ("victims"). The injurer and victims are risk neutral. Each victim's property yields him a private benefit. Let h be victims' aggregate benefits and $\Delta h \equiv h/n$ be one victim's benefit. The injurer engages in a socially valuable activity, which reduces victims' benefits from their activities to zero. h is therefore victims' aggregate *harm* (that is, lost benefit) from the injurer's activity. Finally, we assume that the injurer attributes no value to victims' properties.

The injurer can increase the probability that victims do not suffer harm by taking precautions (for example, elevating a smokestack); we call the probability that victims do not suffer harm "safety probability." In particular, to prevent victims' harm with probability $p \in [0, 1]$, the injurer must spend $c(p)$,[97] where $c(p)$ is thrice continuously differentiable, $c(0) = 0$, $c'(p) > 0$, and $c''(p) > 0$. Thus, the injurer's marginal cost of increasing the safety probability is strictly increasing at an increasing rate.

We further assume that the injurer's cost of increasing the safety probability is not affected by victims' aggregate harm. The marginal social net benefit from increasing the safety probability is thus increasing with victims' expected harm.[98] This assumption holds naturally for the factory residents example discussed in the Article.

Social welfare is equal to the safety probability (that is, the probability that victims do not suffer harm) times victims' aggregate benefits from their activities less the injurer's precaution costs:

$ph - cp.$ (1)

The first-order condition for maximum is:

$c'(p) = h.$ (2)

(2) implicitly defines the socially optimal safety probability as a

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96.   For a more elaborate model, see Ehud Guttel & Shmuel Leshem, *Bargaining Around Cost-Benefit Standards*, 103 J. PUB. ECON. 55 (2013).

97.   Alternatively, to prevent a fraction *p* of victims' harm, the injurer must spend *c(p)*.

98.   Note that social welfare is $ph - cp$ (*see* (2)) and that, because $\frac{\partial c(p)}{\partial h} = 0, \frac{\partial (ph-c(p))}{\partial p \partial h} = 1$.

function of victims' aggregate harm.[99] We accordingly let $P(h): [0, \infty) \to [0, 1]$ map victims' aggregate harm to the socially optimal safety probability.

Under a cost-benefit standard, the injurer is required to take precautions so long as the marginal cost of precautions is lower than the corresponding marginal benefit. We now turn to examine the conditions under which the injurer can profit from buying out one victim under a cost-benefit standard.

Suppose that victims' aggregate harm is h and that the corresponding socially optimal safety probability is $P(h)$. Because each victim's harm is Δh, a victim's minimum buyout amount is $P(h) \cdot \Delta h$. Suppose further that a decrease of Δh in victims' aggregate harm reduces the socially optimal safety probability by Δp (that is, $\Delta p = P(h) - P(h - \Delta h)$). Then, the corresponding decrease in the injurer's socially optimal precaution costs, Δc, is roughly $\Delta p \cdot h$ (because, from (2), $\frac{\Delta c}{\Delta p} \approx h$). A buyout produces gains from trade, therefore, if $\Delta p \cdot h \gtrsim P(h) \cdot \Delta h$, which implies that $\frac{\Delta p}{P(h)} \gtrsim \frac{\Delta h}{h}$. That is, a buyout produces gains from trade if the percentage change in the optimal safety probability is sufficiently greater than the corresponding percentage change in victims' lost benefit.

Now, because $\frac{\Delta c}{\Delta p} \approx h$ (from (2)), Δh is roughly equal to the change in $\frac{\Delta c}{\Delta p}$ (call it $\Delta \frac{\Delta c}{\Delta p}$) as victims' aggregate harm increases from $h - \Delta h$ to h. Substituting $\frac{\Delta c}{\Delta p}$ for h and $\Delta \frac{\Delta c}{\Delta p}$ for Δh in the inequality $\frac{\Delta p}{P(h)} \gtrsim \frac{\Delta h}{h}$ implies that a buyout produces gains from trade if $\frac{\Delta p}{P(h)} \gtrsim \frac{\Delta \frac{\Delta c}{\Delta p}}{\frac{\Delta c}{\Delta p}}$. That is, a buyout produces gains from trade if the percentage change in the optimal safety probability is sufficiently greater than the corresponding percentage change in the additional precaution costs. The next Proposition states this formally:

Proposition 1 *(a necessary and sufficient condition for gains to trade from a one-victim buyout as $\Delta h \to 0$)*

As each victim's harm approaches zero, there are gains from trade between the injurer and one victim if: (a) the point elasticity of the socially optimal safety probability with respect to victims' aggregate harm is greater than 1: $P'(x) \frac{h}{P(h)} \geq 1$; or, equivalently, (b) the point elasticity of

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99. The assumption that $c''(p) > 0$ ensures that the value of p that solves (2) maximizes social welfare.

the marginal cost function with respect to the socially optimal safety probability is smaller than 1: $c''(p)\frac{p}{c'(p)} \leq 1$, *where p = P(h).*

Proposition 1 implies that there are gains from trade between the injurer and one victim as each victim's harm becomes infinitely small if and only if increasing the socially optimal safety probability by one percent increases the injurer's marginal precaution cost by less than one percent. For a buyout to produce gains from trade, therefore, the injurer's precaution costs must not be too expensive. The following example illustrates the condition in Proposition 1.

Example 1 *Suppose the injurer's cost of preventing harm with probability p is* $c(p) = \alpha p^{1.5}$, *where* $\alpha > \frac{2}{3}h$.[100] *Then for any* $p \in [0, 1]$, *the point elasticity of the marginal cost function with respect to the socially-optimal safety probability is smaller than* 1: $c''(p)\frac{p}{c'(p)} = 0.5$ *for any* $p \in [0, 1]$.

In this example, the condition in Proposition 1 holds for any value of victims' harm. Thus for any *h* there exists a sufficiently small Δh such that a buyout produces gains from trade.

The next Proposition generalizes the previous example by providing a *sufficient*, but not necessary, condition for gains from trade from a buyout.

Proposition 2 *(a sufficient condition for gains to trade from a one-victim buyout)*

There are gains from trade between the injurer and one victim for a sufficiently small Δh if, as victims' lost benefits increase, the rate of increase in the marginal socially optimal precaution costs is decreasing ($c'''(p) < 0$ *for* $p \in [0, P(h)]$).

PROOF**.** We first show that $c'''(p) < 0$ for $p \in [0, P(h)]$ iff $P''(x) > 0$ for $x \in [0, h]$. By implicit differentiation of (2) we have that, for $x \in [0, h]$, $P'(x) = \frac{1}{c''(P(x))}$. Differentiating both sides with respect to x gives $P''(x) = -\frac{c'''(P(x))}{[c''(P(x))]^2}P'(x)$. Because $P'(x) > 0$, it follows that $P''(x) > 0$ iff $c'''(p) < 0$.

We now show that if $P''(x) > 0$ for $x \in [0, h]$, then $P'(x)\frac{h}{P(h)} \geq 1$. This implies, by Proposition 1, that there are gains from trade between the injurer and one victim for a sufficiently small Δh. To see this, note that for

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100.   The assumption on α ensures that, for any *h*, the optimal safety probability is smaller than 1.

all $x \in [0, h]$, $P(x)P''(x) > 0$, because $P''(x) > 0$ by assumption. Dividing through by $[P'(x)]^2$ yields $\frac{P(x)P''(x)}{[P'(x)]^2} > 0$. Adding $1 - \frac{P(x)P''(x)}{[P'(x)]^2}$ to both sides gives $1 - \frac{P(x)P''(x)}{[P'(x)]^2} < 1$. Substituting $\left(\frac{P(x)}{P'(x)}\right)'$ for $1 - \frac{P(x)P''(x)}{[P'(x)]^2}$ the previous inequality becomes $\left(\frac{P(x)}{P'(x)}\right)' > 1$. Finally, integrating both sides from 0 to h gives $\int_0^h \left(\frac{P(x)}{P'(x)}\right)' dh > \int_0^h dh$, which simplifies to $\frac{P(h)}{P'(h)} > h$, because $P'(0) = 0$.

We finally show that, if a single-victim buyout produces gains from trade for some Δh, then it also produces gains from trade for any lower Δh. To see this, recall that a buyout produces gains from trade if $\frac{\Delta p}{P(h)} \gtrsim \frac{\Delta h}{h}$. Substituting $P(h) - P(h - \Delta h)$ for Δp and rearranging yields $h[P(h) - P(h - \Delta h)] \gtrsim \Delta h p(h)$. The left-hand side is increasing with Δh and the right-hand side is decreasing with Δh, which implies that, if $\frac{\Delta p}{p(h)} \gtrsim \frac{\Delta h}{h}$ holds for some Δh, it must also hold for any lower Δh.

Proposition 2 provides a sufficient condition for a single-victim buyout to produce gains from trade: the marginal precaution costs are increasing at a decreasing rate with the socially optimal probability of no harm. This condition means that the injurer's precaution technology is relatively efficient in that, for any safety probability, the marginal cost of precaution increases at a sufficiently slow rate.